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LIST OF ACRONYMS AND SYMBOLS

“	Inches
‘	feet
%	percent
°C	degrees Celsius
°F	degrees Fahrenheit
AWFCO	automatic waste feed cut-off system
bgs	below ground surface
BIF	Boiler/Industrial Furnace
Btu/lb	British thermal units per pound
Cal/OSHA	State of California Division of Occupational Safety and Health
CCE	Closure Cost Estimate
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CHIT	Container Hazard Identification Table
CIH	Certified Industrial Hygienist
CO	carbon monoxide
DAF	dissolved air flotation
DOT	Department of Transportation
DTSC	Department of Toxic Substances Control
DNF	dissolved nitrogen flotation
EBS	Emergency Broadcast System
EFT	Effluent Treatment Plant
EPA	Environmental Protection Agency
ESP	electrostatic precipitator
gpm	gallons per minute
HASP	Health and Safety Plan
HSO	Health and Safety Officer
IC	Incident Commander
kPa	kilopascals
LDR	land disposal restriction
M^3	cubic meters
MEK	methyl ethyl ketone
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MSDS	Material Safety Data Sheet
NFPA	National Fire Protection Association
NO_X	nitrogen oxides
NSR	Normalized Stoichiometric Ratio
OSHA	U.S. Department of Labor Occupational Health and Safety Administration
OVA	organic vapor analyzer
P&ID	Piping and Instrumentation Drawing

LIST OF ACRONYMS AND SYMBOLS

PEL	permissible exposure limit
PG&E	Pacific Gas and Electric Company
PMAO	Petrochemical Mutual Aid Organization
PPE	personal protective equipment
ppm	parts per million
ppmv	parts per million by weight
psi	pounds per square inch
psig	pounds per square inch gauge
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RWQCB	Regional Water Quality Control Board
SAP	Sampling and Analysis Plan
scfm	standard cubic feet per minute
SMR	Shell Martinez Refinery
STLC	soluble threshold limit concentration
TCLP	toxicity characteristic leachate procedure
TDC	total distributing control
TLV	threshold limit value
TSDF	Treatment, Storage, or Disposal Facility
TTLC	total threshold limit concentration
U.S. DOT	United States Department of Transportation
VOC	volatile organic compound
w.c.	water column

SECTION A. PART A

SECTION B. FACILITY DESCRIPTION

B.1 Facility Identification

Facility EPA I.D. Number:	CAD 009164021
Name:	Shell Oil Products US – Martinez Refinery A Division of Equilon Enterprises LLC
Mailing Address:	Shell Oil Products US – Martinez Refinery P.O. Box 711 Martinez, California 94553
Location:	Marina Vista and Shell Avenue Contra Costa County Martinez, California 94553
Telephone Number:	(925) 313-3000
Principle NAICS Code:	32411 (Petroleum Refineries)
Secondary NAICS Codes:	324121 (Asphalt Paving Mixture and Block Manufacturing) 324199 (Other Petroleum and Coal Products Manufacturing)

B.1.1 Facility Overview

The Shell Oil Products US – Martinez Refinery (SMR) is a petroleum refinery (Facility) owned and operated by Equilon Enterprises LLC.

Until March 1, 2002, Equilon Enterprises LLC was a joint venture between Shell Oil Company and Texaco, Inc. On March 1, 2002, Royal Dutch Shell purchased Texaco's interest in Equilon. Equilon remains the owner of the Martinez Refinery. Equilon owns and operates the Martinez facility as Shell Oil Products US – Martinez Refinery. The previous name under Equilon was "Martinez Refining Company, A Division of Equilon Enterprises LLC". Prior to that change, the refinery was named "The Martinez Manufacturing Company, owned and operated by the Shell Oil Company until March 31, 1996, and then became an independently operated subsidiary of Shell called "The Shell Martinez Refining Company" until June 30, 1998. The Hazardous Waste Facility Permit transfer from "The Shell Martinez Refining Company" to "Martinez Refining Company, A Division of Equilon Enterprises LLC" occurred on July 1, 1998.

In this permit application the terms "Refinery", "Facility", and "SMR" will be used interchangeably as descriptors for the Shell Oil Products US - Martinez Refinery.

SMR is located at the South shore of the Carquinez Strait, near the city of Martinez, California, on 1,000 acres of land. The products manufactured at SMR include gasoline, intermediate fuels (jet, diesel, kerosene), industrial fuels, and asphalt.

SMR has three units that currently treat hazardous waste. They are the Carbon Monoxide (CO) Boilers 1, 2 and 3. Hazardous waste from the wastewater treatment plant is accumulated in another regulated unit, Tank 12038, before being sent to the CO Boilers. The residence time of the waste in the tank is approximately one day.

Another treatment unit, the ETP-1 Biotreater, underwent delay of closure in 1998 and is in non-hazardous wastewater treatment service. Prior to the construction of the new SMR effluent treatment plant ETP-2, all process wastewater from SMR entered the ETP-1 Biotreater. The ETP-1 Biotreater was previously permitted since it processed wastewater with benzene concentrations greater than 0.5 mg/L. The new ETP-2 Biotreater tank is permitted under California Permit-by-Rule regulations. The ETP-1 Biotreater will remain in non-hazardous service. Since DTSC has authorized delay of closure of the unit (see **Section D.3**), SMR will close ETP-1 in accordance with an approved closure plan when the ETP-1 Biotreater ceases operation in the future.

Another treatment unit, the RM-17 Incinerator, went through closure in early 1996 and no longer incinerates hazardous waste. Another storage unit, Vessel 482, went through closure in early 1997 and now stores hazardous waste under Generator (90 day) requirements.

The three CO Boilers produce steam using carbon monoxide as a primary fuel. The CO fuel comes from two Refinery process, the catalytic cracking process and the flexicoking process, and is supplemented by refinery fuel gas. The three CO Boilers incinerate hazardous waste DNF solids (a listed RCRA hazardous waste) and Waste Biosolids. These are generated on site and are routed via Tank 12038 to the CO Boilers. Sulfinol Reclaimer Bottoms (a characteristic RCRA hazardous waste because of chromium) has been used in the past as a supplemental fuel in the boilers, but the waste stream is no longer generated on-site. The CO Boilers are equipped with an air pollution control system consisting of electrostatic precipitators to remove solids and a urea injection sytem to control emissions of nitrogen oxides.

B.1.2 Owner/Operator Identification

Name:	Equilon Enterprises LLC
Mailing Address:	Equilon Enterprises LLC 1100 Louisiana Street, Suite 2200 P.O. Box 4453 Houston, Texas 77002
Telephone Number:	(713) 241-7600

The owner of the facility and the land on which the facility is located is the same as the facility operator, Equilon Enterprises LLC.

B.1.3 Facility Contacts

Name:	Steven D. Overman
Title:	Senior Staff Engineer Shell Martinez Refinery
Work Telephone Number:	(925) 313-3281

B.2 Facility Maps and Location

A series of maps are provided for the Refinery. **Table B-1** provides a key to these maps.

Five topographic contour maps for SMR are provided because of size limitations. The area covered by each contour map is indicated on the simplified SMR sketch located in the lower right hand corner of each contour map.

B.2.1 Facility Location

Facility location maps are provided in Maps 1-5 (see **Table B-1**).

The location of each of the units is provided in **Table B-2**. Written legal descriptions of the properties on which the units are located are provided as follows:

Attachment B-18 – legal description of the property where the CO Boilers are located.

Attachment B-19 – legal description of the property where Tank 12038 is located.

B.2.2 USGS Topographic Maps

SMR is located on four United States Geologic Survey (USGS) maps which are Vine Hill, California; Benicia, California; Briones, California; and Walnut Creek, California (see **Table B-1**).

The Shell Oil Products US – Martinez Refinery property boundary, the area 2,000 feet from the property boundary, and the area one mile from the property boundary is indicated on the USGS maps. The maps show all surface water bodies.

B.2.3 Detailed Topographic Maps

Table B-3 lists the information that is provided and where the information may be found.

Note: Power lines and power poles are not present in the areas of the hazardous waste units as one sees them on the street. The power from the property boundary to the facilities is sent through lines that are placed in trays where the phone lines, instrument lines and computer lines are placed. These trays follow the same course as aboveground pipelines in SMR. Therefore, there are no power lines as one usually thinks of power lines at any of the hazardous waste units that could, for example, be brought down because a crane runs into them. Hence, no power lines are shown on the maps in conjunction with the hazardous waste units.

B.2.4 Water Well Location Maps

Maps 14 and 15 (see **Table B-1**) show the wells located on site. These wells are used for ground water monitoring. SMR has never used any wells for the underground injection of fluids.

The groundwater within one mile of SMR boundary does not meet secondary standards for drinking water. Therefore, there are no drinking water wells.

Map 16 (see **Table B-1**) shows the location of wells off-site within one mile of SMR. Information about these wells is presented here. This information was obtained from the Regional Water Quality Control Board, which received the information from the California Department of Water Resources. None of the water producing wells are located directly downgradient of SMR.

Well 1, located 2,000 feet west of SMR, is a cathodic protection well and does not produce water.

Well 2, located 5,200 feet southeast of SMR, was drilled as a test hole.

Well 3, located approximately 200 feet upgradient (south) of SMR, is a 90-foot deep irrigation well and is the only active supply within one mile of SMR.

Well 4, located 1,000 feet down gradient (north) of SMR, is a test well and is not used for water production.

Well 5, located 1,000 feet southeast (upgradient) of SMR, is an active domestic well that does not contain a pump.

B.3 Site Characteristics

B.3.1 Site Geology

The Shell Oil Products US – Martinez Refinery is an existing facility that is not undergoing substantial modification. The CO Boilers began operating in the late 1960s. Tank 12038 was built in 1989. The Shell Oil Products US – Martinez Refinery contracted with Woodward-Clyde Consultants to complete a seismic study for Tank 12038. The study shows that the tank is not located within 200 feet of a fault that has been displaced in Holocene time. A copy of the study is provided as **Attachment B-21**.

A seismic evaluation will be submitted for SMR active hazardous waste units and the associated certification will be included in **Section D**.

B.3.2 Site Hydrogeology (Groundwater)

The depth to groundwater for each of the hazardous waste units is provided in **Table B-4**. The data was generated by contractors hired by SMR to complete hydrogeological studies of SMR. The information has been submitted to the Regional Water Quality Control Board. The groundwater within one mile of the SMR perimeter does not meet secondary standards for drinking water.

B.3.3 Site Surface Hydrology (100-year Floodplain)

None of the previously or currently permitted hazardous waste units (CO Boilers or Tank 12038) lie within the 100-year floodplain. During a 100-year flood, the water level of the Carquinez Strait and connecting sloughs raise to an elevation of 6.0 feet (per the National Geodesic Vertical Datum of 1929). This information was submitted to the Regional Water Quality Control Board in the Report of Waste Discharge. The extent of the flooding associated with a 100-year storm is shown on Map 9 (see **Table B-1**).

Two Flood Insurance Rate Maps (FIRM) issued under the National Flood Insurance Program by the Federal Emergency Management Agency are provided (**Attachment B-22**). Tank 12038 is located on the FIRM titled "City of Martinez, California Contra Costa County" revised on May 2, 2002. The CO Boilers are located on the FIRM titled "Contra Costa County, California (Unincorporated Areas)" revised on September 7, 2001. The FIRM illustrate that the active hazardous waste units are not located in the 100-year floodplain. The 100-year floodplain shown on Map 9 does not exactly match the floodplain shown on the FIRM, but both maps illustrate the flood protection provided by berms that have been installed and which have changed the floodplain.

Because none of the hazardous waste units are located within the 100-year floodplain, SMR is not required to provide information regarding the hydrodynamic and hydrostatic forces expected from a 100-year flood, structural studies showing the design of operational units and flood protection devices and how these will prevent washouts, and a detailed description of procedures to remove hazardous wastes to safety before the facilities flood.

B.3.4 Traffic Information

B.3.4.1 Traffic Volumes

Traffic routing and control at SMR allows for free and safe access of routine and emergency traffic onto and about SMR. Everyday approximately 70 vehicles enter and leave SMR, however, only a small fraction of this traffic is associated with the operation of the CO Boilers or Tank 12038. Waste DNF Solids is transferred by pipes through the surge tank (Tank 12038) to the CO Boilers.

Approximately one flatbed truck every week is required to haul the precipitator fines from the CO Boilers off-site for disposal in a permitted Class I disposal facility. The truck route for the precipitator fines from the CO Boilers through the refinery to off-site is identified on Map 1.

The general traffic in SMR consists of product shipments (asphalt, sulfur, petroleum coke and propane), SMR personnel, contractors and hazardous waste shipments. The product shipments use cars, tank trucks and hopper trucks. SMR personnel use cars and pickup trucks. The contractors use pickup trucks, cars, vacuum trucks, end dumps, forklifts, cranes and backhoes. The hazardous waste shipments associated with SMR (as a generator not a hazardous waste facility) use bins, end dumps, vacuum trucks, enclosed vans and flatbeds.

SMR has an established traffic control system which is enforced by the Health and Safety Department. All vehicles entering and exiting SMR must be checked in and out at one of the vehicle gates shown on Map 1. The maximum speed limit in the refinery is 20 mph. In some operating areas the maximum speed is 15 or 10 mph. All speed limit requirements are posted. Reflectionized markers are present along roads where there is a bank. Each major intersection is marked with a stop sign and the other intersections are marked with yield signs. Some of the bridges in SMR are designated as one-lane bridges and others are posted with weight limits. If one lane of a road is blocked for any reason, a traffic control system is setup with flagged personnel.

B.3.4.2 Access Roads

All roads within SMR are constructed of black top pavement. The roads can handle an H20 load capacity that is the Department of Transportation's Code for the load capacity of a truck and trailer. This means that the roads in SMR can handle any truck that is allowed to travel on public roads.

Table B-1
Facility Maps

Map	Description	Attachment
Map 1	General Facility Map with Hazardous Waste Areas	B-1
Map 2	USGS – Vine Hill, California	B-2
Map 3	USGS – Benicia, California	B-3
Map 4	USGS – Briones Valley, California	B-4
Map 5	USGS – Walnut Creek, California	B-5
Map 6	Contra Costa County Land Use Map and (A-F) Legend	B-6
Map 7	Storm Water Drainage Area	B-7
Map 8	Simplified Map – Major Process Sewer and Storm Drain System	B-8
Map 9	1988 Contour Map – Hazardous Waste Facility Permit – 5-7615	B-9
Map 10	1988 Contour Map – Hazardous Waste Facility Permit – 5-7616	B-10
Map 11	1988 Contour Map – Hazardous Waste Facility Permit – 5-7617	B-11
Map 12	1988 Contour Map – Hazardous Waste Facility Permit – 5-7618	B-12
Map 13	1988 Contour Map – Hazardous Waste Facility Permit – 5-7619	B-13
Map 14	Ground Water Contour Map – December 1988 Western Portion	B-14
Map 15	Ground Water Contour Map – December 1988 Eastern Portion	B-15
Map 16	Well Survey Map	B-16
Map 17	Solid Waste Management Units-RCRA Permit Site Locations	B-17

Table B-2
Location of Units

Unit	Location Information
CO Boilers	90’ ∅ x 220’ high Latitude 38° 0’ 37”/ Longitude 122° 6’ 51” Township 2 North, Range 2 West, Section 17 Mt. Diablo Base and Meridian Parcel No. 378-110-009-8 Zoning: Heavy Industrial Land Use: Industrial
Tank 12038	20’ ∅ x 20’ high Latitude 38° 1’ 21”/ Longitude 122° 7’ 8” Township 2 North, Range 2 West, Section 18 Mt. Diablo Base and Meridian Parcel No. 378-110-013-1 Zoning: Heavy Industrial Land Use: Industrial

Table B-3
Map Information

Information	Location
Property boundary of facility	Map 1, 2, 3
Surroundings extending 2000 feet beyond property boundary	Map 2, 3
Latitude	Table B-2
Longitude	Table B-2
Township	Table B-2
Range	Table B-2
Section	Table B-2
Principal meridian	Table B-2
Assessors parcel numbers	Table B-2
Hazardous waste facility location	Map 1, 9, 11, 12
Contours and elevation	Map 9, 10, 11, 12, 13
100-year floodplain	Map 9
Location of surface water	Map 2, 3, 4, 5, 7, 8, 9, 11, 12, 13
Wind rose	Attachment B-20
Land uses and zoning for hazardous waste facilities	Table B-2
Land use within 2000 feet of property boundary	Map 6
Legal boundaries	Map 1,2,3
Location of permanent access roads	Map 1, 7, 8, 9, 10, 11, 12, 13
Location of permanent internal roads	Map 1, 7, 8, 9, 10, 11, 12, 13
Traffic associated with facility	Map 1 (**Section B.3.4**)
Security fencing	Map 1, 9, 10, 11, 12, 13
Access Control	Map 1 (**Section F.1.1)**
Locations of hazardous waste facility	Map 1, 9, 11, 12
Dimensions of hazardous waste facility	Table B-2
Environmental monitoring stations	Map 1, 14, 15
Control of drainage	Map 7, 8
Location of power poles, pipelines, easements (see note above)	Map 1, 9, 10, 11, 12, 13
Past and present solid waste management units	Map 17

Table B-4
Groundwater Depths

Facility	Depth to Groundwater
CO Boilers	50 to 60 feet
Tank 12038	4 to 5.5 feet

SECTION C. WASTE CHARACTERISTICS

The Shell Martinez Refinery has four units that are being permitted to treat hazardous waste, three CO Boilers and Tank 12038.

C.1 Information on Specific Wastes to be Stored in Tank 12038

Tank 12038 is used to store one hazardous waste stream (Dissolved Nitrogen Flotation solids otherwise known as DNF Solids) and one non-hazardous waste liquid (Waste Biosolids). The DNF solids waste stream is the same as the Dissolved Air Flotation (DAF) solids identified in the previous Part B application, except that nitrogen is added to the wastewater feed to the unit rather than air. The DNF Solids and Waste Biosolids waste streams are described below.

Sulfinol Reclaimer Bottoms was a characteristically hazardous waste stream that was intermittently (about once per year) added to Tank 12038. Since this process is no longer in use and the equipment has been dismantled, the Sulfinol Reclaimer Bottoms waste stream is no longer generated and will no longer be added to Tank 12038.

C.1.1 DNF (Dissolved Air Flotation) Float

a.	EPA Waste Code:	K048
b.	California Waste Code:	222
c.	Type by Name:	DNF (Dissolved Nitrogen Flotation) Float
d.	Hazardous Properties:	Toxic by 22 CCR §66261.32
e.	Estimated Quantity:	2,400 tons per month average 28,000 tons per year
f.	Process:	Waste generated from treatment of wastewater generated from petroleum refining and the manufacture of industrial organic and inorganic chemicals.
	NAICS Code:	32411 Petroleum Refineries
g.	Major Hazardous and Non-Hazardous Constituents:	DNF Solids See **Tables C-1, C-2, C-3**
h.	Solids loading:	5% average (4% to 6% range)

C.1.2 Waste Biosolids

a.	EPA Waste Code:	None (not a RCRA hazardous waste)
b.	California Waste Code:	None (Not a California hazardous waste per 22 CCR 66262.11)
c.	Type by Name:	Waste Biosolids
d.	Hazardous Properties:	Not Hazardous
e.	Estimated Quantity:	8,000 tons per month maximum 60,000 tons per year maximum
f.	Process:	Waste biomasss resulting from treatment of wastewater generated from petroleum refining and the manufacture of industrial organic and inorganic chemicals.
	NAICS code:	32411 Petroleum Refineries
g.	Major hazardous and non-hazardous constituents:	See **Table C-1, C-2 and C-3**
h.	Solids loading:	3% to 6%

C.2 Waste to be Burned in the CO Boilers

The following section provides information on the waste streams to be burned in the CO Boilers.

The proportion of the individual constituents in the combined waste to the CO Boilers will vary, but will generally be from about 26% to 41% DNF Solids with the remainder being Waste Biosolids. Since both of these waste streams contain about 5% solids, the solids content of the combined waste will also be about 5%. The physical properties of the combined waste are based on when the waste is composed of 33% DNF Solids and 67% Waste Biosolids.

The DNF Solids and Waste Biosolids are transferred by pumps through separate pipes to a common surge tank (Tank 12038) as they are generated. The combined wastes are pumped from Tank 12038 to the CO Boilers. The residence time of the wastes in the tanks is only about one day, which does not allow enough time for the solids, water and oil portions of the wastes to separate. However, Tank 12038 is equipped with a mixer to ensure homogeneity of the waste. Further, the pumps that move the waste also assist in homogenizing and mixing the waste.

The Refinery will preferentially route DNF Solids to Tank 12038 and will then add Waste Biosolids to the permit limit of 30 gallons per minute (gpm) combined waste feed for all the CO Boilers. At a given time, process conditions or steam demand from the boilers may reduce the amount of Waste Biosolids to the CO Boilers. Typical parameters (at the range midpoint) for the combined waste stream fed to the CO Boilers on an as-received wet basis are shown below:

a. Physical Properties:	Water:	94 to 98%
	Sludge (oil and solids)	2 to 6%
	Specific Gravity:	1 to 1.05
b. Ultimate Analysis on the Sludge	Carbon:	<1 to 4%
	Oxygen:	81 to 87%
	Hydrogen:	10 to 12%
	Nitrogen:	< 1%
	Phosphorus:	< 500 ppm
	Chlorine:	< 0.5%
c. Ash Content:	on Tk-12038 Wastestream:	0.5 to 2.50%
d. Heat of Combustion:	100 to 400 Btu/lb	

C.3 Waste Analysis Plan

The purpose of the waste analysis plan is to obtain precise, technically valid and properly documented analytical results. These results will be used to determine whether the chemical and/or physical composition of the waste analysis have been considered to ensure that the program goals are achieved.

C.3.1 Sampling Procedures

The sampling locations and sampling methods for the RCRA Waste Streams to be sampled at the Shell Martinez Refinery are listed in **Table C-4**.

The combined waste stream for CO Boilers will be analyzed. The individual waste streams (as described in **Section C.2**) will be analyzed separately if there is reason to believe that the process producing the individual waste stream has changed.

C.3.2 Constituents to be Sampled and Rationale

The constituents to be sampled for each waste stream are listed in **Table C-5**. The chemical and physical analysis used to characterize the waste streams were selected based on Shell Martinez Refinery process knowledge, the known historical characteristics of the waste streams and the regulatory requirements.

C.3.3 Analytical Methods

The analytical methods used to analyze each of the constituents are described in **Table C-6**. As laborotary methods evolve, equivalent test methods may be substituted.

C.3.4 Frequency of Sampling

C.3.4.1 CO Boiler Waste Streams

The combined CO Boiler waste stream will be analyzed on a semi-annual basis for the properties and by the test methods listed in this waste analysis plan.

C.3.4.2 ETP-1 Aerator (Biotreater) Waste Streams

As described in Section D.3, the Enhanced Treatment Plant #1 (ETP-1) is a surface impoundment that previously accepted wastewater streams that were hazardous waste. Since 1996, ETP-1 has only taken non-hazardous wastewater streams. Because ETP-1 now only accepts non-hazardous wastewaters but is an integral component to the refinery wastewater processing, SMR petitioned DTSC to allow closure of ETP-1 to be deferred. DTSC granted a Delay of Closure for this unit in a letter dated August 21, 2003. DTSC subsequently requested that SMR sample and analyze the feed and effluent streams to ETP-1 to confirm waste streams meet standards for non-hazardous waste. The sampling frequency will be similar to that for Tank 12038 displayed in **Table C-4**. The analytical method used for the feed and effluent samples is limited to EPA SW-846 Method 8260 for Volatile Organic Compounds.

C.3.5 Additional Requirements for Facilities Handling Ignitable, Reactive or Incompatible Wastes

No reactive, incompatible or ignitable wastes are treated in the CO Boilers. However, the facility is designed, constructed, maintained and operated to minimize the possibility of fire and explosion.

C.3.6 Quality Assurance/Quality Control (QA/QC)

The analytical methods used will be those specified in the waste analysis plan. The test methods employed will, at a minimum, follow the QA/QC procedures outlined in each EPA approved method, as specified in SW-846.

C.3.7 Chain of Custody

Chain of custody procedures, as specified in SW-846 Section 1.2, will be used for all samples. The chain of custody procedures are the basis for the documentation and control necessary to trace a sample from sample collection to final analysis. As part of this documentation, all samples and containers will be labeled.

C.3.8 Updating the Waste Analysis Plan

The waste analysis plan will be reviewed as appropriate to ensure its accuracy and revised. SMR will also meet the requirements of 22 CCR 66264.13(a)(4)(A), which states that the analysis must be repeated when the owner or operator is notified, or has reason to believe that the process or operation generating the hazardous waste has changed.

C.4 Waste Minimization

C.4.1 Refinery-wide

SMR has established a program to actively pursue the minimization of solid waste (hazardous and non-hazardous waste) both at point of generation (source reduction) and disposal off-site (recycle). The program is coordinated by the corporate office located in Houston, Texas and consists of a four step process. The steps of the process are:

(1) Identify and quantify the solid wastes generated at all locations nationwide.

(2) Prioritize the wastes according to regulatory requirements, quantity, locations at which waste is generated and economics.

(3) Develop methods to minimize waste by reducing generation, recycling, reclaiming, and treating to reduce volume and /or toxicity.

(4) Implement the waste minimization methods.

SMR has established a solid waste database, which includes (for each solid waste generated) the generator (SMR location), the annual quantity generated, hazard characteristics, physical characteristics, description of management method and cost of management method. The database is updated annually. This data is then used to identify and prioritize waste reduction opportunities.

The required annual Waste Minimization Certificate is in **Section K**.

C.4.2 CO Boilers

One hazardous waste liquid stream is burned in the CO Boilers, the DNF Solids.

The DNF Solids is a sludge byproduct generated at the Effluent Treatment Plant, which processes the wastewater generated throughout the Refinery before it is discharged to the Carquinez Straits. All refineries have some type of effluent treatment plant and generate sludge byproducts, though not all may have DNF units, which generate the DNF Solids. The Effluent Treatment Plant is a place where process water and storm water is accumulated and treated.

Refineries and chemical manufacturers use a large quantity of water in operation. Process water, which is used in the operation of the equipment, picks up solids that are brought in with feedstocks (like crude oil) and are generated in the operating equipment (like scale and rust). Further, the storm water that is collected on the property picks up dirt. The solids and/or oil in the process and storm water must be removed in order to meet the Regional Water Quality Control Board (RWQCB) requirements for water discharged from industrial sources.

The DNF unit is one of the units used in the processing the wastewater. Therefore, effluent treatment sludge byproducts will always be produced. Further, as the RWQCB's requirements become stricter to improve the quality of water that is discharged, the material removed from the water could increase the quantity of the effluent treatment sludge byproducts. Conversely, the Refinery has a source control program to reduce the amount of oil entering the process water

resulting in a decrease in the quantity of the effluent treatment sludge byproducts. Most importantly, however, is the fact that burning the DNF Solids and Waste Biosolids in the CO Boilers is, in itself, a waste minimization effort. Prior to 1980, the sludge byproducts were disposed of directly to land.

SMR typically routes nearly all DNF Solids that is generated to the CO Boilers. Waste Biosolids will be added to reach the maximum permit limit of 30 gallons per minute (gpm) on an hourly average of the combined waste stream feed to all three CO Boilers. Process conditions may limit the amount of Waste Biosolids that can be processed so that the total waste feed to the CO Boilers at any time may be less than 30 gpm.

The CO Boilers' primary fuel source is regenerator gas from the Catalytic Cracker. Supplemental fuel, such as natural gas or refinery gas, however is required in the CO Boilers for flame stability. See **Section D** for more information.

Table C-1 Inorganic /Physical Parameters of the CO Boiler Waste Feeds

Inorganic/Physical Parameters	Units	DNF Solids[2]	Waste Biosolids [2]
Hexavalent Cr	mg/kg	< 0.1	< 0.1
Reactive Sulfide	mg/kg	10	< 5
Flash (PMCC)	°F	> 150 (1)	> 150 (1)
Oil	%W	7.0 0.4 8.0	0.4 2 0.3
Water [3]	%W	90 95 88	95 95 97
Solids	%W	6 5 4	3 6 3
Ash	%W	1.5 1.5 2.0	0.9 0.8 0.9
pH	--	8.9 8.6 10.1	7.1 6.3 7.1
Total Metals			
Antimony	mg/kg	<0.2 0.14 <0.8	<0.2 <0.3
Arsenic	mg/kg	<0.8 1.1 1.1	<0.12 <0.34
Barium	mg/kg	12 70 15	2.3 14
Beryllium	mg/kg	<0.1 1.0 0.2	<0.1 <0.1
Cadmium	mg/kg	<0.2 <0.4 <0.4	<0.1 <0.4
Chromium	mg/kg	140 400 89	16 77
Cobalt	mg/kg	1.9 9.2 1.9	0.22 0.74
Lead	mg/kg	7.4 23 5	<0.2 <0.3
Mercury	mg/kg	0.56 0.16 0.35	0.13 <0.05
Nickel	mg/kg	27 250 59	3.2 29
Selenium	mg/kg	0.96 13 1	1.3 14
Silver	mg/kg	0.8 18 1	1.2 18
Vanadium	mg/kg	72 630 57	8.4 <4

(1) Samples too wet to analyze above 150°F

(2) Multiple columns of data represent analysis performed on samples drawn on different days.

(3) Water content of DAF Float and Waste Biosolids are actual water contents as the wastes are generated at the Effluent Treatment Plant. No water is added to the waste streams.

Table C-2
Toxicity Analysis Results for DNF Solids and Waste Biosolids

Parameter	Units	DNF Solids[(1)]	Waste Biosolids
Antimony	mg/L	<0.4	<0.02
Arsenic	mg/L	<0.04	<0.02
Barium	mg/L	<0.88	0.058
Beryllium	mg/L	<0.02	<0.001
Cadmium	mg/L	<0.01	<0.006
Chromium	mg/L	3.2	0.026
Cobalt	mg/L	<0.08	0.014
Lead	mg/L	<0.6	<0.03
Mercury	mg/L	<0.004	<0.002
Nickel	mg/L	1.5	0.047
Selenium	mg/L	<0.26	<0.02
Silver	mg/L	<0.2	<0.004
Vanadium	mg/L	2.2	0.11

(1) EPA Method 1330, SW846 utilized

Table C-3
Organic Constituents Present in DAF Float and Waste Biosolids

Parameter	Appendix VIII Compound	DNF Solids [2] (mg/kg)	Waste [2] Biosolids (mg/kg)
Benzene	*	5 - -	- -
Ethyl Benzene		- 14 120	- -
Toluene	*	62 27 320	- -
Xylene		180 92 390	- -
Benz(a)anthracene	*	4 - 4	- -
Bis(2-ethylhexyl)phthalate	*	- 32 31	- 2
Crysene		7 7 121	7 -
Di-n-octyl phthalate		- - 1	- -
1-Methylnapthalene		66 19 58	42 -
Napthalene	*	37 15 69	- -
Phenathrene		19 11 25	- -
Pyrene		8 - 6	- -
Cresols	*	26 10 8	- 3
2,4-Diethylphenol	*	3 4 -	- -
Phenol	*	15 9 11	- -

(1) Only those compounds detected are included in this summary.

(2) Multiple columns of data represent analysis performed on samples drawn on different days.

Table C-4
Sampling Procedures for the Shell Martinez Refinery RCRA Waste Streams

Waste Stream	Sampling Method	Sampling Location	Frequency
CO Boiler Waste Streams	Tap Sample	Tank 12038	Four grab samples taken over a 48-hour period and composited into one sample
ETP-1 Aerator (Biotreater) Feed Stream	Tap Sample	Sample Tap at ETP Control Room Lab	Four grab samples taken over a 48-hour period and composited into one sample
ETP-1 Aerator (Biotreater) Effluent Stream	Tap Sample	Sample Tap at ETP Control Room Lab	Four grab samples taken over a 48-hour period and composited into one sample

Table C-5
Analytes for the Shell Martinez Refinery RCRA Waste Streams

Waste Stream	Analytes
CO Boiler Waste Stream	Total Organic Halogens Heating Value Ultimate Analysis (C, O2, H2, N, P, and Ash) Moisture Volatile Organic Compounds Semi-Volatile Organic Compounds RCRA Metals Chlorine/ Chlorides
ETP-1 Feed and Effluent Waste Streams	Volatile Organic Compounds

RCRA metals include Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Lead, Mercury, Nickel, Selenium, Silver and Thallium.

Table C-6
Analytical Methods for the Shell Martinez Refinery RCRA Waste Streams

Analyte	Analytical Method
GENERAL ANALYTES	
Total Organic Halogens	EPA SW-846 Method 9020
Heating Value	ASTM Method D-240
Ultimate Analysis	
Carbon	ASTM Method D-5291
Oxygen	ASTM Method D-5291
Hydrogen	ASTM Method D-5291
Nitrogen	ASTM Method D-5291
Phosphorus	EPA SW-846 Method 365.2
Ash	ASTM Method D-482
Chlorides	EPA SW-846 Method 300
METALS	
Antimony	EPA SW-846 Method 6010
Arsenic	EPA SW-846 Method 6010
Barium	EPA SW-846 Method 6010
Beryllium	EPA SW-846 Method 6010
Cadmium	EPA SW-846 Method 6010
Chromium	EPA SW-846 Method 6010
Lead	EPA SW-846 Method 6010
Mercury	EPA SW-846 Method 7471
Nickel	EPA SW-846 Method 6010
Selenium	EPA SW-846 Method 6010
Silver	EPA SW-846 Method 6010
Thallium	EPA SW-846 Method 6010
ORGANIC ANALYTE	
Total Organic Halogens	EPA SW-846 Method 9020
Semi-Volatile Organic Compounds	EPA SW-846 Method 8270
Volatile Organic Compounds	EPA SW-846 Method 8260

SECTION D. PROCESS INFORMATION

The Refinery currently has four permitted hazardous waste treatment, storage or disposal units: Tank 12038 (see **Section D.1**) and three CO Boilers, COB-1, COB-2, and COB-3 (see **Section D.2**). Tank 12038 is used for temporary storage of hazardous waste. The three CO Boilers treat hazardous waste and are regulated as BIF (Boiler and Industrial Furnace) units. Each of these permitted units is described below. In addition to these four units, the Effluent Treatment Plant #1 (ETP-1) Biotreater was formerly used to manage hazardous wastewater streams. This unit no longer accepts hazardous waste and was DTSC granted a Delay of Closure to this unit (see **Section D.3**).

Other hazardous wastes are generated on-site and are accumulated before being disposed of off-site. Although some containers are used to manage hazardous waste at the Refinery, no containers are used for the storage of hazardous wastes. Therefore the requirements for facilities that store containers do not apply to the SMR.

No underground tanks are used for the storage of hazardous wastes.

D.1 Tank 12038

Tank 12038 is an aboveground tank installed to replace tanks 1065 and 383, which have both been dismantled and removed from the Refinery. Tank 12038 was installed in May 1991 and was repaired and re-certified in 1993.

D.1.1 Process Description

Tank 12038 is a surge vessel for the waste feed (hazardous waste DNF Solids and non-hazardous Waste Biosolids) to the CO Boilers. The DNF Solids and Waste Biosolids are continuously generated. In order to handle the quantity of waste liquid generated, the waste must be burned continuously in the boilers. Therefore, the tank is used only as a surge vessel with the tank providing a residence time of approximately one day.

A process flow diagram for Tank 12038 is provided in **Figure D-1**. DNF Solids is pumped from a sump through a pipe that is connected to Tank 12038. Biosolids from the Biotreater are also pumped via pipe into the DNF Solids inlet pipe to the tank. The DNF Solids and Waste Biosolids are then pumped through the same pipe to Tank 12038. The pipe system is designed and operated such that both materials can be pumped through it at the same time.

Mixing of the two waste streams occurs in the tank through pumping and an agitator in the top of the tank and involves no chemical reactions. The formation of combustible vapors is prevented by maintaining a nitrogen blanket in the tank's void space. The mixed waste stream is continually pumped out of the tank to the CO Boilers via a pipe. If the tank is overfilled, waste can also exit the tank into an overflow sump. The tank is equipped with high level alarms and the overflow sump has a level switch to alarm when liquids are detected in the sump.

The feed system to Tank 12038 consists of four air-powered pumps to transfer the DNF Solids and the Waste Biosolids into the tank (see **Figure D-1** for a Process Flow Diagram). The two air-powered pumps for the DNF Solids are controlled manually. The sump, which first receives the DNF Solids, has a level indicator with a high and low level alarm. The alarm is located in the Effluent Treating control room and is both audible and visible. When the alarm is activated, the operator either starts up or shuts down the pump(s) accordingly. The air-powered pumps for the Waste Biosolids are controlled by the level in the sludge thickener. (The sludge thickener is used to remove biosolids from a slipstream of biosolids sludge removed from the Biotreater to control the biota concentration.) The level indicator on the sludge thickener sends a signal to a set of control valves. When the sludge thickener level is below the set point, a control valve maintains the Waste Biosolids recycling back to the sludge thickener. When the sludge thickener level is above the set point, a control valve allows the Waste Biosolids to flow to Tank 12038.

D.1.2 Equipment

Figure D-2 is a Piping and Instrumentation Drawing (P&ID) of the tank system. The tank system consists of a leak detection system, a nitrogen purge system, a vent absorber, a level indicator and alarm system, a mixer, flame arrestor, an overflow sump, grinders, a screen, and associated pipes, valves, and flanges.

a. Tank 12038

Tank 12038 is a double wall and double bottom tank with a cone roof. The tank is 20 feet in diameter and 20 feet high, has a capacity of 47,754 gallons, and is nitrogen-blanketed. Design features of Tank 12038 are listed in **Table D-1**. The double wall and double bottom on the tank provide full secondary containment and leak detection. The tank was constructed according to API 650 specifications of carbon steel to meet the EPA requirements for hazardous waste storage tanks. Drawings of Tank 12038 are included in **Figure D-3**.

The interior wall and bottom of the Tank 12038 primary shell is lined with a cross-linked epoxy-phenolic coating manufactured by Wisconsin Protective Coating Corporation. The manufacturer's specification information on the coating is provided in **Attachment D-1**. Carbon steel with a phenolic coating is an appropriate material of construction for this tank and is compatible with the waste because:

a. the combined waste of DNF Solids and Waste Biosolids in the tank is about 95 pecent water with the remainder being sludge (oil and solids), and

b. the pH of the waste is about 6 to 10.

The Plasite coating on the tank also helps to protect the inner tank wall from corroding above the liquid level due to the possible presence of low concentrations of hydrogen sulfide in the vapor space in this tank.

The secondary shell serves as the secondary containment for the tank. The interstitial space between the primary and secondary shell is equipped with a continuous monitor to detect leaks

(discussed below) from the primary tank. The interstitial space between the two shells is equipped with a pressure/vacuum relief valve. The interstitial space is a totally enclosed space containing a fixed quantity of gas. Ambient temperature changes may cause a change in pressure in the interstitial space up to +/- 1 psig. The pressure/vacuum relief valve, which relieves to the atmosphere, is present to control the pressure fluctuations in the interstitial space. The relief valve is set to minimize thermal breathing which minimizes the amount of atmospheric moisture in the interstitial space.

b. Leak Detection System

The leak detection system consists of Ronan's Series X76S Leak Detector Monitor System Model LS-3. The manufacturer's instructions and operating manual for the monitor system is provided as **Attachment D-2**. The secondary bottom of the tank is sloped 1 inch per 10 feet to allow any material present in the interstitial space to be collected in one place. A drain is present at this low point which is kept closed. Two leak sensors are suspended in the interstitial space as close to the floor as possible near this low point. The sensors act as a backup for each other with only one needing to detect liquids to trigger an alarm. The leak detector monitor is equipped with an audible and visual alarm that is located in the control room. A blinded six inch valve is provided on the secondary shell where the sensors are located to allow for inspection and testing of the sensors and for sampling of any material that is collected. The sampled material is visually inspected for solids and hydrocarbon, which indicates if DNF Solids or Waste Biosolids have been released from the primary shell. A vacuum truck hose can be connected to this valve to remove any material accumulations in the secondary shell.

c. Nitrogen Purge

A nitrogen blanket is maintained in the tank's void space above the liquid level to prevent formation of combustible vapor mixture.

d. Vent Absorber

A vapor control system is present for the primary shell to control emissions of both volatile organic compounds and hydrogen sulfide. The system utilizes two 55-gallon canisters filled with IVP (caustic treated) granular activated carbon. The carbon is changed at least once per month.

e. Instrumentation

The tank has leak detectors inside the walls to detect leakage with alarms in the Effluent Treatment Plant control center. Telepulse gauging makes it possible to set low and high alarms that will activate in the Logistics control center. The telepulse gauging system will also alarm at any incorrect movement in the tank, which is not in the proper mode. The telepulse gauging system is checked at least monthly against actual tank gauging done by hand.

Tank 12038 is equipped with an overfill prevention system. The tank has a level indicator (bubbler type) which reads out at the Logistics Control Center. The level indicator is connected to a high/low level alarm that alarms both audibly and visually in the Effluent Treatment Plant control room. This level and alarm system is supported by a second independent level switch

that is connected to a high-high level (audible/visual) alarm that alarms audibly in the Logistics Control Center.

f. Mixer

A top-mounted mixer is locate in the center of the tank and attached to the roof. The mixer has a 7.5-horsepower motor and rotates at 45 revolutions per minute (rpm). The material of all wetted parts is 316 series stainless steel. See **Figure D-4** for more details on the mixer. Three vertical baffles are installed in the tank to improve the effectiveness of the mixer.

g. Flame Arrestor

A flame arrestor is connected between the roof of the tank and the vent absorbers and prevents flash back of ignited vapors to the tank.

h. Overflow sump

The primary shell has an overflow line with a liquid seal. This line flows into a concrete sump by the tank. The sump is connected to the effluent system through a valve. This valve is kept closed and visually inspected daily to insure that it is closed. The inspection is documented on the "Daily Hazardous Waste Storage Tank Inspection Sheet" (see **Section F.2.1.**). The valve is opened only to drain uncontaminated rainwater to the effluent system. The sump is equipped with a level indicator which alarms in the control room if the tank overflows.

i. Grinders and Screen /basket strainers

The pipes flowing from Tank 12038 to the CO Boilers are equipped with two comminutors SP-1762 and SP-12339 (grinders) which pulverize the biosolids to aid flow through the pipes. In addition, the lines have dual sludge strainers (SP-1763) to filter any large biosolids. Each set of strainers consists of two identical strainers so that the process does not need to be stopped for the strainer to be cleaned.

j. Pump and Pump Controls

The combined waste of DNF Solids and Waste Biosolids is pumped to the CO Boilers to be burned. The waste feed pumping rate is set by controlling inventories in Tank 12038. Two pumps can be used to pump the waste to the boilers. Pump P-4385 is in parallel service with Pump P-4207 and can be lined up and operated in a similar fashion. P-4385 differs from P-4207 by having a higher output pressure, approximately, 450 psig at 20 gpm (rates and pressures vary somewhat with the consistency of Floc). Both pumps use a gear reducer from motor to pump. P-4385 us used as the primary pump while P-4207 is used as the spare.

These pumps are controlled by Start/Stop stations at each pump. Both pumps are interlocked with the comminutors. If the selector switch is in the REMOTE position, the grinder will start and stop with each floc pump. If the grinder reaches an overload condition either pump that is running will stop. Along with the grinder the comminutors package includes a strainer which is back flushed back to Tank 12038.

Integral to the waste feed system is the back pressure control loop. The control valve maintains the set pressure on the pump discharge by recalculating flow back to Tank 12038. The recirculation gives control of flow at the CO Boilers. The back pressure is set such that a pressure of 60 psig exists just upstream of the control valve.

Pumps 4385 and 4207 are positive displacement pumps and therefore require a relief valve for line protection. The relief valve is located near the strainers and is set at 425 psig.

k. Other Features

Tank 12038 is marked with the National Fire Protection Association (NFPA) label with hazard descriptions and a hazardous waste label which reads "Caution -- This Tank Contains Hazardous Wastes" in English and Spanish with 1" lettering. A "Container Hazard Identification Table" required by Federal OSHA Hazard Communication Standard is located in a green box by the operator shelter. The Container Hazard Identification Table provides information on the contents of Tank 12038 and other pieces of equipment to all personnel present in the operating area of the Refinery.

D.1.3 Requirements for Ignitable or Reactive Wastes

Although the waste placed in Tank 12038 is not ignitable or reactive, the tank is designed to comply with the special provisions required for tanks that contain ignitable or reactive wastes. The waste in Tank 12038 is stored in such a way to protect it from any material or conditions that may cause the waste to ignite or react. The tank is an enclosed tank (i.e., closed roof) so that other materials cannot come in contact with the waste. The tank is grounded to prevent formation of a static charge that could ignite the waste and the tank vapor space has a nitrogen blanket to maintain an environment that is oxygen deficient and cannot support combustion. Also, any work done on or around the tank that may create a source of ignition must be done under a Health and Safety permit. Issuance of a Health and Safety permit requires the Operations Foreman and a Health and Safety Inspector to specify what precautions need to be taken to insure that a fire or explosion does not occur.

Tank 12038 meets the requirements of Tables 2-1 through 2-6 of the National Fire Protection Association's "Flammable and Combustible Liquids Code". For a tank that has a capacity less than 50,000 gallons, the tank must be at least 30 feet from the property line and 10 feet from any public way and the nearest on-site building. Tank 12038 is approximately 215 feet from the property line and approximately 42 feet from the nearest public way and on-site building.

D.1.4 Response to Leaks or Spills or if System Becomes Unfit for Continued Use

If the tank or secondary containment has a leak or spill or is unfit for use, the tank will be removed from service and the following requirements will be satisfied (See 22 CCR 66264.196 for a more detailed procedure):

- Flow of hazardous waste into the tank will be immediately stopped, and the tank system will be inspected to determine the cause of the release.

- If the release is from the tank system, within 24 hours or at the earliest practicable time, waste will be removed from the spill area to prevent further release of hazardous waste to the environment, and to allow inspection and repair of the tank system.

- If the material was released to the secondary containment, all released materials will be removed within 24 hours or in a timely manner as is possible.

- Once a release is detected, a visual inspection of the release will be immediately conducted, and, based upon the inspection: (1) every effort will be made to prevent further migration of the leak or spill to soils or surface water; and (2) visibly contaminated soils or surface water will be removed and properly disposed.

- Any release to the environment will be reported to DTSC within 24 hours of its detection, unless: or the leak or spill is less than or equal to one pound of hazardous waste and the leak and spill is immediately contained and cleaned up. Releases may also be reportable under 40 CFR 302.

- Within 30 days of detection of a release to the environment (which is reported to the Agency under RCRA), a report containing pertinent information as outlined in 22 CCR 66265.196(d)(3)(i)-(v) will be submitted to the Agency.

If a tank system has undergone extensive repair as defined in 22 CCR 66265.196(f); then an appropriate certificate attesting to the tank system integrity, which is signed by an independent, qualified, registered professional engineer, will be obtained before returning the tank system to service. This certification will be submitted to the Agency within seven days after returning the tank system to use.

D.1.5 Tank Certification

The certification for Tank 12038 is provided in Appendix 1.

The condition of Tank 12038 will be reassessed regularly by Shell Pressure Equipment Inspection group according to the following schedule. This is in addition to the daily inspections done on the tank by operators.

Visual external inspections:	Annual Roof Inspection
	Tank shell, foundation, nozzles every 5 years
Ultrasonic Thickness Readings:	Roof thickness every 5 years External shell and nozzles every 10 years
Radiographic Inspection:	Nozzles every 10 years
Piping from Tank to CO Boilers:	Ultrasonic thickness (UT) and Radiographic Tests (RT) for thickness every 5 years
Operations Inspections:	Check for leaks between inner and outer compartment via the drain valve Monthly external inspection of tank condition

The above inspection schedule is based on a combination of normal industry practices and the many years of experience by SMR in handling the DNF Solids and Bios lids material in a tank.

D.1.6 Inspection Procedure

See **Section F** for inspection schedules and forms. This includes:

- Daily tank inspections, and
- Daily biosludge feed line inspections

D.1.7 Compliance with Title 22, Chapter 14, Articles 27, 28 and 28.5

Tank 12038 is not subject to Title 22, Chapter 14, Article 27 (RCRA Subpart AA) standards for process vents because the tank is not one of the process units described in 22 CCR 66264.1030(b).

Tank 12038 is also not subject to Title 22, Chapter 14, Article 28 (RCRA Subpart BB) Air Emission Standards for Equipment Leaks because the Tank 12038 waste streams do not contain greater than 10% organics as specified in 22 CCR 66264.1050(b).

Tank 12038 is subject to the Title 22, Chapter 14, Article 28.5 (RCRA Subpart CC) Air Emission Standards for Tanks, Surface Impoundments, and Containers. Refer to **Section L** of the Part B Permit Application.

D.2 CO Boilers

D.2.1 Process Description

There are three CO Boilers of identical design at the refinery. Each boiler burns waste received from Tank 12038. The CO Boiler feed system is shown in **Figure D-2**. The combined waste feed is a liquid with about 95% water and 5% or less biosolids (dead biota and organic compounds) and has a heating value less than 1,000 Btu/lb. (See **Section C** for the composition range of the waste feed). To prevent plugging problems, a Simplex strainer (SPP-15383) was installed in the waste liquid line before it splits to the 3 boilers. The maximum waste feed rate is 30 gpm hourly rolling average combined for all boilers. The CO Boiler process flow is shown in **Figures D-5, D-21, and D-22**.

The CO Boilers burn three gaseous fuels described below:

1) Fluid Catalytic Cracker Unit regenerator off-gas, a fuel containing CO, is burned continuously in the CO Boilers.
2) Flexicoker gas (FXG), a fuel containing CO, is burned in the boilers as required to meet steam demand.
3) Refinery fuel gas (RFG), a common refinery fuel similar to natural gas, is a mixture of natural gas and hydrocarbon gas that is produced in the refinery and is burned continuously in the CO Boilers.

The three CO Boilers were also formerly equipped to burn refinery-produced low sulfur fuel oil. However, the current Title V air permit from the Bay Area Air Quality Management District no longer allows fuel oil to be burned in these boilers.

The Fluid Catalytic Cracking Unit regenerator off-gas is the primary fuel for the CO boilers. Combustion of the regenerator off-gas does not produce enough heat to maintain its own combustion. Therefore, support fuels must be burned to keep the regenerator off-gas above the minimum temperature required for combustion.

Flexicoker gas and refinery fuel gas are the support fuels for the CO boilers. Flexicoker gas is introduced through a duct into the boiler while fuel gas and the waste liquid are burned directly in the burners. Combustion air is controlled by varying the blower speed to maintain a constant excess oxygen concentration in the flue gas. The oxygen content of the combustion gases is normally 2 to 2.5%. Each firebox has four burners; two are used for burning waste feed (burners 1 and 4). Fuel gas (FXG and RFG) is burned in all four burners as a support fuel. Each burner has a central gun that uses steam to atomize the waste liquid (combined DNF Solids and Biosolids) with a waste turndown ratio of 3:1. **Figures D-6 and D-7** show the typical congifuration of the waste feed to the burner and the burner arrangement on the CO Boiler. These are typical configurations and are representative of all three CO Boilers.

The urea injection system was retrofitted to the CO boilers to reduce emissions of nitrogen oxides (NO_X). The system does not alter the structure or operation of any other air pollution control device or the boiler. The system was tested in April and May of 1992, as required by the Bay Area Air Quality Management District (BAAQMD). During the testing, the system reduced NOx emissions close to 50% while operating well under the regulatory limit for ammonia slip (50 parts per million by volume at 3% O_2, 3-hour rolling average). Testing also showed that ammonia slip and NO_X reduction depend strongly on firebox temperature and that ammonia slip rates vary inversely with firebox temperature and directly with Normalized Stoichiometric Ratio (NSR). The NSR is the desired molar ratio of urea injected to the amount of NO_X produced. NO_X reduction also varied inversely with firebox temperature and directly with NSR.

A 50% urea solution is periodically delivered to the storage tank by truck. With the condensate dilution system, the solution is diluted to 40% urea as the tank is filled. This prevents crystallization from occurring. The tank is equipped with a tank level indicator, mixer, and a high-level alarm and beacon. Any spills in the truck unloading area are collected in a sump and released to the process sewer after testing.

The urea solution is further diluted with condensate prior to being injected into the boiler. The concentrated urea stream and the condensate stream are merged immediately downstream of their control stations and mixed via an in-line mixer. The resulting diluted urea solution is then piped to each boiler's four injectors.

The injectors are mounted on the north wall of each CO boiler just underneath the boiler convection section. Nozzles in the tips of the injectors, which extend into the boiler, direct the atomized spray down into the main flow of gas. The injectors have two air supplies, one for

atomizing the urea solution and the other for cooling the injector assemblies. There is a flow alarm on the atomizer air to each injector and a low-pressure alarm on the air supply.

Currently, the urea injection system is controlled by a total distributing control (TDC) flow controller. The urea flow rate is determined based on the NO_X production of the boiler. The urea injection system is controlled by a process computer. The computer determines the amount of urea to inject based on the boiler's NO_X production and NSR. The computer maintains this ratio by manipulating the urea flow rate to the boiler. In the event of a computer failure, the urea flow will automatically reset to a conservative urea flow rate to prevent excessive ammonia emissions. In the future, urea injection will be controlled to a control NO_X mass emissions limit.

Combustion air is moved into each boiler by a forced draft fan. The fan flow rate is optimized to give a minimum residence time of 0.5 seconds (at 1,800°F) for gases in the firebox and display a reading of less than 3% excess oxygen by the stack gas analyzer. Flue gas from the firebox is cooled in the boiler heat exchange section. The flue gas then enters the electrostatic precipitator at approximately 600°F. The precipitator design is the plate-and-wire type (see **Figure D-8**).

Perforated distribution plates at the inlet spread the gas uniformly across the precipitator. The plates and wires maintain a field voltage between 200 to 220 volts and current between 0.5 to 1.0 amp/field to capture particulates. The particulates captured on the plates are later dislodged from the hoppers with a combination of an air horn vibration system and air cannons. There are two air horns installed on opposite walls (north & south) of each hopper. Their purpose is to provide acoustical cleaning of accumulated solids in the hoppers. One air cannon located at the base of each hopper clears particulates from the bottom outlet valves. Particulate removal from the hoppers is managed by a relay timed control system. When the control system energizes, the rotary star valve at the bottom of each hopper opens. The air horns then send out sound waves that encourage dust to slide to the bottom of the hopper.

After a prescribed length of time has elapsed, the timer activates the air cannon, which rapidly discharges a small volume of air into the bottom of the hopper and facilitates solids flow into the screw conveyor. The air horns and air cannons are located on the hoppers for all three CO Boilers, with eight hoppers per boiler. The air horns and air cannons were installed after a study which characterized the solids and then showed pneumatic equipment to be more effective than previously used mechanical vibrators in mobilizing the CO Boiler fines.

The ash (catalyst fines and fly ash solids) is removed from each hopper through a rotary star valve into an enclosed screw conveyor, which moves the solids to the main dust hopper (see **Figure D-9**). The main dust hopper has a vent that allows equalization of hopper pressure with ambient pressure. The vent is covered with a bag filter. As solids are removed, a net flow of gas of about 2 ACFH moves with the solids and eventually out through the vent. Solids are emptied from the hopper into sling bags, which are transported off-site for disposal.

The flue gas flows from the electrostatic precipitator into the stack at rates up to 180,000 SCFM and is discharged at a temperature of 500 to 600°F.

D.2.2 Equipment

The CO Boiler systems consists of the following components: Firebox, Draft Fan, fluegas duct upstream of the ESP, Urea Injection System, and Electrostatic Precipitator, conveyor, dust hopper, sling bag, fluegas duct downstream of the ESP, the stack and pumps. A diagram of each piece of equipment is provided in **Figure D-10**.

a. Firebox (F62, F64, F68)
Manufacturer - Alcorn Combustion Manufacturing Company
Model Number - no model number
Material - carbon steel
Dimensions - 29.6 ft length, 19.16 ft width, and 12.9 ft height
Volume - L-shaped with an inside volume of approximately 5,300 cubic feet
Maximum heat duty - 207 MMBtu/hour
Normal discharge pressure - about 5 inches water column (w.c.).
Design Features - four fuel burners, dual-fluid type, pyramid 80 refractory is 9.5 inches thick on the floor and 9 inches thick on the walls, boiler convective section has 5-inch thick refractory

b. Flue gas duct upstream of the ESP
Location - between boiler and ESP
Material - carbon steel lined with refractory

c. Draft Fan (B179, B180, B181)
Design Capacity - 105,000 ACFM
Design Pressure - 15 inches water column

d. Urea Injection System (See **Figure D-11**)
Storage Tank - 54,000gallon capacity, 22' x 22', internally coated, cone roof with mixer
Pumps - Urea injection pump 12168, Flow: 5-180 gph. Spare pump 12183
Process - NO_X emissions reduction by conversion of NO_X to N2
Filters - Condensate filter SP-12170, urea filter SP-12169, both with backflush
Dilution System - diluent water flows through the filter at 150 to 500 gph
Atomizing Injectors - four injectors per boiler, two to five SCFM flow rate to each injector

e. Electrostatic Precipitator (SP-75, SP-76, SP-77) with dust hoppers
ESP Design - plate and wire type (two chambers with four fields in each chamber)
Manufacturer - Research-Cotrelle
Design Features - bus section, air horn vibration system, air cannon system, rotary star valve

Dust hoppers - eight per boiler (four north side, four south side) to one main dust hopper via conveyors

f. Conveyor (S-690, S-691, S-692, S-693, S-694, S-695, S-696, S-698)
Type - screw type

g. Sling Bag
Manufacturer - Helios Container Systems
Material - woven polypropylene, reinforced seams
Volume - 36 cu ft, 35x35x42 inches, 3000 lb capacity
Additional Description - DOT-approved

h. Flue gas duct downstream of the ESP
Material - carbon steel

i. Stack
Material - carbon steel
Diameter - 8 ft outside diameter

D.2.3 Instrumentation

The original pneumatic controls at the boilers were replaced with Honeywell TDC equipment in the early part of 1998. Computer control allows multiple parameters to be monitored simultaneously and optimized for peak performance. Some of the transmitters, indicators and controllers used in the boilers are listed below. The automatic waste feed cut-off system depends on instrumentation described below and is further discussed in **Section D.2.4**. **Table D-2** lists test and calibration requirements for the monitoring and recording devices used to operate the CO Boilers.

a. Firebox Instrumentation

The instrumentation on the waste feed burners (guns) is shown on **Figure D-15** (COB-1), **Figure D-16** (COB-2) and **Figure D-17** (COB-3) and is summarized below.

Instrument Summary		**Description**	**Type of Monitor**	**Instrument Range**	**Description of Operation**
Instrument	DCS Signal				
9TE 3193 9TE 3182 9TE 3195	9TI 3193 9TI 3182 9TI 3195	Firebox Temperature (East)	Thermocouple	1,500 to 2,500	Monitors firebox temperature - east thermocouple
9TE 3176 9TE 3194 9TE 3188	9TI 3176 9TI 3194 9TI 3188	Firebox Temperature (West)	Thermocouple	1,500 to 2,500	Monitors firebox temperature - west thermocouple

9PT 1724 9PT 1725 9PT 1751	9PI 1724 9PI 1725 9PI 1751	Firebox pressure	Pressure sensor	0 – 10" w.c.	Monitors firebox pressure
9FT 2669 9FT2672 9FT2675	9FC 2669 9FC 2672 9FC 2675	Waste Feed Flow	Flow meter	0 – 14 gpm	Monitors waste feed flow to the firebox

b. Urea Injection System Instrumentation

Equipment Number	Description	Type of Monitor	Instrument Range	Description of Operation
PSL2576 PSL2596 PSL2616	Air supply alarm	pressure gauge	0-100 psig	indicates low air flow to the urea injection system; alarms at 65 psig
FT2577 FT2597 FT2617	Atomizing and cooling air	flow meter	0 - 6000 SCFM	Monitors cooling and atomizing air to the boilers
LI2567 LT2567	Level indicator	Float	10.5" to 19' 8 1/8"	Indicates level in Tank 12166
FT2568	Urea flow	flow meter	0-4 gpm	Monitors urea flow to the boilers or recycled back to Tank 12166
FT2574 FT2594 FT2614	Urea flow	flow meter	0-80 gpm	Monitors urea flow to each boiler
FT2573 FT2593 FT2613	Condensate flow	flow meter	0-3.7 gpm	Monitors condensate flow to each boiler

c. Electrostatic Precipitator Instrumentation (including conveyor, dust hopper, sling bag) is summarized below and also shown on **Figure D-19**.

Instrument Summary		Description	Type of Monitor	Instrument Range	Description of Operation
Instrument	DCS Signal				
9ET 2670 9ET 2673 9ET 2676	9EI 2670 9EI 2673 9EI 2676	Power to Precipitators	Current	0 - 352 KVA	Measures power supply to electrostatic precipitator plates

d. Stack Instrumentation

Instrument Summary		Description	Type of Monitor	Range	Description of Operation
Instrument	DCS Signal				

9AT 2610 9AT 2611 9AT 2607	9AI 2610 9AI 2611 9AI 2607	Oxygen Monitor	Teledyne	0 - 10%	Monitors oxygen in the stack gas
9AT 2640 9AT 2642 9AT 2644	9AI 2640 9AI 2642 9AI 2644	CO Monitor	Gas filter correlation with IR detector	0 - 1000 ppm	Monitors CO in the stack gas
9FT 1595 9FT 1596 9FT 2678	9FI 1595 9FI 1596 9FI 2678	Stack gas flow	Annubar for COB 1, COB 2 and COB3	0 - 209,000 scfm	Measures stack gas flow

D.2.4 Automatic Waste Feed Cutoff System

The waste feed cutoff system automatically shuts off waste feed when operating conditions exceed the limits established by the permit.

The hazardous waste-feed cutoff levels are assigned by SMR based on permit conditions assigned by DTSC. The permit conditions may depend on results from the RCRA Trial Burn that was performed in June 2006 and Decmber 2006. The waste feed cutoff will cover the following parameters:

- Waste liquid feed rate – exceeds maximum level
- Stack gas carbon monoxide (CO) – exceeds maximum level
- Boiler firebox temperature – below minimum level
- Boiler firebox pressure – exceeds maximum level
- Combustion gas fow rate – exceeds maximum level
- Electrostatic precipitator power – below minimum level
- Atomizing differential pressure – below minimum level

Any of the trips being activated will cause the waste liquid shutoff valve to close and stop the flow of waste liquid to the boiler. In addition the hazardous waste-feed cutoff system is to be activated when any of the above instruments required for the automatic wast feed cut-off is not operational.

In the event that the automatic waste feed cut-off fails to activate when required, waste must be manually removed from the boiler and cannot be burned in that boiler until the problem with automatic waste feed cutoff is identified and corrected. This event must clearly be documented on the waste feed events log and include the date, time, operator name, Boiler # and cause of failure of the waste feed cut-off system. The corrective action for the failure of the waste feed cut-off system must be clearly documented.

A typical shutdown sketch for on e of the CO Boilers is shown in **Figure D-18**.

D.2.5 Start-up and Shut-down and Operating Procedures

Start-up and shutdown and operating procedures for the CO Boilers and related equipment are provided in :

- **Attachment D-3** (CO Boiler Shutdown)
- **Attachment D-4** (Biosludge Startup and Shutdown)
- **Attachment D-5** (CO Boiler and Precipitator Startup Procedure)
- **Attachment D-6** (Hazardous Waste – CO Boiler Preciptator Dust and Flyash)

Note that Shell updates procedures regularly or as necessary to incorporate changes or improvements.

D.2.6 Emergency Shutdown Procedures

Emergency shutdowns occur in the event of a power failure or an unexpected equipment failure. These procedures are included in **Attachment D-7**.

D.2.7 Inspection Procedures

See **Section F** for more information on inspections.

D.2.8 Trial Burn Plan

An initial Trial Burn Plan for CO Boiler Units 1, 2, and 3 was submitted to DTSC in March 2005. Revision 1 was issued in July 2005 to make technical corrections. Revision 2 was submitted in November 2005 to address DTSC comments. Some page revisions were made in January 2006 and collectively with the November 2005 submittal are referred to as the Final Trial Burn Plan for CO Boiler Units 1, 2, and 3. DTSC approved this final plan on February 6, 2006.

D.2.9 Trial Burn Report

The CO boilers were tested in 1988, 1991, and 1993 to determine cc performance standards. Results of these tests can be found in the docume Report for CO Boiler No. 1 at Shell Martinez Manufacturing Complex, April 1989, Trial Burn Report for CO Boiler No. 2 at Shell Martinez Manufacturing Complex, and Trial Burn Report for CO Boiler No. 3 at Shell Martinez Manufacturing Complex.

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SMR conducted RCRA Trial Burn testing on one of its carbon monoxide (CO) boilers during the weeks of June 5 and June 12, 2006. Trial burn testing was performed on CO Boiler No. 2 (COB-2) in response to a request from the DTSC and under full oversight of the DTSC.

The June 2006 trial burn consisted of three test conditions and started on June 6. The first test condition addressed ESP settings and Test Condition 2 provided chemical analysis data for input into a Health Risk Assessment. Test Condition 3, the destruction and removal efficiency

(DRE) test, was performed on June 13, 2006. The summary of the trial burn is contained in the Trial Burn Report for CO Boiler No. 2 (ENSR, September 2006). The DRE test conducted on June 13, 2006 did not meet trial burn objectives as the performance standard of 99.99% DRE was met for only one of three runs. All other test parameters for the June trial burn complied with the current permit limits. The causes for not achieving the DRE standard were reviewed and after detailed investigation, a retest was scheduled and successfully executed. The Condition 3 retest was performed during the week of December 11-15, 2006 and was also under the oversight of DTSC. The results are documented in ENSR's February 2007 Trial Burn Report fpr CO Boiler No. 2 Condition 3 Retest. Two operating conditions (designated as Conditions 3A and 3B) were evaluated during the December retest. Planned operations for the DRE retest were outlined in the "Trial Burn DRE Retest Plan for CO Boiler No. 2 – Revision 1" submitted to DTSC in November 2006.

D.3 Effluent Treatment Plant #1 (ETP-1) Biotreatment

ETP-1 is a 3.8 million gallon, 1.4 acre surface impoundment used to process wastewater from the Refinery operations (see **Figures D-12, D-13, and D-14**). The pond is located in the Refinery north of Marina Vista. The wastewater processed in ETP-1 contained levels of benzene above the RCRA hazardous waste limits. Regulatory changes in the 1990s precluded the continued use of this pond in handling hazardous waste. As a result, a new effluent treatment plant (ETP-2) was constructed and permitted by DTSC under Permit-By-Rule. In early 1996, benzene-laden wastewaters were diverted from ETP-1 to ETP-2. As a result, wastewater entering ETP-1 was no longer characteristically hazardous due to benzene concentration (a RCRA D018 hazardous waste).

Because ETP-1 now only accepts non-hazardous wastewaters but is an integral component to the refinery wastewater processing, SMR petitioned DTSC to allow closure of ETP-1 to be deferred. DTSC granted a Delay of Closure for this unit in a letter dated August 21, 2003. Supporting documentation relative to the Delay of Closure is provided in Appendix 2.

Because ETP-1 no longer processes hazardous waste, it is not discussed further in this section and in othe relevant . Closure of this unit will be described in the Closure Plan (**Section I** of the Part B Permit Application).

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Table D-1
Tank 12038 Design Features

Table D-2
CO Boiler Monitoring and Recording Devices

Parameter	Location	Transmitter Number	Type of Monitor	Operating Range	Instrument Accuracy	Calibration Process	Calibration Frequency	Recorder Number	Recording Device	Recording Information
Waste Feed Rate	Upstream from waste feed nozzle	COB-1 - 9FT2669 COB-2 - 9FT2672 COB-3 -9FT2675	flow meter	0-14 gpm	5% of span	set zero. check zero and span.	quarterly calibration,monthly cutoff test	COB-1 - 9FR2669 and FIC2669\ COB-2 - 9FR2672 and FIC-2672 COB-3 -9FR2675 and FIC 2675	Process Control Computer and RADDICAL Data Storage System	
Stack Gas Carbon Monoxide	Stack	COB-1 - 9AI2640 COB-2 - 9AI2642 COB-3 - 9AI2644	Gas filter correlation w/IR detector	0-1000 ppm	5% of span	Calibration check: Set and verify zero with CO free gas standard. Set instrument span with known gas standard. Set span to equal gas standard concentratio	daily	COB-1 - 9AR2640 COB-2 - 9AR2642 COB-3 - 9AR2644	Process Control Computer and RADDICAL Data Storage System	
						System Audit: Review calibration check data, inspect transport and interface system.	daily			
						Calibration Error Test	quarterly			
						Performance Specification Test	yearly			
Firebox Temperature	at exit of boiler	COB-1 - east 9TE 3193 COB-1 - west 9TE 3176 COB-2 - east 9TE 3182 COB-2 - west 9TE 3194 COB-3 - east 9TE 3195 COB-3 - west 9TE 3188	shielded thermocouple (TC)	1,500-2,500 degrees F	5% of span	Calibrate recorder per manufacturer's specification	quarterly calibration, monthly cutoff test	COB-1 - 9T1502 and TR-1502 COB-2 - 9T1508 and TR-1508 COB-3 - 9T1514 and TR-1514	Process Control Computer and RADDICAL Data Storage System	
Combustion gas flowrate	Stack	COB-1 - 9FT 1595 COB-2 - 9FT 1596 COB-3 - 9FT 2678	Annubar flow meter (COB 1, COB 2 and COB 3)	0-5.0" H_2O 0-209,000 SCFM	5% of span	Per manufacturer's specifications	quarterly	COB-1 - 9FR 1595 COB-2 - 9FR 1596 COB-3 - 9FR 2678	Process Control Computer and RADDICAL Data Storage System	
ESP Power	ESP	COB-1 - 9ET 2670 COB-2 - 9ET 2673 COB-3 - 9ET 2676	KVA	0-352 KVA	5% of span	Per manufacturer's specifications	quarterly	COB-1 - 9ER 2670 COB-2 - 9ER 2673 COB-3 - 9ER 2676	Process Control Computer and RADDICAL Data Storage System	

Parameter	Location	Transmitter Number	Type of Monitor	Operating Range	Instrument Accuracy	Calibration Process	Calibration Frequency	Recorder Number	Recording Device	Recording Information
Atomizing Fluid/ Waste feed	Waste feed nozzle	Burner #1- 9PDT 1556 9PDT 1566 9PDT 1576 Burner #4 9PDT 1555 9PDT 1565 9PDT 1575	differential pressure	0-100 psi	5% of span	Per manufacturer's specifications	quarterly	Burner #1- 9PDR 1556 9PDR 1566 9PDR 1576 Burner #4 9PDR 1555 9PDR 1565 9PDR 1575	Process Control Computer and RADDICAL Data Storage System	
Firebox pressure	Firebox	COB1 - 9PT 1724 COB2 - 9PT 1725 COB3 - 9PT 1751	pressure sensor	0-10 w.c.	5% of span	Per manufacturer's specifications	quarterly	COB1 - 9PR 1724 COB2 - 9PR 1725 COB3 - 9PR 1751	Process Control Computer and RADDICAL Data Storage System	
Oxygen(1)	at exit of boiler heat exchange section	COB 1 - 9AR2610 COB 2 - 9AR2611 COB 3 - 9AR2607	Teledyne	0-10%	0.5%	Calibration check: Set and verify zero with O2- free gas standard. Set span with known gas standard. Set span to equal gas standard concentration.	daily	COB 1 - 9AR2610 COB 2 - 9AR2611 COB 3 - 9AR2607	Process Control Computer and RADDICAL Data Storage System	
						System Audit: Review calibration check data, inspect transport and interface system.	daily			
						Calibration Error Test	quarterly			
						Performance Specification Test	yearly			
Firebox Temperature	at exit of boiler	COB-1 - east 9TE 3193 COB-1 - west 9TE 3176 COB-2 - east 9TE 3182 COB-2 - west 9TE 3194 COB-3 - east 9TE 3195 COB-3 - west 9TE 3188	shielded thermo-couple (TC)	1,500-2,500 degrees F	5% of span	Calibrate recorder per manufacturer's specification Replace Thermocouples Annually	quarterly calibration of signal, monthly cutoff test	COB-1 - 9T1502 and TR-1502 COB-2 - 9T1508 and TR-1508 COB-3 - 9T1514 and TR-1514	Process Control Computer and RADDICAL Data Storage System	
Combustion gas flowrate	Stack	COB-1 - 9FT 1595 COB-2 - 9FT 1596 COB-3 - 9FT 2678	Annubar flow meter	0-209,000 SCFM	5% of span	Per manufacturer's specifications	quarterly	COB-1 - 9FR 1595 COB-2 - 9FR 1596 COB-3 - 9FR 2678	Process Control Computer and RADDICAL Data Storage System	
ESP Power	ESP	COB-1 - 9ET 2670 COB-2 - 9ET 2673 COB-3 - 9ET 2676	KVA	0-352 KVA	5% of span	Per manufacturer's specifications	quarterly	COB-1 - 9ER 2670 COB-2 - 9ER 2673 COB-3 - 9ER 2676	Process Control Computer and RADDICAL Data Storage System	

SECTION E. CORRECTIVE ACTION

E.1 New Releases

In the event any of the following are identified, SMR will notify DTSC orally within 24 hours of discovery and in writing within 10 days of such discovery (or per other schedule as issued by DTSC) summarizing the findings including the immediacy and magnitude of any potential threat to human health and/or the environment:

- an immediate or potential threat to human health and/or the environment,
- a new release of hazardous waste and/or hazardous constituents, or
- the discovery of a new Solid Waste Management Unit (SWMU) not previously identified.

E.2 Facility Description

Some information in this section is from the "RCRA Facility Assessment Report, Shell Oil Company Martinez Manufacturing Complex" completed by A.T. Kearney for EPA, February, 1988. Hereinafter, this report will be referred to as the "RFA Report". The RFA Report is based on information found in the RCRA files and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) files of EPA Region 9, files and reports of the DTSC and files and reports of the San Francisco Region of the California Regional Water Quality Control Board (RWQCB). The RFA Report contains information collected during records review, data evaluation, interviews and a visual site inspection performed November 11, 12 and 13, 1987, to evaluate the potential for release of hazardous constituents from solid waste management units and areas of concern at the Facility.

E.2.1 Operational History

The Facility was established at its present location in 1913 with a product terminal. In 1916, SMR commenced refining operations at this site at which time it processed 20,000 barrels of crude oil per day. In 1931, SMR constructed a chemical plant at this site for the production of secondary butyl alcohol. Since 1913, SMR has produced up to 50 different chemicals at the Facility, including alcohol, peroxides, solvents and catalysts.

E.2.2 Facility Location

SMR owns and operates a petroleum refinery and chemical manufacturing plant located on a 1000-acre site on the south shore of the Carquinez Strait and Suisun Bay, near the city of Martinez. The areas surrounding the Facility to the west, south and southeast are generally residential and light industrial. A former PG&E power plant is located immediately west of the Facility and the Mountain View Sanitary District operates a wastewater treatment facility on the eastern edge of the refinery. Undeveloped marshland and open water border the Facility to the north and northeast.

E.2.3 Products

SMR currently manufactures gasoline, intermediate fuels (jet, diesel, and kerosene), industrial fuels, asphalt and catalysts.

E.2.4 Topography and Meteorology

The local topography varies from hilly south of and onto the Facility, to tidal flats north and northeast of the Facility. In general, the topography slopes from the south to the north in the direction of the Carquinez Strait. The climate in the area around the Facility is mild, with an average high temperature in August of 70°F and an average low in January of 42°F. Average annual rainfall is 18 inches, with most precipitation occurring between November and February. Less than 10% of the precipitation recharges the groundwater, with the remainder forming surface run-off. However, man-made topographic features (e.g. ponds and dikes) may influence local groundwater recharge.

E.2.5 Surface Water and Floodplain

The Facility is divided into two watersheds. Surface and process water in the west watershed is collected by the sewer system, which drains to the effluent treating area north on Marina Vista Boulevard. Process wastewater in the east watershed is discharged to the gross oil separator and then pumped to the west watershed for additional treatment. Storm (surface) water in the east watershed is diverted through ditches, eventually entering the Suisun Bay at Bulls Head Point.

E.2.6 Geology and Hydrogeology

The Facility is located within the San Francisco Bay Hydrologic Study Area and is bounded on the east by the Ygnacio Valley Groundwater Basin and on the west by the Arroyo del Hambre Groundwater Basin. Due to the limited occurrence of groundwater beneath the Facility, the area is not designated as a groundwater basin. Several unnamed aquifers occur beneath the Facility, but are limited in water yield and size. Groundwater beneath the Facility occurs in several modes, including: 1) in interconnected pores and fractures within the bedrock hills, 2) temporarily or seasonally within alluvial deposits and localized fill that overlie the bedrock, 3) within unconsolidated alluvial fill, which blankets the lower elevations, and 4) within the pore spaces of low permeability bay moods that occur near the Carquinez Strait and Suisun Bay. Groundwater beneath the Facility, both shallow and deep, is brackish and limited in available economic quantities. Therefore, groundwater is not utilized as a domestic or industrial supply source. However, the groundwater basin that borders the Facility on the east and west is used as water supply sources.

Groundwater beneath the site is recharged primarily from the surrounding hills. Water percolates downward through the pore spaces and fractures until it reaches the water table, where the flow is then governed by hydraulic gradients as water moves to areas of lower potential energy at the base of the hills. Many of the unconsolidated alluvial sediments that occur at the bases of the hills are less permeable than the bedrock of the hills and retard the flow of groundwater. As recharging groundwater from bedrock encounters the less permeable alluvial sediments, a mounding of groundwater occurs. During periods of high rainfall, water level fluctuations of over 25 feet have been observed in some wells and in the presence of seeps along the flanks of the hills. Groundwater within the alluvial sediments discharges to ponds, creeks and marshlands in and surrounding the Facility, as well as to Carquinez Strait

and Suisun Bay. Groundwater flowing beneath the western property line of the Facility discharges to the Arroyo del Hambre Groundwater Basin, whereas groundwater flowing east from the Facility discharges to the Ygnacio Valley Groundwater Basin. Groundwater that flows north from the central portion of the Facility discharges into the Carquinez Strait.

E.2.7 Groundwater Monitoring

As part of prior site investigation efforts and on-going quarterly groundwater monitoring, SMR has drilled numerous groundwater monitoring wells at the Facility. The locations of these wells are shown in **Attachments B-14 and B-15**.

E.3 Regulatory Activities

The EPA issued a RCRA Part A Permit within Administrative Order RCRA-09-89-0114 in May 1990. Within the permit, the EPA has identified sites at SMR, typically solid waste management units, which require a RCRA Facility Investigation and a Corrective Measures Study. **Table E-1** details a list of all RCRA Facility Assessment (RFA) units. The locations of the sites identified in the RFA along with three sites identified since the RFA are shown on **Attachment B-17. These sites have also been identified by the California RWQCB within Orders 87-070,** 88-146, and 95-234. Like the EPA, the RWQCB established requirements at these sites to characterize, and if appropriate, install corrective action facilities. Most of the sites have been characterized and remediated under the leadership of the RWQCB. As of March 2005, the RWQCB continues to manage groundwater monitoring and corrective action under the current Order 95-234.

Attachment B-17 and **Table E-1** serve as a summary of Corrective Action activities at SMR.

Table E-1
List of RCRA Facility Assessment Units

Unit No.	Description	DTSC Recommended Action	Corrective Action Completed	Ongoing/ Planned Corrective Action
4.1*	Land Treatment Area "FF"	A	None	F
4.2	Inactive Unit "H"	A	K, R	F, I
4.3	Inactive Unit "I"	A	L	J
4.4	Inactive Unit "L"	A	L	J
4.5	Inactive Oil Collection Tanks and Sumps	B	Q	None
4.6	Inactive Landfill Area "M"	A	M	F, H
4.7	Inactive Landfill Area "O"	A	K	J
4.8	Inactive Land Disposal Area "Q"	A	M, N	I
4.9	Open Burning and Landfill Area (Unit "W")	A	K	J
4.10	Inactive Land Disposal Area "X"	A	L	J
4.11	Inactive Impoundment "Y"	A	K	J
4.12	Inactive Landfill Area "Z"	A	M	F, I
4.13	Pond Area "AA"	A	M	F, I
4.14	Land Disposal Area "DD"	A	M	F, I
4.15	Ballast Water Pond (Unit "B")	B	K	F
4.16	Oily Water Sump "N"	A	M, R	I
4.17	Oily Water Sump "K"	A	L	J
4.18	Hazardous Waste Drum Storage Area "J"	None	None	None
4.19	Waste Transfer Station "MM"	C	None	None
4.20	PCB Storage Area	None	None	None
4.21	Gross Oil Separator Unit "U"	None	None	None
4.22	Corrugated Plate Interceptor, Unit "TT"	None	None	None
4.23	CPI Trash Screen and Waste Bin	None	None	None
4.24	CPI Dumpster Boxes	None	None	None
4.25	API Separator Bar Screen and Trash Bin	None	None	None
4.26	API Separator, Unit "F"	None	None	None
4.27	Sand Boxes, Unit "II"	None	None	None
4.28	Centrifuge System, Unit "E"	None	None	None
4.29	Flash Mixer/pH Adjustment, Unit "P"	None	None	None
4.30	Dissolved Air Flotation, Unit "HH"	None	None	None
4.31	Final pH Adjustment Unit	None	None	None
4.32	Biotreater Equalization Feed Ponds, Unit "D"	D	N	None

Table E-1
List of RCRA Facility Assessment Units

Unit No.	Description	DTSC Recommended Action	Corrective Action Completed	Ongoing/ Planned Corrective Action
4.33	Emergency Wastewater Holding Ponds, Unit "C"	D	N	None
4.34	Activated Sludge Biotreater (Pond 7)	D	L	F
4.35	Two-Stage Dissolved Air Flotation Clarifiers	None	None	None
4.36	Biotreater Sludge Thickener, Unit "GG"	None	None	None
4.37	Biosludge Storage Tank 1197	None	None	None
4.38	Sand Filter Feed Pond (Pond 5A)	D	N	None
4.39	Sand Filters	None	None	None
4.40	Final Holding Pond (Pond 5)	D	N	None
4.41	Sulfide Caustic Flash Pot	None	None	None
4.42	Caustic Knock Out Pot	None	None	None
4.43	Caustic Sump	None	None	None
4.44	Spent Caustic Storage Tank 952, Unit "PP"	None	None	None

Notes:

1. This column provides a partial list of documents related to the unit.
2. Now part of Stormwater Holding Ponds – see 4.66.
3. Waste materials have been removed.
4. Petition submitted to RWQCB to remove from list of waste disposal sites.
5. Petition submitted to RWQCB to waive corrective action requirements.
6. Closed pursuant to a closure plan submitted to the RWQCB.

KEY:

Status:

C – Corrective Action is being performed at the unit.

M – Groundwater Monitoring is being performed at the unit.

N – Not listed on Revised RCRA Part A Permit Application, 11/15/91.

P – Listed on Revised RCRA Part A Permit Application, 11/15/91.

Documents:

I – *Investigation of Item 15 Facilities*, PACIFIC, 1/31/91 (Shell Report Index 32.1).

L – Letter from Shell Oil Company to US EPA, 11/11/93 (Shell Report Index 51.1).

R – *Response to EPA Questions*, PACIFIC, 4/26/93 (Shell Report Index 51.0).

T – *Technical Review of Documents*, PRC Environmental Management, 5/23/91.

SECTION F. PROCEDURES TO PREVENT HAZARDS

This section describes the Shell Martinez Refinery (SMR) programs that address regulatory requirements contained in:

- Security (22 CCR 66264.14)
- General Inspection Requirements (22 CCR 66264.15)
- Preparedness and Prevention (22 CCR 66264.30 through 66264.37)

The facilities, procedures, and plans implemented by SMR to comply with these requirements are described below.

F.1 Security

SMR implements a security program to prevent unknowing entry and minimize the potential for unauthorized entry to its manufacturing facility and its active hazardous waste units. The security program meets the requirements of 22 CCR 66264.14 by providing warnings of and restricting access to the facility 24-hours a day, seven days a week. Security program components include:

- passive barriers with means to control entry (e.g. fences, gates, locks, etc.);
- active surveillance devices and resources (e.g. surveillance cameras, off-shift security personnel, etc.) and
- passive information devices (e.g. signs, markings, etc.).

SMR security program components are described in detail below.

F.1.1 Security Procedures and Equipment

F.1.1.1 Barriers and Means to Control Entry

Due to the nature of its manufacturing operations, SMR Facility has an extensive security program to control the entry of people and animals. Entry to the Facility is strictly controlled and restricted to authorized personnel. A fence and a contract security force control access to the Facility as discussed below. The active hazardous waste treatment and storage units (the CO Boilers and Tank 12038) are located within SMR Facility and access to these areas is controlled through the overall Facility security program.

The entire Facility is fenced at the property line (see topographic maps in **Section B**) with a six foot chain link fence topped with strands of barbed wire. This fence serves as a physical barrier to both prevent unknowing entry and minimize unauthorized entry to the Facility meeting the requirements of 22 CCR 66264.14.

Numerous gates are located along the fence-line. Gates are controlled by the security force and are either:

- staffed by security personnel for surveillance; or are
- normally locked with opening/closing as required controlled by security personnel.

The main gate that is staffed for 24-hour a day surveillance by the security force is Gate 75 located off of Marina Vista Boulevard. Gate 75 provides controlled access to the facility 24-hours a day, 7 days a week.

A secondary gate used during normal working hours is Gate P-3. During normal working hours (e.g. Monday through Friday during day shift) this gate is staffed by security personnel and used primarily for contractor access. This gate is located on Pacheco Boulevard east of Gate P-2.

F.1.1.2 Surveillance Devices and Resources

As discussed above, active surveillance is provided by gates staffed by security personnel. The security force provides active surveillance 24-hours a day, seven days a week from the Security Office and Gate 75 and regularly patrols both the Facility and the Facility perimeter. All non-SMR personnel must pass through a manned gate and have specific authorization by management personnel for entry.

SMR personnel are issued identification badges that provide them access to the Facility through the gates that use a card-operated, computer-controlled access system. Contractors may also be issued badges after meeting security and safety training requirements. The card-operated gates can allow pedestrian or vehicular traffic. Employee's cars, in general, are restricted to the parking area outside the Refinery fence. The other gates along the fence-line are kept locked and can be unlocked only by the security force for personnel with proper authorization. See the topographic maps in **Section B** for the location of all gates.

The security force is maintained by a staff of trained security guards under contract to the Facility. The guards are equipped with two-way radios to report any potential unknowing or unauthorized entries immediately.

Supplemental security measures at the Facility include the use of surveillance cameras which can monitor and record:

- ingress/egress at selected locations, and
- critical manufacturing areas.

F.1.1.3 Warning Signs/Information Devices

Warning signs informing people that they are entering a hazardous waste management area are located at strategic points around the active hazardous waste units. At the CO Boilers, these signs read:

"Caution – Hazardous Waste Area –Unauthorized Persons Keep Out"

in English and Spanish, in 1" high block lettering. Tank 12038 is posted with signs that read:

"Caution – This Tank Contains Hazardous Wastes"

in English and Spanish, in 1" high block lettering.

The signs described above are legible at a distance of 25 feet.

Additional hazard warning and information devices are located throughout the facility including those listed below.

- No smoking signs posted throughout the Facility.
- Personal protective equipment requirement designated areas and signs posted throughout the Facility.
- All industrial water connections in the CO Boilers and Tank 12038 operating areas posted with signs (in English and Spanish) stating that the water is not fit for human consumption.
- "Container Hazard Identification Table" (CHIT) information required by Federal OSHA and Cal-OSHA Hazard Communication Standards are located in designated areas throughout the facility including in the vicinity of the two active hazardous waste units. The CHIT system provides information on the potential hazards of materials in the refinery. The CHIT list is located in a green box outside each operator shelter and in the Refinery computer system. The information on the list includes the MSDS number, equipment name and number, common name for chemical substances in equipment and containers in the unit and the potential health and safety hazards of the substances. The MSDSs for the wastes managed in the active SMR hazardous waste units are included in **Attachment F-1**.

F.2 Inspection Plan

SMR has developed an inspection plan to find and correct deficiencies in hazardous waste-related equipment, structures, systems, and devices on-site that could cause or lead to a release of hazardous waste constituents to the environment and/or a threat to human health.

Because the active hazardous waste units and associated safety and emergency equipment at SMR are integrated components of the manufacturing process, responsibility for inspections is assigned to a number of departments within the organization. Each designated supervisor is responsible for making sure inspections are performed and for maintaining the inspection records. The designated supervisor also implements the required remedial and corrective action measures. The attached inspection procedures and schedules reflect existing unit operations and may be modified periodically to accommodate the changing nature of operations.

F.2.1 Inspecton Schedule, Logs, and Criteria

As described below, the inspection plan meets the requirements of 22 CCR 66264.15 for a written inspection schedule that defines:

- items to be inspected;

- inspection criteria (i.e. type of problems to be looked for); and
- frequency of inspection based on the rate of deterioration of equipment and probability of environmental or human health incident.

F.2.1.1 Facility-wide Inspections

The inspection schedule for the hazardous waste storage and treatment units includes emergency and operating equipment that are important for preventing, detecting or responding to environmental or human health hazards.

Personal protective equipment (e.g. hard hats, goggles, safety glasses, ear protection, gloves, safety shoes, etc.) is provided to personnel is for personal use during day-to-day operation. It is the responsibility of the employee to inspect and replace the equipment as necessary. Respirators are used as necessary and are cleaned after each use and maintained as required by the Facility Health and Safety Department. Coveralls are turned in by employees for cleaning by a contract industrial laundry or replacement if required. Personal protective equipment is maintained in stock at SMR and most common items are available at all times in large quantities.

Emergency equipment is inspected weekly. The Facility Health and Safety Department services the fire extinguishers and supplied air respirators as required. The Maintenance Department services the other emergency equipment as required. The checklists for the CO Boilers and Tank 12038 emergency equipment are provided in **Tables F-1 and F-2**, and locations are shown in **Figures F-1 and F-2.**

Fire protection equipment and facility communications and alarm systems are tested and maintained as necessary to ensure proper operation in time of an emergency. Tests are conducted weekly on the alarm systems.

F.2.1.2 Hazardous Waste Unit Inspections and Monitoring

Operators are required to routinely check the operation of their units by performing physical inspections, taking readings of unit monitoring devices, and reviewing the readings for abnormalities. Observations from inspections and data from monitoring devices are recorded on operating logs for foreman and supervisors to review. A record of these inspections and monitoring data is kept for a minimum of 3 years and includes:

- Date and time of the inspection.
- Name of the inspector.
- A notation of the observations made.
- Date and nature of any repairs or other remedial actions.

The inspection and monitoring for Tank 12038 and the CO Boiler units are discussed below.

F.2.1.3 Tank 12038

Tank 12038 and ancillary equipment are inspected daily for:

- Vapor control system pressure and tank level.
- Tank corrosion and/or leaks.

- Data from overfill control monitors.
- Piping system for leaks, spills, etc.
- Other leaks, corrosion and/or erosion in the surrounding tank area (including secondary containment).

Tank 12038 daily inspection items are listed in **Table F-3**. The results of the inspections for Tank 12038 are recorded on the "Daily Hazardous Waste Storage Tank Inspection Sheet" (**Figure F-3**) and the "Daily Biosludge Feed Line Inspection Sheet" (**Attachment F-7**). Completed inspection sheets are maintained for a minimum of 3 years.

The structural integrity of Tank 12038 has been certified and this described in **Section D**. The condition of Tank 12038 will be reassessed regularly by Shell Pressure Equipment Inspection group. This is in addition to the daily inspections discussed above.

In the event that Tank 12038 or its secondary containment has a leak or spill or is unfit for use, the tank will be removed from service and the requirements of 22 CCR 66264.196 will be satisfied as described in **Section D.1.4**.

Monitoring devices for Tank 12038 are routinely checked by operators and readings of the monitoring devices are recorded and reviewed for abnormalities. These readings are recorded on operating logs for the foreman and supervisors to review. The operating logs for Tank 12038 are provided in **Attachment F-2**. As the operator checks the units, problems with the monitoring equipment are identified and repaired on a schedule that ensures that the problem does not lead to an environmental or human health hazard.

Instrumentation assessment consists of routine calibration and visual inspection. See **Section D** for calibration frequencies.

F.2.1.4 CO Boilers

CO Boilers Equipment Inspection Procedure:

1. The operator will visually inspect the CO Boilers and associated equipment at least daily for leaks, spills, fugitive emissions and signs of tampering according to the frequencies specified in **Table F-4**.

2. The operator, in conducting the equipment inspection, will fill out the form shown in **Attachment F-6**. Any maintenance/repairs will be performed according to the procedures in **Section F.2.2**.

3. The automatic waste feed cut-off system (AWFCO) will be tested by activating the shutoff valve at least once monthly and the results of the test recorded in **Attachment F-3**.

4. Tests of the waste feed cut-off system are meant to verify operation and are not meant to require dismantling or unscheduled calibration. Because the shutoff valve is "fail safe" (e.g. remains in the closed position in the event of a failure or when power is lost) only

the feed cutoff logic and associated alarms need monthly testing. The valve need not be activated. This is accomplished by simulating inputs into the feed cutoff logic, which tests the operability of the system without actually closing the "fail safe" valve and stopping flow.

5. If the waste feed cut-off system "trips" (e.g. waste feed is cut-off due to a process operations excursion from specified limits) during a 30-day period, the actual trip will satisfy the need to test the valve. However, the other components of the cut-off system still need to be tested to ensure they are functioning properly.

6. Because the valves are "fail safe" and the electronic components of the system have been highly reliable, the AWFCO system tests are conducted monthly rather than weekly.

CO Boilers Monitoring Procedure:

1. Every four hours the operator will record measurements from all the recording equipment listed in the operating log located in **Attachment F-5**. The operating log will be submitted to the shift team leader and operations specialist for review.

2. Normally, data collection and storage is performed via the SMR Operational Data Server. If recording devices are used for data collection, a visual inspection of the recording devices will be conducted when measurements are taken to ensure that they are in proper working order. This inspection will involve ensuring that paper supply is adequate, the correct scale is being used and the pens are the correct color and are in good operating condition. Any malfunctions and repairs will be documented on the log sheet.

3. To ensure proper operation and accuracy of monitoring devices, the monitoring devices will be calibrated according to the frequencies and methods listed in **Section D**. The deactivation/reactivation procedure specified below will be followed during instrument or analyzer calibration. If, during calibration, the thermocouple switch setting is changed, then the bypass/reactivation procedure listed below will be followed.

CO Boilers Deactivation/Reactivation of Waste Feed Cutoff During Instrument Calibration Procedure

1. During calibration of instruments and analyzers, the waste feed cutoff system for the specific instrument that is being calibrated will be deactivated to avoid false automatic waste feed cutoff. This is necessary in order to calibrate the entire range of equipment. Upon completion of the calibration, the waste feed cutoff system will be reactivated.

   The deactivation and reactivation of the waste feed cutoff system will be documented on a log sheet and kept as part of the operating records. A copy of the log sheet is provided in **Attachment F-4**. For each deactivation and reactivation of the waste feed cutoff system the following information will be recorded:

   - Date and time
   - Operator (e.g. name of person deactivating/reactivating the system)

- Event (e.g. deactivation/reactivation)
- Cause of event (e.g. routine calibration of instrument or analyzer)
- Corrective action (as necessary)

CO Boilers Bypass/Reactivation of Waste Feed Cutoff While Changing the Thermocouple Selector Switch Setting Procedure

CO Boilers No. 1, No. 2 and No. 3 have two thermocouples each. Only one of the thermocouples is used at a time. When the active thermocouple provides inconsistent or questionable readings, the operators switch to the second thermocouple. Indications that a thermocouple may be malfunctioning include but are not limited to illogical readings, erratic readings, identical readings or no response. The purpose of the thermocouple switch is to continue to allow operation of the boilers by providing temperature data when the thermocouple in use is malfunctioning. The second thermocouple will then be used for compliance firebox temperature measurements. When the operators switch to the second thermocouple, a work request will be initiated to service the malfunctioning thermocouple. The second thermocouple will continue to be used for compliance measurements until it is determined that it needs to be switched (e.g. it is malfunctioning). While the operators are changing the thermocouple selector switch setting, they temporarily bypass the waste feed cutoff system.

Without the bypass procedure, the waste feed will cutoff due to the instantaneous temperature signal interruption when the thermocouple selector switch setting is changed. The cutoff system will be bypassed, the selector setting changed and then the system will be reactivated.

The bypass and reactivation of the waste feed cutoff system will be documented on a log sheet and kept part of the operating record. A copy of the log sheet is provided in **Attachment F-4**. For each bypass and reactivation of the waste feed cutoff system, the following information will be recorded:

- Date and time
- Operator (e.g., name of person deactivating/reactivating the system)
- Event (e.g., deactivation/reactivation)
- Cause of event (e.g. routine calibration of instrument or analyzer)
- Corrective action (as necessary)

CO Boilers Integrity Assessments

The operator will perform a thorough internal and external inspection of the CO Boilers' systems in accordance with Section 770, Article 5, Subchapter 2 of the Division of Industrial Safety, Boiler and Fired Pressure Vessel Safety Orders. Documentation that these inspections are performed will be included in the facility's operating record.

F.2.2 Remedial Action

Designated supervisors are responsible for initiating any required remedial action resulting from inspections. All remedial action requested to be done on equipment is submitted to the Maintenance Department utilizing a ticket system. The requester of the work enters the date,

priority of work and what work needs to be done, then issues a copy of the ticket to the Maintenance Department. When the work is completed, the Maintenance Department returns the ticket to the requester.

Any deterioration or malfunction of the equipment or structures that are found during an inspection will be remedied on a schedule that ensures the problem does not lead to an environmental or health hazard. If a hazard is imminent or has already occurred, then remedial action will be taken immediately.

F.3 Preparedness and Prevention

SMR operation is focused on the safe handling of raw materials, products and wastes through the minimization of the potential for fires/releases at the facility. The facility is designed and equipped to meet applicable safety requirements. Standard operating procedures and emergency plans are in place and regular training is provided to personnel. A detailed description is provided below of the equipment, structures, and procedures in place to meet the preparedness and prevention requirements of 22 CFR 66264.30 through 66264.37.

F.3.1 Communication Equipment

The Facility has an extensive system to provide for both internal and external communication including:

- a telephone network,
- alphanumeric pagers assigned to Facility personnel,
- a two-way radio communication system, and
- a fire alarm system.

A description of each of these systems is provided below.

The telephone network consists of a private automatic exchange for internal communications with access to the SMR Switched Network and external telephone networks (e.g., SBC, MCI, AT&T) for calls outside SMR.

A private (direct) communications network has also been installed that permits the Facility to make immediate contact at any time with the communications center of the following local fire and police agencies:

- Contra Costa County Consolidated Fire District,
- Contra Costa County Sheriff's Department, and
- City of Martinez Police Department.

This private (direct) communications system is closed and unlisted and there is no other access at either end. The Facility's direct line is located at the Security Communications Center. Four additional direct line outlets exist:

- two in the Facility's Emergency Operations Center for use should the center be activated,

- one in the office of the Health and Safety Supervisor (who is also the Incident Commander/Emergency Coordinator), and
- one in the office of the Environmental Affairs Manager.

The telephone system allows for contacting each of the public agencies individually or all at one time through provision of conference call capability. SMR also has a vehicle set-up to be the Incident Command Center that provides for direct communication from any incident location on-site.

Designated telephone stations within the Facility have been equipped with a back-up system. If power is lost to the communications equipment building for a period longer than the life of the standby battery system, then these phones will automatically transfer to the trunks at the SBC center office in Martinez, to provide communications between the Facility and the external SBC system.

The Facility utilizes an outside vendor for its personnel paging system. This system provides local (ranging from Redding to Bakersfield), regional (ranging from Washington to California and Nevada), and nation-wide coverage for individual pagers. Pagers have alphanumeric capability which allows text messaging. Key operational and management personnel are assigned pagers for emergency response purposes.

A 10-repeater trunking system is used for two-way radio communications by Facility personnel. This system utilizes hand-held radios that provide all operators with two-way communication with other operators, process controllers, and foreman.

The fire alarm system at the Facility includes an in-house designed and built Emergency Broadcast System to simultaneously transmit emergency messages over all primary radio frequencies to radios in various locations throughout the Facility.

Backup equipment for the fire alarm system includes:

- closed loop fire phones in operating areas,
- alphanumeric pagers for notification of the Auxiliary Fire Crew and other off-duty personnel, and
- a Facility-wide fire whistle system.

Critical components of the fire alarm system are tested weekly.

F.3.2 Artificial Lighting

Lighting is provided throughout the Facility to ensure safety of personnel and the safe handling of hazardous materials including the identification of spills and/or releases.

F.3.3 Emergency Equipment

The emergency equipment provided for the CO Boilers and Tank 12038 is listed in **Table F-1** and F-2 and is shown on **Figures F-1 and F-2.** A brief description of the overall facility emergency equipment is given below.

F.3.3.1 Portable Fire Extinguishers and Fire Control Equipment

A list of the Mobile Fire Apparatus for the Facility is provided in **Section G**, **Table G-1**. A list of additional portable emergency equipment (including fire suppression equipment and supplies) present in the Facility is provided in **Section G, Table G-2**. SMR fixed fire water system supplies hydrants, water monitors and hose reels throughout the facility. A description of the fire water system is included in **Section F.3.4** below.

Each operating area is equipped with emergency equipment for fire control as required by the Facility Health and Safety Department. The equipment for each operating area includes:

- fire extinguishers (e.g. CO_2 and dry chemical),
- fire blankets,
- fire hoses and reels, and
- fire monitors (free standing fire water nozzles).

F.3.3.2 Spill Control and Decontamination Equipment/Supplies

The Facility maintains the following spill response supplies on-site to contain and clean up hydrocarbon materials or oil discharged to water:

- 20 each 3M Type 126 oil sweeps (100' long) or equivalent,
- 12 bales of 3M Type 270 booms (4 booms to a bale) or equivalent, and
- 10 bales of 3M Type 156 absorbent sheets (100 sheets to a bale) or equivalent.

During an emergency, additional sweeps, booms and absorbent sheets are obtained from suppliers as required. These items are kept at the wharf area and are disposed of as hazardous waste after use.

The Facility also maintains twenty-five bags of granular absorbent (50 pounds each) for spill containment and cleanup. The granular absorbent is placed on the ground to prevent a spill from spreading and to aid in cleanup.

Vacuum trucks can be used to recover liquid materials that have spilled and 20 cubic yard bins can be used to contain and transport solid wastes off-site for disposal if (e.g. contaminated soil, etc.) generated from spill cleanup. The Facility does not own any vacuum trucks or bins. The trucks and bins are rented from various local contractors and can be obtained as required. Purchase Orders are in place between SMR and several hazardous material/waste contractors

that can provide trained personnel, special equipment, and materials if required by SMR for spill containment, clean-up, and disposal.

Each operating area is equipped with emergency equipment for spill control and decontamination as required by the Facility Health and Safety Department. The equipment for each operating area includes:

- emergency showers and eye baths,
- supplied-air respirators (e.g. self-contained breathing apparatuses), and
- steam hoses and lances.

F.3.4 Water and Fire Control

F.3.4.1 Fire Control Water Supply

Water for fire control and industrial use is drawn from the Martinez Terminal Reservoir of the Contra Costa Canal. As an alternative, water can be drawn directly from the 42" shortcut pipeline through a connection located near the old Vine Hill raw water pumps. The primary system is capable of delivering a total of 13,000 gallons per minute (gpm) of water to the Facility. Industrial use requires about 8,000 gpm with occasional demands up to 10,000 gpm. The primary system, therefore, provides a reserve capacity of 3,000 to 5,000 gpm for emergencies. In addition, 5,000 gpm can be obtained from the shortcut pipeline.

The Facility has an agreement with Tesoro Corporation's Amorco Terminal for emergency water. An eight-inch interconnecting pipeline between the Facility and the Amorco fire water system permits delivery of up to 1,000 gpm of water at 150 psig.

All industrial water connections in the CO Boilers and Tank 12038 operating areas are posted with signs (in English and Spanish) stating that the water is not fit for human consumption.

F.3.4.2 Potable Water Supply

The potable or "domestic" water for the Facility is obtained from the City of Martinez water system. The water is piped to all drinking, washing and sanitary facilities, and the emergency showers and eye baths in the Facility. The domestic water is not connected to any refinery or chemical process. Backflow into the public water supply is prevented by approved backflow prevention devices (currently Clayton Model D) and double check valves at each of the meter locations on the domestic water headers.

F.3.5 Testing and Maintenance of Equipment

Emergency equipment is inspected weekly. The Facility Health and Safety Department services the fire extinguishers and supplied air respirators as required. The Maintenance Department services the other emergency equipment as required. The checklists for the CO Boilers and Tank 12038 emergency equipment are provided in **Tables F-1 and F-2**, respectively.

Fire protection equipment and facility communications and alarm systems are tested and maintained as necessary to ensure proper operation in time of an emergency. Tests are conducted weekly on the alarm systems.

Documentation of inspections of emergency equipment, fire protection equipment and facility communication/alarm systems are maintained for a minimum of 3 years.

F.3.6 Access to Communication and/or Alarm Systems

All operators, foremen, Health & Safety personnel and the Incident Commander carry a two-way radio when working at the Facility. This provides immediate access to the internal SMR communication system for personnel managing hazardous waste on-site. Additionally, telephones are available in the Unit Control Rooms, offices, and administrative areas throughout the facility.

F.3.7 Aisle Space

Sufficient aisle space around all Facility units (including active hazardous waste units) is maintained to allow unobstructed movement of personnel and emergency equipment to any area of the Facility in the event of an emergency. Personnel are trained in this requirement and it is enforced as an operating standard throughout the facility.

F.3.8 Arrangements with Local Agencies

a. Police Departments, Fire Departments and Other Local Agencies

SMR has a long history of working with fire, police, and other local agencies on pre-planning for and response to emergency situations. As a part of this relationship, an Incident Command Structure has been agreed to and adopted to assign roles and responsibilities among the parties in the event of an emergency on-site including those involving active hazardous waste units. Local agencies that have been involved with emergency pre-planning activities for SMR include:

- the Contra Costa County Consolidated Fire District
- the Contra Costa County Sheriff's Department,
- the City of Martinez Police Department,
- the Contra Costa County Department of Health Services, Environmental Health Division, and
- the U.S. EPA Region 9 HazMat Response Team.

Arrangements for communication in an emergency with fire and police agencies are described in **Section F.3.1** above.

A detailed description of the organizational roles and responsibilities can be found in the SMR Emergency Procedures Manual available on-site in the Environmental Affairs Department for inspection by the California Department of Toxic Substances Control and U.S. EPA.

b. Hospitals/Ambulance Services/Medical Providers

First aid is provided by the Facility Medical Center during normal working hours (usually 7:30 am to 4:00 pm, Monday through Friday). An on-duty foreman or other first-aid trained personnel can provide first aid off-shift, on weekends, and on holidays.

Staffing at the Facility Medical Center usually includes:

- a registered nurse and a medical assistant during normal working hours;
- a x-ray technician approximately 1 – 2 days per week; and
- a physician available approximately 6 – 8 hours per week.

Additional services are made available via a contract that is maintained for emergency medical services with Mount Diablo Hospital or other emergency service provider. Ambulance service is also provided through a contract with a local ambulance service (e.g. AMR, etc.).

During an emergency, medical services can also be provided via the internal Emergency Medical Service unit that is part of the overall SMR emergency response team as described below and in **Section G**.

c. Emergency Response Teams

As described in **Section G**, SMR maintains a comprehensive internal emergency response capability that currently includes the following organizational units that can respond to fires, medical emergencies, and releases of chemicals/wastes:

- Basic Fire Crew
- Auxiliary Fire Crew
- Rescue Crew (SHARC)
- TIGER (Emergency Medical Service)
- Operating Personnel (from the area in which the fire occurs)
- Operations Emergency Response Paging Groups
- Incident Command Post (Field Headquarters)
- Emergency Operations Center
- Administrative Headquarters
- Health and Safety Personnel

Additionally, SMR is a member of the Petrochemical Mutual Aid Organization (PMAO), an entity comprised of refineries and chemical plants in the San Francisco Bay Area which provide

assistance to one another in the form of fire-fighting equipment, fire control materials, and manpower in the event of a major fire or similar emergency at one of their locations.

And, as mentioned in **Section F.3.3** above, Purchase Orders are in place between SMR and several hazardous materials contractors (e.g. Phillips Services, Inc., etc.) that can provide personnel trained in hazardous waste emergency response if required by SMR for spill containment, clean-up, and disposal.

d. Documentation

Documentation of planning activities, formal cooperation agreements, and/or submittal of emergency planning information is maintained on-site in the SMR Health and Safety Department and/or Environmental Affairs Department. In the event that an entity refused to enter into a cooperation agreement with SMR, documentation would also be maintained of such a refusal.

SMR has submitted copies of its emergencies procedures to the Local Emergency Response Committee, the Contra Costa County Consolidated Fire District, and the Contra Costa County Department of Health Services Environmental Health Division as part of the Hazardous Materials Business Plan required under AB2185 and to fulfill requirements under SARA Title III.

F.3.9 Prevention Procedures, Precautions and Structural Devices

a. Unloading/Loading

The unloading and loading of hazardous waste is done via dedicated pumps and piping systems (as described in **Section D**) that connect on-site waste generation points to Tank 12038 and Tank 12038 to the CO Boilers.

Potential hazards in the unloading/loading processes at Tank 12038 and the CO Boilers are primarily:

- failure of waste conveyance components (e.g. piping, pumps, valves, etc.) resulting in release of hazardous waste;
- failure of tank system components (e.g. primary containment, secondary containment, level sensors, alarms, etc.) resulting in the release of hazardous waste; and
- failure of CO Boiler components (e.g. valves, piping, guns, etc.) resulting in the release of hazardous waste.

To minimize hazards in the unloading/loading process, SMC implements procedures covering the regular inspection of system components and monitoring devices as described in **Section F.2** Inspection Plan. These inspections address the potential failure of waste conveyance system components, Tank 12038 system components, and CO Boiler components. These inspections cover the daily operational conditions as well as the long term structural integrity of the systems. Structural integrity evaluation measures are further described in **Section D.1.5** Tank Certification.

b. Management of Run-off

The Facility is divided into two watersheds. Surface and process water in the west watershed is collected by the sewer system, which drains to the effluent treating area north on Marina Vista Boulevard. Process wastewater in the east watershed is discharged to the gross oil separator and then pumped to the west watershed for additional treatment. Storm (surface) water in the east watershed is diverted through ditches, eventually entering the Suisun Bay at Bulls Head Point. Maps B-7 and B-8 illustrate the surface and process water collection systems.

Surface water discharges for the entire SMR (including both treated industrial effluent discharges and storm water discharges) are currently regulated under NPDES permit CA0005789 (Order Number 01-141) issued by the San Francisco Bay Regional Water Quality Control Board. Under this permit, SMR is required to:

- treat industrial effluent to specific numeric effluent limitations,
- implement a monitoring program for treated effluent discharges and submit periodic monitoring reports,
- prepare and maintain a Storm Water Pollution Prevention Plan that describes measures used to prevent contamination of storm water run-off for the entire facility, and
- perform monitoring of storm water discharges and submit annual reports of storm water monitoring.

This permit specifically addresses both of the active hazardous waste units (i.e. Tank 12038 and the CO Boilers) in evaluating potential contaminants and associated monitoring requirements. SMR's compliance with this permit ensures adequate management of run-off from the active hazardous waste unit areas.

c. Prevention of Contamination of Water Supplies

Contamination of water supplies is prevented through:

- inspections for releases from hazardous waste units,
- tank secondary containment and leak detection systems,
- separation of the industrial water system from the domestic/potable water system,
- backflow prevention devices protecting public water supplies,
- monitoring of groundwater per the requirements of the San Francisco Bay Regional Water Quality Control Board,
- proper construction and closure of monitoring wells, and
- surface water discharges managed in compliance with NPDES requirements.

Hazardous waste unit inspections for releases from system components and secondary containment structures are the primary means to prevent migration of hazardous waste constituents to sub-surface water supplies. Inspections for both Tank 12038 and the CO Boilers are described in **Section F.2** above. Tank 12038 is double-walled tank with a leak detection system as described in **Section D.1.2**.

Contamination of public water supplies is prevented by separation of the industrial water supply from the domestic/potable water supply at SMR. In addition, approved backflow prevention devices (currently Clayton Model D devices) and double check valves are installed at each of the meter locations on the domestic/potable water headers.

Monitoring of groundwater is conducted per the requirements of the San Francisco Bay Regional Water Quality Control Board. The current permit requires SMR to periodically monitor historic areas of subsurface contamination and evaluate concentration trends for each area's constituents of concern. Based on periodic monitoring, if trigger levels are exceeded, corrective action measures will be required to be implemented.

Active monitoring wells on-site have been constructed with wellheads above grade and water-tight well closures. Inactive wells have been closed in compliance with regulatory requirements that prevent the potential for contamination of sub-surface water supplies.

SMR manages its surface water discharges (including both treated industrial effluent discharges and storm water discharges) in compliance with the NPDES permit issued by the San Francisco Bay Regional Water Quality Control Board as discussed under **Section F.3.9.b** above.

Based on the measures listed above, water supplies are adequately safeguarded at SMR.

d. Mitigation of Effects of Power Outage/Equipment Failure

The effect of power outages is essentially eliminated by the availability of back-up power supplies via an extensive power supply system engineered for the refinery. Primary power to SMR is provided by Pacific Gas and Electric (PG&E) via 4 each 125,000 volt feeders. Three (3) substations on site step down the power from 125,000 volts to 12,000 volts. The 12,000 volt power supplies motor control centers at the refinery. Should power be lost from one or more of the main feeders, an automatic switching system would transfer a back-up source of power from an alternate feeder. In addition to the PG&E power supply, a supplemental power source is provided by an on-site 100 megawatt cogeneration plant that feeds into the main grid.

The effect of equipment failure for the CO Boilers is mitigated by having a series of three boilers that allows for continuous operation if one unit goes down for scheduled or unscheduled maintenance. Additionally, SMR Maintenance Department may either maintain a limited inventory of frequently required parts/components or make arrangements with manufacturers to procure parts/components on an expedited basis. The Maintenance Department has also identified local vendors if additional equipment is required in an emergency including generators, lighting, pumps, portable tanks, etc.

e. Prevention of Undue Exposure of Personnel to Hazardous Waste

SMR manages its operations to minimize personnel exposure to hazardous materials and/or hazardous waste. This is done by:

- implementation of industrial hygiene and safety programs that evaluate potential exposure hazards and specify the use of appropriate personal protective equipment (PPE), and
- implementation of procedures designed to minimize exposure to hazardous wastes during sampling/maintenance activities.

The hazardous wastes handled at the Facility are generated by the manufacturing operations and no wastes are accepted from off-site facilities. The wastes do not pose any significantly different hazards than the products the Facility manufactures. The MSDS for the waste burned in the CO Boilers are provided in **Attachment F-1**.

The major risk in the Facility is that of fire involving raw materials and/or products. Therefore, the personal protective equipment required for use in the CO Boilers and Tank 12038 areas is generally the same as the personal protective equipment required throughout the Facility.

All personnel in the Facility are required to wear “hard hats” while in the operating areas. All personnel are required to wear safety glasses while in the operating area. All personnel in an operating area shutdown for maintenance are required to wear safety glasses.

Goggles are attached to the hard hats for use in designated areas when samples are drawn, when lines are open and in an emergency. A yellow line on the ground designates areas that require goggles.

All personnel are required to wear safety shoes while in operating areas. Safety shoes are enclosed toe shoes of substantial weight with a liquid resistant upper and a substantial sole.

Hearing protection is required when personnel enter areas of high noise level as determined by the Facility Health and Safety Department. An orange line on the ground designates two types of hearing protection. Part of the area around the CO Boilers is designated as a hearing protection area.

Personal protective equipment (PPE) is provided to each employee for normal day-to-day use. Boots, flame-retardant coveralls, chemically-resistant gloves, and respirators are available to all personnel should it be required. Normal PPE items are maintained in SMR inventory as stock items which are kept on hand at all times in adequate quantities.

It is the employee’s responsibility to replace the PPE as required and employees have been trained in this responsibility. Chemically-resistant gloves are to be replaced by the employee as required. Boots are collected and cleaned. Flame-retardant coveralls are sent to a contract laundry for cleaning and are replaced by the laundry as required. Respirators are cleaned and serviced after each use by the Facility Health and Safety Department.

Chemically-resistant gloves are worn when performing any work that could cause product contact. Chemically-resistant boot covers are worn in designated contaminated areas. A sink with hot and cold water and detergent is provided for washing hands after discarding gloves. All disposable protective clothing are normally used once and then disposed of as hazardous waste.

The only time personnel are directly exposed to the waste(s) is when a sample is taken or when maintenance is performed on internal surfaces of Tank 12038, the waste conveyance system, or the CO Boilers.

Samples are normally taken from dedicated sample ports that are controlled by valves and limit potential exposure. Sampling personnel are required to use appropriate PPE as discussed above.

When maintenance is performed on contaminated system components, they are decontaminated before servicing. Decontamination is performed by washing with a water/detergent mixture to emulsify the contaminants and then rinsing with hot water. Hot water makers equipped with eductors for premixing detergent are situated throughout the Facility.

f. Minimization of Releases to Atmosphere

Releases of waste to the atmosphere are minimized due to the chemical composition of the two waste streams managed in Tank 12038 and the CO Boilers. As described below and discussed in **Section C**, the DNF Solids and Waste Biosolids are composed primarily of water. Additionally, the waste streams are managed in a closed system with the two primary emission points controlled and monitored as follows.

- The Tank 12038 vent is routed to a carbon filter to abate organic emissions as described in **Section D.1.2.d.**
- The emissions from the CO Boilers are monitored for compliance with DTSC and Bay Area Air Quality Management District (BAAQMD) limits.

g. Management of Ignitable and Reactive Wastes

The SMR active hazardous waste units are dedicated to two waste streams generated on-site and which are made up of over 80% water. These are:

- a non-hazardous waste stream, Waste Biosolids, and
- a listed RCRA hazardous waste, DNF Solids (K048).

Neither of these waste streams meets the criteria for ignitability or reactivity. Historic operational and analytical data have substantiated that these waste streams are compatible with each other and compatible with the materials of construction of Tank 12038 and the CO Boilers systems.

Given the above, no reactive, incompatible or ignitable wastes are stored in Tank 12038 or treated in the CO Boilers. However, the facility is designed, constructed, maintained, and operated to minimize the possibility of fire and explosion. A number of the measures used by SMR to control ignition sources and minimize the possibility of fire/explosion are listed below.

- Tank 12038 is an enclosed tank (i.e., closed roof) so that other materials can not come in contact with the waste.

- Tank 12038 is grounded to prevent formation of a static charge that could ignite the waste,

- Tank 12038's vapor space has a nitrogen blanket to maintain an environment that is oxygen deficient and cannot support combustion.

In addition, the following practices apply to the entire SMR Facility.

Smoking and vehicular traffic is restricted in operating areas.

- A work permit procedure is implemented throughout the facility that requires atmospheres be tested for combustible gases before a source of ignition is created.

- A grounding and bonding procedure is implemented throughout the facility to prevent hydrostatic charge.

- Nitrogen purging is used for certain operating equipment to prevent a flammable mixture from occurring.

- Installation of vapor recovery systems is used on floating roof tanks.

- Inspection of equipment is performed to insure structural integrity.

Tank 12038 meets the requirements of Table 2-1 through 2-6 of the National Fire Protection Association's "Flammable and Combustible Liquids Code". For a tank that has a capacity less than 50,000 gallons, the tank must be at least 30 feet from the property line and 10 feet from any public way and the nearest on-site building. Tank 12038 is approximately 215 feet from the property line and approximately 42 feet from the nearest public way and on-site building.

SMR has evaluated the requirement for the storage of ignitable wastes a minimum of 50 feet/15 meters from the property line. Because neither of the waste streams managed in Tank 12038 and the CO Boilers are ignitable, this requirement is not applicable.

Table F-1 CO Boilers Emergency Equipment Checklist

Table F-2 Tank 12038 Emergency Equipment Checklist

Table F-3 Tank 12038 Inspection Schedule

Table F-4 CO Boilers and Air Pollution Control Equipment Inspection Schedule

SECTION G. CONTINGENCY PLAN

SMR maintains an comprehensive emergency management program that includes most of the elements required in a Contingency Plan per Article 4, Chapter 14, Division 4.5 of Title 22 of the California Code of Regulations. This emergency management program is based primarily on the SMR Emergency Procedures Manual (EPM) that is designed to manage large scale refinery incidents (including fires, explosions, chemical releases, etc.). The SMR EPM is necessary to safeguard human health and the environment from the potential hazards of fires, explosions, chemical releases, etc. from refinery raw materials and products. In addition to the EPM, SMR also maintains an Oil Spill Response Plan, a Spill Prevention Control and Countermeasures Plan and an Environmental Procedures Manual that contain information relevant to emergency response and control.

The EPM contains procedures that serve to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water from the SMR active hazardous waste units (i.e. Tank 12038 and/or the CO Boilers). The appropriate EPM procedures will be carried out immediately whenever there is a fire, explosion, or release of hazardous waste or hazardous waste constituents that could threaten human health or the environment.

Per 22 CCR 66264.52(b), this section of the Part B Permit serves as a supplement to the EPM and associated emergency plans at SMR. This section contains the requirements specific to compliance with Title 22 of the California Code of Regulations and the SMR Hazardous Waste Facility Permit and will be used to insure these requirements are met in the event of an incident at SMR involving hazardous wastes.

Due to the complexity of the emergency planning activities/documentation required for SMR and because the EPM is a stand alone document (subject to the review of other regulatory agencies and requiring frequent updates), the EPM is not being included as part of the Part B submittal. Typical procedures from the EPM are included for review in **Section G.5** below and the EPM is available in the Environmental Affairs Department for inspection by the California Department of Toxic Substances Control, U.S. Environmental Protection Agency, or other authorized agency.

The EPM and/or this Contingency Plan section will be amended in the event:

- the facility's permit is revised.
- the plan fails in an emergency.
- the list of emergency equipment changes.
- the list of emergency coordinators changes.
- the facility 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.

G.1 Arrangements with Local Agencies

As described in **Section F.3.8**, SMR has a long history of working with fire, police, and other local agencies on pre-planning for and response to emergency situations. As a part of this relationship, an Incident Command Structure has been agreed to and adopted to assign roles and responsibilities among the parties in the event of an emergency on site including those involving active hazardous waste units. Local agencies that have been involved with emergency pre-planning activities for SMR include:

- the Contra Costa County Consolidated Fire District,
- the Contra Costa County Sheriff's Department,
- the City of Martinez Police Department,
- the Contra Costa County Department of Health Services, Environmental Health Division, and
- the U.S. EPA Region 9 HazMat Response Team.

Arrangements for communication in an emergency with fire and police agencies include dedicated direct telephone lines (as described in **Section F.3.1**) with the following agencies:

- Contra Costa County Consolidated Fire District,
- Contra Costa County Sheriff's Department, and
- City of Martinez Police Department.

The SMR has submitted copies of its EPM to the Local Emergency Response Committee, the Contra Costa County Consolidated Fire District, and the Contra Costa County Department of Health Services Environmental Health Division as part of the Hazardous Materials Business Plan and to fulfill requirements under SARA Title III.

As discussed in **Section F.3.8.d**, documentation of planning activities, formal cooperation agreements, and/or submittal of emergency planning information is maintained on-site in SMR's Health and Safety Department and/or Environmental Affairs Department. In the event that an entity refused to enter into a cooperation agreement with SMR, documentation would also be maintained of such a refusal.

G.2 Emergency Coordinator

The SMR Health and Safety Supervisor is the primary Emergency Coordinator. The SMR Emergency Coordinator is given the title of Incident Commander (IC) and that is the term used in this document and the EPM. The primary IC or the alternate IC is available on-site during normal working hours (usually 8:00 a.m. to 4:30 p.m. Monday through Friday), and are on call during off-hours. The IC has been delegated the authority to commit the resources needed to carry out the EPM/Contingency Plan section. The individual serving as IC has the training and/or experience to be thoroughly familiar with:

- all aspects of the facility's EPM/contingency plan section,
- all operations and activities at the facility,
- the location and characteristics of waste handled,
- the location of all records within the facility, and
- the facility layout.

The list of Incident Commanders is kept up-to-date and changes are sent out as required to all individuals/agencies that hold a copy of the EPM/contingency plan section. The current IC and alternate are:

Incident Commander (IC)	**Work Phone**	**Home Address/Phone**
Tom McKnight, Primary	(925) 313-3427	2108 Olympic Drive Martinez, California 94553 (925) 370-0454
Ken Sibley, Alternate	(925) 313-3896	7667 Locke Road Vacaville, California 95688 (707) 448-6902

G.3 Emergency Action for Incidents Involving Hazardous Waste

The IC is responsible for assuring the actions listed below are carried out immediately wherever there is a fire, explosion, or release of hazardous waste or hazardous waste constituents which could threaten human health or the environment. Due to the complexity of potential incidents at SMR, the actions listed below are assigned to the “IC or designate”. The IC is responsible for overall coordination of the incident under the established Incident Command System. This system maintains overall responsibility with the IC but allows delegation of activities per the established command structure.

G.3.1 Immediate Emergency Notifications

Whenever there is an imminent or actual emergency situation, the IC or designate will immediately activate internal facility alarms or communication systems to notify all affected facility personnel. This notification will be accomplished via SMR communication systems as described in **Section F.3.1**. The primary systems for internal notification/communication are

- two-way radio communications utilizing hand-held radios that provide all operators with two-way communication with other operators, process controllers, and foreman; and

- the fire alarm system which includes an in-house designed and built Emergency Broadcast System to simultaneously transmit emergency messages over all primary radio frequencies to radios in various locations throughout the Refinery.

Notification of appropriate state or local agencies with designated response roles if their help is needed wil be done via external telephone lines available on site and dedicated direct telephone lines with the following agencies:

- Contra Costa County Consolidated Fire District,
- Contra Costa County Sheriff's Department, and
- City of Martinez Police Department.

G.3.2 Identification of Hazardous Materials

The IC or designate is responsible for the identification of the character, source, amount, and areal extent of any released hazardous materials/wastes. This is may accomplished through:

- observation of labels, placards, or other informational signage;
- review of operating records including manifests, profiles, and/or analytical data; and/or
- sampling and analysis of materials/wastes/potentially contaminated environmental media.

G.3.3 Assessment

Concurrent with the identification of released hazardous materials/wastes, the IC or designate is responsible for assessing the potential hazards to human health or the environment that could result from the release, fire, or explosion. This assessment will include the direct and indirect effects from the release such as the generation/dispersal of reaction products or gases, fire suppression agent run-off, and/or contaminated environmental media.

G.3.4 Evacuation Assessment/OES Reporting

If the IC or designate determines that the facility has had a release, fire, or explosion that could threaten human health, or the environment outside the facility, IC or designate is responsible for:

- immediate notification of local authorities if the evacuation of local areas may be advisable;
- being available to help appropriate officials decide whether local areas should be evacuated; and
- immediate notification and reporting to the California State Office of Emergency Services.

The IC or designate in consultation with the Environmental Affairs Department will assure notification of the appropriate regulatory agencies (depending upon the specifics of the incident). The regulatory criteria for notifying the California State Office of Emergency Services (OES) will be followed and OES will be notified via the toll-free number of 800-852-7550. The OES notification will include:

- name and telephone number of the reporter,
- name and address of the facility,
- time and type of the incident,
- name and quantity of material(s) involved,
- extent of injuries, and
- possible hazards to human health and the environment outside the facility.

G.3.5 Control Procedures

Control procedures for specific incident types are contained in the SMR Emergency Procedures Manual (EPM). Typical procedures from the EPM are included for review in **Section G.5** below and the EPM is available in the Environmental Affairs Department for inspection by the California Department of Toxic Substances Control, U.S. Environmental Protection Agency, or other authorized agency.

G.3.6 Prevention of Recurrence/Spread of Fires/Explosions/Releases and Monitoring of System Shutdowns

The IC or designate is responsible for taking all reasonable measures necessary to ensure that fires, explosions, and/or releases do not occur, recur, or spread to other hazardous wastes at the facility. To accomplish this, the IC or designate is responsible as required for:

- stopping facility processes/operations;
- collection/containment of released material; and
- removing/isolating containers.

In the event that facility processes/operations are shut-down, the IC or designate is also responsible for monitoring for system leaks/pressure/gas generation/ruptures as appropriate.

All operating areas of the Refinery are monitored 24-hours a day to insure the equipment is operating properly. If an emergency results in the shutdown of the CO Boilers or Tank 12038, or any other operating equipment at the Refinery, the equipment will continue to be monitored. This monitoring will identify if any hazard conditions may develop including but not limited to leaks, equipment failure, and pressure and temperature excursions.

G.3.7 Response to Leaks or Spills from Tank Systems or Tank Secondary Containment Systems and Disposition of Leaking or Unfit-for-Use Tank Systems

The IC or designate is responsible for assuring that the response to releases from tank systems or associated secondary containment systems is in compliance with 22 CCR 66264.196 including the following action as required:

- stopping waste additions to the tank system/secondary containment system and inspecting the system to determine the cause of the release;

- removing waste from the tank/secondary containment system within 24 hours or as timely manner as possible to prevent further release of hazardous waste to the environment and allow for inspection/repair;
- containing visible release(s) to the environment and performing a visual inspection of the release(s) and implementing activities to prevent further migration of the released material into environmental media and removing/properly disposing of any visible contamination of soil/surface water; and
- performing reporting as required in 22 CCR 66264.196 (b)(5).

The IC or designate is responsible for repair or disposition of the tank system or tank secondary containment system in compliance with 22 CCR 66264.196 (b)(6) and 66264.196 (b)(7). Further discussion of these requirements can be found in **Sections D.1.4 and F.2.1**.

G.3.8 Storage, Treatment, and Disposal of Released Material/Incompatible Waste Evaluation

Per **Section G.3.3** above, the IC or designate is responsible for the identification of the hazardous materials/wastes involved in a fire, explosion, or release. The IC or designate uses this information to determine the appropriate methods for the storage, treatment and disposal of released materials/wastes. The IC or designate is also responsible to ensure that potentially incompatible materials/wastes are identified and segregated to avoid the possibility of reactions.

The two active hazardous waste units at SMR (i.e., the CO Boilers and Tank 12038) are permitted to manage only two waste streams both of which are generated on-site (i.e., DNF Solids and Waste Biosolids). These waste streams are compatible with each other and with the materials of construction of the active hazardous waste units. Therefore, the requirement (i.e. to insure that potentially incompable materals/wastes are identified and segregated to avoid the possibility of reactions) may not require any action in most incidents.

G.3.9 Post-Emergency Equipment Management

The IC or designate is responsible for assuring that all emergency equipment is decontaminated and fit for its intended use prior to resuming facility operations.

G.3.10 Notification of Federal, State and Local Authorities Before Resuming Operations

Prior to resuming facility operations in the affected areas of the facility, the IC or designate is responsible for reporting requirements in 22 CCR 66264.56 (i). This requires that the Department of Toxic Substances Control, and other appropriate State and local authorities are notified that the facility is in compliance with 22 CCR 66264.56(h) and that in affected areas of the facility:

- no waste that is incompatible with the released material is transferred, treated stored of until cleanup procedures are completed; and
- all emergency equipment listed in this Contingency Plan section is cleaned and fit for its intended use before operations are resumed.

As stated under **Section G.3.8** above, the active hazardous waste units at SMR (i.e., the three CO Boilers and Tank 12038) are permitted to manage only two waste streams both of which are generated on-site (i.e., DNF Solids and Waste Biosolids). These waste streams are compatible with each other and with the materials of construction of the active hazardous waste units. Therefore, the requirement (i.e., to insure that wastes which are incompatible with the wastes that were released are not treated or stored in the facilities until cleanup after an emergency is complete) may not require any action in most incidents.

Additionally, the IC or designate is responsible for written reporting to the Department of Toxic Substances Control per the requirements of 22 CCR 66264.56 (j). The report will be filed in the Operating Record and submitted to the Department of Toxic Substances Control within 15 days after the incident. The Environmental Affairs Department is normally responsible for generating and filing the report. The report will include the following information.

1. Name, address, and telephone number of the owner/operator.
2. Name, address, and telephone number of facility.
3. Date, time, and type of incident.
4. Name and quantity of material(s) involved.
5. Extent of injury, if any.
6. Assessment of actual or potential hazards to human health or the environment, where this is applicable.
7. Estimated quantity and disposition of recovered material that resulted from the incident.

G.4 Emergency Equipment

Emergency equipment is also described in **Section F.3.3**.

G.4.1 Hazardous Waste Unit Equipment

The emergency equipment located in the CO Boilers area and Tank 12038 area is listed in **Section F** on **Tables F-1 and F-2**, and locations are illustrated on **Figures F-1 and F-2**.

G.4.2 Refinery Fire Suppression Equipment

A list of the typical mobile fire apparatus maintained at SMR is provided in **Table G-1**. A list of the typical additional portable emergency equipment present at the Refinery is provided in **Table G-2**.

In addition to the equipment listed above, there are multiple hydrants, water monitors and hose reels located on the fixed fire water system (a description of the fire water system is included in **Section F.3.4**). The fire water system also supplies certain units on-site (e.g., LPG loading rack, reservoir pump house, propane bullets and spheres) that are equipped with water deluge systems.

G.4.3 SMR Communication Equipment

SMR has an extensive communications network that is described in **Section F.3.1**. Included in this network, is a private telephone system and a two-way radio system. The radio system includes mobile and portable radio units which are assigned to:

- all emergency vehicles,
- a large number of non-emergency vehicles,
- key response personnel (all operators, foremen, Health & Safety personnel and the Incident Commander carry a radio when working at the Refinery), and
- in an emergency, all Environmental Affairs personnel have access to a radio.

Alphanumeric pager units are also provided to key Refinery personnel. The primary Incident Commander and designated alternate carry a pager off-hours. In addition, all managers and Environmental Affairs personnel have pagers which allow contact during and after work hours.

A modern fire alarm system covers all areas of the Refinery and is maintained and operated by the Health & Safety Department. This alarm system is described in **Section F.3.1**.

G.4.4 Spill Control Equipment and Supplies

An inventory of spill response equipment is provided in the SMR EPM and Oil Spill Response Plan. A general description of typical supplies and equipment available is provided below:

SMR typically maintains the following materials on site to clean up hydrocarbon materials or oil discharged to water:

- twenty (20) 3M Type 126 sweeps (each sweep is 100' long),
- twelve (12) bales of 3M Type 270 booms (4 booms to a bale), and
- ten (10) bales of 3M Type 156 absorbent sheets (100 sheets to a bale)

During an emergency, additional sweeps, booms and absorbent sheets are obtained from suppliers as required. These items are kept at the wharf area and are disposed of as hazardous waste after use.

SMR also typically maintains 25 bags (50 pounds each) of granular absorbent for spill containment and cleanup. The granular absorbent is placed on the ground to prevent a spill from spreading and to aid in cleanup.

Vacuum trucks can be used to recover liquid materials that have spilled and 20 cubic yard bins can be used to contain and transport wastes generated from spill cleanup (e.g. contaminated soil, etc.) off-site for treatment/disposal. The Refinery does not own any vacuum trucks or bins. The trucks and bins can be obtained from local contractors as required.

Tank 12038 (which stores the main volume of hazardous waste managed in the CO Boilers) is a double-walled tank. The secondary wall of Tank 12038 is capable of holding the entire capacity of the tank.

G.4.5 Decontamination Equipment

Each operating area is equipped with emergency equipment for decontamination as required by the Refinery Health and Safety Department. The equipment for each operating area includes:

- emergency showers and eye baths, and
- steam hoses and lances.

Emergency showers and eyebaths are located throughout the Refinery. The emergency showers and eyebaths are supplied by the facility potable water system. It is a standard operating procedure that emergency equipment is routinely inspected, maintained clean, and ready for use at all times. Industrial water is used in the steam hoses and lances to decontaminate all equipment. See **Section F.3.4** for more details on the water supply.

Hazardous material/waste contractors are typically working on-site and can provide equipment to treat, store or remove wastes, contaminated soil, or water generated during an emergency. SMR also has contracts with additional hazardous material/waste contractors that can supply equipment and trained labor in the event of an emergency.

G.5 Typical Emergency Procedures

Typical emergency procedures are presented below. These general descriptions are superceded by specific procedures in the EPM.

G.5.1 Emergency Notification

1. An emergency may be reported from any phone within the Refinery by calling 444 or 3601. Calls to either extension are received by the officer on duty at the SMR Security Communications Center.

2. The Security officer will activate the Refinery alarm system and page emergency response teams. The following will respond:

   A. Members of the Basic Fire Crew on duty at the Refinery

   B. Auxiliary Fire Crew

   C. Operating personnel of area involved

   D. Health & Safety Response Team, including Incident Commander

   E. Emergency Response Team of area involved

   F. Public Affairs/Environmental Response Team

   G. Departmental Duty Personnel

3. Incident Commander

The Supervisor of the Health & Safety Department has been designated as the primary Incident Commander (IC) for SMR. The primary IC or his alternate are either on duty at the Refinery, or on-call at any time.

4. External Communication

Information during emergencies may be obtained by calling the refinery Main number at (925) 313-3000. The call will be relayed to a member of the Public Affairs/Environmental Response Team.

SMR has direct telephone lines to provide immediate contact on an around-the-clock basis between the Refinery and the following public agencies:

- Contra Costa County Consolidated Fire District
- Contra Costa County Sheriff's Department (serves as information source for Office of Emergency Services and other county agencies)
- City of Martinez Police Department

With this arrangement, SMR can contact each of the above public agencies immediately whenever an emergency situation develops within the Rifinery that may in any way affect the adjacent community. SMR has an operational agreement with the Fire District for emergency assistance as may be needed. Mount Diablo Hospital Emergency Room or other provider supplies emergency medical assistance.

Upon arrival at SMR, State emergency response teams report to the Emergency Operations Center which is manned by Environmental Affairs personnel. At the center, the response actions to be taken, determined by the nature of the emergency, are coordinated with outside agencies. The State Office of Emergency Services is notified whenever there is an emergency involving the CO Boilers or Tank 12038.

G.5.2 Fire Emergency Roles and Responsibilities

The typical roles and responsibilities for a fire emergency response are presented below. This general description is superceded by specific procedures in the EPM.

SMR maintains a trained fire-fighting force on site. The Refinery is also a participating member of the Petrochemical Mutual Aid Organization (PMAO), a mutual aid organization comprised of refineries and chemical plants in the San Francisco Bay Area which provide assistance to one another in the form of fire-fighting equipment, fire control materials, and manpower in the event of a major fire or similar emergency at one of their locations. Detailed procedures for obtaining mutual aid assistance are specified in the Emergency Procedures Manual.

The typical roles and responsibilities in the event of a fire emergency are outlined below.

1. Basic Fire Crew:

   A. Assistant Fire Chief

      1) Contacts Operations Foreman or representative of area involved.

         a) Determines if there is a need for rescue and administering aid to injured or trapped personnel.

         b) After assuring safety of people, determines what is burning and why.

         c) If possible, shuts off or isolates source of fuel.

         d) Looks for other potential sources of fuel in the area & isolates if possible.

      2) Directs Basic Fire Crew

         a) Arranges for supplemental support and replacement of those already on the scene.

         b) Directs the positioning of fire trucks and hoses.

         c) Plans and executes fire fighting strategy.

         d) Continues above activities until fire is extinguished.

   B. Crew Captain

      1. Reports to Assistant Fire Chief for direction on truck and hose positioning.

      2. Relays fire fighting plan from Assistant Fire Chief to Fire Crew.

      3. Ensures that Fire Crew members are properly trained, attired and equipped.

2. Health & Safety Department Personnel:

The first Health & Safety Department representative to arrive, and each one thereafter, contacts the Assistant Fire Chief (or Health & Safety Department representative in charge), and assists in carrying out the fire fighting plan. If applicable, constructive suggestions are offered to improve the overall effectiveness of the plan. Once the Fire Chief or one of the Deputy Chiefs have arrived at the scene, the Assistant Fire Chief turns over the command, passing along all available information.

As Health & Safety Department personnel arrive, they assume the following positions and responsibilities:

A. Incident Commander: Health & Safety Supervisor or designated alternate. Provides overview of situation through communications with Operations and gives general direction of fire control activities.

B. Operations Chief: Health & Safety Supervisor/ MPO or designated alternate. Provides on-site supervision of Fire Crews to see that overall plan is executed as directed by Chief.

C. Crew Captain: Health & Safety Sr. Inspector. Supervises hose crews as directed by the Deputy Chief. Provides information to Deputy Chief regarding status of crews and conditions.

D. Engine Operator: Health & Safety Inspectors. Takes over operation of fire-fighting equipment as directed by Deputy Chief. Provides relief to equipment operators who initially responded to fire.

3. Auxiliary Fire Crew:

   A. Put on turn-out gear and report to Chief for assignment.

   B. Relieve Basic Fire Crew members as assigned by Chief (and as conditions permit), so that they may return to their operating duties.

4. Operating Department:

   A. Operations Foreman of area where fire occurs:

      1) Accounts for all personnel in immediate fire area.

      2) Determines source of fuel feeding fire and directs Operators to isolate.

      3) Communicates status of operations to Assistant Fire Chief upon his arrival at the scene, or designate representative to do so.

      4) Be prepared to direct activities of "early arrivals" on use of fire monitors, hoses, etc.

      5) Requests help as necessary from unit Process Manager.

   B. Operations Supervisor of area where fire occurs:

      1) Contacts Operations Foreman upon arrival and assists in on-site operating supervision.

   C. Operations Manager of area where fire occurs:

      1) Contacts Operations Supervisor and/ or Operations Foreman upon arrival and assists as required.

      2) Coordinates stabilization and orderly shutdown, as appropriate, of units not involved in the fire.

   D. Operations Foremen of areas not in immediate fire zone:

      1) Remain with units and see that personnel not assigned to Fire Crew stay in their area and continue performing their assigned jobs.

   E. Operations Managers of units not involved in immediate fire zone:

1. Report to control centers of units for which they are responsible, ensuring units are stable and secure.

5. Administrative Staff:

Assist as necessary to keep people away from the fire. Fire control requires that the supervision of operations be directed by operations management. The direction of the fire crews shall be by and through the Incident Commander, who will rely upon operations management for advice and consultation.

G.5.3 Evacuation Procedure

The evacuation routes for the hazardous waste units are described as follows and in the typical evacuation procedure below. For reference, the CO Boilers are part of Light Oil Processing (see item 8 below) and the evacuation plan for Tank 12038 follows the same plan for Central Maintenance Department Personnel and Contractors (see item 14 below). The evacuation routes for these areas are shown on **Figure G-1** for the CO Boilers and **Figure G-2** for Tank 12038. The routes shown are the primary routes. If these routes are blocked any road leading to the gathering points can be used as alternative evacuation routes. The roads are shown on the maps provided.

The typical evacuation procedure is presented below. This general description is superceded by specific procedures in the EPM.

The Incident Commander (IC) or designate decides if facility personnel need to be evacuated and, if necessary, implements the evacuation. It is the local agencies' responsibility to decide if the public needs to be evacuated. Local agencies are kept informed of the response activities and Refinery personnel are available to discuss the need for public evacuation. The IC or designate will assure that requirements discussed under **Section G.3.4** above are fulfilled.

There are several office buildings, maintenance shops and Process Control Rooms within the Refinery. The office buildings and shops are normally occupied Monday through Friday from 7:00 a.m. to 4:30 p.m. The Process Control Rooms are those that direct the operation of the Refinery's process units, and are occupied 24 hours per day, 7 days per week, 365 days per year.

The purpose of these procedures is to provide a preplanned evacuation plan with predetermined routes to safely move SMR personnel, as well as contractor personnel and visitors, out of the affected areas to a safe location.

As a general rule, Operations personnel will remain in their Units during an emergency. If it becomes necessary to evacuate their particular operating area, they will normally make every effort to secure their Unit before evacuating. This may require the operators to don SCBA or other protective equipment in order to safely secure their Units, or to take other precautionary measures, such as turning off fresh-air make up fans to Control Rooms, etc.

Each office building in the Refinery has a floor plan posted in hallways with exits clearly marked. Each building has emergency lighting units in hallways. Office buildings have individuals who have been designated as evacuation "monitor", with designated vacation reliefs.

Notification of the need for evacuation will be made through the EBS System (Emergency Broadcast System) and through the Refinery Paging System. This notification process is activated by the Refinery Security Communications Center located in the Main Office Building.

The EBS message is broadcast over all two-way radios within the Refinery. The message is then transmitted over the paging system and monitored at the following locations:

1. Administrative Secretary's office - Main Office Building
2. LOP Operations office (Distilling/ Hydroprocessing Secretary's office)
3. OPCEN Office
4. Maintenance Office
5. Garage Foreman's office
6. Health & Safety Office
7. CSE Computer Building
8. Facilities Engineering office
9. Systems Building
10. Quality Assurance Foreman's Office
11. Training Department
12. 501 Shell Avenue
13. LOP Zone Shop 1
14. LOP Zone Shop 2
15. OPCEN Zone Shop 4
16. Clean Fuels Trailers
17. Clean Fuels Control Center
18. Logistics Control Center
19. SMR Carpenters Shop
20. SMR Garage
21. Field Shipping (North Gate)
22. Machine Shop
23. Machine Shop Office
24. LOP Control Center
25. OPCEN Control Center
26. LHT Control Room
27. Lubricants Office Building
28. Quality Assurance Office Building
29. Air Products (Hydrogen Plant) Control Room
30. Air Products Secretary's Office

Upon notification to evacuate, persons in the area to be vacated shall proceed as directed by their evacuation "monitors" to their assigned assembly point and await further instructions from the Health and Safety Department or the Administrative Headquarters. **Figure G-3** shows evacuation assembly points for the entire refinery.

Evacuation "monitors" are responsible for accounting for their own Department's personnel at the evacuation assembly point. It is important that these "monitors" take a role call as quickly as possible so that any missing persons can be accounted for. The names of "missing" persons should be forwarded to the administration Headquarters so that procedures can be implemented to determine their disposition. Each department is responsible for assigning this task.

Localized emergency warning devices are installed in LOP and OPCEN to advise maintenance and contractor employees of the need to evacuate an area in case of an emergency. Warning devices are located in the five operating areas in LOP and can be locally activated by an Operator in those areas. These warning devices can also be activated from the LOP Control Center.

Two sirens are also located in the OPCEN area, and can be activated from the OPCEN Control Center. These warning devices are to be activated only in the area(s) directly affected by an emergency and are to be used to signal non-essential personnel of the need to evacuate the immediate area. Special local alarms will be utilized in all major shutdowns as may be necessary. (Departments who may have non-essential people in these areas are responsible for instructing them in the meaning of the alarm and what they should do when they hear it.) Operating departments will be responsible for conducting periodic, routine tests of these emergency warning devices.

In the event of a major emergency, an Administrative Headquarters will be activated and located in the office of the President and CEO of the SMR.

The evacuation routes for the hazardous waste facilities are provided in the following discussion. For reference, the CO Boilers are part of Light Oil Processing (item 8) and the evacuation plan for Tank 12038 follows the same plan for Central Maintenance Department Personnel and Contractors (item 14). The evacuation routes for these areas are shown on **Figure G-1** for the CO Boilers and **Figure G-2** for Tank 12038. The routes shown are the primary routes. If these routes are blocked any road leading to the gathering points can be used as alternative evacuation routes. The roads are shown on the maps provided.

For evacuation in the following areas, employees shall proceed as follows:

1. Main Office Building Area (includes old Environmental Bldg, Quality Assurance & Medical Center)
   A. Parking lot across from Quality Assurance
   B. South Gate
   C. Old Machine Shop

2. Health and Safety
   A. Old Machine Shop
   B. North 1 Gate
   C. Fire Grounds

3. Lubricants North/South (includes Sulfonation, Asphalt, LHT1 and 2, LDU, Furfural and Bleacher House)
   A. North 1 Gate
   B. East Gate
   C. South Gate

   Note: The above sections (1,2,3) will apply except in the event of an emergency due to a release of hazardous vapors. If the evacuation is necessary because of hazardous vapors, employees leaving these areas shall first check wind direction by observing steam plumes, wind socks and/or the flag pole. Employees should move crosswind to an area that is free from vapors.

4. Operations Central

   After receiving the evacuation notice via the EBS System, the evacuation sirens located in the Hydrogen/Dimersol area and on the FXU structure should be sounded and employees proceed to one of the following areas depending on location of emergency.
   A. North of OpCen Cooling Water Tower 50
   B. OpCen Parking Lot
   C. Lower Gate 72 adjacent to Parsons trailer

In the event of a hazardous gas release, the following steps should be taken by Control Center personnel:

Control Center personnel will shut down the air supply Fan No. 1 and the exhaust Fan No. 1, located in the air conditioning room. Switches are on the west wall of the air conditioning room.

The air conditioner will remain in operation. With the air supply fan down, it will be required to open the north door of the air conditioning room into the hallway. A wedge or prop will be required to hold the north door open.

The location of MSA air packs at the OPCEN Control Center are two each outside the east door, two each outside the south door, and one outside the west door. Four additional air packs are located inside the OPCEN Control Center on the east wall (spare MSA air packs).

5. Systems Office Building (Old Purchasing Offices)

Evacuate to one of the following locations depending on location of emergency.

   A. Fire Grounds
   B. North side of Opcen parking lot by Gate 50
   C. South Gate (via Shell Avenue using personal vehicles)

If the evacuation is caused by a problem at the Lube Hydrotreater, employees should check wind direction by observing the windsock located at DSU.

If the problem is caused by any of the OPCEN units, again check the wind sock and proceed crosswind, or as directed by the Health & Safety Department.

Evacuated employees shall notify their supervision of their location.

6. Logistics Control Center

After all product movements that could contribute to the emergency are secured, pertinent records (pump sheets, etc.) should be gathered up by the Product Dispatcher. The Product Dispatcher shall relocate either to the LOP Control Center or the OPCEN Control Center and use the Remote Varec System to monitor or direct subsequent operations.

Any Logistics gauging, wharf or Basins personnel in outlying areas will monitor their radios and proceed as directed by the Product Dispatcher.

7. Light Oil Processing (includes Control Center, Dist/Hydro, Cracked Products, EM&SR, Zone Shops 1 and 2, and the Computer Control Center)

After receiving the evacuation notice, the evacuation horns in all four Quads shall be activated by Control Center personnel. Employees evacuated shall proceed to one of the following locations depending on location of the emergency.

A. Main Shops
B. North of Logistics Control Center
C. Gravel area South Side of Quad B

Personnel required for the orderly shutdown of units will stay and secure units.

Contract and Maintenance personnel will report to one of the designated evacuation areas outlined in #15 and await instructions from the Health & Safety Department. Control Center personnel will shut down air conditioning intake units, don self-contained breathing apparatus (if necessary) and secure units.

Evacuated employees shall notify their supervision of their location.

8. Control Systems Engineering Computer Building

In the event of an emergency that requires the evacuation of the Computer Building, all 'nonessential' employees are to leave the premises. Only employees who are required for the safe shutdown of the building and its equipment will be allowed to stay and perform these tasks and these employees can only stay long enough to perform these tasks if doing so presents no immediate threat to their safety. All employees who are aware of the need to evacuate should try to check out with their supervisor while they are leaving the building. This will save crucial time in accounting for all of the department's personnel.

Employees need to evacuate in a way that minimizes their exposure to the area where the emergency is occurring. The following routes and gathering points are recommended.

* If the emergency situation is in Quad A, computer personnel should evacuate through the north door of the computer room and head west down LOP's central east/west roadway (between Quad B and Utilities) and meet in the dirt area southwest of Quad B.

* If the emergency situation is in Quad D, computer personnel should evacuate through the southern door of the two story addition and head south down the Quad A/B roadway and meet in front of the Pacheco Gate #1 change house.

* If the emergency situation is in Quad B, computer personnel should evacuate through the northeast door of the computer room and head east down LOP's central east/west roadway (between Quad D and Quad A) and meet in front of the Pacheco Gate #1 change house.

* If the emergency situation is in Quad C or Utilities, computer personnel should evacuate through the southern door of the two story addition and head south down the Quad A/B roadway and meet in front of the Pacheco Gate #1 change house.

9. LOP Office/Projects Trailers

This building is to be evacuated any time a message announcing an emergency in LOP is announced over the Emergency Broadcast System. If existence of a serious emergency condition in LOP (i.e. fire or explosion) is known before the alarm is announced on the EBS, all buildings will be evacuated immediately.

In the event of a hazardous gas release, the following steps should be taken. Personnel should shutdown all air conditioning units, close all windows and doors, stay in the building and await further instructions from the Health & Safety Department.

In the event of an emergency that requires the evacuation of the LOP Office Building, the employees at the west end of the building should use the exit door on the south side of the building near the Distilling/Hydroprocessing or Utility Department's Secretary's Office. The personnel on the east end of the building should use the exit doors located at east end and center of the annex building (Cracked Products) and all personnel in the Computer Department should use the exit doors at the west end of the building. Personnel located in the trailers on the east end of the building should exit the trailers and immediately go to the south side of the office building. After exiting the building and trailers, everyone should proceed to one of the following designated areas depending on the location of the emergency.(and await further instructions from the Health & Safety Department). Care should be taken to watch for any emergency vehicle traffic. Evacuated employees shall notify their supervision of their location.

A. P-1 Gate
B. Main Shops
C. Gate 62 Gravel Area South Side HCU Quad B

Any available personnel essential to safely secure the operating units will be given instructions by an Operations Supervisor.

10. Facilities Engineering Office

This building is to be evacuated any time a message announcing an emergency in LOP is announced over the Emergency Broadcast System. If existence of a serious emergency condition in LOP (i.e. fire or explosion) is known before the alarm is announced on the EBS, the building will be evacuated immediately.

In the event of a hazardous gas release, the following steps should be taken. Personnel should shutdown all air conditioning units, close all windows and doors, stay in the building and await further instructions from the Health & Safety Department.

Employees within the Facilities Engineering Trailer Complex shall exit the building and walk to one of the following designated areas depending on location of emergency.

A. P-1 Gate
B. Main Shop
C. Gate 62 Gravel Area South Side HCU - Quad B

Facilities Engineering personnel who are in the field at the time of the evacuation order shall follow the evacuation directions of the area that they are in.

Personnel leaving this area will walk. Do not attempt to drive or start vehicles adjacent to the Trailer Complex.

Evacuated employees shall notify their supervisor of their location.

11. Temporary Trailers

A specific evacuation plan is to be developed for each trailer that is located in proximity to an operating unit. The department responsible for activities requiring a trailer is responsible for developing such a plan.

12. Main Shops Area (includes Shipping & Receiving, Garage, Contractor Buildings, Parsons Warehouse area)

Upon notification of evacuation, employees should proceed to one of these designated areas, notify their supervision of their location, and await further instructions from the Health & Safety Department.

A. P-2 Gate
B. P-1 Gate
C. P-3 Gate (inside), (Across from Old Parsons Warehouse)

13. Chemical

B. Building - Upon notification to evacuate, sound the evacuation horn and leave the building. Proceed to the assembly point by Tank 243T.

All other operators in Chemical should don SCBA and secure their units.

If the evacuation of Chemical is caused by a release of hazardous vapors, employees should check the wind socks in the area and proceed crosswind to an area designated by the Health & Safety Department.

14. 501 Shell Avenue (and Parsons Trailers)

Upon notification of evacuation, employees within 501 Shell Avenue and the Trailer Complex (located east of the building) shall evacuate the building either through the west door or the east door and assemble either

A. 501 Parking Lot

B. G-72 Parking Lot

C. East Gate Parking Lot

Depending on the nature of the emergency requiring the evacuation, employees should check the windsock at Chem West and move cross wind to the necessary assembly points.

If the emergency were caused by a toxic gas release, employees would stay inside, shutdown air conditioner and await further instructions from the Health and Safety Department. Evacuated employees shall notify their supervision of their location.

15. Maintenance Department Personnel and Contractors

In the event of an emergency or unit upset that requires evacuation of an area, the following will be reporting locations for Maintenance personnel:

Personnel working west of Shell Avenue will report one of the following areas depending on location of emergency.

A. South Gate

B. Old Machine Shop

C. Parking Lot Across from QA

People working east of Shell Avenue will report to one of the following areas depending on the emergency.

A. Main Shops

B. North of OpCen CWT,

C. North of Logistics Control Center

People working at OPCEN will report to one of the following areas depending on location of emergency.

A. CWT

B. Opcen Parking Lot

C. Lower Gate 72 across from Parsons Trailers.

Members of the Auxiliary Fire Crew will report the Auxiliary Firehouse.

Contractor personnel will evacuate to areas previously designated by the SMR Project Engineer or SMR Representative who supervises their activities. Evacuated employees shall notify their supervision of their location.

When the emergency has ended, employees will again be notified via the EBS System.

16. Community Evacuation

The responsibility for determining the need to evacuate any portion of the surrounding community in the event of an emergency lies with the local agencies (Contra Costa County Health Services Department, Sheriffs Department or Martinez Police Department - depending on the location of the emergency situation). SMR will provide all necessary information concerning an emergency situation to the Incident Commander on the scene so that informed decisions can be made. Contact with City or the County Incident Commander will normally be made by the Fire Chief or his alternate, utilizing the Health & Safety Department Radio system. (The City or County Incident Commander has been instructed to pick up a Health & Safety Radio at P-1 for all major emergencies.) The Emergency Operations Center will serve as a backup (if necessary) by utilizing the Direct Phone line to City and County agencies, with information supplied by the Field Headquarters that is routinely established at the scene of the emergency.

Table G-1
Typical Mobile Fire Apparatus

ENGINE NO. 1 (MT-122)	National Foam 50' Telesqurt diesel-driven, 1,750 gpm Foam/Water pumper with 750 gallons of AFFF/ATC 3%-6% foam concentrate on board. Equipped with Servo-Command system for foam operation. Carries SCBA equipment, turnout gear, etc. Responds to all alarms. Located at OpCen Firehouse.
ENGINE NO. 2 (MT-135)	National Foam, 3,000 gpm Foam/Water pumper with 1000 gallons of AFFF/ARF 3%-6%foam concentrate on board. Equipped with Servo-Command system for foam operation. Carries SCBA equipment, turnout gear, etc. Responds to all alarms. Located at the DCU Firehouse
ENGINE NO. 3 (MT-82)	International, 750 gpm Combination Foam/Water Pumper. Carries 750 gallons of XL-3 foam concentrate and has foam-metering system. Also carries SCBA equipment, turnout gear, etc. Responds when called for. Located at Lab Firehouse.
POWER WAGON NO. 4 (MT-630)	Ford Pickup, 1.5 ton, with four-wheel drive. Carries EMS supplies, rescue equipment, various fire apparatus, 200 gallons of water, and 30 gallons of AFFF-ATC 3%-6% foam concentrate. Responds to all emergencies. Driven by the OSSI..
DRY CHEMICAL UNIT NO. 5 (MT-625)	Ford Pickup, 3/4 ton, F-250, with 500 lb. dry chemical (Purple "K") extinguisher unit mounted on truck bed. 800 gpm monitor with 100 feet of 2 ½" hose. Responds to all emergencies. Driven by Safety Inspector.
DRY CHEMICAL UNIT NO. 6 (MT-626)	Ford Pickup, 3/4 ton, F-250 with 500 lb. dry chemical (Purple "K") extinguisher unit mounted on truck bed. 800 gpm monitor with 100 ft of 2 ½" hose. Responds to all emergencies. Driven by Safety Inspector
ENGINE NO. 8 (MT-112)	Ford, 1,500 gpm Combination Foam/ Water Pumper. Carries 1,000 gallons of AFFF-ATC3%-6% foam concentrate, which is proportioned through a pressure balance system. Carries SCBA equipment, turnout gear, etc. Responds to all fire alarms. Located at LOP Firehouse.
MOBILE COMMAND POST (MT-134)	Blue Bird Motor Home. Assorted hearing, eye and respiratory protection. Operations and Health and Safety Department radios and headsets. Assorted supplies, maps and manuals, bullhorn, flashlights, Cellular telephones. Responds to all fire alarms.
MONITOR TRUCK NO. 7 (MC-580)	Ford Pick-up ½ ton with 2,200 gpm monitor and 100 feet of 5" hose.
FOAM TENDER (MT-125)	Freightliner diesel-driven tanker. Carries 2,000 gallon XL-3 in forward compartment and 2,000 gallons of water in aft compartment. Can be used to nurse-maid foam pumpers or resupply water to Fire Truck #4. Available on call.
FOAM TOWER TRAILER (MTT-31)	Two-wheel trailer carrying three 50', 500 gpm portable foam towers and a portable foam monitor. Responds on call. Located at Auxiliary Firehouse.
FOAM LIQUID TANKS (Two)	500 gallon units containing 3% foam concentrate. Designed to be transported to the scene of an emergency by load-lugger truck when called for. Located at Auxiliary Firehouse.
EQUIPMENT CARRIER (MT-96)	Assorted fire line adapters, nozzles and tools. 750' of 1-1/2" hose, 600' 2-1/2" hose and 1,100' of 5" hose. Two Apollo 750 gpm portable monitors. 1,250-watt portable generator with three 300-watt lights on stands with extension cord and electrical wyes. 2-1/2" hose bridges, 6 MSA-SCBA's and spare bottles. Responds on call.

Table G-2
Typical Additional Portable Emergency Equipment

Fire Hose	2,000 Feet of 1-1/2 inch and 4,000 feet of 2-1/2 inch fire hose is located on reels throughout the Refinery, on fire trucks, and in the Health and Safety shop. 1,300 feet of 5-inch high volume hose is located in the Health and Safety Service Shop, on fire trucks, and equipment carrier.
Fluoroprotein Foam XL-3	Approximately 2,600 gallons of Chubb National XL-3 foam are located at the fire control agent staging area.
AFFF Foam	300 Gallons of 3M AFFF foam are located at the fire control agent staging area.
Portable Fire Water Monitors	15 Portable Akron 750 gpm fire water monitors are located on fire trucks and in the Health and Safety Shop.
Water Cannon	One Stang 2,000 gpm water cannon is located on Truck # 7.
Extinguishers	Approximately 1,400 fire dry chemical, CO_2, and water fire extinguishers are located throughout the Refinery.
AFFF/ATC Foam	730 Gallons of 3M AFFF/ATC foam is located at the wharf in tanks and drums. 2,400 Gallons of AFFF/ATC is located in the fire control agent staging area. 1750 Gallons of AFFF/ATC is located on fire trucks.
Hazmat Foam	360 Gallons of Chubb National Foam Universal Gold in 5 gallon pails. This hazmat foam is in the fire control agent staging area.
Foam Towers	Four Portable foam towers located at the Refinery's fire training grounds.
SCBA	350 Self-contained breathing apparatus are located throughout the Refinery.
Breathing Air Trailers	18 Four-cylinder breathing air trailers (1,200 cu/ft per trailer) and 10 two-cylinder breathing air trailers (600 cu/ft per trailer) are located at the Health and Safety Service Center and in use throughout the Refinery.
Turn-out Gear	Approximately 250 sets of full turn-out gear located on the equipment carrier and fire trucks, and in the auxiliary fire hose and fire training grounds, and throughout the Refinery
Furnace Gear	100 Sets of furnace gear are located in the Health and Safety Service Center and throughout the Refinery.
Acid Gear	60 Sets of 16 oz. PVC, corrosive resistant, self-extinguishing suits are located in the Health and Safety Service Center and throughout the Refinery.

SECTION H. PERSONNEL TRAINING

H.1 Program Description

All employees involved in handling, storing, or otherwise managing hazardous waste at the facility are supplied with information and trained with classroom instruction or on-the-job experience that ensures compliance with personnel training requirements outlined in 22 CCR 66264.16. The training program discussed in this section is applicable to personnel involved with Tank 12038 and the CO Boilers.

All facility personnel involved with the management of hazardous waste successfully complete a training program consisting of either computer based instruction or on-the-job training, or both, which trains them to perform their duties in a way that ensures compliance with all applicable federal and state hazardous waste facility regulations. As part of the program, personnel are trained to respond effectively to emergencies by instructing them in emergency procedures, emergency equipment, and emergency systems, which include the following areas where applicable:

1. Procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment;
2. Key parameters for automatic waste feed cut-off systems;
3. Communication or alarms;
4. Response to incipient stage fires or explosion;
5. Evacuation procedures;
6. Shutdown of operations.

An outline of training modules used in the Utilities Department (CO Boilers) and Effluent Treatment Plant (Tank 12038) are provided in this section. The training includes operational topics as well as hazardous waste management, and emergency response. Copies of the complete training manuals are retained by the Environmental Affairs Department for review. The training department maintains training records for the personnel, which includes what training is received, when it was received, and the employee's signature. A description of the training received by the personnel is maintained in a Mandatory Training Quick Reference Guide, which is updated by the training department to reflect current regulations and SMR policy mandated training. A copy of this guide is not provided as part of the operations plan but a copy is retained by the training department for review.

For additional information, **Section D.1 and D.2** of this permit application provides a detailed process description and operational discussion of the Tank 12038 and the CO Boilers, respectively. Additionally, the index for the Operator Training Manuals used by the Utilities Department and Logistics Department are provided in **Table H-1** and **Table H-2**.

H.2 Personnel Job Description

The director of the hazardous waste training program is the Senior Hazardous Waste Technician in the Environmental Affairs Department. The person filling this position has direct hazardous waste management experience, and is capable of instructing facility personnel on hazardous waste management procedures, as well as emergency and evacuation procedures.

A task analysis of each job related to the management of hazardous waste at the CO Boilers and Tank 12038 was completed in order to design the training program to meet the actual job tasks. This analysis determines the knowledge and skills a person must have in order to perform the assigned job. The task analysis was used to determine the type of training that each job must receive in order to ensure that the facility is in compliance with all applicable federal and state regulations.

All analyses completed to classify a waste as hazardous or non-hazardous according to applicable federal and state regulations are completed by contract laboratories approved by the California Department of Toxic Substances Control. No analyses required to classify a waste is completed by SMR personnel. Therefore, the training requirements for performing field tests are not applicable to the CO Boilers or Tank 12038 personnel.

H.3 Training Schedule

The introductory training for all new and transferred personnel is completed within six months of employment or transfer. On average, the training is completed within two to three months. No employee will work in an unsupervised position until training is completed. All personnel complete a continuing computer-based training program annually. The computer-based training program consists of the same training information provided in the introductory training regarding the management of hazardous waste at either the CO Boilers or Tank 12038. New or transferred personnel complete approximately 48 hours of introductory training specific to the management of hazardous waste. Personnel complete approximately eight hours of computer-based follow-up training annually, which is specific to the management of hazardous waste. Other training is also received in areas other than hazardous waste management.

H.4 Training Records

A record that the training has been received and successfully completed is maintained at the facility until closure. The record includes the job title, names of the personnel filling the job, a written job description, the training required and documentation that the training has been completed.

The Utilities Department Training Coordinator is responsible for maintaining all training records for hazardous waste facility training in conjunction with operation of the CO Boilers to treat hazardous waste and in handling the precipitator dust from the CO Boilers. Similarly the Logistics Training Coordinator is responsible for maintaining all training records for hazardous waste training concerning the storage of biosludge in Tank 12038. The training record includes the following information:

1. Job title for each position at the facility related to hazardous waste management;

2. Written job descriptions of the type and amount of both introductory and continuing training that will be given to the facility personnel filling each position;

3. Names of the personnel filling the position

4. Documentation that the introductory and continuing annual training is completed

All training records specific to hazardous waste facility training for the CO Boilers and Tank 12038 will be kept electronically until closure of the individual units.

Table H-1
Training Manual Index
Process Operator – Boiler Side: Utilities

INDEX MODULE #	TITLE
1	PROCEDURES AND FIRE AND SAFETY EQUIPMENT
2	HAZARDOUS AREAS AND HAZARDOUS MATERIALS
3	LOCATIONS OF MAJOR EQUIPMENT
4	INSTRUMENT TOTAL DISTRIBUTED CONTROL (TDC) SYSTEM
5	STEAM SYSTEM
6	HPBFW PUMPS
7	CO BOILER – PRINCIPLES OF STEAM GENERATION
8	CO BOILER – BFW/STEAM FLOW
9	CO BOILER – STEAM DRUM AND BOILER BLOWDOWN SYSTEM
10	CO BOILER – CIRCULATING PUMPS
11	CO BOILER – FORCED DRAFT FAN/AIR SYSTEM
12	CO BOILER – CO FLOW
13	CO BOILER – FUEL GAS AND FXG BURNING
14	CO BOILER – BIOSLUDGE BURNING SYSTEM
15	CO BOILER – SOOT BLOWER SYSTEM
16	CO BOILER – PRECIPITATORS AND OPACITY MONITORING SYSTEMS
17	CO BOILER – PRECIPITATOR DUST HANDLING FACILITIES
18	CO BOILER – UREA INJECTION SYSTEMS
19	CO BOILER – NORMAL OPERATION AND READINGS
20	CO BOILER – STARTUP AND SHUTDOWN
21	CO BOILER – SHUTDOWN DEVICES AND EMERGENCY PROCEDURES
22	BOILER 4 – PRINCIPLES OF STEAM GENERATION
23	BOILER 4 – STEAM DRUM AND BOILER BLOWDOWN SYSTEM
24	BOILER 4 – FORCED DRAFT FAN/AIR SYSTEM
25	BOILER 4 – PILOT GAS AND REFINERY FUEL GAS OPERATION
26	BOILER 4 – NORMAL OPERATION AND READINGS
27	BOILER 4 – STARTUP AND SHUTDOWN
28	BOILER 4 – SHUTDOWN DEVICES AND EMERGENCY PROCEDURES
29	BOILER WATER SAMPLE TESTING
30	FUEL GAS SYSTEM AND GAS MANIFOLD TO THE H2 PLANTS
31	STEAM SPILL STATIONS, BLOWDOWN DRUMS, ELECTRICAL SYSTEM, AND GENERAL TROUBLE ALARM PANEL
32	DAILY ROUTINES
33	UTILITIES EMERGENCY PROCEDURES
34	MANAGEMENT OF CHANGE TRAINING

Table H-2
Training Manual Index
Process Operator – Effluent Treating Plant: Logistics Department

INDEX MODULE #	TITLE
1	PROCEDURES AND FIRE AND SAFETY EQUIPMENT
2	HAZARDOUS AREAS AND HAZARDOUS MATERIALS
3	LOCATIONS OF MAJOR EQUIPMENT
4	GAUGING
5	INSTRUMENT TOTAL DISTRIBUTED CONTROL (TDC-3000) SYSTEM
6	API SEPARATOR SYSTEM
7	FLASH MIXERS AND N2 FLOTATION UNITS
8	BIOTREATER FEED SYSTEM
9	BIOTREATER/CLARIFIERS & POLYMER SYSTEM
10	BIOSLUDGE THICKENER
11	ETP#2 DISSOLVED NITROGEN FLOTATION (DNF) SYSTEM
12	AERATOR AND BIOCLARIFIER SYSTEM
13	LOW POINT SUMP/PROCESS WATER TANKS
14	DIVERSION TANKS TK-12519 AND TK-12520
15	SELENIUM PRECIPITATION UNIT POND SYSTEM
16	SELENIUM PRECIPITATION UNIT LAMELLA SYSTEM
17	EFFLUENT FLOW TO THE BAY/GAC UNITS
18	GROSS OIL SEPERATOR/SLOP OIL SYSTEM
19	HYDRAULIC SEAL DRUM
20	THERMAL OXIDIZER F-12248
21	SAMPLING AND TESTING
22	READINGS, MANIFESTS, AND CALL FILES
23	AIR QUALITY CONTROL
24	ENVIRONMENTAL AND EMERGENCY PROCEDURES
25	SHIP MOORING
26	MANAGEMENT OF CHANGE

SECTION I. CLOSURE PLAN

I.1 Introduction

This Closure Plan addresses the requirements of 22 CCR 66264.110 et seq and 40 CFR Part 264, Subpart G pertaining to closure of the permitted hazardous waste units at the Shell Martinez Refinery (SMR or the Refinery) in Martinez, California. The Closure Plan describes procedures that SMR will use when permitted hazardous waste activities cease to occur at this location. In accordance with regulatory guidance, the closure cost estimate assumes that an independent third party will perform closure. This Closure Plan provides sufficient detail should third party closure be required.

This Closure Plan defines the procedures to close SMR in a manner that: 1) minimizes the need for further maintenance and controls, and 2) minimizes or eliminates to the extent necessary to protect human health and the environment, post-closure release of hazardous constituents, leachate, contaminated rainfall and runoff or hazardous waste decomposition products to the ground, surface waters, or to the atmosphere.

The Closure Plan addresses the present and former hazardous waste storage and treatment units that are under the regulatory authority of the California Department of Toxic Substances Control (DTSC). If required, a separate closure plan will be prepared to address the requirements of closure for hazardous material handling areas pursuant to the California Fire Code Section 8001.13.3 and submitted to the local agency. Additional site closure and/or remedial measures may be required by other agencies such as the San Francisco Bay Regional Water Quality Control Board.

This Closure Plan outlines the scope of closure, expected date of closure, and tentative schedule. It details the inventory of wastes on-site and describes final treatment. It also presents the decontamination and disposal procedures, which will be utilized at closure and provides a closure cost estimate in accordance with the regulations.

This Closure Plan and subsequent revisions will be kept on-site until closure is completed and certified in accordance with 22 CCR 66264.115.

I.2 Facility Information

This section provides a brief summary on the permitted hazardous waste management units at SMR.

I.2.1 General Facility Description

SMR is a petroleum refinery owned and operated by Equilon Enterprises LLC a subsidiary of Shell Oil Products US.

The Refinery is located at the South Shore of the Carquinez Strait, near the city of Martinez, California, on about 1,000 acres of land. SMR currently manufactures gasoline, intermediate fuels (jet, diesel, and kerosene), industrial fuels, asphalt and catalysts.

The Refinery has five permitted units:

- Three CO Boilers (COB-1, COB-2, and COB-3) used to burn hazardous waste dissolved nitrogen flotation (DNF) solids and non-hazardous biosolids,
- Tank 12038 used to store DNF and non-hazardous biosolids, and
- The Effluent Treatment Plant #1 (ETP-1) Biotreater, which was authorized by DTSC for delay of closure in 2003 and has processed non-hazardous wastewater since 1998.

I.2.2 Owner/Operator Information

The pertinent information identifying the Refinery is identified below:

Facility Name(s):	Shell Martinez Refinery
EPA ID Number:	CAD 009164021
Facility Physical Address:	Marina Vista and Shell Avenue Contra Costa County Martinez, California 94553
Facility Mailing Address:	Shell Martinez Refinery P.O. Box 711 Martinez, California 94553
Contact Person:	Mr. Steven Overman
Telephone Number:	(925) 313-3000
Facility Operator:	Equilon Enterprises LLC
Property Owner:	Equilon Enterprises LLC
Other Applicable Environmental Permits:	BAAQMD Title V Air Permit NPDES Wastewater Discharge Permit

I.2.3 Facility Location Description

Information on the location and description of SMR and the surrounding area is provided in **Section B** of the Part B Application.

I.3 Waste Management Units

SMR has five hazardous waste management units at the facility. The specific units and capacities of each are described in **Section D** of the Part B Permit Application and are summarized below:

Unit	Type of Unit	Capacity or Throughput
Tank 12038	Storage Tank	47,754 gallons
CO Boiler 1	Boiler/Industrial Furnace (BIF)	10 gallons per minute (hourly average) of hazardous waste combusted
CO Boiler 2	Boiler/Industrial Furnace (BIF)	Same as CO Boiler 1
CO Boiler 3	Boiler/Industrial Furnace (BIF)	Same as CO Boiler 1
ETP-1 Biotreatment Pond	Surface Impoundment	3.8 million gallons

As described in **Section D** of the Part B Permit Application, ETP-1 has not processed hazardous wastewater streams since 1998, when the wastewater streams that were classified as hazardous waste due to benzene content were diverted to ETP-2, a covered biotreatment tank. However, since Shell requested and received authorization to delay the closure of this unit, it is included in this Closure Plan.

I.4 Waste Description and Maximum Inventory

I.4.1 Waste Description

The wastes stored in Tank 12038 and combusted in CO Boilers 1 through 3 is a K048 RCRA-listed hazardous waste. The listing basis for this material is hexavalent chromium and lead. Prior to construction of ETP-2 and the subsequent diversion of benzene-laden wastewater to this unit, ETP-1 processed refinery wastewater streams that were characteristically hazardous due to benzene concentration (a RCRA D018 hazardous waste).

I.4.2 Constituents of Concern

Specific constituents of concern are listed below based on the waste materials managed at SMR.

Unit	Constituent(s) of Concern
Tank 12038	Metals[1] , Total Petroleum Hydrocarbons
CO Boiler 1	Metals[1]
CO Boiler 2	Metals[1]
CO Boiler 3	Metals[1]
ETP-1 Biotreatment Pond	Metals[1], Benzene, Total Petroleum Hydrocarbons

1. Metals include Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Lead, Mercury, Nickel, Selenium, Silver and Thallium.

I.4.3 Waste Management Units and Maximum Waste Inventory

The waste management units to be closed are described in **Section I.3** of this Closure Plan.

The maximum waste inventory used in the Closure Cost Estimate is the following:

- 47,754 gallons in Tank 12038 (maximum tank capacity).
- DNF and Biosolids contained in the piping from Tank 12038 to the CO Boilers.
- K048-derived electrostatic precipitator (ESP) fines accumulated in the Main Hopper (estimated 10,000 pounds).
- 1,500 tons of contaminated sediment on the bottom of ETP-1 (based on previous studies which determined there to be a maximum of six inches of sediment on the bottom).

In addition, there are various units on site that do not affect the maximum volumes for inventory elimination. These include the CO Boilers where there is no accumulation. Other items include process equipment (pumps and strainers), carbon adsorption containers, and similar auxiliary process equipment. These equipment items are included in closure activities and the closure cost estimate for sampling and cleaning or disposal.

I.4.4 Closure Generated Waste

In addition to the maximum inventory of hazardous waste described above, additional hazardous wastes include wastes that will be produced from implementing the closure steps identified in **Section I.5.3**. These closure wastes may include contaminated rinse waters, waste residues, contaminated personal protective equipment (PPE), miscellaneous equipment wastes (such as pumps, filters, and pipes or hoses), sampling wastes, and other wastes, metal structures, and furnace refractories. These will be managed as hazardous wastes unless it can be shown to that they are not K048 waste by the mixture or derived-from rule and that they are non-hazardous based on analysis as discussed in **Section I.6**. and in the Sampling and Analysis Plan (**Appendix B**).

The estimated quantities of these additional wastes are:

- Closure Generated Liquid Waste - 147,000 gallons water
  (from rinsing and pressure washing)
- Closure Generated Solid Waste - 18,800 cubic yards
  (Demolition debris, miscellaneous equipment, soil, PPE, etc.)

I.4.5 Disposition of Wastes

SMR will use current vendors for disposal of hazardous wastes resulting from closure. Should additional vendors be needed, or if closure is handled by a third-party, disposal vendors will be selected as follows.

Prior to sending any closure wastes offsite for treatment and/or disposal, SMR (or a third party) will assess that each Treatment, Storage, or Disposal Facility (TSDF) to be used is permitted to receive the specific waste. In addition, an effort will be made to determine if the TSDF is in good standing with the authorizing agency. One method is to determine the status of the proposed TSDF by EPA pursuant to the CERCLA Off-site Rule under 40 CFR 300.440.

Standard TSDF waste acceptance procedures will be followed including establishing waste profiles. One potential TSDFs that could be used for liquid and solid hazardous wastes generated by closure activities or wastes present on site at time of closure is:

Clean Harbors (Buttonwillow)
2500 W. Lokern Road
Buttonwillow, California 93206
Approx. Distance – 250 miles

Any closure wastes sent offsite for disposal will be placed in proper containers or bulk packagings (including trucks or railcars) that meet the United Nations performance-oriented packaging standards or bulk containers that meet the U.S. Department of Transportation (DOT) requirements under 49 CFR 172 et seq. All containers used will be properly labeled at the time of waste generation and manifested in accordance with generator standards under 22 CCR 66262. A hazardous waste manifest form approved by the state where the receiving facility is located will also accompany all shipments of hazardous waste. Shipments will also be placarded and marked in accordance with U.S. DOT rules. If the receiving state has no special manifest form, a California Manifest form will be used. Land Disposal Restriction (LDR) Forms will be filled out for any hazardous wastes subject to LDR standards. This form will be filled out to identify all the applicable waste codes and treatment standards. These LDR forms will be submitted to the TSDF with the first shipment of each waste stream and will be either maintained with the profile or they will accompany each hazardous waste manifest, depending on the standard procedures of the receiving TSDF. Copies of any LDR forms used will be included with the closure report.

I.4.6 Estimated Date of Closure

There are no current circumstances that would indicate the need to close the Refinery. However, for the purposes of this Closure Plan, SMR will be assumed to operate for another 30 years and have an estimated closure date of mid-year 2035. SMR may remain in service past this date as economic and regulatory factors allow. If the closure date is to be extended, such will be indicated in an amendment to the Closure Plan as indicated in **Section I.14** or during a future update to the Part B Permit application, or reapplication in ten years.

I.5 Closure Procedures

This section describes the specific procedures to be used to close SMR.

I.5.1 Closure Goals

This Closure Plan defines the procedures to close SMR in a manner that: 1) minimizes the need for further maintenance and controls, and 2) minimizes or eliminates to the extent necessary to protect human health and the environment, post-closure release of hazardous constituents, leachate, contaminated rainfall and runoff or hazardous waste decomposition products to the ground, surface waters, or to the atmosphere.

The intent of this Closure Plan is to remove hazardous wastes and hazardous waste contaminated materials associated with the storage and treatment units. This can involve removal and proper disposal of some units, while others may be clean closed and left in place or reused. Any units that cannot be appropriately decontaminated in accordance with the closure goals defined below, will be removed and managed as a hazardous waste, unless they can be properly characterized as a non-hazardous waste. The specific closure performance standards are shown below for the types of equipment, structures, and media if they are to be left in place or reused:

a. Metal Tanks or Structures

Attainment of the closure performance standard for metal tanks or structures that handled characteristic hazardous wastes only will be based on interior wipe samples showing constituents of concern at levels below those identified by a risk-based analysis.

Metal tanks that managed characteristic wastes and tanks that handled RCRA listed hazardous wastes will be designated as closure waste. The tanks will be sent for offsite management after proper characterization. This may include the hazardous debris alternative treatment standards (e.g., treatment to “clean debris surface”) under the Land Disposal Restriction Requirements in 22 CCR 66268.45 to determine the appropriate disposition.

b. Concrete Containment Areas

This closure performance standard will apply to concrete containment areas. The background levels for metals content will be the statistically derived mean plus two standard deviations for background samples. Background samples will be collected from concrete locations that have not been exposed to hazardous waste or hazardous materials. If the recorded values are above the statistically expected range for the background samples, the unlined containment area will be assumed to be contaminated. The background level for organic constituents will be non-detect based on the EPA SW-846 test methods in effect in 2005. If methods for calculating a risk-based site-specific cleanup level for concrete are established and accepted by DTSC, such may be used to develop specific standards for organics and/or metals. Containment and/or areas that can not be cleaned to meet the closure performance standard will be removed and managed as closure generated waste as described in **Section I.5.3.11** after being characterized as described in **Section I.6**.

c. Soils / Groundwater

A risk-based cleanup standard will be developed at time of closure using current toxicological protocols and data at that time and the Prop 65 Risk Level (one in 100,000 cancer risk) or a Hazard Quotient of 1 for non carcinogens. A cost for preparation is included in the closure cost estimate. SMR will endeavor to meet the specified risk-based levels for residential use. If these cannot be met, a note to the property deed will be filed. Should extensive subsurface contamination (soil or groundwater) be detected as a result of operations of the hazardous waste units at the Refinery and the subsurface contamination cannot be adequately removed or remediated, a Post-Closure Plan will be submitted to DTSC for review and approval as part of the closure actions.

d. Rinse Waters (from small miscellaneous pieces of equipment)

The used rinse water will be compared to the fresh (unused) rinse water. The allowable increase above that used for cleaning will be the Industrial Risk-Based Screening Level determined identified for groundwater. If the rinse water contains an increase less than the values specified, the equipment is deemed to be clean.

e. Pipe, Pipe Components, and small miscellaneous pieces of equipment)

These equipment items may be designated as closure-generated waste and such equipment may be handled in accordance with the alternative treatment standards for hazardous debris (e.g., treatment to “clean debris surface”) under the Land Disposal Restriction Requirements in 22 CCR 66268.45.

I.5.2 Closure Notification

SMR will notify the Regional Office of the California DTSC at least 180 days prior to the date closure is expected to begin. This notification will include the proposed risk-based soil and groundwater cleanup standards as described in **Section I.5.1**.

I.5.3 Closure Activities

All closure work described below in this section will be performed with the knowledge and concurrence of the certifying engineer (or their agent), who will observe and document closure activities for the Closure Report as described in **Section I.13**. The manager of the fieldwork will also maintain a field logbook that will be used to document that closure activities have been performed properly. Photographs, diagrams, and other records will be developed as necessary to describe the closure activities performed. All confirmation samples of equipment or media will be performed in accordance with the Sampling and Analysis Plan in **Attachment I-2** to this Closure Plan. This will include the appropriate use of quality control samples, trip blanks, and equipment blanks. The sample locations are summarized in **Attachment I.3**.

All closure activities are expected to be completed within the 180 days from the date of DTSC approval of the Closure Plan. A Closure Schedule is attached as **Figure I-1**. If unexpected circumstances arise during implementation of the Closure Plan, the Facility will request an extension and provide appropriate justification.

I.5.3.1 Preparatory Work

All contractors shall prepare a Final Site-Specific Health and Safety Plan (HASP) for the closure activities in accordance with 8 CCR 5192. Refer to the site Health and Safety Procedures contained in **Attachment I-1** as a guide, however, any Closure Contractors performing work onsite shall develop their own HASP which may be more protective of worker health than the Shell Health & Safety Procedures. If the final HASP is less protective of worker health (e.g., reduced use of personal protective equipment), the HASP will be certified by a Certified Industrial Hygienist (CIH) and offered to DTSC for review prior to closure implementation.

Contract employees shall be under the direct control of Shell or their on-site agent (e.g. consultant) who will have the authority to enforce the HASP and to shut down work to evaluate new safety hazards or to address non-conformances with established safety procedures.

DTSC and the Regional Water Quality Control Board will be notified of the date that field closure activities will commence.

I.5.3.2 Removal of Waste Inventory in Tanks

The contents of Tank 12038 will be transferred to tanker trucks and/or other appropriate containers for shipment to an appropriate TSDF. The bulked wastes will be sent to a recycling facility (such as a cement kiln) or TSDF, as appropriate, following the procedures described in **Section I.5.3.11** (pre-approval of the TSDF, and proper use of manifests and LDR notifications, DOT/UN approved packaging, placarding and other transportation procedures).

Note that if SMR is performing the closure of the facility, they may elect to process as much of the waste as possible in the CO Boilers. (The Closure Cost Estimate is prepared assuming that the waste will be sent offsite for treatment and disposal).

I.5.3.3 Tank 12038 Closure Activities

The actions to close Tank 12038 and associated equipment are described below. Do not enter the tanks to clean them prior to performing at least one initial rinse from outside the tank and evaluating whether or not it is a permit-required confined space that meets the requirements of 8 CCR 5157 or 8 CCR 5158, as applicable.

- Disconnect all electrical from tank and associated equipment.
- Remove waste inventory in tank (see **Section I.5.3.2**).
- Remove the mixer from the tank. Separate the mixer blade and shaft assembly from the motor. Dispose of the mixer and shaft as closure generated wastes. The motor may be sent offsite as scrap metal, since it did not contact the waste biosolids.

- Remove any remaining instrumentation on the tanks (such as level controls, level switches, and temperature gauges) and place in either the scrap metal bin (if not in direct contact with waste) or in the closure debris bin for disposal as closure waste.

- Inspect the length of the welded piping from Tank 12038 to the CO Boilers. Focus on any flange connections (e.g., at valves, pumps, etc.). Based on this inspection select 20 locations under the piping for soil sampling (see **Section I.5.3.7**). These should be biased towards any areas of suspected leakage in the transfer piping to/from Tank 12038.

- Flush piping from CO Boilers into Tank 12038. Pump out rinsate and manage as a closure generated waste (RCRA listed waste by mixture rule).

- Clean the tank with high pressure water wash. Dispose of rinsate and/or sludge residues as K048 hazardous waste using a vacuum truck or pumps to empty the tank into a tanker truck for hazardous waste shipment.

- Dismantle Tank 12038 (using shears not torches) and manage as a closure generated waste. Sampling is not necessary. Because the tank will be sent as closure waste (RCRA listed waste by mixture rule), confirmation sampling will not be required.

- Dismantle piping and pumps associated with Tank 12038 and manage as a closure generated waste.

- Clean concrete tank foundation using high pressure water wash. Collect one sample of concrete directly under the former tank location. Collect one soil sample from directly under the tank and four samples from outside the tank foundation, one form each quadrant. See concrete and soil sampling procedures in **Section I.5.3.7**.

I.5.3.4 CO Boiler Closure Activities

The actions to close one of the CO Boilers are described below. Repeat for the other two CO Boilers if they are to be closed as well.

- Disconnect all electrical from boilers and electrostatic precipitators (ESPs).

- Remove stack and dispose as closure generated waste.

- Clean ESPs by water washing. It is assumed that less water will be needed than to clean Tank 12038 since only dust will be removed. However to account for internals, the same rinse rate of 1 gal/ft^2 (external area) was used.

- Collect five wipe samples from each of the ESP assemblies to verify attainment of the closure performance standard for the metals of concern (for metal tanks). Sample from areas of most visible contamination. If cleaning is effective and such areas can not be identified, select five random locations.

- Dismantle and dispose of ESP and hoppers (assumed will meet "clean debris surface" under 22 CCR 66268.45).

- Sandblast and/or pressure wash interior of the firebox to remove majority of hazardous waste dust.

- Dismantle and dispose of CO Boiler firebox, firebox, tubes, and fan as closure generated waste (RCRA hazardous waste debris).

- Pressure Wash or sandblast concrete under former CO Boiler. Collect rinsate (or sandblast media) and manage as closure generated waste. Collect eight concrete samples and eight soil samples (see **Section I.5.3.7**) from under the CO Boiler/ESP area and analyze to determine attainment of closure performance standard.

I.5.3.5 ETP-1

The actions to close the ETP-1 former surface impoundment are described below:

- Sample water in pond and analyze for NPDES discharge permit parameters.

- Disconnect all electrical in area.

- Remove treated wastewater from pond by pumping to NPDES discharge location (no further treatment is assumed).

- Clean 100 yd^3 of miscellaneous structures and equipment in ETP-1 area, remove and dispose as closure generated waste.

- Remove an estimated 1,000 yd^3 of sludge from the bottom of ETP-1. Previous studies have shown maximum depth of sludge to be six inches, with most areas considerably less. Extrapolating the maximum of six inches over the entire bottom of ETP-1 provides a conservative estimate of sludge removal. Sample and analyze the sludge per disposal facility guidelines (on average less than one sample per truck), stabilize the sludge to remove free liquids, and dispose as closure generated waste (characteristically hazardous, California-hazardous, or non-hazardous waste).

- Remove drainage and liner systems present. Dispose as a closure-generated waste.

- Collect soil samples from 150 locations in and around ETP-1 (see **Section I.5.3.7**). This is based on one sample about every 500 ft^2 plus 10% additional to account for field adjustments based on site observations.

- Remove contaminated soil (assumed about 1 foot depth for 2,518 yd^3 and dispose of as closure generated waste.

- Backfill, compaction, and grading of former pond location.

- Install a geomembrane, clay cover, topsoil, and vegetative cover.

I.5.3.6 Decontamination of Miscellaneous Plant Equipment Items

Unless discussed in another Closure Step such as instrumentation and mixer systems in **Section I.5.3.3**, all other miscellaneous DTSC-regulated plant equipment such as pumps, filter housings, screens, strainers, and hazardous waste transfer piping will be identified and inspected. The certifying engineer (or their agent) will assess each piece of equipment to determine whether or not it should be cleaned and what method would be most effective. Rather than cleaning, it is expected that most small miscellaneous equipment items will be discarded into a debris bin and managed as closure-generated waste.

If a piece of miscellaneous equipment is to be cleaned prior to being reused elsewhere or left onsite, or to assure it can meet the definition of scrap metal, or to otherwise facilitate its disposal, the equipment will be cleaned by wiping, pressure washing, steam cleaning, or use of detergents or other cleaners, and/or wipes. During high-pressure washing, efforts will be made to minimize or eliminate any carryover outside containment areas. Workers shall not be in the direction of high-pressure water washing. Materials may be assumed to be hazardous wastes, without testing, at the discretion of the closure manager. These materials will be subject to LDR standards and may be managed under the alternative treatment standards for debris.

Equipment may only be left in place or elsewhere onsite if it is not K048 hazardous waste or it has been cleaned and it is proven to meet the closure performance standard in **Section I.5.1**. Cleaning methods may include wiping, pressure washing, steam cleaning, or use of detergents or other cleaners, and/or wipes. If sampling shows contamination (i.e., the closure performance standard has not been attained), the equipment will be either cleaned further, or removed and placed in the debris bin and managed appropriately as a hazardous or a non-hazardous waste pending waste characterization.

Piping that contained hazardous wastes will be flushed with water or a suitable solvent until sampled and shown to meet the closure performance standard, or it will be removed and placed in a debris bin for disposal as a closure generated waste.

I.5.3.7 Confirmation Soil and Concrete Sampling

This section describes the methods for collecting confirmation soil and concrete samples to demonstrate that the closure performance standard has been met. Soil and concrete samples will be collected at the locations summarized in the Sample Summary Table in **Attachment I-3**. In addition, background soil samples will be collected from about fifteen locations that were not impacted by hazardous waste or residues. (The statistical analyses of the initial results may suggest that additional background samples be collected per DTSC guidance).

When soil samples are collected from under concrete containment areas it will be necessary to core through the concrete. The top portion of this core may serve as the concrete sample for analysis and comparison to the closure performance standard. An alternative is to use a Roto-Hammer sample collected as described below. When additional concrete samples are needed, such as from background locations, they can also be obtained by using a Roto-Hammer with masonry bit, to collect samples for laboratory analysis. The minimum volume of sample to be

collected will be determined by the analytical laboratory. Refer to the Sampling and Analysis Plan in **Attachment I-2**. Initially eight background concrete samples will be collected from concrete areas not exposed to hazardous wastes.

At least 48 hours prior to drilling, the site boundaries will be marked with white paint, and Underground Service Alert (USA) will be notified as required by law. In addition, a drilling permit will be obtained from the Contra Costa County Occupational Health Department, Hazardous Materials Division, if required. A professional utility locating service will also be hired to attempt to identify the location of underground utilities in the near vicinity of proposed boring locations. The drilling contractor will not be allowed to advance a boring within three feet from a known underground utility.

Notify DTSC of the anticipated soil sampling efforts in accordance with the schedule and procedures prescribed by them.

Core drill holes through asphalt or concrete as needed to collect samples in the approximate locations described in the Sample Summary in **Attachment I-3**.

The borings will be advanced using truck-mounted direct push equipment in the presence of a field geologist. The borings will be advanced to about six feet below ground surface (bgs). Soil samples will be collected at six inches to one-foot bgs and also at about three feet and six feet bgs. Soil samples will be obtained using a direct push sampler (for example, Geoprobe) with plastic (acetate), brass or stainless steel liners. The direct push method for soil sampling is preferred because it minimizes excess soil cuttings and does not generate dust during sampling. The soil borings and samples will be collected from the locations described in the Sample Summary in **Attachment I-3**. The borings will be continuously cored and boring logs generated. The geologist will screen extracted soil cores for physical evidence of contamination (e.g., odors, chemical sheen, or discoloration). The soil samples will be cut from the acetate sample tubes, sealed with Teflon tape, capped, labeled, and placed in a pre-chilled ice chest.

After the samples are collected, each boring will be backfilled with grout. The collected samples will be transferred under formal chain-of-custody documentation to a state-certified laboratory to be analyzed individually as specified in the Sampling and Analysis Plan (**Attachment I-2**).

Background samples will be similarly collected and handled.

Attainment of the closure performance standard will be determined by comparison of analytical data to the background levels or the risk-based closure performance standard developed in accordance with **Section I.5.1**. If necessary to achieve the closure performance standard, soil will be removed. Removal procedures shall follow the procedures in **Section I.5.3.12**. In lieu of removal, SMR may elect to remediate the soil. However, the methods of remediation used shall be submitted to DTSC for review and approval prior to implementation.

Based on a review of the initial soil data, an evaluation will be made whether additional soil samples from other depths and/or locations are warranted and if grab groundwater samples are required or if samples should be collected from onsite monitoring wells, if they are properly

located and are functional. If grab groundwater samples are obtained, a minimum of three samples will be collected with one being upgradient of the Refinery. The procedures identified previously for notifying Underground Service Alert and other local agencies responsible for subsurface investigations shall be followed prior to collection of groundwater samples.

Note that contamination will be determined by looking for evidence of releases from the top layers of the soil down. Lower soil boring depths that may show signs of contaminants indicative of local soil and groundwater contamination in the surrounding area, where the layers of soil above showed no signs of contamination will be evaluated by the closure engineer in association with the DTSC to determine if the contamination likely result from operations of the hazardous waste units at the facility or from other sources.

I.5.3.8 Groundwater Sampling

SMR has over four hundred ground water monitoring well locations. A total of 30 wells will be sampled in the areas surrounding the ETP-1 and CO Boilers. Since Tank 12038 is an aboveground, double-walled tank, any releases to the environment would be visible or apparent from the soil samples in the area and groundwater samples will not be needed.

I.5.3.9 Procedures for Sandblasting and Pressure Washing

Sandblasting or pressure washing methods used at the site to clean horizontal or vertical surfaces shall be performed as described below.

a. Sandblasting

Abrasive blasting methods will be used on exterior surfaces of tanks and on containment areas only when high-pressure washing is determined to not be effective. When abrasive blasting is used, preference shall be given to wet methods. Furthermore, all applicable provisions of Bay Area Air Quality Management District (BAAQMD) Regulations shall be followed to minimize the effects of carryover. Dry unconfined abrasive blasting shall not be used unless the abrasives have been approved for use by BAAQMD.

All residues from abrasive blasting shall be managed as a closure waste.

b. Pressure Washing

During pressure washing operations, workers shall follow at a minimum the procedures identified in the Health and Safety Plan. In addition, the workers shall take measures to prevent carryover of the spray into non-target areas especially offsite or onto soil areas of the facility. The specific measures to be used will depend on the surfaces to be cleaned and other factors such as:

- Whether the surface to be cleaned is horizontal or vertical,
- The elevation of the surface to be cleaned,
- Whether the surface is inside or outside of a structure,

- The presence and height of containment walls,
- Whether it is an internal surface or external surface (for example, it may be possible to clean the inside of a tank without special precautions to prevent overspray),
- The pressure of the pressure washing system and physical or chemical additives that may be used to enhance the cleaning effectiveness,
- Other engineering controls that may be used to control the pressure washing process.

Residues from pressure washing secondary containment surfaces shall be removed by pump or by wet vacuum and similarly managed as closure waste.

I.5.3.10 Cleaning Closure Equipment

Upon nearing completion of closure, or upon completion of specific closure steps, closure equipment used will be decontaminated. One or a combination of more than one of the following techniques will be used: high-pressure water wash; steam cleaning; acidic or basic rinses; or cleaning in a solution of a commercial cleaner, followed by triple rinsing with clean potable water. Pressure washing shall follow the procedures in **Section I.5.3.9**. These cleaning wastes will be collected and managed as closure waste.

I.5.3.11 Disposition of Closure Wastes

All closure-generated wastes will be properly containerized or bulked. The waste streams will be properly characterized in accordance with **Section I.6**. to determine their proper waste classification. All closure waste will be managed through appropriate disposal or recycling.

Records will be maintained of all shipments from the site including materials to be reused, scrap metal, and non-hazardous wastes.

I.5.3.12 Removal of Closure wastes

For the purposes of this Closure Plan, it is assumed that there will be the following waste shipments from closure activities:

- Truck shipment (bulk) for removal of tank waste inventory
- Rinsewater from closure decontamination
- Rolloff bins of closure-generated waste.

Closure wastes generated onsite shall be loaded onto trucks in a manner to minimize the potential for spills and other releases.

If soil is to be excavated, soil will preferably be placed directly into trucks. If it is necessary to stockpile soil it will be placed onto high-density polyethylene sheet with a minimum thickness of 60 mils. Provisions such as tarps shall be employed to minimize wind blowing of the soil. In addition, soil being loaded onto trucks shall be moistened sufficiently to reduce windblown emissions. Wetting will not be necessary for soil types such as compacted clays that will not be

dispersed by the wind. The dumping height of the soil shall also be minimized to further reduce potential emissions. Once loaded, the soil shall be covered by a tarp before the truck travels on public roads.

If any concrete or asphalt secondary containment areas or other surfaces are to be removed, they will need to be broken into pieces that can be handled by an excavator bucket and loaded into a truck. When breaking concrete surfaces, the generation of dust shall be minimized through use of a water mist, selection of size reduction technique, or other measures. It will not be necessary to tarp truckloads of concrete or asphalt rubble.

I.6 Characterization of Closure Wastes

Closure wastes will be classified as hazardous or non-hazardous prior to disposal. Wastes materials that are derived from or were formerly mixed-with Resource Conservation and Recovery Act (RCRA) listed hazardous wastes will be managed as RCRA listed hazardous waste unless otherwise exempt form such classification. For all other wastes, the general methodology will be to first determine if the waste is a federal RCRA hazardous waste and then if it is a California-only (non-RCRA) hazardous waste. This procedure is consistent with California Regulations under 22 CCR 66262.11. If the waste is not hazardous under either federal or state laws and regulations, the closure wastes may be disposed of as non-hazardous waste.

Waste classification procedures are described in the Sampling and Analysis Plan (**Attachment I-2**). For wastes that are sampled for waste characterization purposes, appropriate analytical techniques will be used by a California-certified laboratory and all samples will be transported under chain-of-custody procedures. Wastes that are determined to be hazardous from this evaluation will be placed in appropriate containers, labeled as hazardous wastes, and manifested and transported to an offsite, permitted TSDF for recycling, treatment, or disposal as hazardous waste.

I.7 Prevention of Contamination During Closure

It is not anticipated that performance of closure activities will impact a saturated zone of soil. Closure activities will be performed in a safe, well-organized manner and no additional precautions or special procedures are expected to be necessary. Any rainfall that occurs prior to completion of closure will be pumped to a clean tank and managed in the wastewater system onsite or discharged to the local sanitation district under permit. Accumulated storm water may also be managed appropriately as a closure waste.

I.8 Partial Closure Activities

The closure as outlined in this Closure Plan is intended to constitute the final closure.

During the course of operations it may be necessary to close portions of hazardous waste management units in the facility. An example of this type of closure would be the replacement of a tank or tank components that have developed a leak or when an integrity assessment indicates that the minimum metal thickness is inadequate for continued use.

The Facility shall maintain records of partial closure activities and include them with the final documentation of Closure. The procedures for partial closure should follow the same procedures described in this Closure Plan to the extent practical.

I.9 Schedule for Closure

The closure schedule is provided in **Figure I-1** and shows the activities and estimated time to complete each in weeks (assuming 4 weeks per month). This schedule shows completion of all closure activities within 180 days of DTSC approval of the Closure Plan. If an extension is required, such a request shall be made to DTSC in accordance with 22 CCR 66264.113(b).

I.10 Closure Cost Estimate and Finacial Assurance

A summary of the Closure Cost Estimate (CCE) and the Cost Pro computer model output is provided in Appendix 3 along with a summary of the bases and assumptions used. Some of the significant assumptions are discussed below.

The Financial Assurance documentation is included as Appendix 4.

I.10.1 Regulatory Requirements

SMR has prepared a closure cost estimate in accordance with 22 CCR 66264.142(a).

- SMR will adjust the closure cost estimate annually for inflation, and/or other factors, in accordance with 22 CCR 66264.142(b). SMR will make this adjustment within sixty days prior to the anniversary date of its closure financial assurance mechanism.
- SMR will revise the closure cost estimate as necessary in accordance with 22 CCR 66264.142(c), within thirty days of any modification of the closure plan that results in a change in the cost required to close the facility.
- SMR will revise the closure cost estimate and closure financial assurance mechanism at least thirty days before operating a new hazardous waste management unit.
- SMR will maintain at the facility a copy of the most current cost estimate in accordance with 22 CCR 66264.142(d).

I.10.2 Cost Factors

The unit costs associated with closure of the facility are based on the following assumptions and procedures.

- The unit costs for all closure activities are based on the cost of hiring a third party to close the facility. A third party is someone other than the parent or subsidiary of the owner or operator.

I.10.3 Assumptions

- Cost for decontaminating sampling equipment between samples is considered to be negligible.
- Detailed estimates for sampling and analytical costs are included in the CCE. An allowance for Quality Control/Quality Assurance (QA/QC) samples is included at the rate of one QA/QC sample per eight samples. This is to account for duplicates, field blanks, and equipment blanks. No cost for collecting the QA/QC samples was assumed since these will normally be blanks or split from another sample already collected.

I.10.4 Inventory Elimination Costs

The costs associated with eliminating the remaining waste inventory at facility closure are presented in the CCE. This includes the wastes and amounts discussed in **Section I.4.3.** The nature of the wastes managed in the DTSC-permitted units in the Refinery is not expected to change.

I.10.5 Miscellaneous Closure Cost Items

An allowance for disposal of closure-generated wastes such as pipes, PPE, and other solids was included.

Soil sampling costs are based on use of direct-push equipment (rather than hollow-stem auger) since the soil type and sampling depths favor this technique. Soil sampling includes an allowance for subsurface exploration permit application fees and preparation.

Costs are included for: 1.) preparation of a Health Risk Assessment to develop site-specific closure performance standards for soil groundwater and concrete; and 2.) a security staff (two guards) to be present during the six-month closure period.

I.11 Sample Control

The closure procedures will require samples of one or more of the following materials: wastewater, liquid wastes, solid wastes, wipe samples, concrete samples, and soil samples. All sample collection, handling, and analysis procedures will be done in accordance with EPA Publication SW-846. All samples will be labeled and sealed to prevent contamination or tampering.

To establish the documentation necessary to trace sample possession from the time of collection, a Chain-of-Custody Record will be filled out and will accompany every set of samples. Only laboratories that are state certified for the specific analyses desired may be used.

The laboratory will follow established quality control protocols throughout the analyses. This will include blanks, spikes, internal standards, and duplicate samples. This information will be available for each sample set.

Further details are presented in the Sampling and Analysis Plan in **Attachment I-2**.

I.12 Facility Security Arrangements During Closure

During closure, signs stating, "Danger Hazardous Waste - Unauthorized Personnel Keep Out" will be maintained at the locations of hazardous waste management units. Security staffing will be present to control access to the site. Visitors will gain access to the site through a controlled location during closure work. A security guard will be stationed at the entrance to control access during the work period. These security measures are designed to prevent exposure of unauthorized individuals during execution of the closure activities. If necessary, security guards will be hired to control access to the site.

I.13 Closure Report and Certification

Closure activities will be completed as described in this plan. Any deviations from the plan will be documented in the closure report. The closure report will also document the sampling and analytical results of all confirmation samples. Records of the disposition of all hazardous wastes and hazardous materials will be included in the closure report.

The closure report will be prepared within the DTSC required 60 days of completion of closure and will contain a certification from the owner or operator of the Facility and an independent certifying engineer. The certification will include the certification statements required under 22 CCR 66264.115. In accordance with DTSC regulations, the certifying engineer will be a registered professional engineer in California.

The Closure Report will contain, at a minimum, the following:

1. Certification by an independent registered professional engineer;
2. Supervisory personnel description;
3. Summary of Closure Activities;
4. Field Engineer Observation Reports;
5. Sampling Data and Analyses (i.e., sampling locations, soil boring logs, chain of custody, analytical results, etc.);
6. Discussion of Analytical Results;
7. Manifests showing disposition of waste inventory;
8. Modifications and Amendments to Closure Plan (if applicable);
9. Photographs.

I.14 Plan Amendments

This Closure Plan may be amended any time prior to the notification of partial or final closure of the Facility as provided by 22 CCR 66264.112(c). Amendments will be made:

- Whenever changes in the Part B Permit affect the Closure Plan, or
- There is a change in the expected year of closure, or
- Unexpected events occur while performing partial or final closure activities that require a modification of the approved Closure Plan.

SMR will modify the Closure Plan upon authorized request by DTSC. Such an amendment will be submitted within 60 days of the request, or within 30 days if this occurs during partial or final closure activities. Amendments to the Closure Plan will be in accordance with 22 CCR 66264.112.

In particular, the Closure Plan will be amended and submitted to DTSC for review and approval if extensive soil contamination is discovered during implementation of the closure work plan. Such an amendment will address the required removal or remediation procedures necessary to achieve the Closure Performance Standard in **Section I.5.1.**

I.15 Miscellaneous Requirements

This section lists remaining regulatory requirements and how they apply to the Facility.

I.15.1 Post-Closure Plan, Contingent Post-Closure Plan and Cost Estimate

The objective of this Closure Plan is to close the Facility in a manner that precludes the need for post-closure care. An allowance made to facilitate this includes preparation of a Health Risk Assessment to determine site-specific, risk-based cleanup goals.

Should extensive soil contamination be detected that cannot be adequately removed, or the groundwater quality has been impacted above risk-based levels, an amended Closure Plan will be submitted to DTSC for review and approval. This amendment shall include a Post-Closure Plan and Post Closure Control Cost Estimate.

I.15.2 Survey Plat

This requirement will apply if the site is closed and hazardous waste remains onsite in the soil (i.e., the Closure Performance Standard is not attained for the ETP-1). In such a case, SMR shall submit a survey plat to the local zoning authority, or the authority with jurisdiction over land use, and to DTSC. This shall be submitted no later than the submission of the Closure Certification Report. The survey plat shall indicate the location and dimensions of hazardous waste disposal units with respect to permanently surveyed vertical and horizontal benchmarks. This plat shall be prepared and certified by a professional land surveyor licensed in California.

The documents filed with the local authority with jurisdiction over land use, must state the owner's or operator's obligation to restrict disturbance of the hazardous waste area in accordance with DTSC regulations.

FIGURES

ATTTACHMENT I-1

HEALTH AND SAFETY PROCEDURES FOR FACILITY CLOSURE

ATTACHMENT I-2

SAMPLING AND ANALYSIS PLAN FOR FACILITY CLOSURE

ATTACHMENT I-3

CLOSURE SAMPLE SUMMARY

SECTION J. ENVIRONMENTAL PERMIT SUMMARY

Agency/Permit Name	Permit Number
California Department of Toxic Substance Control (DTSC) Hazardous Waste Facility Permit	CAD 009164021
Bay Area Air Quality Management District Title V Major Facility Operating Permit	A0011
San Francisco Regional Water Quality Control Board National Pollutant Discharge Elimination System	CA0005789
San Francisco Regional Water Quality Control Board Groundwater Monitoring Order	95-234

SECTION K. CERTIFICATION

K.1 Part B Permit Application Certification

"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 persons directly responsible for gathering the information, the information submitted is, to be 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."

SIGNED _____

NAME Aamir Farid

TITLE Refinery Manager

DATE _____

K.2 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 the 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 practical 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 false certification, including the possibility of fine and imprisonment for flagrant falsification.

SIGNED _____

NAME Aamir Farid

TITLE Refinery Manager

DATE _____

SECTION L. AIR EMISSION STANDARDS

L.1 Applicability and Definitions

Tank 12038 and the CO Boilers are not subject to Title 22, Chapter 14, Article 27 (RCRA Subpart AA) standards for process vents because the tank and the boilers are not one of the process units described in 22 CCR 66264.1030(b)

Tank 12038 and the CO Boilers are also not subject to Title 22, Chapter 14, Article 28 (RCRA Subpart BB) Air Emission Standards for Equipment Leaks because the Tank 12038 waste stream and the piping to the CO Boilers waste streams do not contain greater than 10% organics as specified in 22 CCR 66264.1050(b).

Tank 12038 is subject to the Title 22, Chapter 14, Article 28.5 (RCRA Subpart CC) Air Emission Standards for Tanks, Surface Impoundments, and Containers since the waste stream may contain more than 500 parts per million of volatile organic compounds. The requirements are discussed below.

The requirements of Article 28.5, 22 CCR 66264.1080-1090 apply to owners and operators of facilities that treat, store or dispose of hazardous waste in tanks, surface impoundments or containers subject to either Articles 9, 10, or 11 of Chapter 14 except as in § 66264.1. This section is equivalent to the Federal EPA Standards under Title 40 of the Code of Federal Regulations Part 264, Subpart CC. Note that the requirements for surface impoundments are not included here since ETP-1 no longer handles hazardous wastewater. Also as used here, Subpart CC refers to the requirements in Article 28.5 of Title 22 of the California Code of Regulations, Division 4.5, Chapter 14.

Normally SMR does not handle the Tank 12038 DNF Solids in containers. Should the Refinery need to use containers to temporarily accumulate DNF Solids (a K048 RCRA hazardous waste), the containers and their selection will need to comply with the requirements under 22 CCR 66264.1086.

Subpart CC requirements do not apply to the following:

- Containers with a design capacity less than or equal to 0.1 cubic meters, (about 26 gallons).
- Units managing hazardous waste with less than 500 ppmw volatile organics (as volatile organic compounds are defined in Article 28.5).

Some terms used to describe compliance with Article 28.5 of 22 CCR 66264 (Subpart CC) are defined below:

- **Cover** - device or system that is placed on or over a hazardous waste such that the entire waste surface area is enclosed and sealed to reduce air emissions to the atmosphere. Examples of covers include a fixed roof installed on a tank, a lid installed on a drum and an enclosure in which an open container is placed during waste treatment.

- **Fixed Roof** - a rigid cover that is installed in a stationary position so that it does not move with the fluctuations in the level of the hazardous waste placed in a tank.
- **In Light Material Service** - managing a material for which both of the following conditions apply: The vapor pressure of one or more of the organic constituents in the material is greater than 0.3 kilopascals (2.25 mm Hg) at 20°C (68°F); and the total concentration of the pure organic constituents having a vapor pressure greater than 0.3 kPa at 20°C is equal to or greater than 20% by weight.
- **Waste Determination** - performing all applicable procedures in accordance with the requirements of 22 CCR 66265.1083 to determine whether a hazardous waste meets the standards specified in this subpart.
- **Organic vapor tight** - the container sustains a pressure change of not more that 750 pascals within 5 minutes after the container is pressurized to a minimum of 4,500 pascals.
- **Waste stabilization** - any physical or chemical process used to either reduce the mobility of hazardous constituents in a hazardous waste or eliminate free liquids as determined by Test Method 9095 (Paint Filter Liquids Test) in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication No. SW-846, Third Edition, September 1986, as amended by Update I, November 15, 1992 (incorporated by reference-refer to section 66260.11). A waste stabilization process includes mixing the hazardous waste with binders or other materials, and curing the resulting hazardous waste and binder mixture. Other synonymous terms used to refer to this process are "waste fixation" or "waste solidification." This does not include the adding of absorbent materials to the surface of a waste, without mixing, agitation, or subsequent curing, to absorb free liquid.

L.2 Tanks

A tank requires Tank Level 1 control devices as specified in 22 CCR 66264.1084(c) if the tank meets the requirements of 22 CCR 66264.1084(b)(1)(A) through (b)(1)(C):

- For a tank with a capacity greater than 39,890 gallons (151 cubic meters), the vapor pressure of the the material in the tank is less than or equal to 5.2 kPa (0.754 psi).
- The tank contents are not heated, and
- Hazardous waste within the tank is not treated by a stabilization process.

Tanks not meeting any of the the above must provide Tank Level 2 Controls.

L.2.1 Tank Level 1 Control Requirements

When a tank is equipped with a fixed roof, the waste in the tank is not stabilized, heated, or treated in a process that produces an exothermic reaction, and the vapor pressure does not exceed 0.754 psi for tanks greater than 39,890 gallons, the tank is not required to be vented to a control device. Tanks with Level 1 controls must have fixed roofs that provide a continuous barrier over the entire tank surface.

Tank 12038 has a capacity of 47,754 gallons and the vapor pressure has been measured to be less than 0.754 psi. The tank is also nitrogen blanketed and of closed-roof design and the waste in the tank is not heated notr stabilized. Therefore, Tank 12038 requires only Level 1 controls. However, Tank 12038 is vented to a carbon adsorption canister for odor control anad would meet Level 2 controls described below.

The tank vapor pressure will be retested if changes in operations or processes could cause the vapor pressure to increase above Level 1 limits.

Level 1 tank fixed roofs and closures will be maintained closed unless adding or removing wastes. Tanks subject to Tank Level 1 controls will not be used for waste stabilization, as defined in **Section L.1** above.

Tanks subject to Tank Level 1 controls will be visually inspected on an annual basis. The facility will inspect for visible cracks, holes, or gaps in roof sections or between roofs and tank walls; broken, cracked, or otherwise damaged seals or gaskets; and broken or missing hatches, access covers, caps, or other closure devices that may result in air pollutant emissions.

L.2.2 Tank Level 2 Control Requirements

Tanks subject to Tank Level 2 controls must be equipped with fixed roofs and vented to control devices.

The only situation where Tank 12038 is required to meet Level 2 controls is because the vapor pressure of the contents exceeds 0.754 psi. Curently the vapor pressure is below this level.

Transfers into and out of Tank 12038 are conducted using closed systems consisting of hard piping to prevent exposure of the hazardous waste to the environment and would meet Level 2 transfer standards.

Tanks requiring Level 2 Controls must be inspected in accordance with 22 CCR 66264.1084(g)(3). Since Shell is only required to manage Tank 12038 as a Level 1 tank despite the presence of the carbon adsorption system, Shell need not meet the inspection requirements in §66264.1084(g)(3).

L.2.3 Stabilization In Tanks

Shell does not stabilize hazardous wastes in Tank 12038.

L.3 Containers

The facility routinely places hazardous wastes containing volatile organics into containers. However, such containers are not typically used in the permitted processes on site (CO Boilers 1, 2, and 3, Tank 12038, and ETP-1). The following general Subpart CC container requirements apply:

- Emissions from containers larger than 0.1 m^3 (26 gallons) and less than or equal 0.46 m^3 (121 gallons) will be controlled in accordance with the Container Level 1 standards of 22 CCR 66264.1086(c).

- Emissions from containers greater than 0.46 m^3 (121 gallons) that are not in light material service will be controlled in accordance with the Container Level 1 standards of 22 CCR 66264.1086(c).

- Emissions from containers greater than 0.46 m^3 (121 gallons) that are in light material service will be controlled in accordance with the Container Level 2 standards of 22 CCR 66264.1086(d).

- Emissions from containers 0.1 m^3 (26 gallons) that are used in waste stabilization processes will be controlled in accordance with the Container Level 3 standards of 22 CCR 66264.1086(e).

L.3.1 Container Level 1 Standards

Containers subject to Level 1 controls as indicated above can be managed by any of the following:

- A container meeting U.S. Department of Transportation requirements for the packaging of hazardous materials (49 CFR part 178 – Specifications for Packaging or 49 CFR 179 – Specifications for Tank Cars or 49 CFR 173.12(b) for lab packs),

- A container equipped with a cover and closure devices that form a continuous barrier over the container openings such that when the cover and closure devices are secured in the closed position there are no visible holes, gaps, or other open spaces into the interior of the container. The cover may be a separate cover installed on the container (e.g., a lid on a drum or a suitably secured tarp on a roll-off box) or may be an integral part of the container structural design (e.g., a "portable tank" or bulk cargo container equipped with a screw-type cap), or

- An open-top container in which an organic-vapor suppressing barrier is placed on or over the hazardous waste in the container such that no hazardous waste is exposed to the atmosphere. One example of such a barrier is application of a suitable organic-vapor suppressing foam.

Containers subject to Container Level 1 controls will be maintained closed at all times except when hazardous waste is being added or removed, for maintenance, or when necessary to avoid unsafe conditions. When hazardous waste is being added or removed in batches, no more than fifteen minutes will be allowed to lapse between batches while the container remains open. Otherwise, the container will be closed.

L.3.2 Container Level 2 Standards

Containers subject to Level 2 controls can be any of the following:

- A container meeting U.S. Department of Transportation requirements for the packaging of hazardous materials (49 CFR part 178 – Specifications for Packaging or 49 CFR 179 – Specifications for Tank Cars or 49 CFR 173.12(b) for lab packs),

- A container that operates with no detectable organic emissions as defined in 22 CCR 66260.10 and determined in accordance with the procedure specified in 22 CCR 66264.1086(g), or

- A container that has been demonstrated within the preceding 12 months to be vapor-tight by using 40 CFR part 60, appendix A, Method 27 in accordance with the procedure specified in 22 CCR 66264.1086(h).

Containers subject to Container Level 2 standards will be maintained closed and secured, except when hazardous waste is being added or removed, for maintenance, or when necessary to avoid unsafe conditions. Transfers of hazardous waste in or out of a Level 2 container will be conducted in a manner to minimize exposure to the atmosphere.

L.3.3 Container Level 3 Standards

SMR will not stabilize organic hazardous wastes containing greater than or equal to 500 ppmw volatile organics in containers unless Shell completes the following tasks:

- Develop plans for the design and operation of air controls that meet the requirements for stabilization in containers in Article 28.5 of 22 CCR 66264;

- Submit the plans to DTSC for review and approval; and

- Air controls are installed and operating in accordance with the agency's approval.

L.3.4 Container Inspections

Containers subject to Level 1 controls will be inspected in accordance with 22 CCR 66264.1086(c)(4). Containers subject to Level 2 controls will be inspected in accordance with 22 CCR 66264.1086(d)(4).

Containers that are attached to or form a part of any truck, trailer or railcar will be tested to be organic vapor tight per Method 27 of 40 CFR Part 60, Appendix A and the results will be documented.

L.4 Waste Determination

Procedures used to determine the average volatile organic concentration of a hazardous waste at the point of generation will be conducted in accordance with the requirements of 22 CCR 66264.1083(a) and 66265.1084(a)(2) through (a)(4), as applicable. Procedures for determining the maximum organic vapor pressure of a hazardous waste in a tank will meet the requirements of 22 CCR 66264.1083(c) and 66265.1084(c)(2) through (c)(4).

L.5 Closed System Vents and Control Devices

The SMR monitors the output of the carbon canister for hydrogen sulfide. The carbon is replaced at least one per month or sooner if hydrogen sulfide is detected (using a Drager .tube or similar method with a detection level less than 1 ppm).

The closed vent-control system if Tank Level 2 standards are required, may have periods of planned maintenance that do not exceed 240 hours per year.

L.6 Recordkeeping Requirements

Shell will maintain records such that all relevant requirements in 22 CCR 66264.1089 are met. These requirements include:

- Subpart CC tank inventory,
- Inspection results from tank inspections described above, and
- Defect repair records,

L.7 Reporting

The SMR shall report to the DTSC on a semi-annual basis each occurrence during the previous six months when a control device is operated continuously for 24 hours or longer in noncompliance with the applicable requirments. The facility shall report to the DTSC within fifteen days of an occurrence in which tanks using controls as specified in 22 CCR 66264.1084(c) (Tank Level 1 controls) receive a material with a vapor pressure above that allowed in 22 CCR 264.1084(b)(1)(A) through (b)(1)(C). In accordance with 22 CCR 66264.1090(a), Shell will also report each occurrence when hazardous waste is placed in a unit in noncompliance with the conditions specified in 22 CCR 66264.1082(c)(1) or (c)(2), as applicable.

If no exceedances occur during a semi-annual period, no report will be filed.

Table L-1
Monitoring Schedule

Equipment Type	Monitoring Frequency	Monitoring Category
Tank cover and cover openings	Annually	Visual
Container Covers(Truck, trailer, Railcar)	Annually	Method 27
Closed Vent Systems	Annually	“No Detectable Emissions”
Container Covers	Semi-Annually/Annually	“No Detectable Emissions”