To: Lin, Sharon[Lin.Sharon@epa.gov]; McDaniel, Doug[McDaniel.Doug@epa.gov]; Schofield, John[Schofield.John@epa.gov]; Kowbel, Nelline@DTSC[Nelline.Kowbel@dtsc.ca.gov]
From: Koch, Lori@DTSC
Sent: Fri 3/24/2017 3:47:12 PM
Subject: RE: DTSC/EPA Shell Biotreater Call
Shell Biotreater Monitoring Well Data 06112002.pdf
Notice of Deficency Delay of Closure Biotreater 08122002.pdf
Response to NOD Delay of Closure Biotreater 09122002.pdf
Second Notice of Deficiency Delay of Closure Biotreater 11272002.pdf
Response to 2nd NOD Delay of Closure Biotreater 02142003.pdf
Delay of Closure Request for Extension 12172002.pdf
Confirmation of Regulatory Interpretaion draft memo April 2003.pdf
Meeting Summary Delay of Closure 06132003.pdf

Hi Sharon

I am attaching the files I located regarding the Shell Biotreater Delay of Closure. I have also attached a draft memo that discusses DTSCs regulatory interpretation at the time, although it was not finalized, it may be informative. Let me know if you have any further questions.

Regards,

Lori

-----Original Appointment-----
From: Lin, Sharon [mailto:Lin.Sharon@epa.gov]
Sent: Monday, March 20, 2017 10:19 AM
To: Lin, Sharon; McDaniel, Doug; Schofield, John; Koch, Lori@DTSC; Kowbel, Nelline@DTSC
Subject: DTSC/EPA Shell Biotreater Call
When: Thursday, March 23, 2017 10:00 AM-11:00 AM (UTC-08:00) Pacific Time (US & Canada).
Where: Conference Call 415 947-8200

Conference Bridge Call in number 415 947 8200, Conference Number 415-972-9174, participant Access code 459810

Shell Biotreater - Delay of Closure

Shell Oil Products US

Martinez Refinery
PO Box 711
Martinez, CA 94553-0071

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

DEPARTMENT OF TOXIC SUBSTANCES CONTROL
FACILITY PERMITTING BRANCH
BERKELEY
DEC 18 2002
STATE OF CALIFORNIA EPA
RECEIVED

December 17, 2002

Department of Toxic Substances Control
Attn: Waqar Ahmad, Facility Permitting
700 Heinz Avenue, Suite 300
Berkeley, CA 94710-2737

SUBJECT: Shell Martinez Refinery Response to Department of Toxic Substances Control Notice of Deficiency on Delay of Closure of Biotreater – Request for Extension (EPA ID No. CAD 009 164 021)

On November 27, 2002, Shell Martinez Refinery (SMR) received a second notice of deficiency regarding the delay of closure of the Biotreater. In this memo, DTSC made several requests relating to monitoring well analytical data and associated statistical analyses. The requests were a result of analytical data supplied to the DTSC in the quarterly monitoring reports and our notice of deficiency response submitted on September 12, 2002, which indicated a number of monitoring wells with statistically higher contaminant levels relative to designated background wells.

SMR reviewed your letter and subsequently held a meeting with you at your Berkeley office on December 13, 2002 to discuss the letter and agree upon a forward plan to finalize the delay of closure. We appreciate the opportunity to have this face-to-face dialogue and feel that the meeting was beneficial in keeping our goals aligned. We also appreciate that Mr. Brian Lewis was able to join the meeting briefly and offer his perspective to the matter.

Topics discussed during the meeting include:

- Brief overview of the events leading up to the request for delay of closure of the biotreater,
- Review of the monitoring well data that were statistically above "background" levels,
- Appropriateness and limitations of the statistical evaluation given the inclusion of non-detect values and the history of contamination in the area of the biotreater,
- Relevance to the delay of closure of the current facility corrective action, specifically the boundary control capture approach that exists at the biotreater location.

As we discussed in our meeting, in order to adequately address the issues necessary to finalize the delay of closure, SMR requests an extension until January 31, 2003 to respond to your November 27, 2002 notice of deficiency letter.

If you have any questions or concerns regarding this matter, please contact me at (925) 313-3281.

Very truly yours,

John Lazorik, Environmental Engineer
Environmental Affairs
Shell Oil Products, Martinez Refinery

Shell Oil Products US

Martinez Refinery
PO Box 711
Martinez, CA 94553-0071

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

DEPARTMENT OF TOXIC SUBSTANCES CONTROL
FACILITY PERMITTING BRANCH
BERKELEY
JUN 1 6 2003
STATE OF CALIFORNIA EPA
RECEIVED

June 13, 2003

Department of Toxic Substances Control
Attn: Waqar Ahmad, Facility Permitting
700 Heinz Avenue, Suite 300
Berkeley, CA 94710-2737

SUBJECT: Meeting Summary – Delay of Closure for Surface Impoundment ETP-1 Biotreater, June 5, 2003 (EPA ID No. CAD 009 164 021)

As requested, Shell Oil Products US, Martinez Refinery (Shell) is providing the attached summary notes from the subject June 5, 2003, meeting regarding the Delay of Closure for ETP-1 Biotreater.

Shell appreciates the engagement by staff from DTSC and the San Francisco Bay Regional Water Quality Control Board in this meeting as well as your commitment in working with us to finalize the delay of closure process.

Please refer any questions or concerns regarding this matter to John Lazorik at (925) 313-3281.

Very truly yours,

Teresa H. Makarewicz

Teresa Makarewicz, Manager
Environmental Affairs Department

cc: Alan Friedman, SFBRWQCB

Shell Oil Products US

Martinez Refinery
PO Box 711
Martinez, CA 94553-0071

SUBJECT: Meeting Minutes – Delay of Closure for Surface Impoundment ETP-1 Biotreater, June 5, 2003 (EPA ID No. CAD 009 164 021)

In Attendance: Dan Glaze (Shell), John Lazorik (Shell), Waqar Ahmad (DTSC), Norman Shopay (DTSC), Alan Friedman (SFBRWQCB), Brent Dyer (Shell Global Solutions), Sanjay Garg (Shell Global Solutions)

The purpose of this meeting was to bring together key staff from DTSC, SFBRWQCB, and Shell to discuss the regulatory and technical aspects of the delay of closure of the ETP-1 Biotreater. An important Shell objective was to demonstrate that the corrective action program currently in place under SFBRWQCB Order 95-234 is sufficient to assure protection of human health and the environment with regard to continued use of the ETP #1 biotreater for treatment of non-hazardous wastewater.

Background

Shell Martinez Refinery (SMR) was required to obtain a RCRA Hazardous Waste Facility Permit for operating the ETP #1 Biotreater due to the likelihood of benzene concentrations above RCRA hazardous waste levels in the Biotreater feedwater. Shortly thereafter, Federal land ban regulations prohibited the treatment of hazardous waste in unlined surface impoundments, in effect, making the RCRA permit for treating hazardous waste unusable. In the early part of 1996, benzene containing process wastestreams were routed to the newly constructed ETP-2 Biotreater tank that is currently permitted under California Permit-By-Rule (PBR) regulations. Although the ETP-1 Biotreater was no longer receiving hazardous waste, it's continued use is essential to the refinery operation for meeting NPDES permit limits. As such, SMR submitted a Class 2 Permit Modification to the DTSC in April of 1998 for a delay of closure of the ETP-1Biotreater surface impoundment.

Following the Delay of Closure submittal, DTSC made several requests for information related to monitoring wells associated with the ETP-1 Biotreater and detection of potential leaks. However, due to the hydrogeologic nature of the area surrounding the Biotreater and the presence of legacy contamination from other potential sources, statistical analyses from monitoring well data cannot be used as a viable indicator of a release from the unit. In recent meetings with DTSC staff, SMR also indicated that the Biotreater is located within the boundaries of the refinery's West Valley groundwater capture zone and is explicitly covered by the facility corrective action program as defined in San Francisco Bay Regional Water Quality Control Board Order WDR 95-234. Since corrective action is already in place, Shell's position was that statistical analyses is not warranted since the purpose of those analyses is to define a corrective action plan. The intent of this recent meeting was to

demonstrate to DTSC and SFBRWQCB staff that the corrective action program currently in place is robust enough to be protective of human health and the environment from any existing or potential groundwater contamination in the area, including a release, however unlikely, from the Biotreater.

Overview of the Martinez Refinery and Groundwater Management

Dan Glaze summarized the evolution of the Martinez Refinery from 1915 to present as new operating units were constructed to meet product demands and new environmental regulations. In the 1980's SFBRWQCB and USEPA required investigations of disposal sites and contamination from historic spills and leaks. Over 600 wells were installed and over 70 site investigations were completed with corrective action in place. Under direction of SFBRWQCB staff, SMR subsequently developed a groundwater basin boundary control strategy based on full capture of groundwater at various downgradient property lines.

Requirements for this basin boundary control to assure ongoing environmentally protective management of refinery groundwater were formalized by the SFBRWQCB under their Order 95-234 issued in December, 1995. As required by Provision 5 of this Order, SMR currently submits annual updates of the corrective action program to the SFBRWQCB and DTSC in an annual "Groundwater Boundary Control Capture Verification Modeling Report". This report describes the effectiveness of the extraction systems and summarizes the continued refinement and enhancement of the boundary control system at the refinery.

Capture Zone Modeling

Participating via videoconference, Brent Dyer and Sanjay Garg of Shell Global Systems (SGS) in Houston, provided a technical presentation of the capture zone modeling that is currently in place at SMR. As stipulated in WDR Order 95-234, detailed three-dimensional numerical groundwater flow modeling and data analyses is performed to verify boundary control capture at all perimeter compliance areas of each of the refinery's four major groundwater basins. The ETP-1 Biotreater falls completely within the demonstrated capture zone of the West Valley Basin.

The groundwater flow and pathline simulation models for all basins are constructed using U.S. Geological Survey's MODFLOW model and the MODPATH model. The widely used Groundwater Modeling System (GMS 3.1, DOD 1998) is used to prepare input files for the abovementioned models and produce graphic output files. Capture zone polygons are developed using particle tracking results and flow vector plots based on simulated groundwater flow.

The groundwater flow modeling simulations are verified by matching measured and calculated groundwater elevations in wells and determining the mean absolute error. Calibration statistics on the calculated and observed groundwater elevations show excellent correlation indicating that the model is predictive of actual conditions. DTSC requested the addition of a correlation coefficient (i.e. $r^{2)}$ for the calculated versus actual groundwater elevation graph. SMR agreed to provide this in subsequent reports.

Particle tracking is used in the groundwater flow model to illustrate the areas influenced by various groundwater extraction systems in each major basin. Several extraction systems

adjacent to the Biotreater draw the groundwater flow direction toward a French drain system ("the ETP subdrain"), away from the property boundary. This and other extraction systems in the West Valley Basin provide 100% capture of all groundwater contaminants surrounding the Biotreater. Results of the annual modeling exercise illustrate the effectiveness of the groundwater capture systems and the need, if any, for additional extraction wells or increased pumping rates of existing wells providing a dynamic and self-improving system.

Regulatory Summary/Applicability of Order 95-234 Corrective Action to Biotreater

John Lazorik followed up with a summary of pertinent regulations located in CCR Title 22 Sections 66264.97 through 66264.100 regarding groundwater monitoring requirements and the corrective action process as well as Section 66264.113 covering elements of regulated unit closure including delay of closure. These applicable regulations strongly suggest that the purpose of statistical analyses on background and downgradient wells is to determine if there is evidence of release from a treatment unit and to assess the nature and extent of release as a basis for developing a corrective action plan. However, corrective action for historic waste units and existing facilities including the ETP-1 Biotreater, has been formally in place since at least 1995 at the Martinez Refinery. Therefore statistical analyses referenced in DTSC regulations are not currently applicable to the ETP-1 Biotreater since a mature corrective action program for this unit is already in place under SFBRWQCB Order 95-234.

Following the technical and regulatory presentation, Shell proposed that DTSC grant the delay of closure and make the appropriate permit modification provided that Shell continue to implement the corrective action program including the submittal of all appropriate reports. Furthermore, Shell believes it is appropriate that groundwater compliance continue to be managed through SFBRWQCB Order 95-234, as the lead agency, and that this Order be referenced in the DTSC permit modification. DTSC and SFBRWQCB staff offered concurrence that the current corrective action program is protective of the environment and is applicable to the Biotreater. Any changes made to Order 95-234 are subject to review by all interested parties providing DTSC the opportunity to comment on any proposed changes.

Shell agreed to continue the current RCRA well monitoring program specified in the Hazardous Waste Facility Permit issued by DTSC with the need for statistical analyses precluded by corrective action already underway. The "Groundwater Boundary Control Capture Verification Modeling Report" will continue to be provided to DTSC and SFBRWQCB on an annual basis. Alan Friedman suggested that the report include a section that summarizes the activities that took place during the year as a result of recommendation made in the prior years' report. All parties agreed that this would clarify what actions have been taken. This section will be included in the March 2004 submittal.

DTSC agreed to make the appropriate permit modifications to allow continued operation of the ETP-1 Biotreater for the treatment of non-hazardous wastes.

Following the meeting, Dan Glaze and John Lazorik escorted the group for a tour of the effluent treatment plant and RCRA facility including the CO Boilers.

This meeting was a significant milestone in that agreement was reached by all parties to finalize the delay of closure and that the facility corrective action program is embraced by

both the SFBRWQCB and the DTSC as being protective of the environment and applicable to the Biotreater.

Department of Toxic Substances Control

Edwin F. Lowry, Director
700 Heinz Avenue, Suite 200
Berkeley, California 94710-2721

Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

Gray Davis
Governor

FILE COPY

August 12, 2002

Mr. John Lazorik
Environmental Engineer
Shell Oil Products US
Martinez Refinery
P.O. Box 711
Martinez, CA 94553-0071

NOTICE OF DEFICIENCY ON DELAY OF CLOSURE OF BIOTREATER, MARTINEZ REFINING COMPANY, A DIVISION OF EQUILON ENTERPRISES, LLC, MARTINEZ, CALIFORNIA, EPA ID No. CA 009164021

Dear Mr. Lazorik:

The Department of Toxic Substances Control (DTSC) has reviewed your request for Delay of Closure of Biotreater at the Martinez Refining Company. Our Geological Services Unit (Mr. Norman Shopay) has provided his comments (see Attachment 1).

1. Please investigate and confirm the relationship of the up-gradient to the down-gradient point of compliance wells and verify the accuracy of the fourth quarter 2001 groundwater gradient map.

2. Please provide the statistical evaluation in accordance with section 7.0 of the Detection Monitoring Plan and determine if the statistical evaluation of data for the past <u>five</u> years indicates evidence of a release from the regulated unit.

3. Please revise and resubmit the Detection Monitoring Plan and identify it in the Table of Contents of the Part B Operation Plan. Please put revision dates on the detection monitoring plan and table of contents.

4. Please conduct Appendix IX sampling on point of compliance wells during the next scheduled sampling event and then on a five-year cycle until final closure is completed.

Please provide your response within 30 days of the date of this letter.

Should you have any questions please call me at 510- 540-3932.

Sincerely,

Waqar Ahmad

Waqar Ahmad
Hazardous Substances Engineer
Standardized Permits and Corrective Action Branch
Attachment

cc: Mr. Norman Shopay, RG
Hazardous Substances Engineering Geologist
Hazardous Waste Management Program
700 Heinz Ave, Suite 200
Berkeley, CA 94710

Department of Toxic Substances Control

Edwin F. Lowry, Director
700 Heinz Avenue, Suite 200
Berkeley, California 94710-2721

Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

Gray Davis
Governor

MEMORANDUM

TO: Waqar Ahmad
Project Manager
Standardized Permits and Corrective Action Branch

FROM: Norman Shopay, RG NTS
Hazardous Substances Engineering Geologist
Hazardous Waste Management Program
Geological Services Unit

CONCUR: Brian Lewis, CEG, CHG NTS for BL
Hazardous Substances Engineering Geologist Supervisor I
Hazardous Waste Management Program
Geological Services Unit

DATE: August 12, 2002

SUBJECT: Annual Groundwater Monitoring Report
Shell, Martinez Refining Company
Martinez, California
Project No. 25015/200196-33/52PER

DOCUMENT REVIEWED

Annual Groundwater Monitoring Report, January – December 2001, Martinez Refining Company, A Division of Equilon Enterprises LLC, dated February 28, 2002. (Annual Report)

Submittal of Biotreater Groundwater Monitoring Well Data, dated June 11, 2002.

Detection Monitoring Program, Sampling and Analysis Plan for the Biotreater, dated March 11, 1992. (Detection Monitoring Plan)

INTRODUCTION

The Geological Services Unit (GSU) has completed the review of the above-referenced annual groundwater monitoring report and the groundwater monitoring well data for Biotreater surface impoundment. The objective of this review was as follows:

- To provide general comments on the content of the report.

This memorandum provides our comments, concerns and recommendations. If you have any questions, please contact Norman Shopay at (510) 540-3943 or Brian Lewis at (916) 323-3632.

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web-site at www.dtsc.ca.gov

BACKGROUND

The Biotreater is a permitted Resource Conservation Recovery Act (RCRA) regulated unlined surface impoundment. Shell Martinez Refining Company (SMRC) previously submitted a request for a Class 2 permit modification for delay of closure of the Biotreater surface impoundment. SMRC was issued a RCRA Hazardous Waste Facility Permit for the Biotreater in December 1995. The permit was required because of the presence of benzene in the wastewater effluent. In November 1991 samples of the Biotreater influent were collected and analyzed. The results were as follows:

Constituent	Result mg/L 11/15/91	Result mg/L 11/18/91	Result mg/L 11/20/91
Benzene	1.18	0.75	1.30
o-Cresol	1.57	2.80	2.67
m-Cresol	1.69	7.40	7.60

In December 1991 additional influent samples were collected and analyzed from the biotreater as follows:

Constituent	Result ug/L 12/31/91 AM	Result ug/L 12/31/91 PM
Benzene	790	820
Toluene	3,000	3,000
Etlylbenzene	1,000	930
Xylenes	5,000	5,000
Bromomethane	140	52
Chloroform	31	25
Tetrachlorethene (TCE)	11	<10
Naphtalene	350	410
Flourene	55	63
Phenanthrene	190	220
2,4-Dimethylphenol	570	630
2-Methylnaphtalene	400	480
Phenol	6,000	5,800
2-Methylphenol	1,500	1,500
3,4-Methylphenol	5,800	5,500
Barium	139	182
Chromium	6	6
Lead	13	18
Mercury	0.6	0.6
Nickel	72	90
Selenium	174	184
Vanadium	1,820	1,950

The Detection Monitoring Plan identified wells 228 and 600 as background monitoring wells and wells 225, 292B, 292S, 293B, 293S and 604 as downgradient point of compliance wells. Section 7.0 of the Detection Monitoring Plan describes the statistical analysis to be conducted to determine if evidence of a release has occurred.

DISCUSSION

Based on the groundwater gradient map (fourth quarter 2001) the designation of wells 228 and 600 as upgradient does not appear to be consistent. Well 225R appears to be upgradient. In addition, data from well 604 is not presented on the groundwater elevation contour map. Well 292B indicates a groundwater elevation of 11.91 feet on the map, however, Table 9 reports a top of casing (TOC) elevation of 11.91 feet and a water level elevation of 10.98 feet. Well 225R indicates a groundwater elevation of 9.05 feet on the map and Table 9 reports a TOC elevation of 9.94 feet and a water level elevation of 7.27 feet.

1. Please have the facility investigate and confirm the relationship of the upgradient to the downgradient Point of Compliance wells and verify the accuracy of the fourth quarter 2001 groundwater gradient map

The statistical evaluation of data as specified in Section 7.0 of the Detection Monitoring Plan was not located in the groundwater monitoring report. The Detection Monitoring Plan specified in Section 2.0 that the downgradient wells will be sampled semi-annually in quadruplicate for one year to establish a statistical downgradient data set for the point of compliance. Background wells will be sampled semi-annually in quadruplicate for one year to establish a statistical basis for comparing downgradient values to background values.

2 Please have the facility provide the statistical evaluation in accordance with Section 7.0 of the Detection Monitoring Report and determine if the statistical evaluation indicates evidence of a release from the regulated unit.

The facility should review and update the Detection Monitoring Plan to determine if it meets the requirements described in Title 22, California Code of Regulations (22 CCR) section 66264.97 and 98. The list of constituents of concern and monitoring parameters should also be reevaluated based on what is reasonable expected to be in or derived from the waste contained in the regulated unit as described in 22 CCR 66264.93.

3. The facility should revise and resubmit the Detection Monitoring Plan.

Prior to the approval of the delay of closure GSU recommends that the downgradient Point of Compliance wells be sampled and analyzed for Appendix IX parameters. Appendix IX sampling and analysis should also continue on a five year frequency until final closure is completed.

4. The facility should conduct Appendix IX sampling on Point of Compliance wells and continue Appendix IX sampling on a five-year cycle until final closure is completed.

As required by 22 CCR 66264.75 annual groundwater reports shall be submitted to the Department by March 1st of each year. The Annual Report was in compliance and submitted by March 1, 2002. The facility ID number should be referenced on the cover page and in the text.

5. Include the facility ID number on future reports.

Since the Annual Report contains interpretations of hydrogeologic and geochemical data, in the determination of compliance with Title 22, CCR 66264.97(e)(15) and (17), the report shall be signed by a qualified Geologist, registered in the state of California, or a Professional Civil Engineer who takes responsibility for the technical content of the report required by California Business and Professional Code, Geologist and Geophysicist Act Section 7800 et seq. The report was not signed by a qualified professional registered in the State of California.

6. Future reports are to be signed by a qualified professional registered in the State of California.

As required by 22 CCR 66264.97(e)(14), all analytical data is to be presented graphically for each monitoring point. In addition, all graphs for a given constituent shall be plotted at the same scale to facilitate visual comparison of monitoring data. No graphical presentations were included.

7. Future reports should contain graphical presentations for each monitoring point as required.

This completes the review of the above-referenced document. If you have any questions, please call.

117B/nts/pc

Shell Oil Products US

Martinez Refinery
PO Box 711
Martinez, CA 94553-0071

DEPARTMENT OF TOXIC SUBSTANCES
FACILITY PERMITTING BRANCH
BERKELEY
FEB 20 2003
STATE OF CALIFORNIA EPA
RECEIVED

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

February 14, 2003

Department of Toxic Substances Control
Attn: Waquar Ahmad, Facility Permitting
700 Heinz Avenue, Suite 300
Berkley, CA 94710-2737

SUBJECT: Shell Martinez Refinery Response to Department of Toxic Substances Control Notice of Deficiency on Delay of Closure of Biotreater (EPA ID No. CAD 009 164 021)

Shell Martinez Refinery (SMR) submits the following response to the Department of Toxic Substances Control (DTSC) request for additional information needed to finalize the Delay of Closure of the Biotreater Surface Impoundment. A Class 2 Permit Modification for Delay of Closure for the SMR Biotreater Impoundment was requested by SMR on April 6, 1998. Approval of this modification allows the continued operation of the Biotreater for the receipt of non-hazardous refinery wastewater.

Continued operation of the biotreater for the biological treatment of refinery wastewater is critical for maintaining compliance with the facilitiy's NPDES permit. The biotreater is the primary component of the effluent treatment plant responsible for nitrification of ammonia and reduction of organic contaminants necessary to comply with stringent permit limits including fish toxicity. As such, SMR requests a timely resolution to this Delay of Closure permit modification.

The following items were requested by DTSC in their Notice of Deficiency letter dated November 8, 2002 and are listed below with the responses by SMR.

DTSC Recommendation No. 1: *The top of casing elevation should be resurveyed for monitoring well 292B during the next scheduled surveying activity.*

SMR Response:

SMR has scheduled a survey for the top of casing elevation for monitoring well 292B during the first quarter of 2003. Results of this survey will be submitted to DTSC upon completion.

DTSC Recommendation No. 2. and No. 3 (synopsis): *The facility should evaluate if they are in compliance with performing a statistical evaluation of a release from the regulated unit. The facility should provide information to verify that all required statistical evaluation have been historically conducted.*

SMR Response:

In accordance with the SMR Detection Monitoring Program Sampling and Analysis Plan each well listed in the Biotreater area is sampled on a semiannual basis. A sample is collected for two background monitoring wells (228 and 600) and six monitoring wells (225R, 292B, 292S, 293B, 293S, and 604). Each sample is analyzed for 16 different chemicals of concern (COCs) (volatile petroleum hydrocarbon (VPH), benzene, toluene, ethylbenzene, total xylenes, copper, lead, mercury, selenium, vanadium, chromium, barium, nickel, naphthalene, phenol, and 2,4-dimethylphenol). A statistical comparison of the analytical results is made following the quality assurance review from each sampling event.

Any statistical analysis recommended should give the user the best ability to detect significant releases while minimizing the possibility of either errant claims that no release has occurred or errant determinations of significant releases. Historically SMR has in accordance with 40 CFR 264.97 utilized Cochran's Approximation to Behrens-Fisher Student's t-test. However, it was determined that this test was resulting in perceived errant determinations (false indications) of significant increases. Therefore, in accordance to Title 22 Section 66264.97(e)(8)(E) "...another statistical test method submitted by the owner or operator for approval by the Department including, but not limited to, any statistical method which includes a procedure to verify that there is statistically significant evidence of a release from the regulated unit." may be used. To that end SMR proposes the following statistical evaluation and has used this approach on the historic data collected to date:

General Approach:
Monitoring Wells: The best determination of whether a release has occurred at a given well is to compare current samples to historical values at the given well. For each well and constituent, this is accomplished by using a control-chart based approach with one-sided tolerance limits based on the monitoring samples collected to date. A tolerance limit is a statistically based limiting value, which is used to test whether new individual samples are typical for a given constituent/well. See Appendix 1 for an explanation and example of how the tolerance limits are calculated. The purpose of this analysis would be to determine if a given sample is unusual relative to historical values from the same well. If the sample does not exceed this limit, then the conclusion would be that no significant release has occurred. If a sample does exceed this limit, a possible release has been identified, and the appropriate regulations followed.

The use of tolerance limits to determine whether new samples are typical of historical data is a standard statistical approach. It is discussed in any number of statistical texts, including *Probability and Statistics for Engineers and Scientists*, 5th Ed., Walpole and Myers. In addition, this general approach is specifically mentioned as acceptable in *Barclay's California Code of Regulations* ("Environmental Health Standards – Hazardous Waste", Article 6).

Background Wells: In principle, well-chosen background wells could be used as a secondary check once a potential release has been identified. However, in this specific instance, there is no clear or practical way in which to accomplish this. Even cursory inspection of the background well data shows that the COCs are not consistent with each other nor do they appear to be consistent with the monitoring wells. In fact, in many instances, the values at one or both of the background wells were significantly higher than those at the monitoring wells. Therefore, the background wells are not used in the statistical analysis of the monitoring well data.

Log-transformation and Normality Assumptions: It is important to note that for many of the wells and constituents, the percentage of samples below the detection limit was 90% or more. Therefore, all detection-limited samples were replaced with half the corresponding detection limit. As a result, the distributions of the samples are necessarily skewed. This is independent of the value chosen for replacement. The tolerance limits calculated below assume normality. Transforming the data via the natural log will provide some protection against the inflated limits, which could result, though it does not completely remove the non-normalities. Nonetheless, the resulting values calculated do give a reasonable guide for appropriate limits. Therefore the tolerance limits were calculated using a natural log transformation (i.e. transform the data, construct the limit, convert the limit back to original units).

Quadruplicate Sampling: In accordance with the Detection Monitoring Program the initial samples collected in 1992 were collected in quadruplets while those from 1993 forward are single samples. In order to keep the sampling periods consistent with respect to variability, the quadruplets were averaged and treated as a single value. The most likely result of not doing this would be to underestimate variation, which would yield more false indications of significant releases.

Tolerance Limits: Table 1 below contains the tolerance limits calculated for each well as described above. Note that these one-sided limits were calculated for 95% confidence with 95% coverage. Individual well/COC tolerance limit calculations are not included in this report, but can be provided upon request.

Table 1. Tolerance Limits for COCs per Well (ug/l)

	225R	292B	292S	293B	293S	604
VPH	65.12*	135.16*	25.00*	200.14*	58.48*	55.20*
Benzene	2.74	1.15	1.15	1.05	2.08	1.88
Toluene	1.31	1.39	1.83	1.01	2.02	1.94
Ethylbenzene	1.21	1.21	1.21	0.76	1.88	1.94
Xylenes	6.44	2.48	2.12	5.39	4.14	3.30
Copper	25.01	23.37	23.74	31.85	57.32	27.92
Lead	8.40	5.46	8.43	8.65	8.43	3.57
Mercury	0.50	1.05	0.27	0.50	0.50	0.50
Selenium	10.78	11.77	27.47	31.75	17.25	28.24*
Vanadium	14.26	25.46	20.86	29.67	14.06	134.84
Chromium	14.62	13.68	7.15	7.23	7.19*	7.62
Barium	668.19	89.08	739.70*	378.04	455.27	537.82
Nickel	79.02	116.09	55.51	61.99	17.51	77.05
Naphthalene	29.20	19.17	17.51	17.83	17.09	15.37*
Phenol	15.89	17.02	17.00	15.41	15.27	13.38*
DiMethylphenol	16.04	17.18	14.97	15.60	15.27	13.53*

Monitoring Well Exceptions: In the process of developing the limits listed in the table above, unusually large tolerance limits were observed for some constituents at certain monitoring wells. Upon closer inspection, it was determined that in all cases, one or two atypically high or low values were causing the estimate of variability to be too large. Therefore, outliers were eliminated. The tolerance limits for monitoring wells/constituents affected are noted in Table 1 with an asterisk, and the individual samples that were removed are listed below in Table 2.

Table 2. Tolerance Limits Before and After Outlier Removal.

COC	Well	Samples Removed	All Data TL	Outliers Removed TL
VPH	225R	4Q94, 2Q95	182.68	65.12
VPH	292B	4Q94, 2Q95	267.98	135.16
VPH	292S	4Q94, 2Q95	146.42	25.00
VPH	293B	4Q94, 2Q95	335.44	200.14
VPH	293S	4Q94, 2Q95	176.49	58.48
VPH	604	4Q94, 2Q95	172.08	55.20
Selenium	604	4Q02	59.90	28.24
Chromium	293S	2Q94	27.45	7.19
Barium	292S	4Q01	1551.73	739.70
Naphthalene	604	4Q00	21.98	15.37
Phenol	604	4Q00	19.35	13.38
DiMethylphenol	604	4Q00	19.57	13.53

Example of Practical Usage: In order to demonstrate how the statistical approach is used, consider barium at well 292S. The data below represents a time series plot of the analytical concentration over time with the tolerance limit set at 740 ug/L (the red dashed line). Assume a 1Q03 sample was analyzed and determined to have 770 ug/L. Figure 1 below shows how the comparison would be made.

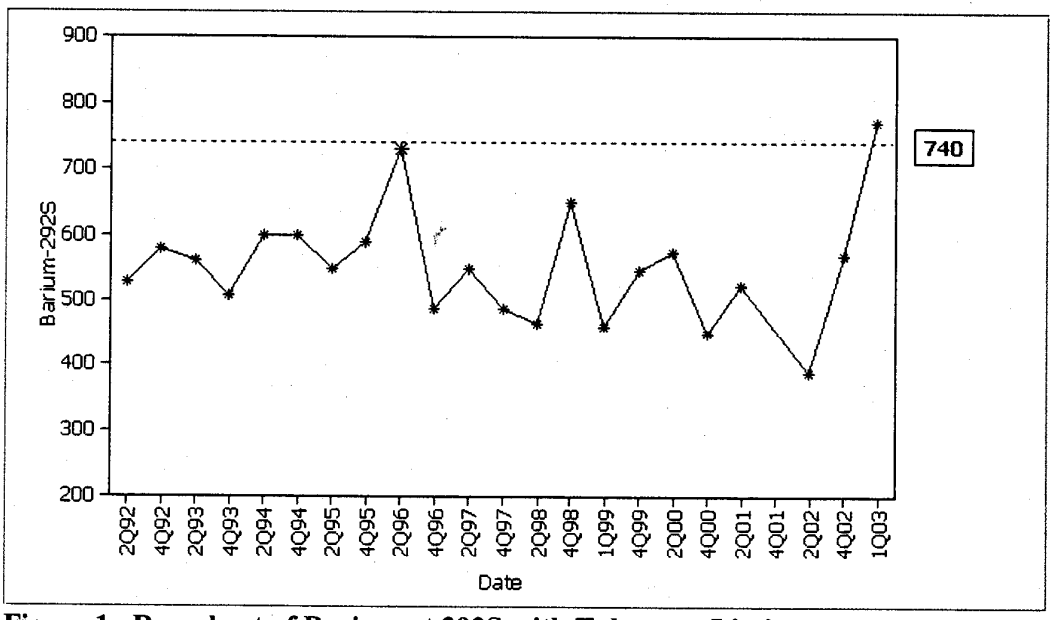


Figure 1. Run chart of Barium at 292S with Tolerance Limit.

Note that 1Q03 sample falls above the tolerance limit based on historical levels of barium at this well (~740ug/L). This would in turn trigger the protocols outlined in Section 66264.98.

Statistical Evaluation: Based on the approach outlined above an evaluation was conducted on the data for all monitoring wells from 1992 to present. (See Appendix 2 for the complete data set.) It was determined that 79 samples exceed the tolerance limit. 65 of these results were non-detect with detection limits greater than the tolerance limits. The primary laboratory explanation for elevated detection limits were due to matrix interferences. SMR will continue to work closely with the laboratory on all future samples in an effort to reduce the number of samples with elevated detection limits. After these samples are eliminated 14 samples are left as potential releases. Table 3 below contains the remaining 14 instances.

Table 3. Potential Exceedances above Tolerance Limits

Well	Date	COC	Result (ug/L)
292S	2Q93	Toluene	2.3
292B	2Q96	Barium	90
292S	2Q98	Nickel	58
293B	2Q96	Benzene	1.9
293B	2Q96	Toluene	1.1
293S	4Q96	VPH	110
604	2Q97	VPH	80
293S(d)	2Q92	Barium	536
293S	2Q94	Chromium	140
604	4Q02	Selenium	130
604	4Q02	Vanadium	160
604	4Q02	Nickel	89
225R	4Q02	VPH	76
292B	4Q02	VPH	190

Potential Exceedance Discussion: The following discussion will address each of the samples listed in Table 3 and provide a determination that there is no historic evidence of a significant release in any of the six monitoring wells down gradient of the Biotreater.

Well 292S in the second quarter of 1993 had a potential exceedance for toluene. In accordance with 66264.98 (j)(2) a verification procedure may be used to confirm if a statistically significant evidence of a release (i.e., resample). Since these statistics are being conducted on a historic data set, the subsequent sampling event immediately following a potential increase will be used as evidence of verification. In all future events, SMR will conduct verification sampling on an as needed basis in a more timely manner. For well 292S the fourth quarter 1993 sample returned a result for toluene of non-detect. This well has also been non-detect for toluene for the subsequent 19 sampling events. Therefore it is determined there is no evidence of significant release in well 292S for toluene.

Well 292B in the second quarter of 1996 had a potential exceedance for barium. However, the next sampling event verified that barium was below the tolerance limit of

89.08 (68 ug/L in 4Q96). Barium results have been below the tolerance limit in this well for the last thirteen sampling events; therefore, there is no evidence of a significant release in well 292B for barium.

In the second quarter of 1998 there was potential evidence of an increase in nickel in well 292S. The following sampling event reported a non-detect value for nickel; therefore, there is no evidence of a significant release in well 292S for nickel. It should be noted that well 292S has fluctuated between non-detect and detect for nickel in the last six years, but has remained below the tolerance limit since 1998.

Well 293B reported a potential increase of benzene and toluene in the second quarter of 1996. In the next sampling event, both COCs were reported below the detection limit, and have been non-detect for the last thirteen sampling events. It is therefore determined that there is no evidence of a significant increase in well 293B of benzene or toluene.

In the fourth quarter of 1996, well 293S returned a detected value for VPH above the tolerance limit. The subsequent sampling event returned a result below the detection limit for VPH, and this well has been below the detection limit for VPH for all twelve proceeding sampling events.

Well 604 reported a potential increase for VPH in the second quarter of 1997. The laboratory reported a value of 80 ug/L, but flagged the data as estimated. The laboratory reported seeing an unidentifiable VPH that was not quantifiable, and therefore listed the estimated value at 80 ug/L. As further confirmation the next sampling event reported VPH for well 604 below the detection limit and the well has remained non-detect for VPH for the following eleven sampling events.

The final quadruplicate sample (d) collected for well 293S for barium in the second quarter of 1992 returned a result higher than the previous three samples collected for that well on that date, and was also the only reported result above the tolerance limit. The resulting average for that sampling period is therefore skewed above the tolerance limit. Therefore the fourth quadruplicate sample is considered suspect. Further, all subsequent sampling events have been below the tolerance limit for barium for this well. Therefore, there is no evidence of a significant increase of barium in well 293S.

Well 293S in the second quarter of 1994 reported a result of chromium above the tolerance limit for that well. However, the subsequent sampling event reported a non-detect for chromium, and the well has returned a result below the detection limit for chromium for the last fourteen sampling events. Therefore it is determined there is no evidence of significant release in well 293S for chromium.

The five remaining potentially significant samples listed in Table 3 occurred during the most recent sampling event (4Q02). All three wells are being re-sampled during February 2003 as verification of a significant release. If it is determined via verification sampling that there has been a statistically significant increase for any of the COCs, SMR will comply with all appropriate regulations.

It has therefore been determined through statistical evaluation that there is no historic evidence of a significant increase in any of the six monitoring wells down gradient of the Biotreater.

Although there were sporadic instances of single results in excess of the tolerance limits, no two consecutive events exceeded the tolerance limits. Given these sporadic low-level exceedances, and the extremely low tolerance limits (e.g., when compared to risk-based levels) SMR would also like the opportunity to discuss with the Department the option of progressive approaches that could be considered indicative of a potential new release.

DTSC Recommendation No. 4: *Although the September 12, 2002 letter was provided as notification by certified mail, no statistical determination has been historically conducted. The facility should verify if any historic evidence of a release was determined.*

SMR Response:

As detailed in SMR response to DTSC Recommendation No. 2 and No. 3 it has been determined that there is no historic evidence that a release from the permitted unit has occurred.

DTSC Recommendation No. 5: *The facility has not conducted Appendix IX sampling and analysis as required by this section. The facility should conduct the Appendix IX sampling and analysis as required.*

SMR Response:

As presented in the previous responses, the unit has not historically demonstrated statistically significant evidence of a release. Therefore, SMR is not required to perform the Appendix IX sampling.

DTSC Recommendation No. 6: *The facility may propose changes to the Detection Monitoring Program and Sampling and Analysis Plan for the Biotreater area. Changes to the monitoring program could be included in the permit modification to authorize the delay of closure of the Biotreater.*

SMR Response:

SMR will take these recommendations under advisement.

In summary, SMR believes the continued operation of the biotreater in a non-hazardous treatment mode does not pose a significant environmental risk. It should be noted that the biotreater unit was regulated as a hazardous waste treatment unit only for benzene and at very low concentrations. Based on the monitoring data and the physical properties of

benzene, there is no reason to expect benzene to be present in sediments at levels of concern.

Over most of the 75 years that the refinery has been in operation, the location of the biotreater has always been an area of effluent treating. Any evidence of contamination in this area could be from historical contamination from a number of sources unrelated to the biotreater. Furthermore, SMR is regulated by Order 95-234 of the San Francisco Bay Regional Water Quality Control Board. This Order addresses environmental concerns and corrective actions associated with contamination in this area. Specifically, the biotreater is located in the West Valley Basin that has effective groundwater extraction systems in place providing complete capture of groundwater exceeding applicable trigger levels. Details of the capture zones can be found in SMR's annual Groundwater Boundary Control Capture Verification Modeling Report.

If you have any questions or concerns regarding this matter, please contact me at (925) 313-3281.

Very truly yours,

John Lazorik, Environmental Engineer
Environmental Affairs
Shell Oil Products, Martinez Refinery

Attachments

cc: Salvatore Ciriello
Supervising Hazardous Substances Engineer
Standardized Permits and Corrective Action Branch
700 Heinz Ave. Suite 200
Berkeley, CA 94710

Appendix 1
Calculation of Tolerance Limits

The tolerance limit is calculated by first taking the average and standard deviation of the natural log (ln) of sample values. Based on the log-transformed data, the tolerance limit is the average plus a multiplier times the standard deviation. This multiplier is based on three things:

- Number of historical data values (generally 22 in our case).
- Confidence level (95% in our case).
- Proportion of the background population we want the limit to bracket (95% in our case).

With these three pieces of information, the multiplier can be obtained from tolerance multiplier tables in any number of books. The one used for this document was *Statistical Design and Analysis of Experiments*, Mason et al.

As an example consider barium at well 292S. There were 21 monitoring values, we want to have 95% confidence, and we want to bracket 95% of the background population. Therefore, the multiplier is 2.3. The average and standard deviation of the ln(barium) at 292S are 6.29 and 0.14, respectively. The tolerance limit is then calculated.

$6.29 + 2.3*0.14 = 6.612$

The corresponding value in the original units is $e^{2.23} = 743$ ug/L. Note this value is slightly different from the tabled value due to rounding.

Appendix 2
Statistical Comparison of Data to Tolerance Limits

200209,1301

Shell Oil Products US

Martinez Refinery
PO Box 711
CA 94553-0071

DEPARTMENT OF TOXIC SUBSTANCES CONTROL
FACILITY PERMITTING BRANCH
BERKELEY
SEP 13 2002
STATE OF CALIFORNIA EPA
RECEIVED

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

September 12, 2002

Department of Toxic Substances Control
Attn: Waqar Ahmad, Facility Permitting
700 Heinz Avenue, Suite 300
Berkeley, CA 94710-2737

SUBJECT: Shell Martinez Refinery Response to Department of Toxic Substances Control Notice of Deficiency on Delay of Closure of Biotreater (EPA ID No. CAD 009 164 021)

Shell Martinez Refinery (SMR) submits the following response to the Department of Toxic Substances Control (DTSC) request for additional information needed to finalize the Delay of Closure of the Biotreater Surface Impoundment. A Class 2 Permit Modification for Delay of Closure for the SMR Biotreater Surface Impoundment was requested by SMR on April 6, 1998. Approval of this modification allows the continued operation of the Biotreater for the receipt of non-hazardous refinery wastewater.

The following four items were requested by DTSC in their Notice of Deficiency letter dated August 12, 2002 and are listed below with the response by SMR.

DTSC Item #1

Investigate and confirm the relationship of the up-gradient to the downgradient point of compliance wells and verify the accuracy of the fourth quarter 2001 groundwater gradient map.

SMR Response:

At initial glance of the fourth quarter refinery ground water elevation map from 2001, it may appear as though ground water beneath the Biotreater is only flowing in a southerly direction; however, after further evaluation it becomes apparent that ground water may also be flowing in a northerly direction as well. To aid in illustrating this point, included as Figure 1 in this response is a zoomed in map of the fourth quarter 2001 ground water elevation contour map of the Biotreater area. This map was generated utilizing both the ground water elevations included as part of the semiannual ground water elevation contour map and the ground water elevations of the wells of specific interest to the Biotreater Detection Monitoring Program. As can

be seen on this map and illustrated with the two red flow arrows, ground water may travel in the direction of well 293B or in the direction of well 604. It appears that a ground water divide may occur beneath the northwest corner of the Biotreater creating this dual ground water flow scenario. As such, the designation of wells 225R, 292B and S, and 293B and S as down gradient POC wells is appropriate to determine any potential release from the Biotreater that could potentially follow the north flow direction. Similarly, utilizing well 604 as the down gradient POC well to determine a potential release that could potentially follow the south pattern is also appropriate.

Due to the fact that ground water may travel in either the north or south direction it is appropriate to provide background wells that are neither north nor south, but rather are hydraulically cross-gradient of the unit. Designating background wells that are not hydraulically upgradient is acceptable according to 22 CCR 66264.97(b)(2). It is unlikely that either background well 228 or 600 would be impacted by a potential release from the Biotreater based on observed flow patterns, therefore, both designated background wells will provide samples that are representative of the background quality of ground water. Therefore no modification to section 2.0 of the Detection Monitoring Program Sampling and Analysis Plan for the Biotreater is warranted.

Both well 292B and well 225R in the fourth quarter of 2001 reported a depth to water (DTW) for the semiannual ground water elevation contour map of 0 ft.; therefore, the value displayed on the contour map is that of the top-of-casing (TOC) elevation for each well. During certain times of the year it is possible to have ground water at or near the ground surface in this part of the facility. Therefore a ground water elevation equal to the TOC for these wells is accurate.

Well 225R in Table 9 originally reported a TOC elevation of 9.94 ft. and a water level elevation of 7.27 ft., which contradict the 9.05 ft. value reported on the semiannual contour map. Table 9 errantly reports the historic reference elevation of 9.94 ft. rather than the updated TOC elevation of 9.05 ft. for well 225R. Table 9 has been updated and now reports a fourth quarter 2001 ground water elevation of 6.38 ft. for well 225R. The complete Table 9 has been included in this response for your use. Also, this well can be gauged multiple times during one quarter due to its inclusion in different monitoring programs. As part of the monitoring program for the Biotreater a DTW of 2.67 ft. was reported in the fourth quarter of 2001 and a DTW of 0 ft. was reported for the semiannual ground water contour elevation map for that same quarter. Therefore it is possible to have differences in what is reported in Table 9 and what is displayed on the contour elevation map. A ground water elevation of 6.38 ft. in Table 9 for the fourth quarter of 2001 and a ground water elevation of 9.05 ft. on the fourth quarter 2001 contour map are the correct values.

DTSC Item #2

Provide the statistical evaluation in accordance with section 7.0 of the Detection Monitoring Plan and determine if the statistical evaluation of data for the past five years indicates evidence of a release from the regulated unit.

SMR Response:

The statistical evaluation is provided in Tables 6.1 and 6.2. The statistical analysis identifies whether the downgradient monitoring wells have been affected by the Biotreater. The t-test uses data summary measures (mean and variance) to calculate a t-statistic (t*) and a comparison t-statistic (tc). Negative values of t* indicate that there is no significant difference between the monitoring data and the background data. If t* is less than tc then it is most likely that there is no change between background data and monitoring data. If t* is greater than or equal to tc then there is most likely an increase between monitoring data and background data.

- One well (Well 292B) exceeded the t-test criteria for nickel.
- Two wells (Wells 225R and 292S) exceeded the t-test criteria for chromium.
- Three wells (Wells 292S, 293B, and 604) exceeded the t-test criteria for vanadium.
- Five wells (Wells 225R, 292S, 293B, 293S, and 604) exceeded the t-test criteria for barium.

Although the statistical evaluation suggests evidence of release from the regulated unit for the parameters listed above, the required t-test is a parametric test and may be skewed due to the use of "half the detection limit" for all non-detect values. In addition, should a contaminant release from the biotreater occur, complete capture is obtained for groundwater exceeding applicable trigger levels in the West Valley Basin effectively preventing any contaminant release to the environment.

DTSC Item #3

Revise and submit the Detection Monitoring Plan and identify it in the Table of Contents of the Part B Operation Plan. Include revision dates on the Detection Monitoring Plan and table of contents.

SMR Response:

With oversight and approval by the San Francisco Bay Regional Water Quality Control Board, the Detection Monitoring Plan was developed according to regulations specified by the Environmental Protection Agency in 40 Code of Federal Regulations (CFR), Part 264, Subpart F and the California Code of Regulations (CCR), Title 22, Chapter 14, Article 6, and Title 23, Chapter 15, Article 5. Following further review of the Detection Monitoring Plan, it appears that the Plan meets all requirements specified in those regulations.

As stated in the response to DTSC Item #1, it is unlikely that either background well 228 or 600 would be impacted by a potential release from the Biotreater based on observed flow patterns, therefore, both designated background wells will provide samples that are representative of the background quality of ground water. Therefore no modification to section 2.0 of the Detection Monitoring Program Sampling and Analysis Plan for the Biotreater is warranted.

With respect to reevaluating the constituents of concern, SMR agrees that a reevaluation is warranted. The current list of constituents of concern is based on analytical data collected on samples of Biotreater influent taken in 1991 and 1992.

However, beginning in 1996 the new effluent system was put on line that effectively changed the characteristic of the Biotreater Surface Impoundment influent stream by rerouting benzene containing wastestreams to the new Biotreater Tank.

SMR proposes to sample the influent stream to the Biotreater Surface Impoundment during the third quarter of 2002 to assist in reevaluating the constituents of concern. The scope of analyses will include all analytes listed in the EPA Region 5 "Skinner List". This list of analytes is a subset of Appendix IX and was developed by EPA to represent constituents of concern applicable to petroleum refining processes. SMR believes this scope of analyses covers all parameters which are reasonably expected to be in or derived from the waste contained in the regulated unit as described in 22 CCR 66264.93. In addition, all parameters identified as constituents of concern based on the 1991 and 1992 sampling events are included within the scope of the Skinner List. A copy of the Skinner List is presented in Attachment 1. Analytical results from this sampling event along with historical monitoring data will be used to evaluate and revise, if necessary the list of constituents of concern and monitoring parameters.

When changes to the Detection Monitoring Program Sampling and Analysis Plan for the Biotreater are made, revision dates will be included on the document. This document is currently identified in the Table of Contents of the Part B Permit Application as Attachment D-13 in the List of Attachments.

DTSC Item #4

Conduct Appendix IX sampling on point of compliance wells during the next scheduled sampling event and then on a five-year cycle until final closure is completed.

SMR Response:

As discussed in our phone conversation, SMR proposes to sample the point of compliance wells for analytes found in the Skinner List during the next scheduled sampling event and then on a five-year cycle until final closure is completed. As stated above, this list includes constituents of concern that are reasonably expected to be in or derived from petroleum refining wastes.

If you have any questions or concerns regarding this matter, please contact John Lazorik at (925) 313-3281.

Very truly yours,

Teresa K. Makarewicz

Teresa K. Makarewicz, Manager
Environmental Affairs
Shell Oil Products, Martinez Refinery

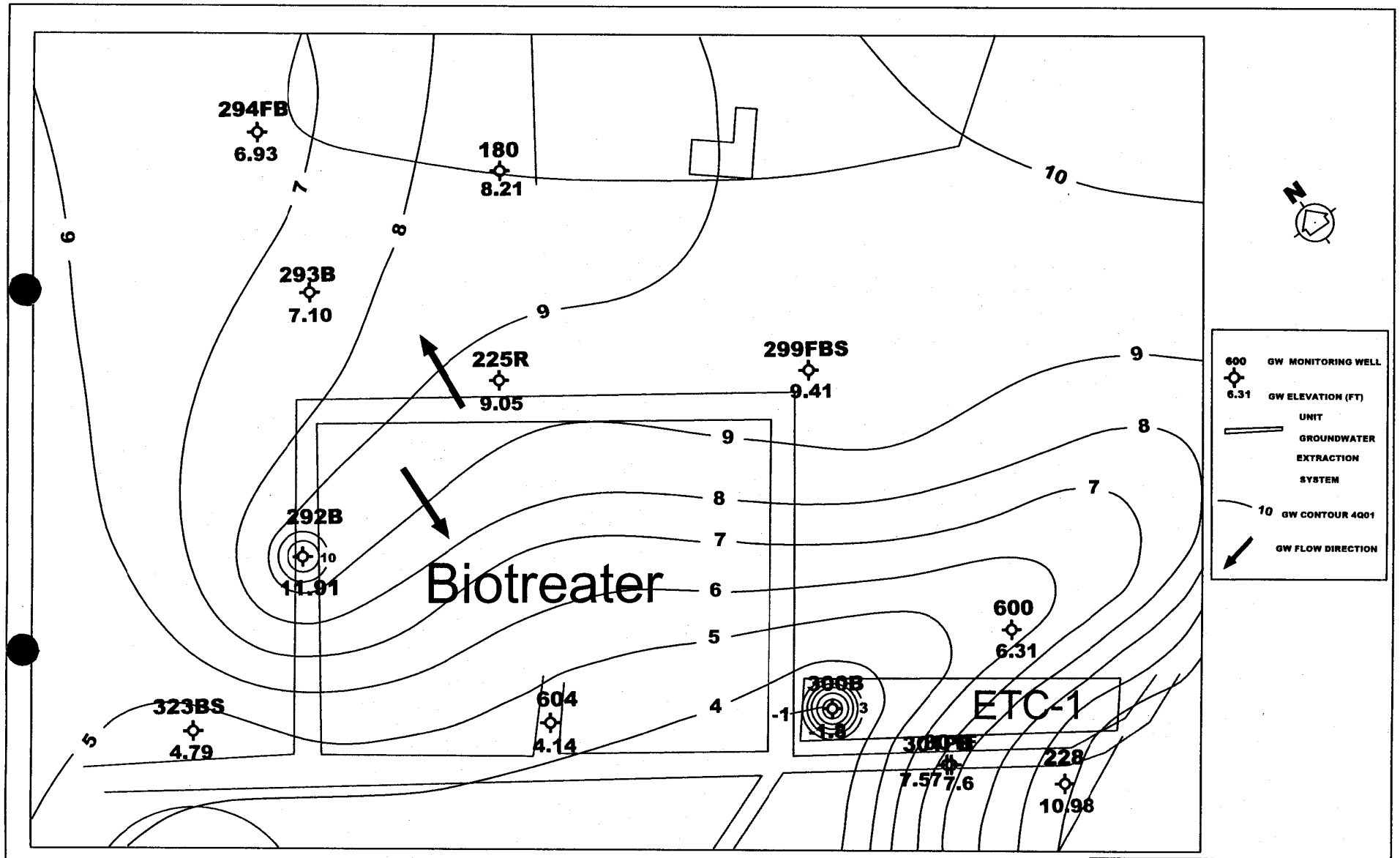


Figure 1
4Q01 Biotreater Ground Water Elevation Contours

Drafted: NAS	Date: 09/10/02
Checked: BAD	Scale:
T:\Projects\Martinez\Biotreater\BiotreaterContourMap.dwg	Shell Global Solutions

ED_001593_00015400

Table 9
Martinez Refining Company
RCRA Monitoring
Semi-Volatile Organic Compounds and Metals
(all results in ug/L)
(PQL/WDR Compliance Trigger Level)

WELL	SAMPLE DATE	Barium (1/4100)	Chromium (2/11)	Copper(2/2.9)	Lead(3/5.6)	Mercury (0.2/0.025)	Nickel (5/8.3)	Selenium (5/5)	Vanadium (15/170)	Benzene(0.5/21)	Toluene(0.5/5000)	Ethyl-Benzene(0.5/81)	Xylenes(0.5/290)	TPH-G (50/1000)	TOC Elevation (ft msl)	Screen Start Elev. (ft msl)	Screen End Elev. (ft msl)	Water Level Elev. (ft msl)
225R	2Q97	150	<2	<2	<2	<0.2	40	6	2	<0.5	<0.5	<0.5	<0.5	<50	9.94	6	-4	9.05
	4Q97	200	3	<2	<2	<0.2	21	9	5	<0.5	<0.5	<0.5	<0.5	<50	9.94	6	-4	9.05
	2Q98	60	<5	3	<2	<0.2	27	<5	<5	<0.5	<0.5	<0.5	<1	<50	9.94	6	-4	9.05
	4Q98	200	<20	<2	<2	<0.2	33	<5	<50	<0.5	0.6	<0.5	2	<50	9.94	6	-4	9.05
	1Q99	160	<5	<2	<3	<0.2	24	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	9.94	6	-4	
	4Q99	171	<5	7	<3	<0.2	24	1	<10	<0.5	<0.5	<0.5	<0.5	<50	9.94	6	-4	9.05
	2Q00	136	<5	5	<2	<0.2	33	1	<10	<0.5	<0.5	<0.5	<0.5	<50	9.05	6	-4	2.67
	4Q00	92	<5	5	<3	<0.2	59	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	9.05	6	-4	3.31
	2Q01	122	<5	8	<3	<0.2	51	<5	<10	<5	<0.5	<0.5	<0.5	<50	9.05	6	-4	4.82
	4Q01	100	<5	<5	<3	<0.2	30	<5	<10	<5	<0.5	<0.5	<0.5	<50	9.05	6	-4	6.38
228	2Q97	240	<2	<2	3	<0.2	4	<5	2	2800	2100	680	2600	8800	14	9.5	-0.5	
	4Q97	190	2	<2	<2	<0.2	4	<5	4	1500	310	190	750	6000	14	9.5	-0.5	
	2Q98	162	<5	<2	<2	<0.2	2	<5	<15	1300	760	440	1300	11000	14	9.5	-0.5	
	4Q98	180	<5	<2	<2	<0.2	7	<5	<50	826	255	53	317	3350	14	9.5	-0.5	
	1Q99	145	<5	<2	<3	<0.2	<5	<5	<10	1190	664	511	1740	11000	14	9.5	-0.5	
	4Q99	166	<5	<2	<3	<0.2	<5	<1	<10	1120	181	194	707	1180	14	9.5	-0.5	
	2Q00	197	<5	<2	<3	<0.2	3	<1	<10	<10	<10	<10	<10	<1000	14	9.5	-0.5	11.1
	4Q00	141	<5	<5	<3	<0.2	<5	<5	<10	684	191	132	413	<250	14	9.5	-0.5	4.61
	2Q01	218	<5	<5	3	<0.2	<5	<5	<10	1370	469	293	830	7270	14	9.5	-0.5	9.89
	4Q01	290	<5	<5	<3	<0.2	<5	<5	<10	2200	1400	390	1600	10000	14	9.5	-0.5	10.98
292B	2Q97	61	<2	<2	<2	<0.2	52	7	1	<0.5	<0.5	<0.5	<0.5	<50	11.91	6.5	-3.5	10.31
	4Q97	60	<2	<2	<2	<0.2	39	9	1	<0.5	<0.5	<0.5	<0.5	<50	11.91	6.5	-3.5	9.99
	2Q98	50	<5	<2	<2	<0.2	56	<2	<15	<0.5	<0.5	<0.5	<1	<50	11.91	6.5	-3.5	10.91
	4Q98	46	<5	2	<2	<0.2	65	<5	<50	<0.5	0.51	<0.5	<1	<50	11.91	6.5	-3.5	9.61
	1Q99	43	<5	<2	<3	<0.2	38	<5	<10	<0.5	0.7	<0.5	<0.5	<50	11.91	6.5	-3.5	
	4Q99	48	<5	4	<3	<0.2	57	<1	<10	<0.5	<0.5	<0.5	<0.5	<50	11.91	6.5	-3.5	9.46
	2Q00	45	<5	<3	<0.2	<10	70	<1	<10	<0.5	<0.5	<0.5	<0.5	<50	11.91	6.5	-3.5	10.71
	4Q00	46	<5	3	<3	<0.2	76	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	11.91	6.5	-3.5	9.53
	2Q01	57	<5	11	<3	<0.2	80	<5	<10	<0.5	<0.5	<0.5	<0.5	113	11.91	6.5	-3.5	10.39
	4Q01	47	<5	<5	<3	<0.2	36	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	11.91	6.5	-3.5	10.89

Table 9
Martinez Refining Company
RCRA Monitoring
Semi-Volatile Organic Compounds and Metals
(all results in ug/L)
(PQL/WDR Compliance Trigger Level)

WELL	SAMPLE DATE	Barium (1/4100)	Chromium (2/11)	Copper(2/2.9)	Lead(3/5.6)	Mercury (0.2/0.025)	Nickel (5/8.3)	Selenium (5/5)	Vanadium (15/170)	Benzene(0.5/21)	Toluene(0.5/5000)	Ethyl Benzene(0.5/61)	Xylenes(0.5/256)	TPHG(50/1000)	TOC Elevation (ft msl)	Screen Start Elev. (ft msl)	Screen End Elev. (ft msl)	Water Level Elev. (ft msl)
292S	2Q97	550	<2	3	<2	<0.2	2	8	10	<0.5	<0.5	<0.5	<0.5	<50	9	-5	-10	
	4Q97	490	2	<2	<2	<0.2	12	10	11	<0.5	<0.5	<0.5	<0.5	<50	9	-5	-10	
	2Q98	468	<5	<2	<2	<0.2	58	<5	<15	<0.5	<0.5	<0.5	<1	<50	9	-5	-10	
	4Q98	650	<5	4	<2	<0.2	<10	<5	<50	<0.5	<0.5	<0.5	<1	<50	9	-5	-10	
	1Q99	461	<5	<2	<3	<0.2	14	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	9	-5	-10	
	4Q99	548	<5	10	<3	<0.2	<5	<1	<10	<0.5	<0.5	<0.5	<0.5	<50	9	-5	-10	
	2Q00	576	6	<2	<3	<0.2	<5	<1	<10	<0.5	<0.5	<0.5	<0.5	<50	9	-5	-10	3.48
	4Q00	449	<5	3	<3	<0.2	8	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	9	-5	-10	-0.9
	2Q01	525	<5	6	<3	<0.2	<5	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	9	-5	-10	-1.8
	4Q01	55	<5	<5	<3	<0.2	23	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	9	-5	-10	7.98
293B	2Q97	150	<2	22	<2	<0.2	12	19	7	<0.5	<0.5	<0.5	<0.5	<50	9.94	5	-5	6.44
	4Q97	230	3	<2	<2	<0.2	7	15	8	<0.5	<0.5	<0.5	<0.5	<50	9.94	5	-5	7.54
	2Q98	54	<5	<1	<2	<0.2	9	10	25	<0.5	<0.5	<0.5	<1	<50	9.94	5	-5	8.04
	4Q98	160	<5	2	<2	<0.2	53	8	<50	<0.5	<0.5	<0.5	<1	<50	9.94	5	-5	6.94
	1Q99	64	<5	3	<3	<0.2	12	10	19	<0.5	<0.5	<0.5	<0.5	<50	9.94	5	-5	
	4Q99	173	<5	9	<3	<0.2	<5	<1	<10	<0.5	<0.5	<0.5	<0.5	<50	9.94	5	-5	5.59
	2Q00	142	<5	3	2	<0.2	23	1	<10	<0.5	<0.5	<0.5	<0.5	<50	9.94	5	-5	6.85
	4Q00	165	<5	3	<3	<0.2	14	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	9.94	5	-5	2.14
	2Q01	127	<5	8	<3	<0.2	20	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	9.94	5	-5	6.58
	4Q01	70	<5	<5	<3	<0.2	23	<5	26	<0.5	<0.5	<0.5	<0.5	<50	9.94	5	-5	6.81
293S	2Q97	330	<2	<2	<2	<0.2	<2	7	3	<0.5	<0.5	<0.5	<0.5	<50	11	-3	-8	
	4Q97	400	<2	<2	<2	<0.2	<2	9	6	<0.5	<0.5	<0.5	<0.5	<50	11	-3	-8	
	2Q98	287	<5	<1	<2	<0.2	<1	<5	<15	<0.5	<0.5	<0.5	<1	<50	11	-3	-8	
	4Q98	380	<5	<2	<2	<0.2	<5	<5	<50	<0.5	<0.5	<0.5	<1	<50	11	-3	-8	
	1Q99	330	<5	<2	<3	<0.2	<5	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	11	-3	-8	
	4Q99	360	<5	9	<3	<0.2	<5	<1	<10	<0.5	<0.5	<0.5	<0.5	<50	11	-3	-8	
	2Q00	352	<5	4	<3	<0.2	<5	<1	<10	<0.5	<0.5	<0.5	<0.5	<50	11	-3	-8	6.89
	4Q00	299	<5	2	<3	<0.2	6	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	11	-3	-8	5.24
	2Q01	343	<5	6	<3	<0.2	<5	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	11	-3	-8	6.66
	4Q01	320	<5	<5	<3	<0.2	<5	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	11	-3	-8	7.44

Table 9
Martinez Refining Company
RCRA Monitoring
Semi-Volatile Organic Compounds and Metals
(all results in ug/L)
(PQL/WDR Compliance Trigger Level)

WELL	SAMPLE DATE	Barium (1/4.100)	Chromium (2/11)	Copper(2/2.9)	Lead(3/5.6)	Mercury (0.2/0.025)	Nickel (5/8.3)	Selenium (5/5)	Vanadium (15/170)	Benzene(0.5/21)	Toluene(0.5/5000)	Ethyl Benzene(0.5/34)	Xylenes(0.5/290)	TPH-G (50/1000)	TOC Elevation (ft msl)	Screen Start Elevation (ft msl)	Screen End Elevation (ft msl)	Water Level Elev. (ft msl)
600	2Q97	61	<2	2	<2	0.2	63	7	2	<0.5	<0.5	<0.5	<0.5	<50	10	3.5	-1.5	
	4Q97	100	<2	2	<2	<0.2	89	15	1	<0.5	<0.5	<0.5	<0.5	<50	10	3.5	-1.5	
	2Q98	62	<10	5	14	<0.2	88	<2	<2	<0.5	<0.5	<0.5	<1	<50	10	3.5	-1.5	
	4Q98	42	<5	3	<2	<0.2	74	<5	<50	<0.5	<0.5	<0.5	<1	<50	10	3.5	-1.5	
	1Q99	24	<5	<2	<3	<0.2	11	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	10	3.5	-1.5	
	4Q99	38	<5	6	<3	<0.2	<5	<1	<10	<0.5	<0.5	<0.5	<0.5	<50	10	3.5	-1.5	
	2Q00	30	<5	24	2	<0.2	21	<1	<10	<1.0	<1.0	<1.0	<1.0	<100	10	3.5	-1.5	5.63
	4Q00	44	<5	7	<3	<0.2	34	10	<10	<0.5	1	<0.5	0.6	<50	10	3.5	-1.5	3.65
	2Q01	84	<5	14	<3	<0.2	97	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	10	3.5	-1.5	5.12
	4Q01	48	<5	14	<3	<0.2	110	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	10	3.5	-1.5	6.31
604	2Q97	160	<2	<2	<2	<0.2	17	8	37	<0.5	<0.5	<0.5	<0.5	80	9	7	-1.5	
	4Q97	250	<2	<2	<2	<0.2	15	8	29	<0.5	<0.5	<0.5	<0.5	<50	9	7	-1.5	
	2Q98	71	<5	<2	<2	<0.2	18	3	38	<0.5	<0.5	<0.5	<1	<50	9	7	-1.5	
	4Q98	110	<5	<2	<2	<0.2	34	7	<50	<0.5	<0.5	<0.5	<1	<50	9	7	-1.5	
	1Q99	67	<5	<2	<3	<0.2	10	<5	28	<0.5	<0.5	<0.5	<0.5	<50	9	7	-1.5	
	4Q99	207	<5	5	<3	<0.2	18	<1	30	<0.5	<0.5	<0.5	<0.5	<50	9	7	-1.5	
	2Q00	132	<5	4	<3	<0.2	23	5	39	<1.0	<1.0	<1.0	<1.0	<100	9	7	-1.5	7.01
	4Q00	129	<5	2	<3	<0.2	23	<5	24	<0.5	<0.5	<0.5	<0.5	<50	9	7	-1.5	6.04
	2Q01	136	<5	7	4	<0.2	36	<5	36	<0.5	<0.5	<0.5	<0.5	<50	9	7	-1.5	5.96
	4Q01	88	<5	<5	<3	<0.2	28	<5	18	<0.5	<0.5	<0.5	<0.5	<50	9	7	-1.5	4.14

Table 9
Martinez Refining Company
RCRA Monitoring
Semi-Volatile and Volatile Organic Compounds and Metals
(all results in ug/L)
(PQL/WDR Compliance Trigger Level)

Well	Date	Acetone	Benzene	Chloroform	Methylene Chloride	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	1,2-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethene (total)	Ethylbenzene	Toluene	Trichloroethene	Vinyl Chloride	Xylenes (total)	Phenol	2-Chlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	4-Methylphenol	4-Methylphenol	Naphthalene	4-Nitrophenol	Pentachlorophenol	Phenol	Pyrene	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	TOC Elevation (ft-msl)	Screen Start elev. (ft-msl)	Screen End elev. (ft-msl)	Water Level elev. (ft-msl)
225R	2Q97	<1	<1	<1	<1	<1	<1	<1	<200	<4	<4	<1	<1	<4	<2	<20	<20	<1	<1	<1	<40	<40	<1	<4	<1	<4	<1	<4	<4	9.94	6	-4	9.05
	4Q97	<1	<1	<1	<1	<1	<1	<1	<50	<1	<1	<1	<1	<1	<1	<5	<5	<1	<1	<1	<10	<10	<1	<1	<1	<1	<1	<1	<1	9.94	6	-4	9.05
	2Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	9.94	6	-4	9.05
	4Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9.94	6	-4	9.05
	1Q99	<6	<6	<6	<6	<6	<6	<6	<28	<11	<6	<6	<6	<6	<6	<28	<28	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	9.94	6	-4	
	4Q99	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9.94	6	-4	9.05
	2Q00	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9.05	6	-4	2.67
	4Q00	<20	<20	<100	<20	<20	<20	<20	<100	<40	<20	<20	<20	<20	<20	<100	<100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	9.05	6	-4	3.31
	2Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	>10	<10	<10	<10	<10	<10	<10	<10	9.05	6	-4	4.82
	4Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	>10	<10	<10	<10	<10	<10	<10	<10	9.05	6	-4	6.38
228	2Q97	<20	<20	<20	<20	<20	<20	<20	<1000	<20	<20	<20	<20	<20	<20	<100	<100	<20	<20	<20	<200	<200	110	<20	<20	<20	<20	<20	<20	14	9.5	-0.5	
	4Q97	<1	<1	<1	<1	<1	<1	<1	<50	<1	<1	<1	<1	<1	<1	<5	<5	<1	<1	<1	<10	<10	33	<1	<1	<1	<1	<1	<1	14	9.5	-0.5	
	2Q98	<5	<5	<5	<5	<5	<5	<5	<27	<11	<5	<5	<5	<5	8	<27	<27	<5	<5	<5	<5	7	120	<5	<5	31	<5	<27	<5	14	9.5	-0.5	
	4Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	7	<25	<25	<5	<5	<5	6	6	12	<5	<5	52	<5	<5	<5	14	9.5	-0.5	
	1Q99	<6	<6	<6	<6	<6	<6	<6	<28	<11	<6	<6	<6	<6	<6	<28	<28	<6	<6	<6	8	6	160	<6	<6	<6	<6	<6	<6	14	9.5	-0.5	
	4Q99	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	9	<25	<25	<5	<5	<5	<5	<5	10	<5	<5	41	<5	<5	<5	14	9.5	-0.5	
	2Q00	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	14	<10	<10	<5	<5	<5	12	10	160	<5	<5	19	<5	<5	<5	14	9.5	-0.5	11.1
	4Q00	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	7	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	14	9.5	-0.5	4.61
	2Q01	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	9	7	55	<5	<5	<5	<5	<5	<5	14	9.5	-0.5	9.89
	4Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	>10	35	<10	<10	<10	<10	<10	<10	14	9.5	-0.5	10.98
292B	2Q97	<1	<1	<1	<1	<1	<1	<1	<50	<1	<1	<1	<1	<1	<1	<5	<5	<1	<1	<1	<10	<10	<1	<1	<1	<1	<1	<1	<1	11.91	6.5	-3.5	10.31
	4Q97	<1	<1	<1	<1	<1	<1	<1	<50	<1	<1	<1	<1	<1	<1	<5	<5	<1	<1	<1	<10	<10	<1	<1	<1	<1	<1	<1	<1	11.91	6.5	-3.5	9.99
	2Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<5	11.91	6.5	-3.5	10.91
	4Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	11.91	6.5	-3.5	9.61
	1Q99	<6	<6	<6	<6	<6	<6	<6	<28	<11	<6	<6	<6	<6	<6	<28	<28	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	11.91	6.5	-3.5	
	4Q99	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	11.91	6.5	-3.5	9.46
	2Q00	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	11.91	6.5	-3.5	10.71
	4Q00	<20	<20	<20	<20	<20	<20	<20	<100	<40	<20	<20	<20	<20	<20	<100	<100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	11.91	6.5	-3.5	9.53
	2Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	11.91	6.5	-3.5	10.39
	4Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	11.91	6.5	-3.5	10.89

ED_001593_00015400

Table 9
Martinez Refining Company
RCRA Monitoring
Semi-Volatile and Volatile Organic Compounds and Metals
(all results in ug/L)
(PQL/WDR Compliance Trigger Level)

WELL	SAMPLE DATE	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(a)pyrene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Phenanthrene	Pyrene	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2,4-Dimethylphenol	2-Methylnaphthalene	Naphthalene	2-Nitrophenol	4-Nitrophenol	Phenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	TOC Elevation (ft-msl)	Screen Stat Elev. (ft-msl)	Screen End Elev. (ft-msl)	Water Level Elev. (ft-msl)
292S	2Q97	<1	<1	<1	<1	<1	<1	<1	<300	<6	<6	<1	<1	<6	<6	<30	<30	<1	<1	<1	<60	<60	<1	<6	<1	<6	<1	<6	9	-5	-10	
	4Q97	<1	<1	<1	<1	<1	<1	<1	<50	<1	<1	<1	<1	<1	<1	<5	<5	<1	<1	<1	<10	<10	<1	<1	<1	<1	<1	<1	9	-5	-10	
	2Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	9	-5	-10	
	4Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9	-5	-10	
	1Q99	<6	<6	<6	<6	<6	<6	<6	<28	<11	<6	<6	<6	<6	<6	<28	<28	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	9	-5	-10	
	4Q99	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	7	<5	<5	9	-5	-10	
	2Q00	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9	-5	-10	3.48
	4Q00	<20	<20	<20	<20	<20	<20	<20	<100	<40	<20	<20	<20	<20	<20	<100	<100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	9	-5	-10	-0.9
	2Q01	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9	-5	-10	-1.8
	4Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	9	-5	-10	7.98
293B	2Q97	<8	<8	<8	<8	<8	<8	<8	<400	<8	<8	<8	<8	<8	<8	<40	<40	<8	<8	<8	<80	<80	<8	<8	<8	<8	<8	<8	9.94	5	-5	6.44
	4Q97	<1	<1	<1	<1	<1	<1	<1	<50	<1	<1	<1	<1	<1	<1	<5	<5	<1	<1	<1	<10	<10	<1	<1	<1	<1	<1	<1	9.94	5	-5	7.54
	2Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	9.94	5	-5	8.04
	4Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9.94	5	-5	6.94
	1Q99	<6	<6	<6	<6	<6	<6	<6	<28	<11	<6	<6	<6	<6	<6	<28	<28	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	9.94	5	-5	
	4Q99	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9.94	5	-5	5.59
	2Q00	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9.94	5	-5	6.85
	4Q00	<20	<20	<20	<20	<20	<20	<20	<100	<40	<20	<20	<20	<20	<20	<100	<100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	9.94	5	-5	2.14
	2Q01	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9.94	5	-5	6.58
	4Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	9.94	5	-5	6.81
293S	2Q97	<1	<1	<1	<1	<1	<1	<1	<300	<6	<6	<1	<1	<6	<6	<30	<30	<1	<1	<1	<60	<60	<1	<6	<1	<6	<1	<6	11	-3	-8	
	4Q97	<1	<1	<1	<1	<1	<1	<1	<50	<1	<1	<1	<1	<1	<1	<5	<5	<1	<1	<1	<10	<10	<1	<1	<1	<1	<1	<1	11	-3	-8	
	2Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	11	-3	-8	
	4Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	11	-3	-8	
	1Q99	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<28	<28	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	11	-3	-8	
	4Q99	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	11	-3	-8	
	2Q00	<6	<6	<6	<6	<6	<6	<6	<13	<6	<6	<6	<6	<6	<6	<13	<13	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	11	-3	-8	6.89
	4Q00	<20	<20	<20	<20	<20	<20	<20	<100	<40	<20	<20	<20	<20	<20	<100	<100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	11	-3	-8	5.24
	2Q01	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	11	-3	-8	6.66
	4Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	11	-3	-8	7.44

ED_001593_00015400

Table 9
Martinez Refining Company
RCRA Monitoring
Semi-Volatile and Volatile Organic Compounds and Metals
(all results in ug/L)
(PQL/WDR Compliance Trigger Level)

WELL	SAMPLE DATE	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Benzoic acid	4-Chloro-3-methylphenol	2-Chlorophenol	Chrysene	Dibenzo(a,h)anthracene	2,4-Dichlorophenol	2,4-Dimethylphenol	4,6-Dinitro-2-methylphenol	2,4-Dinitrophenol	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	2-Methylphenol	4-Methylphenol	Naphthalene	2-Nitrophenol	Phenanthrene	Phenol	Pyrene	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	TOC Elevation (ft-msl)	Screen Start elev. (ft-msl)	Screen End elev. (ft-msl)	Water Level elev. (ft-msl)
600	2Q97	<1	<1	<1	<1	<1	<1	<1	<200	<4	<4	<1	<1	<4	<4	<20	<20	<1	<1	<1	<40	<40	<1	<4	<1	<4	<1	<4	<4	10	3.5	-1.5	
	4Q97	<1	<1	<1	<1	<1	<1	<1	<50	<1	<1	<1	<1	<1	<1	<5	<5	<1	<1	<1	<10	<10	<1	<1	<1	<1	<1	<1	<1	10	3.5	-1.5	
	2Q98	<6	<6	<6	<6	<6	<6	<6	<28	<11	<6	<6	<6	<6	<6	<28	<28	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<28	<6	10	3.5	-1.5	
	4Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	10	3.5	-1.5	
	1Q99	<5	<5	<5	<5	<5	<5	<5	<27	<11	<5	<5	<5	<5	<5	<28	<28	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	10	3.5	-1.5	
	4Q99	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	10	3.5	-1.5	
	2Q00	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	10	3.5	-1.5	5.63
	4Q00	<6.3	<6.3	<6.3	<6.3	<6.3	<6.3	<6.3	<13	<6.3	<6.3	<6.3	<6.3	<6.3	<6.3	<13	<13	<6.3	<6.3	<6.3	<6.3	<6.3	<6.3	<6.3	<6.3	<6.3	<6.3	<13	<6.3	10	3.5	-1.5	3.65
	2Q01	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	10	3.5	-1.5	5.12
	4Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10	3.5	-1.5	6.31
604	2Q97	<1	<1	<1	<1	<1	<1	<1	<50	<1	<1	<1	<1	<1	<1	<5	<5	<1	<1	<1	<10	<10	<1	<1	<1	<1	<1	<1	<1	9	7	-1.5	
	4Q97	<1	<1	<1	<1	<1	<1	<1	<50	<1	<1	<1	<1	<1	<1	<5	<5	<1	<1	<1	<10	<10	<1	<1	<1	<1	<1	<1	<1	9	7	-1.5	
	2Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<5	9	7	-1.5	
	4Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9	7	-1.5	
	1Q99	<6	<6	<6	<6	<6	<6	<6	<28	<11	<6	<6	<6	<6	<6	<28	<28	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	9	7	-1.5	
	4Q99	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9	7	-1.5	
	2Q00	<6	<6	<6	<6	<6	<6	<6	<13	<6	<6	<6	<6	<6	<6	<13	<13	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	9	7	-1.5	7.01
	4Q00	<40	<40	<40	<40	<40	<40	<40	<200	<80	<40	<40	<40	<40	<40	<200	<200	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	9	7	-1.5	6.04
	2Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	9	7	-1.5	5.96
	4Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	9	7	-1.5	4.14

ED_001593_00015400

Table 6.1

Biotreater Wells Statistical Analysis- Background Wells
Fourth Quarter 2001

Shell Oil Product company
Martinez Manufacturing Complex
Martinez, California

Sample ID	Sample Date	Volatile Petroleum Hydrocarbon (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Total Xylenes (ug/l)	Copper (ug/l)	Lead (ug/l)	Mercury (ug/l)	Selenium (ug/l)	Vanadium (ug/l)	Chromium (ug/l)	Barium (ug/l)	Nickel (ug/l)	Naphthalene (ug/l)	Phenol (ug/l)	2,4-Di Methylphenol (ug/l)
228a	4/21/92	16000	1600	1500	570	2600	5	1	0.25	2.5	5	2.5	214	10	230	1	1
228b	4/21/92	11000	1000	660	94	1300	5	1	0.25	2.5	5	2.5	193	10	150	10	47
228c	4/21/92	14000	1500	1400	120	2100	5	1	0.25	2.5	5	2.5	154	10	79	57	32
228d	4/21/92	11000	1200	790	25	1600	5	1	0.25	2.5	5	2.5	172	10	100	2.5	43
228a	10/20/92	9000	15000	910	320	1300	5	1	0.25	2.5	5	2.5	183	10	125	39	52
228b	10/20/92	7700	990	590	250	1000	5	1	0.25	2.5	5	2.5	222	10	69	15	30
228c	10/20/92	8100	1100	620	340	1200	5	1	0.25	2.5	5	2.5	216	10	12	18	24
228d	10/20/92	4200	700	320	200	700	5	1	0.25	2.5	5	2.5	170	10	13	7	18
228	4/21/93	2100	190	200	95	310	5	1	0.25	2.5	5	2.5	194	10	320	200	2.5
228	11/5/93	1400	99	6.2	2.5	190	5	1	0.25	2.5	5	2.5	181	10	65	2.5	19
228	4/19/94	2200	1600	2000	470	2500	10	2.5	1	2.5	5	0.5	240	2.5	140	10	5
228	10/26/94	7800	980	650	340	1100	10	2.5	0.1	2.5	5	0.5	170	2.5	33	5	5
228	4/14/95	20000	1600	1500	680	2200	10	2.5	0.1	2.5	5	1.4	200	5.1	160	5	5
228	2Q97	8800	2800	2100	680	2600	1	3	0.1	2.5	2	1	240	4	110	10	10
228	4Q97	6000	1500	310	190	750	1	1	0.1	2.5	4	2	190	4	33	0.5	0.5
228	2Q98	11000	1300	760	440	1300	1	1	0.1	2.5	7.5	2.5	162	2	120	31	8
228	4Q98	3350	826	255	53	317	1	1	0.1	2.5	25	2.5	180	7	12	52	7
228	1Q99	11000	1190	664	511	1740	1	1.5	0.1	2.5	5	2.5	145	2.5	160	3	3
228	4Q99	1180	1120	181	194	707	1	1.5	0.1	0.5	5	2.5	166	2.5	10	41	9
228	2Q00	500	5	5	5	5	1	1.5	0.1	0.5	5	2.5	197	3.05	160	19	14
228	4Q00	125	684	191	132	413	2.5	1.5	0.1	2.5	5	2.5	141	2.5	2.5	2.5	6.7
228	2Q01	7270	1370	469	293	830	2.5	3.21	0.1	2.5	5	2.5	218	2.5	54.7	2.5	2.5
228	4Q01	10000	2200	1400	390	1600	2.5	1.5	0.1	2.5	5	2.5	290	2.5	35	5	5
600a	4/21/92	25	0.25	0.25	0.25	0.25	20	1	0.25	2.5	5	2.5	112	42	0.5	1	2
600b	4/21/92	25	0.25	0.25	0.25	0.25	5	1	0.25	2.5	5	2.5	96	34	0.5	1	2
600c	4/21/92	25	0.25	0.25	0.25	0.25	11	1	0.25	5	5	2.5	105	35	0.5	1	10
600d	4/21/92	25	0.25	0.25	0.25	0.25	5	1	0.25	11	5	2.5	113	39	0.5	1	NA
600a	10/20/92	25	0.25	0.25	0.25	0.25	5	1	0.25	10	5	2.5	97	10	0.5	1	2
600b	10/20/92	25	0.25	0.25	0.25	0.25	5	1	0.25	6	5	2.5	117	10	0.5	1	2
600c	10/20/92	25	0.25	0.25	0.25	0.25	5	1	0.25	5	5	2.5	148	10	NA	10	10
600d	10/20/92	25	0.25	0.25	0.25	0.25	5	1	0.25	26	5	2.5	172	10	NA	NA	NA
600	4/21/93	25	0.25	0.25	0.25	0.25	5	1	0.25	5	5	2.5	91	70	2.5	2.5	2
600	11/5/93	25	0.25	0.25	0.25	0.25	23	1	0.25	2.5	5	2.5	62	10	2.5	2.5	2
600	4/19/94	25	2.5	2.5	2.5	5	10	5	1	2.5	5	0.5	49	110	5	5	2
600	10/26/94	250	1.25	1.25	1.25	2.5	22	5	0.1	2.5	5	0.5	70	140	5	5	5
600	4/14/95	250	2.5	2.5	2.5	2.5	10	12.5	0.1	2.5	5	1.7	74	83	5	5	5
600	2Q97	25	0.25	0.25	0.25	0.25	2	1	0.2	7	2	1	61	63	0.5	2	2
600	4Q97	25	0.25	0.25	0.25	0.25	2	1	0.1	15	1	1	100	89	0.5	0.5	0.5
600	2Q98	25	0.25	0.25	0.25	0.5	5	14	0.1	1	1	5	62	88	3	3	3
600	4Q98	25	0.25	0.25	0.25	0.5	3	1	0.1	0.25	25	2.5	42	74	2.5	2.5	2.5
600	1Q99	25	0.25	0.25	0.25	0.25	1	1.5	0.1	0.25	5	2.5	24	11	2.5	2.5	2.5
600	4Q99	25	0.25	0.25	0.25	0.25	6	1.5	0.1	0.5	5	2.5	38	2.5	2.5	2.5	2.5
600	2Q00	50	0.5	0.5	0.5	0.5	24	2.33	0.1	0.5	5	2.5	29.8	21	2.5	2.5	2.5
600	4Q00	25	0.25	1.04	0.25	0.64	7.37	1.5	0.1	10	5	2.5	44.3	33.5	3.15	3.15	3.15
600	2Q01	25	0.25	0.25	0.25	0.25	13.5	1.5	0.1	0.25	5	2.5	83.9	96.5	2.5	2.5	2.5
600	4Q01	25	0.25	0.25	0.25	0.25	13.5	1.5	0.1	0.25	5	2.5	48	110	5	5	5
Mean	4Q01	3,799.46	881.86	380.29	139.26	616.92	6.58	2.03	0.21	3.73	5.60	2.23	136.46	29.00	50.93	13.35	9.53
Variance	4Q01	2.77E+07	5.06E+06	3.30E+05	4.08E+04	6.89E+05	3.48E+01	6.76E+00	3.46E-02	2.03E+01	1.87E+01	6.17E-01	4.55E+03	1.34E+03	5.45E+03	9.94E+02	1.62E+02

ED_001593_00015400

Table 6.2

Biotreater Wells Statistical Analysis- Background Wells
Fourth Quarter 2001

Shell Oil Product company
Martinez Manufacturing Complex
Martinez, California

Sample ID	Sample Date	Volatile Petroleum Hydrocarbon (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Total Xylenes (ug/l)	Copper (ug/l)	Lead (ug/l)	Mercury (ug/l)	Selenium (ug/l)	Vanadium (ug/l)	Chromium (ug/l)	Barium (ug/l)	Nickel (ug/l)	Naphthalene (ug/l)	Phenol (ug/l)	2,4-Di Methylphenol (ug/l)
225R(a)	4/21/92	66	0.25	0.5	0.5	0.5	5	1	0.25	2.5	5	5	112	20	0.05	1	1
225R(b)	4/21/92	25	0.25	0.5	0.5	0.5	5	1	0.25	2.5	5	2.5	116	21	0.05	1	1
225R(c)	4/21/92	25	0.25	0.5	0.5	0.5	5	1	0.25	2.5	5	5	150	10	0.05	1	1
225R(d)	4/21/92	84	0.25	0.5	0.5	0.5	5	1	0.25	5	5	5	186	22	0.05	1	1
225R(a)	10/20/92	70	0.25	0.25	0.25	0.25	5	1	0.25	2.5	5	2.5	472	10	2	1	1
225R(b)	10/20/92	25	0.25	0.6	0.25	0.9	5	1	0.25	12	5	2.5	435	10	0.5	1	1
225R(c)	10/20/92	25	0.25	0.25	0.25	0.25	5	1	0.25	2.5	5	2.5	463	10	0.5	1	1
225R(d)	10/20/92	25	0.25	0.25	0.25	5	5	1	0.25	17	5	2.5	368	10	0.5	1	1
225R	4/21/93	25	0.25	0.25	0.25	1	5	1	0.25	9	5	2.5	348	10	2.5	2.5	2.5
225R	10/29/93	25	0.25	0.25	0.25	2.3	5	1	0.25	2.5	5	5	512	10	2.5	2.5	2.5
225R	4/19/94	25	2.5	2.5	2.5	5	10	2.5	1	2.5	5	1.9	310	36	5	5	5
225R	10/26/94	250	1.25	1.25	1.25	2.5	10	2.5	0.1	2.5	5	0.5	380	12	5	5	5
225R	4/14/95	250	2.5	2.5	2.5	2.5	10	12.5	0.1	2.5	5	1.8	220	11	5	5	5
225R	2Q97	25	0.25	0.25	0.25	0.25	1	1	0.1	6	2	1	150	40	0.5	2	2
225R	4Q97	25	0.25	0.25	0.25	0.25	1	1	0.1	9	5	3	200	21	0.5	0.5	0.5
225R	2Q98	25	0.25	0.25	0.25	0.5	3	1	0.1	2.5	2.5	2.5	60	27	3	3	3
225R	4Q98	25	0.25	0.6	0.25	2	1	1	0.1	2.5	25	10	200	33	2.5	2.5	2.5
225R	1Q99	25	0.25	0.25	0.25	0.25	1	1.5	0.1	2.5	5	2.5	160	24	2.5	2.5	2.5
225R	4Q99	25	0.25	0.25	0.25	0.25	7	1.5	0.1	1	5	2.5	171	24	2.5	2.5	2.5
225R	2Q00	25	0.25	0.25	0.25	0.25	4.71	1	0.1	1.44	5	2.5	136	33.2	2.5	2.5	2.5
225R	4Q00	25	0.25	0.25	0.25	0.25	4.52	1.5	0.1	2.5	5	2.5	91.6	59.3	3.15	3.15	3.15
225R	2Q01	25	2.5	0.25	0.25	0.25	8.28	1.5	0.1	2.5	5	2.5	122	51.1	2.5	2.5	2.5
225R	4Q01	25	2.5	0.25	0.25	0.25	2.5	15	0.1	2.5	5	2.5	100	30	5	5	5
Mean		50.87	0.68	0.56	0.53	1.14	4.96	2.33	0.20	4.26	5.63	3.07	237.50	23.24	2.10	2.35	2.35
Variance		4,229.30	0.77	0.43	0.43	2.07	7.47	13.33	0.04	15.26	18.46	3.68	19,653.01	195.50	3.01	2.16	2.16
t'		-4.83	-2.66	-4.49	-4.66	-5.03	-1.57	0.34	-0.05	0.50	0.03	2.02	3.27	-0.94	-4.38	-2.33	-3.69
tc		1.68	1.68	1.68	1.68	1.68	1.69	1.71	1.70	1.70	1.70	1.71	1.71	1.69	1.68	1.68	1.68
292B(a)	4/28/92	25	0.25	0.5	0.5	0.5	5	1	0.25	2.5	5	5	52	32	0.05	1	1
292B(b)	4/28/92	60	0.25	0.5	0.5	0.5	5	1	0.25	2.5	5	2.5	49	30	0.05	1	1
292B(c)	4/28/92	50	0.25	0.5	0.5	0.5	5	1	0.25	2.5	5	5	51	10	0.05	2.5	1
292B(d)	4/28/92	82	0.25	0.5	0.5	0.5	5	1	0.25	2.5	5	5	53	10	0.05	1	1
292B(a)	10/20/92	77	0.25	0.25	0.25	0.25	5	1	0.25	2.5	5	2.5	62	46	0.05	1	1
292B(b)	10/20/92	60	0.25	0.25	0.25	0.25	5	1	0.25	2.5	5	2.5	60	37	0.05	1	1
292B(c)	10/20/92	25	0.25	0.25	0.25	0.25	5	1	0.25	2.5	5	2.5	64	37	0.05	1	1
292B(d)	10/20/92	25	0.25	0.25	0.25	3	5	1	0.25	7	5	2.5	54	10	0.05	1	1
292B	4/21/93	25	0.25	0.25	0.25	0.45	5	1	0.25	2.5	5	2.5	54	26	2.5	2.5	2.5
292B	11/5/93	25	0.25	0.25	0.25	0.25	5	1	0.25	2.5	5	2.5	66	50	2.5	2.5	2.5
292B	4/13/94	25	0.25	0.25	0.25	1	10	2.5	1	2.5	5	0.5	68	32	4.75	4.8	4.8
292B	10/26/94	250	1.25	1.25	1.25	2.5	10	2.5	0.1	2.5	5	0.5	68	64	5	5	5
292B	4/14/95	250	2.5	2.5	2.5	2.5	10	2.5	0.1	2.5	5	1.3	54	30	5	5	5
292B	2Q97	25	0.25	0.25	0.25	0.25	1	1	0.1	7	1	1	61	52	4	4	4
292B	4Q97	25	0.25	0.25	0.25	0.25	1	1	0.1	9	1	1	60	39	0.5	0.5	0.5
292B	2Q98	25	0.25	0.25	0.25	0.5	1	1	0.1	1	7.5	2.5	50	56	2.5	2.5	2.5
292B	4Q98	25	0.25	0.51	0.25	0.5	2	1	0.1	2.5	25	2.5	46	65	2.5	2.5	2.5
292B	1Q99	25	0.25	0.7	0.25	0.25	1	1.5	0.1	2.5	5	2.5	43	38	3	3	3
292B	4Q99	25	0.25	0.25	0.25	0.25	4	1.5	0.1	0.5	5	2.5	48	57	2.5	2.5	2.5
292B	2Q00	25	0.25	0.25	0.25	0.25	1.5	0.1	5	0.5	5	2.5	45	70.2	2.5	2.5	2.5
292B	4Q00	25	0.25	0.25	0.25	0.25	2.76	1.5	0.1	2.5	5	2.5	45.5	76.1	10	10	10
292B	2Q01	113	0.25	0.25	0.25	0.25	11.1	1.5	0.1	2.5	5	2.5	57.2	80.2	2.5	2.5	2.5
292B	4Q01	25	0.25	0.25	0.25	0.25	2.5	1.5	0.1	2.5	5	2.5	47	36	5	5	5
Mean		57.26	0.39	0.47	0.43	0.67	4.69	1.27	0.42	2.93	5.63	2.47	54.68	42.76	2.40	2.80	2.73
Variance		4276.57	0.25	0.25	0.25	0.66	9.43	0.33	1.03	4.03	19.50	1.48	59.04	406.59	6.11	4.57	4.71
t'		-4.82	-2.66	-4.49	-4.66	-5.03	-1.75	-1.91	0.99	-1.01	0.03	0.86	-8.12	2.01	-4.35	-2.24	-3.45
tc		1.68	1.68	1.68	1.68	1.68	1.69	1.68	1.72	1.69	1.70	1.71	1.68	1.69	1.68	1.68	1.68

ED_001593_00015400

Table 6.2

Biotreater Wells Statistical Analysis- Background Wells
Fourth Quarter 2001

Shell Oil Product company
Martinez Manufacturing Complex
Martinez, California

Sample ID	Sample Date	Volatile Petroleum Hydrocarbon (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Total Xylenes (ug/l)	Copper (ug/l)	Lead (ug/l)	Mercury (ug/l)	Selenium (ug/l)	Vanadium (ug/l)	Chromium (ug/l)	Barium (ug/l)	Nickel (ug/l)	Naphthalene (ug/l)	Phenol (ug/l)	2,4-Di Methylphenol (ug/l)
292S(a)	4/21/92	25	0.25	0.5	0.5	0.5	5	1	0.25	2.5	5	5	521	10	0.5	1	1
292S(b)	4/21/92	25	0.25	0.5	0.5	0.5	5	1	0.25	2.5	12	2.5	496	10	0.5	1	1
292S(c)	4/21/92	25	0.25	0.5	0.5	0.5	5	1	0.25	2.5	5	5	572	10	0.5	1	1
292S(d)	4/21/92	25	0.25	0.5	0.5	0.5	5	1	0.25	2.5	5	5	535	10	0.5	1	1
292S(a)	10/20/92	25	0.25	0.25	0.25	0.25	5	1	0.25	2.5	15	2.5	422	10	0.5	1	1
292S(b)	10/20/92	25	0.25	0.25	0.25	0.25	5	1	0.25	2.5	11	2.5	630	10	0.5	1	1
292S(c)	10/20/92	25	0.25	0.25	0.25	0.25	5	1	0.25	2.5	5	2.5	648	10	0.5	1	1
292S(d)	10/20/92	25	0.25	0.25	0.25	0.25	5	1	0.25	13	5	2.5	623	10	0.5	1	1
292S	4/21/93	25	0.25	2.3	0.25	1.6	5	1	0.25	2.5	12	2.5	562	10	2.5	2.5	2.5
292S	11/5/93	25	0.25	0.25	0.25	0.25	5	1	0.25	2.5	13	2.5	511	10	2.5	2.5	2.5
292S	4/13/94	25	0.25	0.25	0.25	0.25	10	2.5	1	12.5	14	1.6	600	2.5	4.7	4.7	4.7
292S	10/26/94	250	1.25	1.25	1.25	2.5	10	2.5	0.1	5	5	2.3	600	2.5	5	5	5
292S	4/14/95	250	2.5	2.5	2.5	2.5	10	12.5	0.1	12.5	5	2.4	550	2.5	5	5	5
292S	2Q97	25	0.25	0.25	0.25	0.25	3	1	0.1	8	10	1	550	2	0.5	3	3
292S	4Q97	25	0.25	0.25	0.25	0.25	1	1	0.1	10	11	2	490	12	0.5	0.5	0.5
292S	2Q98	25	0.25	0.25	0.25	0.5	1	1	0.1	2.5	7.5	2.5	468	58	2.5	2.5	2.5
292S	4Q98	25	0.25	0.25	0.25	0.5	4	1	0.1	2.5	25	2.5	650	5	2.5	2.5	2.5
292S	1Q99	25	0.25	0.25	0.25	0.25	1	1.5	0.1	2.5	5	2.5	461	14	3	3	3
292S	4Q99	25	0.25	0.25	0.25	0.25	10	1.5	0.1	0.5	5	2.5	548	2.5	2.5	7	2.5
292S	2Q00	25	0.25	0.25	0.25	0.25	1	1.5	0.1	0.5	5	5.98	576	2.5	2.5	2.5	2.5
292S	4Q00	25	0.25	0.25	0.25	0.25	2.92	1.5	0.1	2.5	5	2.5	449	8.12	10	10	10
292S	2Q01	25	0.25	0.25	0.25	0.25	6.17	1.5	0.1	2.5	5	2.5	525	2.5	2.5	2.5	2.5
292S	4Q01	25	0.25	0.25	0.25	0.25	2.5	1.5	0.1	2.5	5	2.5	55	23	5	5	5
Mean		44.57	0.39	0.52	0.43	0.57	4.90	1.76	0.20	4.33	8.50	2.84	523.57	10.31	2.40	2.88	2.68
Variance		4,202.08	0.25	0.40	0.25	0.45	8.21	5.68	0.04	15.20	25.66	1.44	14,434.17	132.77	5.45	5.42	4.62
t'		-4.84	-2.66	-4.49	-4.66	-5.03	-1.60	-0.43	-0.05	0.57	2.35	2.21	14.36	-3.16	-4.35	-2.22	-3.48
tc		1.68	1.68	1.68	1.68	1.68	1.69	1.70	1.70	1.70	1.71	1.71	1.71	1.69	1.68	1.68	1.68
293B(a)	4/21/92	120	0.25	0.5	0.5	0.5	5	1	0.25	2.5	5	5	157	10	0.5	1	1
293B(b)	4/21/92	100	0.25	0.5	0.5	0.5	5	1	0.25	2.5	5	2.5	155	10	0.5	1	1
293B(c)	4/21/92	100	0.25	0.5	0.5	0.5	5	1	0.25	2.5	5	5	163	10	0.5	2.5	1
293B(d)	4/21/92	120	0.25	0.5	0.5	0.5	5	1	0.25	6	5	5	214	10	0.5	1	1
293B(a)	10/20/92	140	0.25	0.25	0.25	0.25	5	1	0.25	2.5	5	2.5	186	10	0.5	1	1
293B(b)	10/20/92	140	0.9	2	0.25	1.5	5	1	0.25	2.5	5	2.5	236	10	0.5	1	1
293B(c)	10/20/92	25	0.25	0.6	0.25	6	5	1	0.25	2.5	5	2.5	318	10	0.5	1	1
293B(d)	10/20/92	86	0.25	0.25	0.25	5	5	1	0.25	19	5	2.5	254	10	0.5	1	1
293B	4/21/93	25	0.25	0.25	0.25	0.25	5	1	0.25	2.5	5	2.5	124	10	2.5	2.5	2.5
293B	11/5/93	76	0.25	0.25	0.25	2	5	1	0.25	2.5	5	2.5	219	10	2.5	2.5	2.5
293B	4/19/94	160	2.5	2.5	2.5	5	10	2.5	1	2.5	5	0.5	210	2.5	5	4.8	5
293B	10/26/94	250	1.25	1.25	1.25	2.5	10	2.5	0.1	NR	5	1.4	NR	NR	5	5	5
293B	4/14/95	250	2.5	2.5	2.5	2.5	10	12.5	0.1	2.5	5	1.7	120	13	5	5	5
293B	2Q97	25	0.25	0.25	0.25	0.25	22	1	0.1	19	7	1	150	12	4	4	4
293B	4Q97	25	0.25	0.25	0.25	0.25	1	1	0.1	15	8	3	230	7	0.5	0.5	0.5
293B	2Q98	25	0.25	0.25	0.25	0.5	0.5	1	0.1	10	25	2.5	54	9	2.5	2.5	2.5
293B	4Q98	25	0.25	0.25	0.25	0.5	2	1	0.1	8	25	2.5	160	53	2.5	2.5	2.5
293B	1Q99	25	0.25	0.25	0.25	0.25	3	1.5	0.1	10	19	2.5	64	12	3	3	3
293B	4Q99	25	0.25	0.25	0.25	0.25	9	1.5	0.1	0.5	5	2.5	173	2.5	2.5	2.5	2.5
293B	2Q00	25	0.25	0.25	0.25	0.25	2.64	2.22	0.1	1.46	5	2.5	142	22.7	2.5	2.5	2.5
293B	4Q00	25	0.25	0.25	0.25	0.25	2.51	1.5	0.1	2.5	5	2.5	165	14.3	10	10	10
293B	2Q01	25	0.25	0.25	0.25	0.25	8.46	1.5	0.1	2.5	5	2.5	127	20.2	2.5	2.5	2.5
293B	4Q01	25	0.25	0.25	0.25	0.25	2.5	1.5	0.1	2.5	26	2.5	70	23	5	5	5
Mean		80.09	0.52	0.62	0.53	1.30	5.81	1.79	0.20	5.52	8.48	2.61	167.77	13.24	2.57	2.80	2.74
Variance		5079.63	0.45	0.52	0.43	3.08	20.19	5.68	0.04	31.43	53.26	1.22	4091.33	105.28	5.44	4.57	4.75
t'		-4.79	-2.66	-4.49	-4.66	-5.03	-0.61	-0.38	-0.05	1.31	1.75	1.48	1.86	-2.71	-4.34	-2.24	-3.44
tc		1.68	1.68	1.68	1.68	1.68	1.70	1.70	1.70	1.71	1.71	1.71	1.71	1.69	1.68	1.68	1.68

ED_001593_00015400

Table 6.2

Biotreater Wells Statistical Analysis- Background Wells
Fourth Quarter 2001

Shell Oil Product company
Martinez Manufacturing Complex
Martinez, California

Sample ID	Sample Date	Volatile Petroleum Hydrocarbon (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Total Xylenes (ug/l)	Copper (ug/l)	Lead (ug/l)	Mercury (ug/l)	Selenium (ug/l)	Vanadium (ug/l)	Chromium (ug/l)	Barium (ug/l)	Nickel (ug/l)	Naphthalene (ug/l)	Phenol (ug/l)	2,4-Di Methylphenol (ug/l)
293S(a)	4/21/92	25	0.25	0.5	0.5	0.5	14	1	0.25	2.5	5	5	449	10	0.5	1	1
293S(b)	4/21/92	25	0.25	0.5	0.5	0.5	5	1	0.25	2.5	5	2.5	453	10	0.5	1	1
293S(c)	4/21/92	25	0.25	0.5	0.5	0.5	5	1	0.25	2.5	5	5	403	10	0.5	1	1
293S(d)	4/21/92	25	0.25	0.5	0.5	1.1	5	1	0.25	9	5	5	536	10	0.5	1	1
293S(a)	10/20/92	25	0.25	0.25	0.25	0.25	5	1	0.25	2.5	20	7	342	10	2	1	1
293S(b)	10/20/92	25	0.25	0.25	0.25	0.25	5	1	0.25	2.5	12	2.5	368	10	0.5	1	1
293S(c)	10/20/92	25	0.25	0.25	0.25	0.25	5	1	0.25	2.5	5	2.5	387	10	0.5	1	1
293S(d)	10/20/92	25	0.25	0.25	0.25	0.25	5	1	0.25	9	5	2.5	287	10	0.5	1	1
293S	4/21/93	25	0.25	0.25	0.25	0.25	5	1	0.25	2.5	5	2.5	291	10	2.5	2.5	2.5
293S	11/5/93	25	0.25	0.25	0.25	0.25	5	1	0.25	2.5	5	2.5	344	10	2.5	2.5	2.5
293S	4/19/94	25	2.5	2.5	2.5	5	10	2.5	1	2.5	5	140	300	2.5	5	5	5
293S	10/26/94	250	1.25	1.25	1.25	2.5	10	2.5	0.1	5	5	0.5	NR	NR	5	5	5
293S	4/14/95	250	2.5	2.5	2.5	2.5	10	12.5	0.1	12.5	5	2	330	2.5	5	5	5
293S	2Q97	25	0.25	0.25	0.25	0.25	1	1	0.1	7	3	1	330	1	0.5	3	3
293S	4Q97	25	0.25	0.25	0.25	0.25	1	1	0.1	9	6	1	400	1	0.5	0.5	0.5
293S	2Q98	25	0.25	0.25	0.25	0.5	0.5	1	0.1	2.5	7.5	2.5	287	0.5	2.5	2.5	2.5
293S	4Q98	25	0.25	0.25	0.25	0.5	1	1	0.1	2.5	25	2.5	380	2.5	2.5	2.5	2.5
293S	1Q99	25	0.25	0.25	0.25	0.25	1	1.5	0.1	2.5	5	2.5	330	2.5	2.5	2.5	2.5
293S	4Q99	25	0.25	0.25	0.25	0.25	9	1.5	0.1	0.5	5	2.5	360	2.5	2.5	2.5	2.5
293S	2Q00	25	0.25	0.25	0.25	0.25	3.58	1.5	0.1	0.5	5	2.5	352	2.5	3	3	3
293S	4Q00	25	0.25	0.25	0.25	0.25	2.43	1.5	0.1	2.5	5	2.5	299	5.76	10	10	10
293S	2Q01	25	0.25	0.25	0.25	0.25	6	1.5	0.1	2.5	5	2.5	343	2.5	2.5	2.5	2.5
293S	4Q01	25	0.25	0.25	0.25	0.25	2.5	1.5	0.1	2.5	5	2.5	320	2.5	5	5	5
Mean		44.57	0.49	0.53	0.53	0.74	5.09	1.76	0.20	3.91	6.89	8.76	358.68	5.83	2.48	2.70	2.70
Variance		4,202.08	0.45	0.43	0.43	1.28	12.36	5.68	0.04	9.79	27.41	820.57	3,815.37	16.08	5.35	4.68	4.68
t*		-4.84	-2.66	-4.49	-4.66	-5.03	-1.32	-0.43	-0.05	0.20	1.02	1.09	13.46	-4.24	-4.35	-2.26	-3.47
tc		1.68	1.68	1.68	1.68	1.68	1.70	1.70	1.70	1.70	1.71	1.72	1.71	1.68	1.68	1.68	1.68
604(a)	4/21/92	25	0.25	0.5	0.5	0.5	5	1	0.25	2.5	17	5	428	10	0.5	1	1
604(b)	4/21/92	25	0.25	0.5	0.5	0.5	5	1	0.25	2.5	13	2.5	341	10	0.5	1	1
604(c)	4/21/92	25	0.25	0.5	0.5	0.5	5	1	0.25	5	18	5	346	10	0.5	1	1
604(d)	4/21/92	25	0.25	0.5	0.5	0.5	5	1	0.25	2.5	14	5	379	10	0.5	2.5	1
604(a)	10/20/92	58	0.25	0.25	0.25	0.25	5	1	0.25	2.5	187	2.5	254	10	0.5	1	1
604(b)	10/20/92	25	0.90	0.25	0.25	0.25	5	1	0.25	2.5	112	2.5	309	10	0.5	1	1
604(c)	10/20/92	25	0.25	0.25	0.25	0.25	5	1	0.25	2.5	84	2.5	344	10	NA	1	1
604(d)	10/20/92	25	0.25	0.25	0.25	0.25	5	1	0.25	2.5	66	2.5	326	10	0.5	1	1
604	4/21/93	25	0.25	0.25	0.25	0.7	5	1	0.25	2.5	16	2.5	378	10	2.5	2.5	2.5
604	11/5/93	25	0.25	0.25	0.25	0.5	5	1	0.25	2.5	36	2.5	130	10	2.5	2.5	2.5
604	4/19/94	25	2.5	2.5	2.5	5	10	2.5	1	9.3	17	0.5	330	42	5	5	5
604	10/26/94	250	1.25	1.25	1.25	2.5	10	2.5	0.1	5	13	2.1	230	6	5	5	5
604	4/14/95	250	2.5	2.5	2.5	2.5	10	2.5	0.1	7.9	54	1.5	160	15	5	5	5
604	2Q97	80	0.25	0.25	0.25	0.25	1	1	0.1	8	37	1.0	160	17	0.5	0.5	0.5
604	4Q97	25	0.25	0.25	0.25	0.25	1	1	0.1	8	29	1.0	250	15	0.5	0.5	0.5
604	2Q98	25	0.25	0.25	0.25	0.5	1	1	0.1	3	38	2.5	71	18	2.5	2.5	2.5
604	4Q98	25	0.25	0.25	0.25	0.5	1	1	0.1	7	25	2.5	110	34	2.5	2.5	2.5
604	1Q99	25	0.25	0.25	0.25	0.25	1	1.5	0.1	2.5	28	2.5	67	10	3	3	3
604	4Q99	25	0.25	0.25	0.25	0.25	5	1.5	0.1	0.5	30	2.5	207	18	2.5	2.5	2.5
604	2Q00	50	0.5	0.25	0.25	0.25	4.17	1.5	0.1	5.44	38.80	2.5	132	23.4	3	3	3
604	4Q00	25	0.25	0.25	0.25	0.25	2.31	1.5	0.1	2.5	23.5	2.5	129	23.4	20	20	20
604	2Q01	25	0.25	0.25	0.25	0.25	7.29	3.51	0.1	2.5	36.2	2.5	136	36.2	5	5	5
604	4Q01	25	0.25	0.25	0.25	0.25	2.5	1.5	0.1	2.5	18	2.5	88	28	5	5	5
Mean		49.48	0.53	0.53	0.53	0.75	4.62	1.41	0.20	3.98	41.33	2.55	230.65	16.78	3.09	3.22	3.15
Variance		4191.26	0.45	0.43	0.43	1.26	7.78	0.47	0.04	5.95	1600.17	1.29	12904.06	97.93	17.44	15.91	16.10
t*		-4.83	-2.66	-4.49	-4.66	-5.03	-1.88	-1.52	-0.05	0.31	4.27	1.20	3.67	-2.11	-4.28	-2.12	-3.05
tc		1.68	1.68	1.68	1.68	1.68	1.69	1.68	1.70	1.69	1.72	1.71	1.71	1.68	1.68	1.68	1.69

Note: Analytical results represent actual concentrations or 1/2 of the Reporting Limit, in microgram per liter (ug/l)

ED_001593_00015400

ATTACHMENT 1

Region 5 Waste Management Branch "Skinner List"
Constituents of Concern for Wastes from Petroleum Processes

Inorganics

Antimony	Cadmium	Lead	Silver
Arsenic	Chromium	Mercury	Vanadium
Barium	Cobalt	Nickel	Zinc
Beryllium	Cyanide	Selenium	

Volatile Organics

Benzene	1,2-Dichloroethane	Ethylene dibromide (EDB)	1,1,1-Trichloroethane
Carbon disulfide	1,1-Dichloroethane	Methyl ethyl ketone (MEK)	Trichloroethene
Chlorobenzene	1,4-Dioxane	Styrene	Tetrachloroethylene
Chloroform	Ethylbenzene	Toluene	Xylenes (total)

Semivolatile Organics

Acenaphthene	o-Cresol	Diethyl phthalate	Naphthalene
Anthracene	m-Cresol	2,4 Dimethylphenol	4-Nitrophenol
Benzo(a)anthracene	p-Cresol	Dimethyl phthalate	Phenanthrene
Benzo(b)fluroranthene	Dibenz(a,h)anthracene	2,4 Dinitrophenol	Phenol
Benzo(k)fluoranthene	Di-n-butyl phthalate	Fluoranthene	Pyrene
Benzo(a)pyrene	1,2-Dichlorobenzene*	Fluorene	Pyridine
Bis(2-ethylhexyl) phthalate	1,3-Dichlorobenzene*	Indeno(1,2,3-cd)pyrene	Quinoline
Chrysene	1,4-Dichlorobenzene*	Methyl tertiary butyl ether (MTBE)	*- can be tested as a volatile

Low Concentration Polynuclear Aromatic Hydrocarbons (Optional)

Benzo(a)anthracene	Benzo(k)fluoranthene	Dibenz(a,h)anthracene	Indeno(1,2,3-cd)pyrene
Benzo(b)fluoranthene	Benzo(a)pyrene	Chrysene*	

* added to this group to assist the chromatographic resolution of chrysene from Dibenz(a,h)anthracene in sample extracts

Optional Semivolatile Organics

Indene	Benzenethiol**	Dibenz(a,h)acridine	1-Methylnaphthalene*

*Note that 2-Methylnaphthalene is part of Appendix IX and is a CLP TCL organic. 1-Methylnaphthalene is not on these lists.

**Benzenethiol can be detected in certain petroleum refinery wastes. Its measurement must compensate for its instability at neutral and acid pH values during sample preparation and its unstable instrument calibration standards

Department of Toxic Substances Control

Edwin F. Lowry, Director
700 Heinz Ave, Suite 200
Berkeley, California 94710

Winston H. Hickox
Secretary for
Environmental
Protection

Gray Davis
Governor

November 27, 2002

FILE COPY

Mr. John Lazorik
Environmental Engineer
Shell Oil Products US, Martinez Refinery
P.O. Box 711
Martinez, CA 94553-0071

SECOND NOTICE OF DEFICIENCY ON DELAY OF CLOSURE OF BIOTREATER, MARTINEZ REFINING COMPANY, A DIVISION OF EQUILON ENTERPRISES, LLC, MARTINEZ, CALIFORNIA, EPA ID No. CA 009164021

Dear Mr. Lazorik:

The Department of Toxic Substances Control (DTSC) Geological Services Units (GSU) has reviewed your September 12, 2002 response letter and provided the attached comments (Attachment).

Please provide your response within 30 days of the date of this letter.

If you have any questions, please call Waqar Ahmad of my staff at (510) 540-3932.

Sincerely,

Salvatore Ciriello,
Supervising Hazardous Substances Engineer
Standardized Permits and Corrective Action Branch

Attachment

cc: Mr. Norman Shopay, RG
Hazardous Substances Engineering Geologist
Hazardous Waste Management Program
700 Heinz Ave, Suite 200
Berkeley, CA 94710

Department of Toxic Substances Control

Edwin F. Lowry, Director
700 Heinz Avenue, Suite 200
Berkeley, California 94710-2721

Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

Gray Davis
Governor

MEMORANDUM

COPY

WAQAR

TO: Waqar Ahmad
Project Manager
Standardized Permits and Corrective Action Branch

FROM: Norman Shopay, RG NTS
Hazardous Substances Engineering Geologist
Hazardous Waste Management Program
Geological Services Unit

CONCUR: Brian Lewis, CEG, CHG NTS for BL
Engineering Geologist Supervisor I
Hazardous Waste Management Program
Geological Services Unit

DATE: November 8, 2002

SUBJECT: Response to Comments on 2001 Annual Groundwater Monitoring Report
Shell, Martinez Refining Company, Martinez, California
Project No. 25015/200196-33/52PER

LETTER REVIEWED

Response to Department of Toxic Substances Control (DTSC) request for additional information, dated September 12, 2002, prepared by Shell Oil Products (Response Letter).

INTRODUCTION

The Department of Toxic Substances Control (DTSC) Geological Services Unit (GSU) has completed the review of the above-referenced Response Letter. This memorandum provides our comments and recommendations. If you have any questions, please contact Norman Shopay at (510) 540-3943 or Brian Lewis at (916) 255-6532.

DISCUSSION

The Response Letter discussion regarding the relationship of the upgradient to the downgradient Point of Compliance wells and verification of the accuracy of the fourth quarter 2001 groundwater gradient map is sufficiently addressed.

Recommendation No. 1. The top of casing elevation should be resurveyed for monitoring well 292B during the next scheduled surveying activity.

As requested, the facility conducted a statistical evaluation to determine if evidence of a release from the regulated unit has occurred. The results of the statistical evaluation determined that one well (292B) exceeded the t-test criteria for nickel, two wells (225R and 292S) exceeded the

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Web-site at www.dtsc.ca.gov

t-test criteria for chromium, three wells (292S, 293B and 604) exceeded the t-test criteria for vanadium and five wells (225R, 292S, 293B, 293S and 604) exceeded the t-test criteria for barium. The facility states that "Although the statistical evaluation suggests evidence of release from the regulated unit for the parameters listed above, the required t-test is a parametric test and may be skewed due to the use of "half the detection limit" for all non-detect values. In addition, should a contaminant release from the biotreater occur, complete capture is obtained for groundwater exceeding applicable trigger levels in the West Valley Basin effectively preventing any contaminant release to the environment."

California Code of Regulations, title 22, section 66264.98 describes specific monitoring requirements and actions to be taken in the event of evidence of a release from the regulated unit. It appears that the facility may not be in compliance with the following requirements of section 66264.98. GSU comments and recommendations are indicated as bulleted items.

> Section 66264.98 (g) states that in addition to monitoring for the monitoring parameters specified under subsection (e) of this section, the owner or operator shall periodically monitor for all constituents of concern specified in the facility permit and determine whether there is statistically significant evidence of a release for any constituent of concern using the statistical procedure specified pursuant to section 66264.97(e).

Recommendation No. 2. The facility should evaluate if they are in compliance with this requirement.

> Section 66264.98 (i)(2) states that the owner or operator shall determine whether there is statistically significant evidence of a release from the regulated unit at each monitoring point within a reasonable period of time after completion of sampling.

Recommendation No. 3. The facility should provide information to verify that all required statistical evaluation has been historically conducted.

> Section 66264.98 (j) states that if the owner or operator determines pursuant to subsection (g) or (i) of this section that there is statistically significant evidence of a release from the regulated unit for any monitoring parameter or constituent of concern at any monitoring point, the owner or operator:
>
> (1) shall notify the Department of the finding by certified mail within seven days of such determination. The notification shall identify for each affected monitoring point the monitoring parameters and constituents of concern that have indicated statistically significant evidence of a release from the regulated unit; and
> (2) may immediately initiate a procedure to verify that there is statistically significant evidence of a release from the regulated unit for a parameter or constituent which has indicated a release at a monitoring point if that verification procedure has been specified for that constituent or parameter in the facility permit pursuant to section 66264.97(e)(8)(E).

Recommendation No. 4. Although the September 12, 2002 letter was provided as notification by certified mail, no statistical determination has been historically conducted. The facility should verify if any historical statistical evidence of a release was determined.

> Section 66264.98 (k) states that if the resampling pursuant to subsection (j)(2) of this section confirms that there is statistically significant evidence of a release from the regulated unit or

if the owner or operator does not resample pursuant to subsection (j)(2) of this section, then the owner or operator shall do the following.

(1) For that regulated unit, immediately sample all monitoring points in the affected medium (groundwater, surface water or the unsaturated zone) and determine the concentration of all constituents of concern.

(2) For that regulated unit, immediately sample all monitoring points in the affected medium (groundwater, surface water or the unsaturated zone) and determine whether constituents in the list of Appendix IX to chapter 14 are present, and if so, in what concentration(s).

(3) For any Appendix IX constituents found in the analysis pursuant to subsection (k)(2) of this section that are not specified in the list of constituents of concern for that unit, the owner or operator may resample within one month and repeat the analysis for those constituents. Each constituent detected in both analyses shall be added to the list of constituents of concern specified in the facility permit for evaluation monitoring unless the owner or operator demonstrates to the satisfaction of the Department that the constituent is not reasonably expected to be in or derived from waste in the regulated unit. If the owner or operator does not resample for the constituents found pursuant to subsection (k)(2) of this section, the constituents found during this initial Appendix IX analysis will be added to the list of constituents of concern specified in the facility permit for evaluation monitoring unless the owner or operator demonstrates to the satisfaction of the Department that the constituent is not reasonably expected to be in or derived from waste in the regulated unit.

Recommendation No. 5. The facility has not conducted Appendix IX sampling and analysis as required by this section. The facility should conduct the Appendix IX sampling and analysis as required.

Recommendation No. 6. The facility may propose changes to the Detection Monitoring Program and Sampling and Analysis Plan for the Biotreater area. Changes to the monitoring program could be included in the permit modification to authorize the delay of closure of the Biotreater.

nts/kb/200C

2002061401- Ahma

Shell Oil Products US

DEPARTMENT OF TOXIC SUBSTANCES CONTROL
FACILITY PERMITTING BRANCH
BERKELEY
JUN 1 4 2002
STATE OF CALIFORNIA EPA
RECEIVED

Martinez Refinery
PO Box 711
Martinez, CA 94553-0071

June 11, 2002

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Department of Toxic Substances Control
Attn: Waqar Ahmad, Facility Permitting
700 Heinz Avenue, Suite 300
Berkeley, CA 94710-2737

SUBJECT: **Submittal of Biotreater Groundwater Monitoring Well Data**
(EPA ID NO. CAD 009 164 021)

Per your e-mail request on March 26, 2002, Shell Martinez Refinery (SMR) submits the following information regarding the groundwater monitoring wells associated with SMR's Biotreater. This information was requested in support of finalizing the Delay of Closure of the SMR Biotreater Surface Impoundment that was initiated in a Class 2 Permit Modification dated April 6, 1998. Approval of this modification allows the continued operation of the Biotreater for the receipt of non-hazardous refinery wastewater.

The information you requested includes the following:

- Construction details of the RCRA monitoring wells,
- Well screen interval in relation to groundwater elevations,
- Analytical data from groundwater monitoring program, and
- Locations of monitoring wells in relation to the regulated unit.

Eight groundwater monitoring wells associated with SMR's Biotreater vary in depth from 9.3 feet to 27 feet and are designed to monitor the upper-most aquifer. The general flow of groundwater in the area of the Biotreater is in a northerly direction toward the Bay. As such, wells 228, 600, and 604 are considered upgradient of the Biotreater with the remaining five wells positioned downgradient.

The following information is provided in the attachments:

1. Overview of the Biotreater site illustrating the position of the wells in relation to the Biotreater.
2. Cross-section of the wells along a designated transect defined in the overview.
3. Drilling logs and construction details for each of the eight groundwater monitoring wells associated with SMR's Biotreater.

4. Summary of analytical data for each monitoring well for the last five years.

Should you have any questions regarding this submittal or require additional information, please contact John Lazorik at (925) 313-3281.

Very truly yours,

Teresa K. Makarewicz

Teresa K. Makarewicz, Manager
Environmental Affairs
Shell Oil Products US, Martinez Refinery

Attachments

Martinez - West Valley Basin

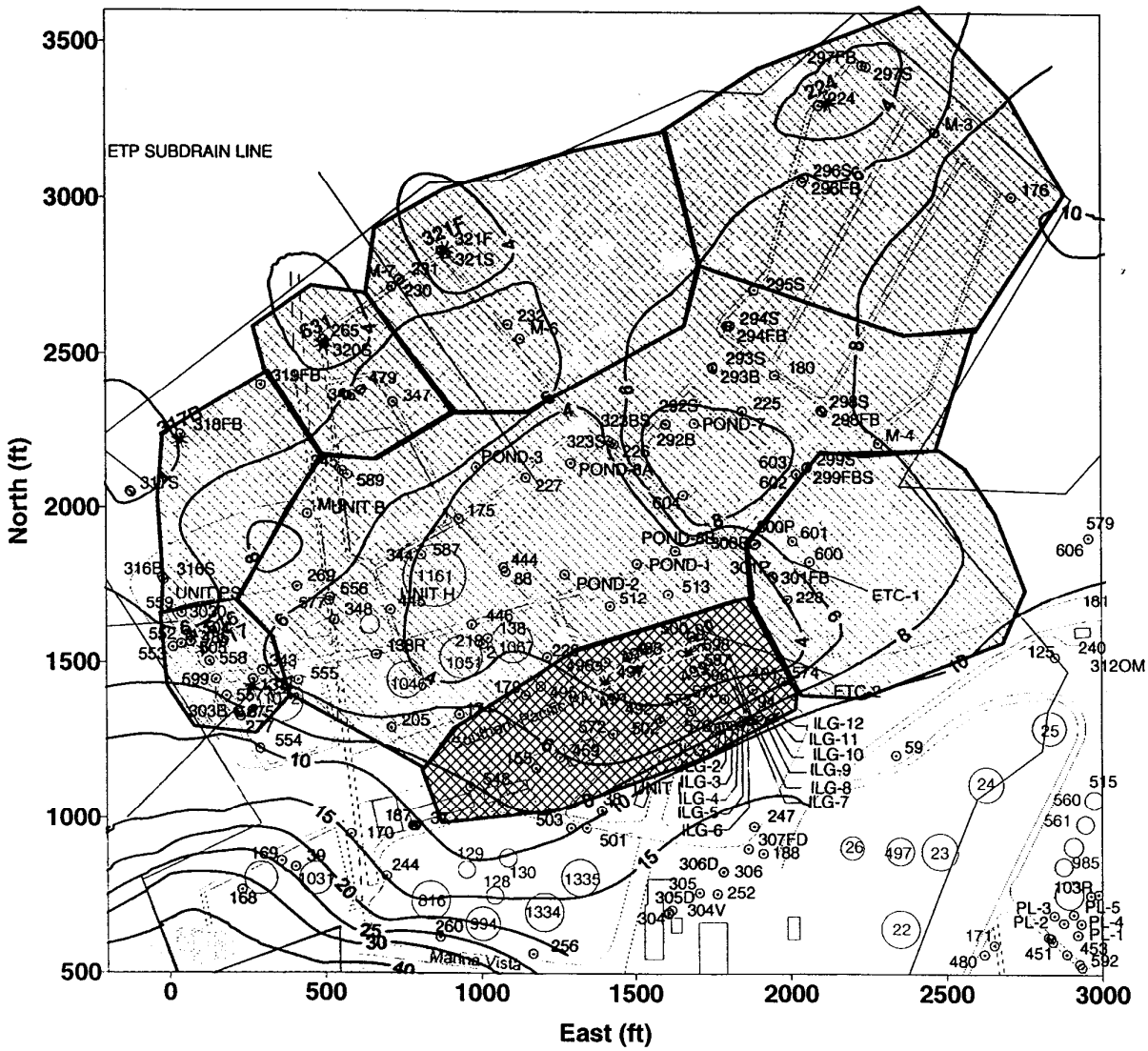
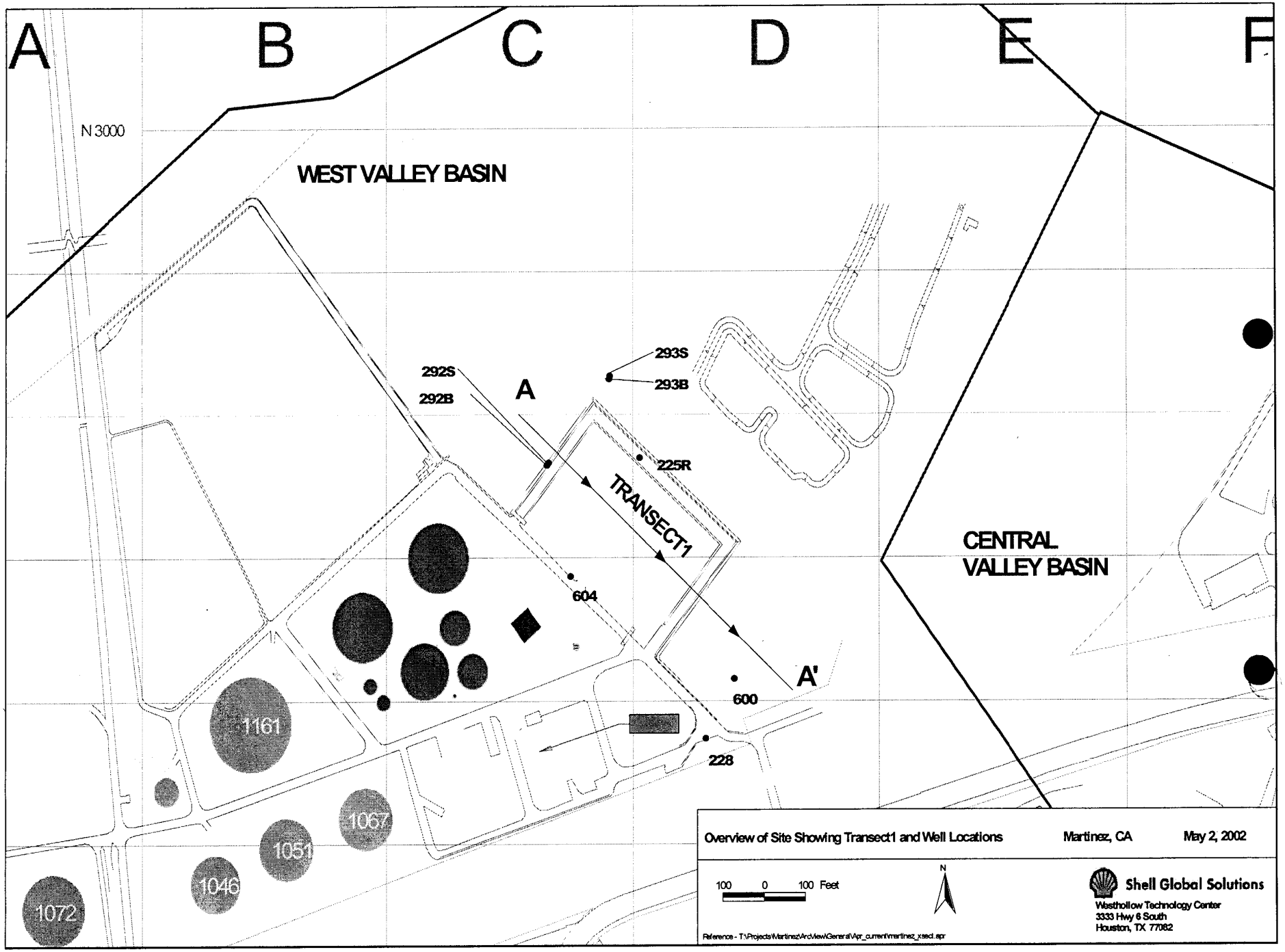
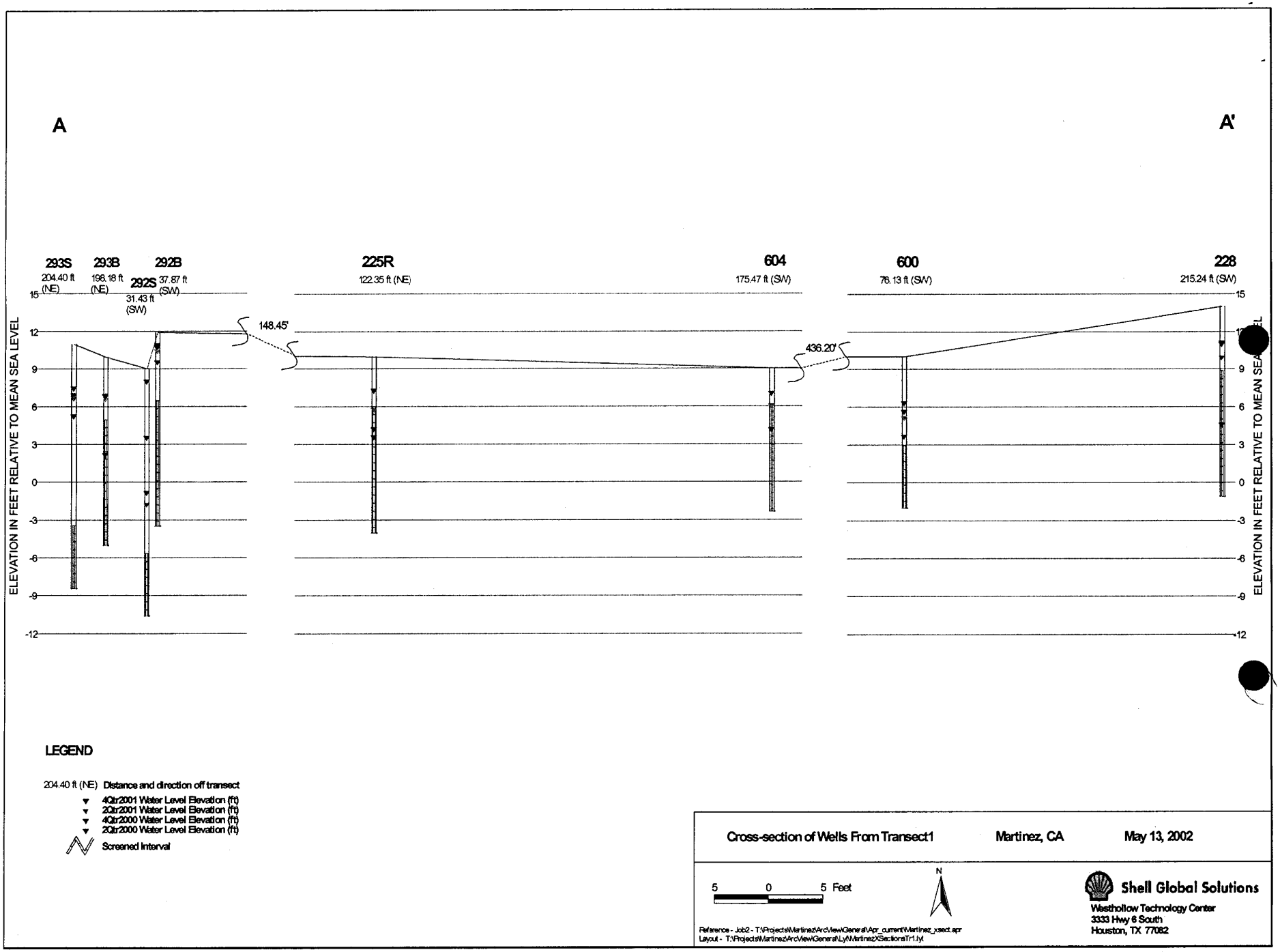


Figure 20. Capture Zones at the West Valley Basin with Simulated Groundwater Elevation Contours Based on the 1999 Data

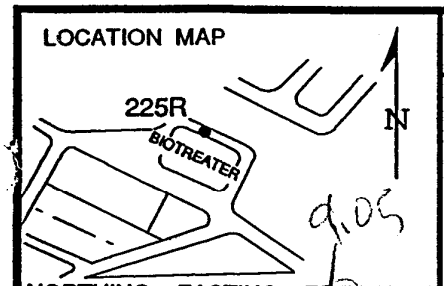


ED_001593_00015402



ED_001593_00015402

LOCATION MAP



NORTHING	EASTING	ELEVATION
2309.1	1814.1	9.78 (TOC)

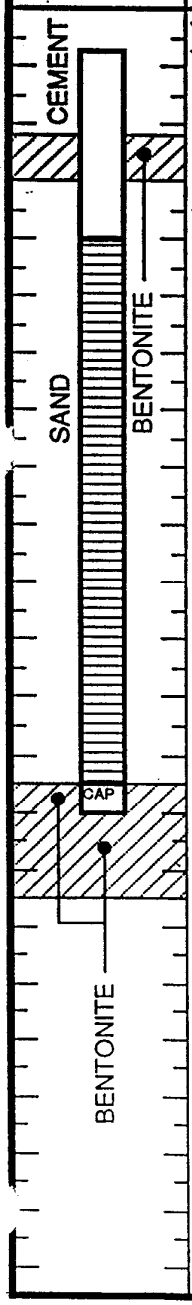
9.05

PACIFIC ENVIRONMENTAL GROUP, INC.

WELL NO. 225R
PAGE 1 OF 1

PROJECT NO. 301-01.09
LOGGED BY: RWNT
DRILLER: All Terrain Drilling
DRILLING METHOD: HSA
SAMPLING METHOD: Dry Core
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020"
GRAVEL PACK: #2-/16 Lonestar

CLIENT: SHELL MMC
DATE DRILLED: 3-23-92
LOCATION: Pond 7
HOLE DIAMETER: 8"/12"
HOLE DEPTH: 15.5'
WELL DIAMETER: 4"
WELL DEPTH: 14.1'
CASING STICKUP: -0.73'



WELL COMPLETION	pH	MOISTURE CONTENT	PID (BIM)	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY / SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
		Dp Mst			1–4			GC, CL	ASPHALT: road base. CLAYEY GRAVEL - FILL: dark grayish brown; low plasticity; 20% clay; 10% silt; 10-20% fine to medium sand; 50-60% coarse sand and gravel; massive; angular gravel fragments; loose; no product odor. CLAY - FILL: dark grayish brown; moderate to high plasticity; 70% clay; 10% silt; 20% fine to medium sand; weak subangular; abundant rounded to subangular polymictic pebbles from 1/4 to1-1/2" diameter; no product odor.
	7.0	Mst	2		5–6			SC	CLAYEY SAND - FILL: pale olive; medium plasticity; 60% fine to medium sand; 20-25% clay; 15-20% silt; weak subangular to massive; abundant subangular 1/4 - 1" pebbles and sandstone fragments throughout; rare asphaltic fragments at 6'; medium dense to loose; no product odor.
		Mst			7			CH	CLAY (Bay Mud): dark gray; high plasticity; 85% clay; 10% silt; 5% very fine sand; massive; abundant roots and grasses throughout; abundant muscovite flakes; moderate product odor at upper strongly rooted sharp contact; weak to moderate product odor throughout.
	8.5	Mst	2		8				
					9–10			MH-CH	SILT TO CLAY (Bay Mud): grayish green; 40% silt; 50% clay; 10% very fine sand; saturated, buttery soft texture; massive; no product odor.
	9.0	Wt	0		10				
		Wt			11				
	8.5				12				
					13				
CAP	7.5	Mst-Wt			14				
			0		15			SC	SANDY CLAY (Bay Sand): grayish green to very dark gray; medium plasticity; 70% clay; 20% fine to medium sand; 10% silt; massive; minor fresh shell fragments; soft; no product odor.
					16–22				BOTTOM OF BORING AT 15.5'

MONITORING WELL 228

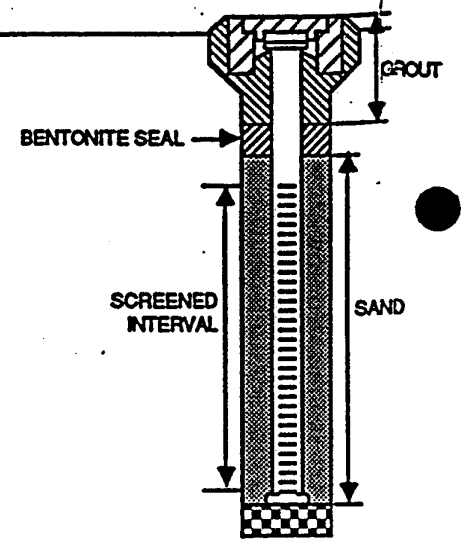
DATE DRILLED: 10/12/87

ELEVATION: 14.36 Feet

DEPTH IN FEET	LABORATORY TEST DATA: TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS: LIQUID LIMIT (%)	ATTERBERG LIMITS: PLASTICITY INDEX (%)	STRENGTH TEST DATA: TYPE OF TEST	STRENGTH TEST DATA: NORMAL OR CONFINING PRESSURE (PSF)	STRENGTH TEST DATA: SHEAR STRENGTH (PSF)	MOISTURE CONTENT (%)	SAMPLING: DRY DENSITY (PCF)	SAMPLING: TYPE OF SAMPLER	BLOWS/FT.
0									U	15
5				PP TV		<250 400			U	2
10									U	2
15	SA/HA						38		U U	2 2
20										
25										
30										
35										

SAMPLE

SYMBOLS	DESCRIPTION
	AC PAVEMENT AND BASEROCK
SM	OLIVE-GRAY TO BROWN SILTY SAND with occasional angular gravel (dry to moist) (loose to medium dense) [FILL]
GM	BROWN SILTY GRAVEL with a strong hydrocarbon odor (wet) (loose)[FILL]
CH/OH	DARK GRAY SILTY CLAY TO ORGANIC CLAY, no odor (wet) (soft) [BAY MUD]
CH/MH	DARK GRAY SILTY CLAY TO CLAYEY SILT with sand, no organic material, slight hydrocarbon odor; (wet) (medium stiff) Silty to fine sandy horizon with some coarse sand particles, no odor



NOTE:
1) Boring completed to a depth of 16.5 feet on 10/12/87.
2) 4-inch observation well installed to a depth of 15.5 feet; screened interval from 5 to 15 feet.
3) Groundwater level recorded at an elevation of 5.35 feet on 10/19/87
4) Elevation shown is top of PVC casing in well.
5) Sampling resistance for a U Type sampler is measured in blows per foot required to drive a sampler 12 inches with a 350 pound hammer falling 18 inches after sampler has been seated 6 inches.
6) Boring Log indicates interpreted subsurface conditions only at the locations and time the boring was drilled.
7) Elevations are approximate, and are expressed in feet, Shell Refinery Datum.
8) For an explanation of terms used, see Soil Classification and Key to Test Data.

ED_001593_00015402

S-12788(1-85)

SHELL OIL COMPANY - WELL LOG

LOCATION MAP

SEE BORING AND MONITORING WELL LOCATION MAP

6' SOUTH OF WELL 292 S

ELEVATION ▶ 11.91' TOC

WELL NUMBER ▶	292 B	LOCATION ▶	Effluent Treatment
DATE ▶	7/19/88	WEATHER ▶	Clear, warm, breezy
LOGGED BY ▶	R. Wagner T. Rogers	DRILLED BY ▶	Kvilhaug
DRILLING METHOD ▶	12" Hollow stem auger	SAMPLING METHOD ▶	None
GRAVEL PACK ▶	#2 Monterey Sand	SEAL ▶	Bentonite/Cement

CASING ▶	TYPE	PVC	BLANK	DIAMETER	4"	LENGTH	2.5 + 3' stick up	HOLE DIA	12"
SCREEN ▶	TYPE	PVC	SLOT 0.010"	DIAMETER	4"	LENGTH	10'	TOTAL DEPTH	12.5'

MOISTURE CONTENT	SORTING	DENSITY	PLASTICITY	SAMPLE NO.	DEPTH	SAMPLE RECOVERY	PENETRATION RESISTANCE	LITHOLOGY/REMARKS	WELL COMPLETION
					0				
					1			FILL - GRAVELLY SANDY CLAY	
				RUN 1	2		43	mottled with many brown and red brown colors,	
					3		44	plastic, moist, very stiff, fill includes sandstone clasts (Domengine?), greater than 3" diameter	
					4		44		
					5		70		
					6		50		
				RUN 2	7		7	as above Gastech 21 ppm	
					8		19		
					9		13		
					10		12		
					11		12		
				RUN 3	12				
				S1				as above	
					13				
					14				
					15				
					16				
					17				
					18				
					19				
					20				

REGISTERED GEOLOGIST
JESSE R. WAGNER
#4312
STATE OF CALIFORNIA

S-12788(1-85)

SHELL OIL COMPANY - WELL LOG

LOCATION MAP

SEE BORING AND MONITORING WELL LOCATION MAP

6' NORTH OF WELL 292 B

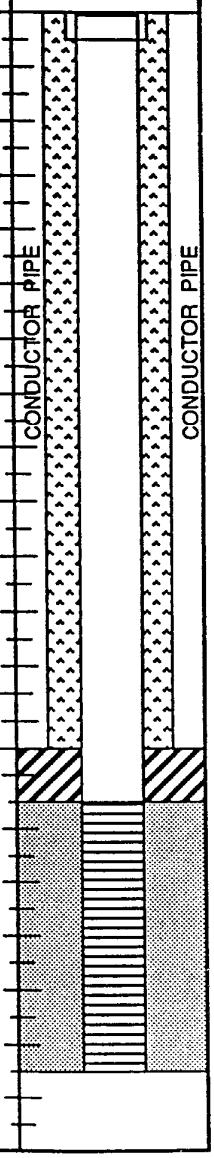
ELEVATION ▶ 9.64' TOC

WELL NUMBER ▶	292 S	LOCATION ▶	Effluent Treatment (Bioturbator Pond)
DATE ▶	8/11/88	WEATHER ▶	Clear, windy
LOGGED BY ▶	R. W. Ely	DRILLED BY ▶	Kvilhaug
DRILLING METHOD ▶	7" Hollow stem auger	SAMPLING METHOD ▶	Drive
GRAVEL PACK ▶	#2 Monterey Sand	SEAL ▶	Bentonite/Cement

CASING ▶	TYPE	Sch 40 PVC	BLANK	DIAMETER	2"	LENGTH	23.5'	HOLE DIA	7"
SCREEN ▶	TYPE	Sch 40 PVC	SLOT 0.010"	DIAMETER	2"	LENGTH	3.5'	TOTAL DEPTH	27'

MOISTURE CONTENT	SORTING	DENSITY	PLASTICITY	SAMPLE NO.	DEPTH	SAMPLE RECOVERY	PENETRATION RESISTANCE	LITHOLOGY/REMARKS
					0			
					1			SEE LOG OF WELL 292 B FOR LITHOLOGY
					2			
					3			
					4			
					5			
					6			
					7			
					8			H Nu = 0 ppm
					9			
					10			
					11			
					12			BAY MUD dark gray (5Y 4/1), plastic, moist, soft to very soft very dark gray (5Y 3/1), silty to sandy clay, moist, soft, contains small shells
					13 (RUN 1)		2	
							2	
					14 (RUN 2)		2	BAY SAND very dark gray (5Y 3/1), medium grained, well sorted sand to depth of 14', from 14' - 17' core consists of very fine poorly sorted sand with few small shells and trace organic matter, moist
							2	
				S1	15		2	
					16 (RUN 3)		2	
							2	Run 3 - very fine sand, as above
					17		2	
					18			
					19			
					20			

WELL COMPLETION



REGISTERED GEOLOGIST
JESSE R. WAGNER
#4312
STATE OF CALIFORNIA

S-12788(1-85)

SHELL OIL COMPANY - WELL LOG

LOCATION MAP

SEE BORING AND MONITORING WELL LOCATION MAP

ELEVATION 9.94' TOC

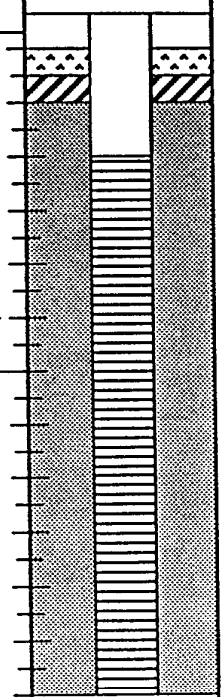
WELL NUMBER	293 B	LOCATION	Effluent Treatment
DATE	7/20/88	WEATHER	Clear, warm, breezy
LOGGED BY	T. Rogers R. Wagner	DRILLED BY	Kvilhaug
DRILLING METHOD	12" Hollow stem auger	SAMPLING METHOD	5' sample tube and Modif. CA Sampler
GRAVEL PACK	#2 Monterey Sand	SEAL	Bentonite/cement

CASING	TYPE	PVC	BLANK	DIAMETER	4"	LENGTH	2'+3' stick up	HOLE DIA	12"
SCREEN	TYPE	PVC	SLOT 0.010"	DIAMETER	4"	LENGTH	10'	TOTAL DEPTH	12'

MOISTURE CONTENT	SORTING	DENSITY	PLASTICITY	SAMPLE NO.	DEPTH	SAMPLE RECOVERY	PENETRATION RESISTANCE	LITHOLOGY/REMARKS
					0			
					1			
					2			FILL - SILTY SAND and CLAY mottled dark grayish brown (2.5Y 4/2) and dark brown (7.5YR 4/4), plastic, moist, very stiff, micaceous with roots, 2" diameter greenstone or graywacke clast at top of core
					3		4 6 7	
					4			
					5		2 3	
					6			? ?
					7		2 3	
					8		2	BAY MUD colors vary but dominately black (2.5Y N2/) and very dark gray (2.5Y N3/), plastic, moist, soft, locally shows stained vertical fractures at ~10.5' there is a < 1/4" thick bed with broken shells and small fragments of carbonized wood
					9		1	
					10		1	
				S1	11		1	
					12		1	
					13		2	
					14			T. D. of Sampled Hole = 14'
					15			
					16			
					17			
					18			
					19			
					20			

Drill Interval: DS #1, DS #2 No Recovery, DS #3

WELL COMPLETION



T. D. = 12'

REGISTERED GEOLOGIST
JESSE R. WAGNER
#4312
STATE OF CALIFORNIA

S-12788(1-85)

SHELL OIL COMPANY - WELL LOG

LOCATION MAP

SEE BORING AND MONITORING WELL LOCATION MAP

WELL NUMBER	293 S	LOCATION	Effluent Treatment adjacent to Well 293 B
DATE	8/23/88	WEATHER	Clear, warm, breezy
LOGGED BY	R. Ely R. Wagner	DRILLED BY	Datum Exploration
DRILLING METHOD	8" Hollow stem auger	SAMPLING METHOD	Drive
GRAVEL PACK	#2 Monterey Sand	SEAL	Bentonite/cement

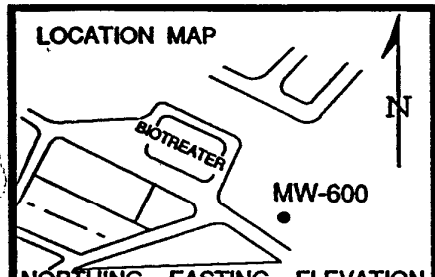
ELEVATION 11.45' TOC

CASING	TYPE PVC	BLANK	DIAMETER 2"	LENGTH 11.5+3' stick up	HOLE DIA 8"
SCREEN	TYPE PVC	SLOT 0.010"	DIAMETER 2"	LENGTH 5'	TOTAL DEPTH 16.5'

MOISTURE CONTENT	SORTING	DENSITY	PLASTICITY	SAMPLE NO.	DEPTH	SAMPLE RECOVERY	PENETRATION RESISTANCE	LITHOLOGY/REMARKS	WELL COMPLETION
					0			NOT SAMPLED - SEE LOG OF WELL 293 B	CONDUCTOR PIPE 0' TO 10'
					1				
					2				
					3				
					4				
					5				
					6				
					7				
					8				
					9				
					10				
					11		2	BAY SAND very dark gray (5Y 3/1), fine to very fine grained sand, moderately well to poorly sorted, moist, small (≤1" diameter) pelycepod shells present	
					12		2		
				RUN 1	12		1		
					13		2		
				RUN 2	13		2		
					14		2		
				S1	14		2		
					15				
					16		2	1/2' of sandy clay, plastic, moist, very soft Gastech 2 ppm	
				RUN 3	16		3		
					17		4	very fine sand with characteristics of Runs 1 and 2 T. D. = 16.5'	
					18				
					19				
					20				

REGISTERED GEOLOGIST
JESSE R. WAGNER
#4312
STATE OF CALIFORNIA

LOCATION MAP



NORTHING	EASTING	ELEVATION
1844.67	2044.59	10.5 (TOC)

PACIFIC ENVIRONMENTAL GROUP, INC.

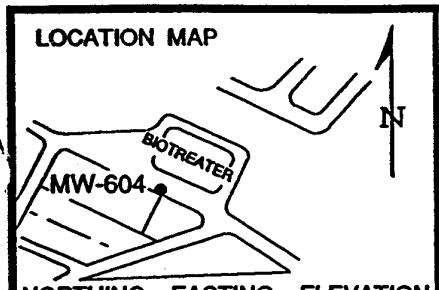
WELL NO. MW-600
PAGE 1 OF 1

PROJECT NO. 301-29.01
LOGGED BY: RWNT
DRILLER: All Terrain
DRILLING METHOD: HSA
SAMPLING METHOD: Continuous Core
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020"
GRAVEL PACK: #2-/16 Lonestar

CLIENT: SHELL MMC
DATE DRILLED: 1-21-92
LOCATION: Biotreater Pond
HOLE DIAMETER: 8/12"
HOLE DEPTH: 12'
WELL DIAMETER: 4"
WELL DEPTH: 9.3'
CASING STICKUP: 3.1'

WELL COMPLETION	pH	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY / SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
CEMENT	8.0	Mst-Wt	0		1			SM	SILTY SAND-FILL: brown to dark brown; 10% clay; 10-20% silt; 70-80% fine to medium sand; no plasticity; massive; abundant fine roots throughout; weakly oxidized; loose; no product odor.
		Wt			2, 3			CL-CH	SILTY CLAY-FILL: brown to dark brown; 80% clay; 15% silt; 5% fine sand; medium to high plasticity; buttery soft texture; weak sub-angular blocky; strongly rooted with fine fresh roots; soft; no product odor.
SAND, BENTONITE	8.0	Mst-Wt, Wt	0		5, 6, 7			CL	SILTY CLAY: grayish green; 75-80% clay; 15-20% silt; 5% fine sand; no to low plasticity; massive; soft buttery texture; minor fine roots; soft; no product odor.
		Mst-Wt			8				@8.5-9': as above; up to 15% fine sand with minor shell fragments.
CAP	8.5	Mst	0		9, 10, 11, 12			SC	CLAYEY SAND (Older Sediments); yellowish brown; 30% clay; 10% silt; 60% fine to medium sand; low plasticity; angular blocky; caliche concentrated along fine sub-vertical fractures and at upper contact zone; medium dense; no product odor. @12': abundant plant (root) debris.
BENTONITE					13, 14, 15, 16, 17, 18, 19, 20, 21, 22				BOTTOM OF BORING AT 12'

LOCATION MAP



NORTHING	EASTING	ELEVATION
2060.54	1645.98	9.84 (TOC)

PACIFIC ENVIRONMENTAL GROUP, INC.

WELL NO. 604
PAGE 1 OF 1

PROJECT NO. 301-29.01
LOGGED BY: DKU
DRILLER: All Terrain Drilling
DRILLING METHOD: HSA
SAMPLING METHOD: Split Spoon
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020"
GRAVEL PACK: #2-/16 Lonestar

CLIENT: SHELL MMC
DATE DRILLED: 1-24-92
LOCATION: Biotreater Pond
HOLE DIAMETER: 8"/12"
HOLE DEPTH: 12'
WELL DIAMETER: 4"
WELL DEPTH: 12'
CASING STICKUP: -0.7'

WELL COMPLETION	pH	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY / SAMPLE INTERVAL / GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
CEMENT		Dp	0				GW	ASPHALT: 3" thick with underlying 9" of gravel; sandy roadbase; sand and fine gravel
	6.5	Mst	0	15	1		CL	GRAVELLY CLAY - FILL: sandy; olive to gray; low to moderate plasticity; 55% clay and silt; 30% fine to coarse sand; 15% fine gravel; angular fill and bedrock blocks; stiff; moderate product odor.
		Mst	0	24	2			
				11	3		SC	CLAYEY SAND - FILL: olive; low plasticity; 25-30% clay and silt; 70-75% fine to medium sand; massive; medium dense; moderate product odor.
				20	4		GC	CLAYEY GRAVEL - FILL: very dark gray; 15% clay and silt; 35% fine to very coarse sand; 50% fine gravel; trace organic debris; medium dense; strong product odor.
BENTONITE	7.0	Mst		8	5		CL	
		Wt		7	6		SC	SANDY CLAY - FILL: black; moderate plasticity; 60% clay and silt; 40% fine to medium sand; trace coarse sand; firm; strong product odor.
SAND		V. Mst		7	7		CH	
		Wt		7	8		SC	CLAYEY SAND - FILL: olive; medium plasticity; 30% clay and silt; 40% very fine to coarse sand; 30% fine gravel; medium dense; moderate product odor.
	7.5	Wt		8	9		CH	SANDY CLAY - FILL: dark gray; moderate to high plasticity; 65% clay and silt; 35% fine to medium sand; black speckling; fine root material; 2" silty sand interbed; firm; moderate product odor.
				3	10		CH	CLAYEY SAND - FILL: dark grayish brown; low plasticity; 15-25% clay and silt; 75-80% fine to medium sand; 5-10% coarse sand; loose; moderate product odor.
	8.0	V. Mst		7	11		CH	SANDY CLAY - FILL: very dark olive gray; high plasticity; 70% clay and silt; 30% fine to coarse sand; soft to firm; faint product odor.
					12			SILTY CLAY (Bay Mud): grayish green; high plasticity; 45% clay; 45% silt; 5% very fine sand; 5% decayed grasses; soft; no product odor.
					13			BOTTOM OF BORING AT 12'
					14			
					15			
					16			
					17			
					18			
					19			
					20			
					21			
					22			

Table 9
Martinez Refining Company
RCRA Monitoring
Semi-Volatile Organic Compounds and Metals
(all results in ug/L)
(PQL/WDR Compliance Trigger Level)

WELL	SAMPLE DATE	Barium (1/4100)	Chromium (2/11)	Copper(2/2.9)	Lead(3/5.6)	Mercury (0.2/0.025)	Nickel (5/8.3)	Selenium (5/5)	Vanadium (15/170)	Benzene(0.5/21)	Toluene(0.5/5000)	Ethyl-Benzene(0.5/81)	Xylenes(0.5/296)	TPH-G(50/1000)	TOC Elevation (ft.-msl)	Screen Start elev. (ft.-msl)	Screen End elev. (ft.-msl)	Water Level elev. (ft.-msl)
225R	2Q97	150	<2	<2	<2	<0.2	40	6	2	<0.5	<0.5	<0.5	<0.5	<50	9.94	6	-4	9.05
	4Q97	200	3	<2	<2	<0.2	21	9	5	<0.5	<0.5	<0.5	<0.5	<50	9.94	6	-4	9.05
	2Q98	60	<5	3	<2	<0.2	27	<5	<5	<0.5	<0.5	<0.5	<1	<50	9.94	6	-4	9.05
	4Q98	200	<20	<2	<2	<0.2	33	<5	<50	<0.5	0.6	<0.5	2	<50	9.94	6	-4	9.05
	1Q99	160	<5	<2	<3	<0.2	24	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	9.94	6	-4	
	4Q99	171	<5	7	<3	<0.2	24	1	<10	<0.5	<0.5	<0.5	<0.5	<50	9.94	6	-4	9.05
	2Q00	136	<5	5	<2	<0.2	33	1	<10	<0.5	<0.5	<0.5	<0.5	<50	9.94	6	-4	3.56
	4Q00	92	<5	5	<3	<0.2	59	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	9.94	6	-4	4.2
	2Q01	122	<5	8	<3	<0.2	51	<5	<10	<5	<0.5	<0.5	<0.5	<50	9.94	6	-4	5.71
	4Q01	100	<5	<5	<3	<0.2	30	<5	<10	<5	<0.5	<0.5	<0.5	<50	9.94	6	-4	7.27
228	2Q97	240	<2	<2	3	<0.2	4	<5	2	2800	2100	680	2600	8800	14	9.5	-0.5	
	4Q97	190	2	<2	<2	<0.2	4	<5	4	1500	310	190	750	6000	14	9.5	-0.5	
	2Q98	162	<5	<2	<2	<0.2	2	<5	<15	1300	760	440	1300	11000	14	9.5	-0.5	
	4Q98	180	<5	<2	<2	<0.2	7	<5	<50	826	255	53	317	3350	14	9.5	-0.5	
	1Q99	145	<5	<2	<3	<0.2	<5	<5	<10	1190	664	511	1740	11000	14	9.5	-0.5	
	4Q99	166	<5	<2	<3	<0.2	<5	<1	<10	1120	181	194	707	1180	14	9.5	-0.5	
	2Q00	197	<5	<2	<3	<0.2	3	<1	<10	<10	<10	<10	<10	<1000	14	9.5	-0.5	11.1
	4Q00	141	<5	<5	<3	<0.2	<5	<5	<10	684	191	132	413	<250	14	9.5	-0.5	4.61
	2Q01	218	<5	<5	3	<0.2	<5	<5	<10	1370	469	293	830	7270	14	9.5	-0.5	9.89
	4Q01	290	<5	<5	<3	<0.2	<5	<5	<10	2200	1400	390	1600	10000	14	9.5	-0.5	10.98
292B	2Q97	61	<2	<2	<2	<0.2	52	7	1	<0.5	<0.5	<0.5	<0.5	<50	11.91	6.5	-3.5	10.31
	4Q97	60	<2	<2	<2	<0.2	39	9	1	<0.5	<0.5	<0.5	<0.5	<50	11.91	6.5	-3.5	9.99
	2Q98	50	<5	<2	<2	<0.2	56	<2	<15	<0.5	<0.5	<0.5	<1	<50	11.91	6.5	-3.5	10.91
	4Q98	46	<5	2	<2	<0.2	65	<5	<50	<0.5	0.51	<0.5	<1	<50	11.91	6.5	-3.5	9.61
	1Q99	43	<5	<2	<3	<0.2	38	<5	<10	<0.5	0.7	<0.5	<0.5	<50	11.91	6.5	-3.5	
	4Q99	48	<5	4	<3	<0.2	57	<1	<10	<0.5	<0.5	<0.5	<0.5	<50	11.91	6.5	-3.5	9.46
	2Q00	45	<5	<3	<0.2	<10	70	<1	<10	<0.5	<0.5	<0.5	<0.5	<50	11.91	6.5	-3.5	10.71
	4Q00	46	<5	3	<3	<0.2	76	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	11.91	6.5	-3.5	9.53
	2Q01	57	<5	11	<3	<0.2	80	<5	<10	<0.5	<0.5	<0.5	<0.5	113	11.91	6.5	-3.5	10.39
	4Q01	47	<5	<5	<3	<0.2	36	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	11.91	6.5	-3.5	10.89

Table 9
Martinez Refining Company
RCRA Monitoring
Semi-Volatile Organic Compounds and Metals
(all results in ug/L)
(PQL/WDR Compliance Trigger Level)

WELL	SAMPLE DATE	Barium (1/4100)	Chromium (2/11)	Copper(2/2.9)	Lead(3/5.6)	Mercury (0.2/0.025)	Nickel (5/8.3)	Selenium (5/5)	Vanadium (15/170)	Benzene(0.5/21)	Toluene(0.5/5000)	Ethyl-Benzene(0.5/81)	Xylenes(0.5/296)	TPH-G(50/1000)	TOC Elevation (ft-msl)	Screen Start elev. (ft-msl)	Screen End elev. (ft-msl)	Water Level elev. (ft-msl)
292S	2Q97	550	<2	3	<2	<0.2	2	8	10	<0.5	<0.5	<0.5	<0.5	<50	9	-5	-10	
	4Q97	490	2	<2	<2	<0.2	12	10	11	<0.5	<0.5	<0.5	<0.5	<50	9	-5	-10	
D	2Q98	468	<5	<2	<2	<0.2	58	<5	<15	<0.5	<0.5	<0.5	<1	<50	9	-5	-10	
	4Q98	650	<5	4	<2	<0.2	<10	<5	<50	<0.5	<0.5	<0.5	<1	<50	9	-5	-10	
	1Q99	461	<5	<2	<3	<0.2	14	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	9	-5	-10	
	4Q99	548	<5	10	<3	<0.2	<5	<1	<10	<0.5	<0.5	<0.5	<0.5	<50	9	-5	-10	
	2Q00	576	6	<2	<3	<0.2	<5	<1	<10	<0.5	<0.5	<0.5	<0.5	<50	9	-5	-10	3.48
	4Q00	449	<5	3	<3	<0.2	8	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	9	-5	-10	-0.9
	2Q01	525	<5	6	<3	<0.2	<5	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	9	-5	-10	-1.8
	4Q01	55	<5	<5	<3	<0.2	23	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	9	-5	-10	7.98
293B	2Q97	150	<2	22	<2	<0.2	12	19	7	<0.5	<0.5	<0.5	<0.5	<50	9.94	5	-5	6.44
	4Q97	230	3	<2	<2	<0.2	7	15	8	<0.5	<0.5	<0.5	<0.5	<50	9.94	5	-5	7.54
D	2Q98	54	<5	<1	<2	<0.2	9	10	25	<0.5	<0.5	<0.5	<1	<50	9.94	5	-5	8.04
	4Q98	160	<5	2	<2	<0.2	53	8	<50	<0.5	<0.5	<0.5	<1	<50	9.94	5	-5	6.94
	1Q99	64	<5	3	<3	<0.2	12	10	19	<0.5	<0.5	<0.5	<0.5	<50	9.94	5	-5	
	4Q99	173	<5	9	<3	<0.2	<5	<1	<10	<0.5	<0.5	<0.5	<0.5	<50	9.94	5	-5	5.59
	2Q00	142	<5	3	2	<0.2	23	1	<10	<0.5	<0.5	<0.5	<0.5	<50	9.94	5	-5	6.85
	4Q00	165	<5	3	<3	<0.2	14	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	9.94	5	-5	2.14
	2Q01	127	<5	8	<3	<0.2	20	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	9.94	5	-5	6.58
	4Q01	70	<5	<5	<3	<0.2	23	<5	26	<0.5	<0.5	<0.5	<0.5	<50	9.94	5	-5	6.81
293S	2Q97	330	<2	<2	<2	<0.2	<2	7	3	<0.5	<0.5	<0.5	<0.5	<50	11	-3	-8	
	4Q97	400	<2	<2	<2	<0.2	<2	9	6	<0.5	<0.5	<0.5	<0.5	<50	11	-3	-8	
D	2Q98	287	<5	<1	<2	<0.2	<1	<5	<15	<0.5	<0.5	<0.5	<1	<50	11	-3	-8	
	4Q98	380	<5	<2	<2	<0.2	<5	<5	<50	<0.5	<0.5	<0.5	<1	<50	11	-3	-8	
	1Q99	330	<5	<2	<3	<0.2	<5	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	11	-3	-8	
	4Q99	360	<5	9	<3	<0.2	<5	<1	<10	<0.5	<0.5	<0.5	<0.5	<50	11	-3	-8	
	2Q00	352	<5	4	<3	<0.2	<5	<1	<10	<0.5	<0.5	<0.5	<0.5	<50	11	-3	-8	6.89
	4Q00	299	<5	2	<3	<0.2	6	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	11	-3	-8	5.24
	2Q01	343	<5	6	<3	<0.2	<5	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	11	-3	-8	6.66
	4Q01	320	<5	<5	<3	<0.2	<5	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	11	-3	-8	7.44

Table 9
Martinez Refining Company
RCRA Monitoring
Semi-Volatile Organic Compounds and Metals
(all results in ug/L)
(PQL/WDR Compliance Trigger Level)

WELL	SAMPLE DATE	Barium (1/4100)	Chromium (2/11)	Copper(2/2.9)	Lead(3/5.6)	Mercury (0.2/0.025)	Nickel (5/8.3)	Selenium (5/5)	Vanadium (15/170)	Benzene(0.5/21)	Toluene(0.5/5000)	Ethyl-Benzene(0.5/81)	Xylenes(0.5/296)	TPH-G(50/1000)	TOC Elevation (ft.-msl)	Screen Start elev. (ft.-msl)	Screen End elev. (ft.-msl)	Water Level elev. (ft.-msl)
600	2Q97	61	<2	2	<2	0.2	63	7	2	<0.5	<0.5	<0.5	<0.5	<50	10	3.5	-1.5	
	4Q97	100	<2	2	<2	<0.2	89	15	1	<0.5	<0.5	<0.5	<0.5	<50	10	3.5	-1.5	
	2Q98	62	<10	5	14	<0.2	88	<2	<2	<0.5	<0.5	<0.5	<1	<50	10	3.5	-1.5	
	4Q98	42	<5	3	<2	<0.2	74	<5	<50	<0.5	<0.5	<0.5	<1	<50	10	3.5	-1.5	
	1Q99	24	<5	<2	<3	<0.2	11	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	10	3.5	-1.5	
	4Q99	38	<5	6	<3	<0.2	<5	<1	<10	<0.5	<0.5	<0.5	<0.5	<50	10	3.5	-1.5	
	2Q00	30	<5	24	2	<0.2	21	<1	<10	<1.0	<1.0	<1.0	<1.0	<100	10	3.5	-1.5	5.63
	4Q00	44	<5	7	<3	<0.2	34	10	<10	<0.5	1	<0.5	0.6	<50	10	3.5	-1.5	3.65
	2Q01	84	<5	14	<3	<0.2	97	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	10	3.5	-1.5	5.12
	4Q01	48	<5	14	<3	<0.2	110	<5	<10	<0.5	<0.5	<0.5	<0.5	<50	10	3.5	-1.5	6.31
604	2Q97	160	<2	<2	<2	<0.2	17	8	37	<0.5	<0.5	<0.5	<0.5	80	9	7	-1.5	
	4Q97	250	<2	<2	<2	<0.2	15	8	29	<0.5	<0.5	<0.5	<0.5	<50	9	7	-1.5	
	2Q98	71	<5	<2	<2	<0.2	18	3	38	<0.5	<0.5	<0.5	<1	<50	9	7	-1.5	
	4Q98	110	<5	<2	<2	<0.2	34	7	<50	<0.5	<0.5	<0.5	<1	<50	9	7	-1.5	
	1Q99	67	<5	<2	<3	<0.2	10	<5	28	<0.5	<0.5	<0.5	<0.5	<50	9	7	-1.5	
	4Q99	207	<5	5	<3	<0.2	18	<1	30	<0.5	<0.5	<0.5	<0.5	<50	9	7	-1.5	
	2Q00	132	<5	4	<3	<0.2	23	5	39	<1.0	<1.0	<1.0	<1.0	<100	9	7	-1.5	7.01
	4Q00	129	<5	2	<3	<0.2	23	<5	24	<0.5	<0.5	<0.5	<0.5	<50	9	7	-1.5	6.04
	2Q01	136	<5	7	4	<0.2	36	<5	36	<0.5	<0.5	<0.5	<0.5	<50	9	7	-1.5	5.96
	4Q01	88	<5	<5	<3	<0.2	28	<5	18	<0.5	<0.5	<0.5	<0.5	<50	9	7	-1.5	4.14

Table 9
Martinez Refining Company
RCRA Monitoring
Semi-Volatile and Volatile Organic Compounds and Metals
(all results in ug/L)
(PQL/WDR Compliance Trigger Level)

WELL	SAMPLE DATE	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Benzoic acid	4-Chloro-3-methylphenol	2-Chlorophenol	Chrysene	Dibenzo(a,h)anthracene	2,4-Dichlorophenol	2,4-Dimethylphenol	4,6-Dinitro-2-methylphenol	2,4-Dinitrophenol	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	2-Methylphenol	4-Methylphenol	Naphthalene	2-Nitrophenol	Phenanthrene	Phenol	Pyrene	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	TOC Elevation (ft.-msl)	Screen Start elev. (ft.-msl)	Screen End elev. (ft.-msl)	Water Level elev. (ft.-msl)
225R	2Q97	<1	<1	<1	<1	<1	<1	<1	<200	<4	<4	<1	<1	<4	<2	<20	<20	<1	<1	<1	<40	<40	<1	<4	<1	<4	<1	<4	<4	9.94	6	-4	9.05
	4Q97	<1	<1	<1	<1	<1	<1	<1	<50	<1	<1	<1	<1	<1	<1	<5	<5	<1	<1	<1	<10	<10	<1	<1	<1	<1	<1	<1	<1	9.94	6	-4	9.05
	2Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<5	9.94	6	-4	9.05
	4Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9.94	6	-4	9.05
	1Q99	<6	<6	<6	<6	<6	<6	<6	<28	<11	<6	<6	<6	<6	<6	<28	<28	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	9.94	6	-4	
	4Q99	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9.94	6	-4	9.05
	2Q00	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9.94	6	-4	3.56
	4Q00	<20	<20	<100	<20	<20	<20	<20	<100	<40	<20	<20	<20	<20	<20	<100	<100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	9.94	6	-4	4.2
	2Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	>10	<10	<10	<10	<10	<10	<10	<10	9.94	6	-4	5.71
	4Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	>10	<10	<10	<10	<10	<10	<10	<10	9.94	6	-4	7.27
228	2Q97	<20	<20	<20	<20	<20	<20	<20	<1000	<20	<20	<20	<20	<20	<20	<100	<100	<20	<20	<20	<200	<200	110	<20	<20	<20	<20	<20	<20	14	9.5	-0.5	
	4Q97	<1	<1	<1	<1	<1	<1	<1	<50	<1	<1	<1	<1	<1	<1	<5	<5	<1	<1	<1	<10	<10	33	<1	<1	<1	<1	<1	<1	14	9.5	-0.5	
	2Q98	<5	<5	<5	<5	<5	<5	<5	<27	<11	<5	<5	<5	<5	8	<27	<27	<5	<5	<5	<5	7	120	<5	<5	31	<5	<27	<5	14	9.5	-0.5	
	4Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	7	<25	<25	<5	<5	<5	6	6	12	<5	<5	52	<5	<5	<5	14	9.5	-0.5	
	1Q99	<6	<6	<6	<6	<6	<6	<6	<28	<11	<6	<6	<6	<6	<6	<28	<28	<6	<6	<6	8	6	160	<6	<6	<6	<6	<6	<6	14	9.5	-0.5	
	4Q99	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	9	<25	<25	<5	<5	<5	<5	<5	10	<5	<5	41	<5	<5	<5	14	9.5	-0.5	
	2Q00	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	14	<10	<10	<5	<5	<5	12	10	160	<5	<5	19	<5	<5	<5	14	9.5	-0.5	11.1
	4Q00	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	7	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	14	9.5	-0.5	4.61
	2Q01	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	9	7	55	<5	<5	<5	<5	<5	<5	14	9.5	-0.5	9.89
	4Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	>10	35	<10	<10	<10	<10	<10	<10	14	9.5	-0.5	10.98
292B	2Q97	<1	<1	<1	<1	<1	<1	<1	<50	<1	<1	<1	<1	<1	<1	<5	<5	<1	<1	<1	<10	<10	<1	<1	<1	<1	<1	<1	<1	11.91	6.5	-3.5	10.31
	4Q97	<1	<1	<1	<1	<1	<1	<1	<50	<1	<1	<1	<1	<1	<1	<5	<5	<1	<1	<1	<10	<10	<1	<1	<1	<1	<1	<1	<1	11.91	6.5	-3.5	9.99
	2Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<5	11.91	6.5	-3.5	10.91
	4Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	11.91	6.5	-3.5	9.61
	1Q99	<6	<6	<6	<6	<6	<6	<6	<28	<11	<6	<6	<6	<6	<6	<28	<28	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	11.91	6.5	-3.5	
	4Q99	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	11.91	6.5	-3.5	9.46
	2Q00	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	11.91	6.5	-3.5	10.71
	4Q00	<20	<20	<20	<20	<20	<20	<20	<100	<40	<20	<20	<20	<20	<20	<100	<100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	11.91	6.5	-3.5	9.53
	2Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	11.91	6.5	-3.5	10.39
	4Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	11.91	6.5	-3.5	10.89

ED_001593_00015402

Table 9
Martinez Refining Company
RCRA Monitoring
Semi-Volatile and Volatile Organic Compounds and Metals
(all results in ug/L)
(PQL/WDR Compliance Trigger Level)

WELL	SAMPLE DATE	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Benzoic acid	4-Chloro-3-methylphenol	2-Chlorophenol	Chrysene	Dibenzo(a,h)anthracene	2,4-Dichlorophenol	2,4-Dimethylphenol	4,6-Dinitro-2-methylphenol	2,4-Dinitrophenol	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	2-Methylphenol	4-Methylphenol	Naphthalene	2-Nitrophenol	Phenanthrene	Phenol	Pyrene	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	TOC Elevation (ft-msl)	Screen Start elev. (ft-msl)	Screen End elev. (ft-msl)	Water Level elev. (ft-msl)
292S	2Q97	<1	<1	<1	<1	<1	<1	<1	<300	<6	<6	<1	<1	<6	<6	<30	<30	<1	<1	<1	<60	<60	<1	<6	<1	<6	<1	<6	<6	9	-5	-10	
	4Q97	<1	<1	<1	<1	<1	<1	<1	<50	<1	<1	<1	<1	<1	<1	<5	<5	<1	<1	<1	<10	<10	<1	<1	<1	<1	<1	<1	<1	9	-5	-10	
	2Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<5	9	-5	-10	
	4Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9	-5	-10	
	1Q99	<6	<6	<6	<6	<6	<6	<6	<28	<11	<6	<6	<6	<6	<6	<28	<28	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	9	-5	-10	
	4Q99	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	7	<5	<5	<5	9	-5	-10	
	2Q00	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9	-5	-10	3.48
	4Q00	<20	<20	<20	<20	<20	<20	<20	<100	<40	<20	<20	<20	<20	<20	<100	<100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	9	-5	-10	-0.9
	2Q01	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9	-5	-10	-1.8
	4Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	9	-5	-10	7.98
293B	2Q97	<8	<8	<8	<8	<8	<8	<8	<400	<8	<8	<8	<8	<8	<8	<40	<40	<8	<8	<8	<80	<80	<8	<8	<8	<8	<8	<8	<8	9.94	5	-5	6.44
	4Q97	<1	<1	<1	<1	<1	<1	<1	<50	<1	<1	<1	<1	<1	<1	<5	<5	<1	<1	<1	<10	<10	<1	<1	<1	<1	<1	<1	<1	9.94	5	-5	7.54
	2Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<5	9.94	5	-5	8.04
	4Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9.94	5	-5	6.94
	1Q99	<6	<6	<6	<6	<6	<6	<6	<28	<11	<6	<6	<6	<6	<6	<28	<28	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	9.94	5	-5	
	4Q99	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9.94	5	-5	5.59
	2Q00	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9.94	5	-5	6.85
	4Q00	<20	<20	<20	<20	<20	<20	<20	<100	<40	<20	<20	<20	<20	<20	<100	<100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	9.94	5	-5	2.14
	2Q01	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9.94	5	-5	6.58
	4Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	9.94	5	-5	6.81
293S	2Q97	<1	<1	<1	<1	<1	<1	<1	<300	<6	<6	<1	<1	<6	<6	<30	<30	<1	<1	<1	<60	<60	<1	<6	<1	<6	<1	<6	<6	11	-3	-8	
	4Q97	<1	<1	<1	<1	<1	<1	<1	<50	<1	<1	<1	<1	<1	<1	<5	<5	<1	<1	<1	<10	<10	<1	<1	<1	<1	<1	<1	<1	11	-3	-8	
	2Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<5	11	-3	-8	
	4Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	11	-3	-8	
	1Q99	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<28	<28	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	11	-3	-8	
	4Q99	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	11	-3	-8	
	2Q00	<6	<6	<6	<6	<6	<6	<6	<13	<6	<6	<6	<6	<6	<6	<13	<13	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	11	-3	-8	6.89
	4Q00	<20	<20	<20	<20	<20	<20	<20	<100	<40	<20	<20	<20	<20	<20	<100	<100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	11	-3	-8	5.24
	2Q01	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	11	-3	-8	6.66
	4Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	11	-3	-8	7.44

9.94
6.81
3.13

10.91
7.46
3.50

Table 9
Martinez Refining Company
RCRA Monitoring
Semi-Volatile and Volatile Organic Compounds and Metals
(all results in ug/L)
(PQL/WDR Compliance Trigger Level)

WELL	SAMPLE DATE	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Benzoic acid	4-Chloro-3-methylphenol	2-Chlorophenol	Chrysene	Dibenzo(a,h)anthracene	2,4-Dichlorophenol	2,4-Dimethylphenol	4,6-Dinitro-2-methylphenol	2,4-Dinitrophenol	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	2-Methylphenol	4-Methylphenol	Naphthalene	2-Nitrophenol	Phenanthrene	Phenol	Pyrene	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	TOC Elevation (ft-msl)	Screen Start elev. (ft-msl)	Screen End elev. (ft-msl)	Water Level elev. (ft-msl)
600	2Q97	<1	<1	<1	<1	<1	<1	<1	<200	<4	<4	<1	<1	<4	<4	<20	<20	<1	<1	<1	<40	<40	<1	<4	<1	<4	<1	<4	<4	10	3.5	-1.5	
	4Q97	<1	<1	<1	<1	<1	<1	<1	<50	<1	<1	<1	<1	<1	<1	<5	<5	<1	<1	<1	<10	<10	<1	<1	<1	<1	<1	<1	<1	10	3.5	-1.5	
upgradient	2Q98	<6	<6	<6	<6	<6	<6	<6	<28	<11	<6	<6	<6	<6	<6	<28	<28	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<28	<6	10	3.5	-1.5	
	4Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	10	3.5	-1.5	
	1Q99	<5	<5	<5	<5	<5	<5	<5	<27	<11	<5	<5	<5	<5	<5	<28	<28	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	10	3.5	-1.5	
	4Q99	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	10	3.5	-1.5	
	2Q00	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	<10	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	10	3.5	-1.5	5.63
	4Q00	<6.3	<6.3	<6.3	<6.3	<6.3	<6.3	<6.3	<13	<6.3	<6.3	<6.3	<6.3	<6.3	<6.3	<13	<13	<6.3	<6.3	<6.3	<6.3	<6.3	<6.3	<6.3	<6.3	<6.3	<6.3	<13	<6.3	10	3.5	-1.5	3.65
	2Q01	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	10	3.5	-1.5	5.12
	4Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10	3.5	-1.5	6.31
604	2Q97	<1	<1	<1	<1	<1	<1	<1	<50	<1	<1	<1	<1	<1	<1	<5	<5	<1	<1	<1	<10	<10	<1	<1	<1	<1	<1	<1	<1	9	7	-1.5	
	4Q97	<1	<1	<1	<1	<1	<1	<1	<50	<1	<1	<1	<1	<1	<1	<5	<5	<1	<1	<1	<10	<10	<1	<1	<1	<1	<1	<1	<1	9	7	-1.5	
upgradient	2Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<5	9	7	-1.5	
	4Q98	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9	7	-1.5	
	1Q99	<6	<6	<6	<6	<6	<6	<6	<28	<11	<6	<6	<6	<6	<6	<28	<28	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	9	7	-1.5	
	4Q99	<5	<5	<5	<5	<5	<5	<5	<25	<10	<5	<5	<5	<5	<5	<25	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9	7	-1.5	
	2Q00	<6	<6	<6	<6	<6	<6	<6	<13	<6	<6	<6	<6	<6	<6	<13	<13	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	9	7	-1.5	7.01
	4Q00	<40	<40	<40	<40	<40	<40	<40	<200	<80	<40	<40	<40	<40	<40	<200	<200	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	9	7	-1.5	6.04
	2Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	9	7	-1.5	5.96
	4Q01	<10	<10	<10	<10	<10	<10	<10	<50	<20	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	9	7	-1.5	4.14

ED_001593_00015402

To: Lin, Sharon[Lin.Sharon@epa.gov]
Cc: Puljiz, Michelle@DTSC[Michelle.Puljiz@dtsc.ca.gov]
From: Ahmad, Waqar@DTSC
Sent: Wed 4/27/2016 11:17:48 PM
Subject: RE: Shell Martinez Refinery Biotreater document / DTSC approval letter
Shell_HWF_Permit_082103.pdf
Shell_LTR_PMOD2_Approval_of_Delay_of_Closure_Biotreater_08-21-2003.pdf
C03-06-11_ETP1BiotreaterDOC - DEG comments2.doc

Hi Sharon:

Enclosed are minutes of the meeting that was held on June 5, 2003 between the Department and the Facility. Also included are approval letter for the delay of biotreater and modified RCRA permit.

Let me know if you need anything else.

Waqar

From: Lin, Sharon [mailto:Lin.Sharon@epa.gov]
Sent: Wednesday, April 27, 2016 3:44 PM
To: Ahmad, Waqar@DTSC; Puljiz, Michelle@DTSC
Cc: Schofield, John
Subject: Shell Martinez Refinery Biotreater document / DTSC approval letter

Hi, Waqar and Michelle,

Thanks for hosting me and providing me with the documents related to the Shell Martinez Biotreater. I reviewed the report (application for exemption from the requirements to retrofit the biotreater) and the engineering report. My attorney would like to know if you could provide us with the DTSC approval letter for this exemption. I didn't see it in the boxes of the files while I was in your office, but I could have missed it. Please advise. Thanks.

Sharon

Shell Oil Products US

Martinez Refinery
PO Box 711
Martinez, CA 94553-0071

SUBJECT: Meeting Minutes – Delay of Closure for Surface Impoundment ETP-1 Biotreater, June 5, 2003 (EPA ID No. CAD 009 164 021)

In Attendance: Dan Glaze (Shell), John Lazorik (Shell), Waqar Ahmad (DTSC), Norman Shopay (DTSC), Alan Friedman (SFBRWQCB), Brent Dyer (Shell Global Solutions), Sanjay Garg (Shell Global Solutions)

The purpose of this meeting was to bring together key staff from DTSC, SFBRWQCB, and Shell to discuss the regulatory and technical aspects of the delay of closure of the ETP-1 Biotreater. An important Shell objective was to demonstrate that the corrective action program currently in place under SFBRWQCB Order 95-234 is sufficient to assure protection of human health and the environment with regard to continued use of the ETP #1 biotreater for treatment of non-hazardous wastewater.

Background

Shell Martinez Refinery (SMR) was required to obtain a RCRA Hazardous Waste Facility Permit for operating the ETP #1 Biotreater due to the likelihood of benzene concentrations above RCRA hazardous waste levels in the Biotreater feedwater. Shortly thereafter, Federal land ban regulations prohibited the treatment of hazardous waste in unlined surface impoundments, in effect, making the RCRA permit for treating hazardous waste unusable. In the early part of 1996, benzene containing process wastestreams were routed to the newly constructed ETP-2 Biotreater tank that is currently permitted under California Permit-By-Rule (PBR) regulations. Although the ETP-1 Biotreater was no longer receiving hazardous waste, it's continued use is essential to the refinery operation for meeting NPDES permit limits. As such, SMR submitted a Class 2 Permit Modification to the DTSC in April of 1998 for a delay of closure of the ETP-1Biotreater surface impoundment.

Following the Delay of Closure submittal, DTSC made several requests for information related to monitoring wells associated with the ETP-1 Biotreater and detection of potential leaks. However, due to the hydrogeologic nature of the area surrounding the Biotreater and the presence of legacy contamination from other potential sources, statistical analyses from monitoring well data cannot be used as a viable indicator of a release from the unit. In recent meetings with DTSC staff, SMR also indicated that the Biotreater is located within the boundaries of the refinery's West Valley groundwater capture zone and is explicitly covered by the facility corrective action program as defined in San Francisco Bay Regional Water Quality Control Board Order WDR 95-234. Since corrective action is already in place, Shell's position was that statistical analyses is not warranted since the purpose of those analyses is to define a corrective action plan. The intent of this recent meeting was to demonstrate to

DTSC and SFBRWQCB staff that the corrective action program currently in place is robust enough to be protective of human health and the environment from any existing or potential groundwater contamination in the area, including a release, however unlikely, from the Biotreater.

Overview of the Martinez Refinery and Groundwater Management

Dan Glaze summarized the evolution of the Martinez Refinery from 1915 to present as new operating units were constructed to meet product demands and new environmental regulations. In the 1980's SFBRWQCB and USEPA required investigations of disposal sites and contamination from historic spills and leaks. Over 600 wells were installed and over 70 site investigations were completed with corrective action in place. Under direction of SFBRWQCB staff, SMR subsequently developed a groundwater basin boundary control strategy based on full capture of groundwater at various downgradient property lines.

Requirements for this basin boundary control to assure ongoing environmentally protective management of refinery groundwater were formalized by the SFBRWQCB under their Order 95-234 issued in December, 1995. As required by Provision 5 of this Order, SMR currently submits annual updates of the corrective action program to the SFBRWQCB and DTSC in an annual "Groundwater Boundary Control Capture Verification Modeling Report". This report describes the effectiveness of the extraction systems and summarizes the continued refinement and enhancement of the boundary control system at the refinery.

Capture Zone Modeling

Participating via videoconference, Brent Dyer and Sanjay Garg of Shell Global Systems (SGS) in Houston, provided a technical presentation of the capture zone modeling that is currently in place at SMR. As stipulated in WDR Order 95-234, detailed three-dimensional numerical groundwater flow modeling and data analyses is performed to verify boundary control capture at all perimeter compliance areas of each of the refinery's four major groundwater basins. The ETP-1 Biotreater falls completely within the demonstrated capture zone of the West Valley Basin.

The groundwater flow and pathline simulation models for all basins are constructed using U.S. Geological Survey's MODFLOW model and the MODPATH model. The widely used Groundwater Modeling System (GMS 3.1, DOD 1998) is used to prepare input files for the abovementioned models and produce graphic output files. Capture zone polygons are developed using particle tracking results and flow vector plots based on simulated groundwater flow.

The groundwater flow modeling simulations are verified by matching measured and calculated groundwater elevations in wells and determining the mean absolute error. Calibration statistics on the calculated and observed groundwater elevations show excellent correlation indicating that the model is predictive of actual conditions. DTSC requested the addition of a correlation coefficient (i.e. $r^{2)}$ for the calculated versus actual groundwater elevation graph. SMR agreed to provide this in subsequent reports.

Particle tracking is used in the groundwater flow model to illustrate the areas influenced by various groundwater extraction systems in each major basin. Several extraction systems

adjacent to the Biotreater draw the groundwater flow direction toward a French drain system ("the ETP subdrain"), away from the property boundary. This and other extraction systems in the West Valley Basin provide 100% capture of all groundwater contaminants surrounding the Biotreater. Results of the annual modeling exercise illustrate the effectiveness of the groundwater capture systems and the need, if any, for additional extraction wells or increased pumping rates of existing wells providing a dynamic and self-improving system.

Regulatory Summary/Applicability of Order 95-234 Corrective Action to Biotreater

John Lazorik followed up with a summary of pertinent regulations located in CCR Title 22 Sections 66264.97 through 66264.100 regarding groundwater monitoring requirements and the corrective action process as well as Section 66264.113 covering elements of regulated unit closure including delay of closure. These applicable regulations strongly suggest that the purpose of statistical analyses on background and downgradient wells is to determine if there is evidence of release from a treatment unit and to assess the nature and extent of release as a basis for developing a corrective action plan. However, corrective action for historic waste units and existing facilities including the ETP-1 Biotreater, has been formally in place since at least 1995 at the Martinez Refinery. Therefore statistical analyses referenced in DTSC regulations are not currently applicable to the ETP-1 Biotreater since a mature corrective action program for this unit is already in place under SFBRWQCB Order 95-234.

Following the technical and regulatory presentation, Shell proposed that DTSC grant the delay of closure and make the appropriate permit modification provided that Shell continue to implement the corrective action program including the submittal of all appropriate reports. Furthermore, Shell believes it is appropriate that groundwater compliance continue to be managed through SFBRWQCB Order 95-234, as the lead agency, and that this Order be referenced in the DTSC permit modification. DTSC and SFBRWQCB staff offered concurrence that the current corrective action program is protective of the environment and is applicable to the Biotreater. Any changes made to Order 95-234 are subject to review by all interested parties providing DTSC the opportunity to comment on any proposed changes.

Shell agreed to continue the current RCRA well monitoring program specified in the Hazardous Waste Facility Permit issued by DTSC with the need for statistical analyses precluded by corrective action already underway. The "Groundwater Boundary Control Capture Verification Modeling Report" will continue to be provided to DTSC and SFBRWQCB on an annual basis. Alan Friedman suggested that the report include a section that summarizes the activities that took place during the year as a result of recommendation made in the prior years' report. All parties agreed that this would clarify what actions have been taken. This section will be included in the March 2004 submittal.

DTSC agreed to make the appropriate permit modifications to allow continued operation of the ETP-1 Biotreater for the treatment of non-hazardous wastes.

Following the meeting, Dan Glaze and John Lazorik escorted the group for a tour of the effluent treatment plant and RCRA facility including the CO Boilers.

This meeting was a significant milestone in that agreement was reached by all parties to finalize the delay of closure and that the facility corrective action program is embraced by

both the SFBRWQCB and the DTSC as being protective of the environment and applicable to the Biotreater.

California Environmental Protection Agency
Department of Toxic Substances Control

HAZARDOUS WASTE FACILITY PERMIT

Facility Name: Shell Oil Products US - Martinez Refinery,
P.O. Box 711
Marina Vista & Shell Avenue
Martinez, California 94553

Owner Name: Equilon Enterprises LLC
P.O. Box 4453
Houston, TX 77210-4453

Operator Name: Shell Oil Products US – Martinez Refinery
P.O. Box 711
Marina Vista & Shell Avenue
Martinez, California 94553

Facility EPA ID Number: CAD 009164021

Effective Date of Permit: December 30, 1995

Expiration Date of Permit: December 30, 2005

Date of Modification: August 21, 2003

Modification No: MODNC2082103-A

Pursuant to Section 66270.42, Title 22, Division 4.5, California Code of Regulations, the Hazardous Waste Permit issued to Martinez Refining Company, A Division of Equilon Enterprises LLC, with an effective date of December 30, 1995, is hereby modified to change the wastestreams processed in the biotreater unit, change the facility and operator names, and to revise the format to include a permit modification history. The revised permit consists of 41 pages including this cover page and Attachment "A".

_____

Mohinder S. Sandhu, P.E., Chief
Standardized Permits and Corrective Action Branch
Department of Toxic Substances Control

Date: _____

TABLE OF CONTENTS

Page

I. DEFINITIONS 4

II. DESCRIPTION OF THE FACILITY AND OWNERSHIP 5

A. OWNER 5

B. OPERATOR 5

C. LOCATION 5

D. DESCRIPTION 5

E. FACILITY SIZE AND TYPE FOR FEE PURPOSES 5

F. PERMITTING HISTORY 5

G. HISTORY OF MODIFICATIONS 6

III. GENERAL CONDITIONS 7

A. PERMIT APPLICATION DOCUMENTS 7

B. EFFECT OF PERMIT 7

C. COMPLIANCE WITH CALIFORNIA ENVIRONEMNTAL QUALITY ACT (CEQA) 8

D. ENVIRONMENTAL MONITORING 8

E. WASTE MINIMIZATION CERTIFICATION 8

F. WASTE MINIMIZATION CONDITIONS 8

IV. PERMITTED UNITS AND ACTIVITIES 10

V. SPECIAL CONDITIONS WHICH APPLY TO ALL OF THE FACILITY'S STORAGE AND/OR TREATMENT UNITS 14

A. WASTE ANALYSIS 14

B. CONDITIONS SPECIFIC TO TANK 12038 14

C. CONDITIONS SPECIFIC TO THE CARBON MONOXIDE BOILERS 15

D. CONDITIONS SPECIFIC TO THE ETP-1 BIOTREATER 20

E. RISK ASSESSMENT 20

F. ADDITIONAL CONDITIONS FOR CO BOILERS: SHORT-TERM INCINERATION TEST 20

VI. CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS 22

A. NEW RELEASES....22

B. SUMMARY OF RFA FINDINGS/RESULTS.... 22

C. CORRECTIVE ACTION REQUIRED FOR EXISTING SWMUs....23

TABLES

1. PERMITTED UNITS AND WASTE STREAMS 10

2. CO BOILERS AUTOMATIC WASTE FEED CUT-OFF LIMITS.... 19

APPENDICES

1. HISTORY OF MODIFICATIONS....25

2. SUMMARY OF CORRECTIVE ACTION ACTIVITIES 28

3. APRIL 20, 1999 CLASS 1 MODIFICATION DETAILS....32

4. JUNE 28, 2000 APPEAL RESOLUTION DETAILS....33

5. AUGUST 14, 2003 CLASS 2 MODIFICATION DETAILS....34

FIGURES

1. FACILITY LAYOUT (MARTINEZ REFINING COMPANY).... 35

2. PERMITTED UNIT #1 – TANK 12038.... 36

3. PERMITTED UNIT #2 – THREE CO BOILERS.... 37

4. PERMITTED UNIT #3 – BIOTREATER....38

5. PROCESS FLOW DIAGRAM FOR PERMITTED UNIT #1 – TANK 12038 39

6. PROCESS FLOW DIAGRAM FOR PERMITTED UNIT #2 – CO BOILERS.... 40

7. PROCESS FLOW DIAGRAM FOR PERMITTED UNIT #3 – BIOTREATER.... 41

ATTACHMENT A

Hazardous Waste Facility Permit

Shell Oil Products US - Martinez Refinery
Marina Vista and Shell Ave.
Martinez, CA 94553
EPA ID No.: CAD 009164021

I. DEFINITIONS

All terms used in this Permit shall have the same meaning as those terms have in the California Health and Safety Code, Division 20, Chapter 6.5, and Title 22, California Code of Regulations Division 4.5, unless expressly provided otherwise by this Permit.

1. "**DTSC**" as used in this Permit means the California Department of Toxic Substances Control.

2. **"Permittee"** as used in this Permit means the Owner and Operator.

3. **"HSC"** as used in this Permit means the Health and Safety Code.

4. **"CCR"** as used in this Permit means the California Code of Regulations.

5. Unless explicitly stated otherwise, all references to items in this Permit shall refer only to items occurring within the same part.

II. DESCRIPTION OF THE FACILITY AND OWNERSHIP

A. OWNER:

The facility owner is Equilon Enterprises LLC (hereafter "owner").

B. OPERATOR:

The facility operator is Shell Oil Products US – Martinez Refinery (hereafter "operator").

C. LOCATION:

The facility is located on the south shore of the Carquinez Straits in the City of Martinez, California on 1000 acres of land (Figure 1).

D. DESCRIPTION:

Shell Oil Products US – Martinez Refinery (Shell Martinez Refinery) is an oil refining and chemical-manufacturing complex on 1000 acres of land. The facility began its operations at this location in 1914. Its operations include light oil processing, which yields primarily gasoline and aviation turbine fuel, and heavy oil processing, which yields lubricating oils and asphalt products. The facility is currently permitted to operate three carbon monoxide boilers (CO boilers) and a Storage Tank 12038 to manage hazardous wastes (Figure 1). Another unit, the Effluent Treatment Plant No. 1 (ETP-1, aka: biotreater), was originally permitted to store and treat hazardous wastewaters, is now permitted to accept only non-hazardous waste in accordance with the August 21, 2003 permit modification. The closure of ETP-1 (aka: biotreater) has been delayed until it ceases to operate at which time the approved closure plan specified in the Part B application, listed in Section III.A.1, will be implemented.

E. FACILITY SIZE AND TYPE FOR FEE PURPOSES:

The facility is categorized as a medium sized incineration facility for the purpose of assessing fees in accordance with HSC, Section 25205.19.

F. PERMITTING HISTORY:

1. On September 30, 1988, Shell Oil Company, the Permittee, submitted applications to the U.S. Environmental Protection Agency (U.S. EPA) and the Department of Toxic Substances Control (DTSC) for permits to operate a hazardous waste facility.

2. On May 8, 1990, the U.S. EPA issued the Permittee a Resource Conservation and Recovery Act (RCRA) Hazardous Waste Facility Permit (RCRA permit) for the management of hazardous wastes. The RCRA permit became effective on June 30, 1990 and expired on June 30, 1995. The hazardous waste management units included in the RCRA permit were the RM-17 Incinerator, CO Boilers Nos. 1, 2, and 3, Tank 12038 and Vessel 482.

3. The Department did not make a concurrent final permit determination with U.S. Environmental Protection Agency (EPA) due to the requirement for an environmental impact evaluation pursuant to the California Environmental Quality Act (CEQA). The Permittee was initially allowed to operate under State interim status. On August 1, 1992, U.S. EPA granted authorization to DTSC to enforce the RCRA permit.

4. The original RCRA permit, effective May 8, 1990, was based on the information submitted in the Part B Application dated September 30, 1988, as modified by subsequent amendments dated February 1, 1989 and May 12, 1989; the RM-17 Incinerator Trial Burn Report, dated October 28,

1988, revised June 5, 1989; the CO Boiler No. 1 Trial Burn Plan, dated November 21, 1988; and the C) Boiler No. 1 Trial Burn Report, dated April 21, 1989.

5. Pursuant to the May 8, 1990 RCRA Permit, the Permittee conducted the following trial burns:

Unit Name	Date of Trial Burn
CO Boiler No. 2	August 20 - 23, 1991
RM-17 Incinerator	August 9 - 11, 1993
CO Boiler No. 3	September 13 - 18, 1993

6. On January 16, 1995, the Permittee applied for renewal of its RCRA permit. Under the authority given to the Department to implement the RCRA program, this Hazardous Waste Facility Permit renewed the RCRA permit issued on May 8, 1990 and terminated State interim status. The Permit was based on the information submitted in the following documents:

   a. Part B Permit Application dated May 8, 1995, Shell Oil Company, Martinez Manufacturing Complex (MMC), RCRA Part B Permit Application, Volumes 1-3, May 8, 1995,
   b. Shell Oil Company, MMC, Hazardous Waste Facility Training Plan, Energy Management and Sulfur Recovery, May 1, 1995,
   c. Shell Oil Company, MMC, Hazardous Waste Facility Training Plan, Logistics, April 12, 1994,
   d. Shell Oil Company, MMC, Hazardous Waste Facility Training Plan, Chemical, March 15, 1994,
   e. RCRA Trial Burn Report for CO Boiler No. 2, November 1991,
   f. Trial Burn Report for RM-17 Incinerator, November 1993, and
   g. Trial Burn Report for the CO Boiler No. 3, December 1993

7. On June 15, 2000, the Permittee submitted a revised Part B Application that changed the name of the facility and operator, revised the waste analysis plan to reflect only treatment of non-hazardous wastewaters in the biotreater unit, and revised the operating log and inspection requirements of the biotreater unit since hazardous wastes are no longer treated in this unit. See Section III.A.1 of this permit for a listing of the specific documents included in the revised Part B Application.

G. MODIFICATIONS

See Appendix 1 for history of permit modifications. Appendices 3 through 5 provide details of each permit modification listed in Appendix 1.

III. GENERAL CONDITIONS

A. PERMIT APPLICATION DOCUMENTS:

1. The approved Part B Permit Application consists of the following documents:
   a. Martinez Refining Company (MRC) A Division of Equilon Enterprises LLC, RCRA Part B Permit Application, Volume I, June 15, 2000
   b. Martinez Refining Company (MRC) A Division of Equilon Enterprises LLC, RCRA Part B Permit Application, Volume II, Attachments – Section B, June 15, 2000
   c. Martinez Refining Company (MRC) A Division of Equilon Enterprises LLC, RCRA Part B Permit Application, Volume III, Attachments – Section C-J, June 15, 2000
   d. Equilon Enterprises LLC, RCRA Confirmation Burn Plan for CO Boiler No. 1, July 1999
   e. Martinez Refining Company, Final Source Test Report, MRC 9911, May 30, 2000
   f. Martinez Refining Company, CO Boiler Health Risk Assessment, June 2000

   This Part B Permit Application and any subsequent revisions thereto, subject to the permit modification requirements contained in 22 CCR 66270.41 and 66270.42, are by this reference made part of this permit.

2. The Permittee shall operate and maintain the facility in accordance with the approved Part B Permit Application.

3. In the event of any conflict between this permit and the approved Part B Permit Application, the most stringent provisions shall prevail.

4. The approved Part B Permit Application and this permit shall be maintained at the facility and place of business at all times until closure is completed.

B. EFFECT OF PERMIT:

1. The Permittee shall comply with the provisions of the California Health and Safety Code, and Division 4.5 of Title 22, CCR. The issuance of this Permit by DTSC does not release the Permittee from any liability or duty imposed by federal or state statutes or regulations or local ordinances, except the obligation to obtain this Permit. The Permittee shall obtain the permits required by other governmental agencies, including but not limited to, the applicable land use planning, zoning, hazardous waste, air quality, water quality, and solid waste management laws for the construction and/or operation of the Facility.

2. The Permittee is permitted to treat and store hazardous wastes in accordance with conditions of this Permit. Any treatment or storage of hazardous waste not specifically authorized in this Permit is strictly prohibited.

3. Compliance with the terms of this Permit does not constitute a defense to any action brought under any other law governing protection of public health or the environment, including, but not limited to, one brought for any imminent and substantial endangerment to human health or the environment.

4. DTSC's issuance of this Permit does not prevent DTSC from adopting or amending regulations that impose additional or more stringent requirements than those in existence at the time this Permit is issued and does not prevent the enforcement of these requirements against the Permittee.

5. Failure to comply with any terms or conditions set forth in the Permit in the time or manner specified herein will subject the Permittee to possible enforcement action including but not limited to penalties pursuant to HSC Section 25187.

6. In addition, failure to submit any information required in connection with the Permit, or falsification and/or misrepresentation of any submitted information, is ground for revocation of this Permit (22 CCR 66270.43).

7. In case of conflicts between the Operation Plan and the Permit, the Permit conditions take precedence.

8. The Permit includes and incorporates by reference any conditions of waste discharge requirements issued by the State Water Resources Control Board or any of the California Regional Water Quality Control Boards and any other conditions imposed pursuant to section 13227 of the Water Code.

C. COMPLIANCE WITH THE CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

DTSC has prepared an Environmental Impact Report (EIR) and a Statement of Findings for the project in accordance with the California Environmental Quality Act (Public Resources Code, Section 21000, et seq.) and the State guidelines. Based on the EIR, DTSC finds that the project will not have any significant adverse effects for which measures incorporated in the operation and design of the facility could not effectively mitigate. DTSC certified that the EIR complied with the provisions of CEQA on April 4, 1995.

DTSC has prepared a CEQA Notice of Exemption for the August 14, 2003 Class 2 permit modification in accordance with Title 14, California Code of Regulations, Section 15061(b)(3).

D. ENVIRONMENTAL MONITORING:

The facility has a detection monitoring program.

The treatment of the waste streams in the CO Boilers is permitted by the Bay Area Air Quality Management District permit for Plant 11. The three CO Boilers are identified as sources S1507, S1509, and S1512. The ETP-1 Biotreater is identified as source S1467. Tank 12038 is identified as source S1805.

Wastewater discharges from the Complex and the Effluent Treatment plant are permitted by National Pollutant Discharge Elimination System Permit No. CA0005789.

E. WASTE MINIMIZATION CERTIFICATION

Pursuant to HSC, section 25209 the Permittee shall certify annually, by March 1 for the previous year ending December 31, that:

1. The facility has a program in place to reduce the volume and toxicity of all hazardous wastes listed in Table 1 of this permit to the degree, determined by the Permittee, to be economically practicable.

2. The method of storage, treatment, or disposal is the only practicable method or combination of methods currently available to the facility, which minimizes the present and future threat to human health and the environment.

The Permittee shall make this certification, in accordance with 22 CCR 66270.11. The Permittee shall submit the certification to the Mohinder S. Sandhu, Chief, Standardized Permits and Corrective Action Branch, 700 Heinz Avenue, Berkeley, CA 94710 and shall record and maintain such certification in the facility Operating Record.

F. WASTE MINIMIZATION CONDITIONS

The Permittee shall comply with the Hazardous Waste Source Reduction and Management Review Act (SB 14) requirements that are specified in the HSC, sections 25244.19, 25244.20 and 25244.21, and any subsequent applicable statutes or regulations promulgated thereunder.

This would include submittal of SB 14 documents to DTSC upon request.

DTSC may require the Permittee to submit a more detailed status report explaining any deviation from, or changes to, the approved waste minimization plan.

IV. PERMITTED UNITS AND ACTIVITIES

This permit authorizes operation only of the facility units and activities listed below. The Permittee shall not treat or store hazardous waste in any units other than those specified in this Section. Any modifications to a unit or activity authorized by this Permit require the written approval of DTSC in accordance with the permit modification procedures set forth in 22 CCR.

IDENTIFICATION OF PERMITTED UNITS AND WASTE STREAMS:

1. Table 1, of this permit, lists the hazardous waste management units and the waste streams generated onsite allowed to be managed in the units under the conditions of this permit. The Permittee shall not receive any offsite waste for treatment, storage, or disposal, unless otherwise approved by DTSC.

2. The Permittee shall only treat the hazardous wastes up to the maximum annual (based on a calendar year) quantities listed in Table 1 of this permit.

TABLE 1: PERMITTED UNITS AND WASTE STREAMS

Waste Stream	Units Allowed to Manage the Hazardous Waste	Hazardous Waste Code No.	Maximum Annual Quantities (tons/year) or treatment rate (gallons/minute)
DAF Float	Tank 12038 Carbon Monoxide Boilers 1, 2 & 3	K048, CWC 222	28,000
Sulfinol Reclaimer Bottoms	Tank 12038 Carbon Monoxide Boilers 1, 2 & 3	D007, CWC 343	18
Waste Biosolids	Tank 12038 Carbon Monoxide Boilers 1, 2 & 3	not classified as hazardous waste under RCRA/HWCA	36,500
Primary treated wastewater	ETP-1 Biotreater	Not applicable since the unit only handles non-hazardous waste.	4000 gallons per minute

* CWC = California Waste Code

UNIT #1 - TANK 12038:

This tank is used to store the hazardous waste liquid stream which is fed to the CO boilers (Figure 2). Process flow diagram for this permitted unit is provided in Figure 5.

Activity Type: Storage of Hazardous Waste

Activity Description: Storage of DAF Float, sulfinol reclaimer, and waste biosolids.

Maximum Storage Capacity: 47,750 gallons

Waste Types: DAF Float, sulfinol reclaimer bottoms, and waste biosolids

RCRA Hazardous Waste Codes: K048, D007

California Hazardous Waste Codes: CWC 222, CWC 343

Note: Waste biosolids are not classified as hazardous waste under RCRA/HWCA

UNIT # 2 CARBON MONOXIDE BOILERS:

The CO boilers generate steam used to operate the refinery. These boilers operate on multiple feeds with the primary fuel being a process gas called catalytic cracker unit regenerator off-gas (Figure 3). Other fuels include flexicoker gas, fuel gas, fuel oil, and hazardous waste liquid. The hazardous waste liquid stream is a mixture of dissolved air flotation float, waste biosolids, and occasionally sulfinol reclaimer bottoms. Process flow diagram for this permitted unit is shown in Figure 6.

Activity Type: Treatment of Hazardous Waste

Activity Description: Treatment of DAF Float, sulfinol reclaimer, and waste biosolids.

Maximum Annual Treatment Capacity: A waste stream comprised of 28,000 tons of DAF Float, 18 tons of sulfinol reclaimer bottoms, and 36,500 tons of waste biosolids.

Waste Types: DAF Float, sulfinol reclaimer bottoms, and waste biosolids

RCRA Hazardous Waste Codes: D007, K048

California Hazardous Waste Codes: CWC 222, CWC 343

Note: Waste biosolids are not classified as hazardous waste under RCRA/HWCA

UNIT #3 – ETP-1 BIOTREATER:

The ETP-1 biotreater receives non-hazardous process wastewaters and stormwater runoff from the facility. This biotreater is a 1.4-acre, unlined, surface impoundment (Figure 4). The ETP-1 Biotreater is permitted to accept non-hazardous wastewaters only. Process flow diagram for this permitted unit is shown in Figure 7.

Activity Type: Treatment of non-hazardous wastewaters

Activity Description: Biological treatment of primary treated wastewater

Maximum Treatment Capacity: 4000 gallons per minute

Maximum Storage Capacity: 3,800,000 gallons

Waste Types: Primary treated wastewater

V. SPECIAL CONDITIONS WHICH APPLY TO ALL OF THE FACILITY STORAGE AND/OR TREATMENT UNITS

A. WASTE ANALYSIS:

The Permittee shall follow the waste analysis procedures as described in the approved Part B.

The Permittee shall verify the analysis of each waste liquid waste feed stream annually as part of its quality assurance program, in accordance with Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA publication SW-846, or equivalent methods approved by DTSC. At a minimum, the Permittee shall maintain proper functional instruments, use approved sampling and analytical methods, verify the validity of sampling and analytical procedures, and perform correct calculations. If the Permittee uses a contract laboratory to perform analyses, then the Permittee shall inform the laboratory in writing that it must operate under the waste analysis conditions set forth in this permit.

B. CONDITIONS SPECIFIC TO TANK 12038:

1. The Permittee shall manage hazardous waste in Tank 12038 in accordance with the requirements of 22 CCR 66264.190 - 66264.199.

2. Storage Requirements

   a. The Permittee may store a maximum of 47,750 gallons of hazardous waste in Tank 12038.

   b. The Permittee is prohibited from storing any waste in Tank 12038 that is not identified in Table 1 of this permit.

3. Tank System Design

   a. The Permittee shall maintain the secondary containment system in accordance with the detailed design plans and descriptions contained in the approved Part B.

   b. To ensure sufficient shell strength, the Permittee shall maintain the shell thickness specified in the approved Part B for each tank.

4. Operating Requirements

   a. The Permittee may blend/mix in the tank systems only the wastes identified in Table 1 of this permit.

   b. The Permittee shall not place treatment reagents in the tank system except for flow improvers to enhance pumpability and odor suppressors to control hydrogen sulfide.

   c. The Permittee shall prevent spills and overflows from the tank or containment systems using the methods described in the approved Part B.

5. Inspection Schedules and Procedures

   a. The Permittee shall inspect the tank systems in accordance with the approved Part B and shall document such inspection in the facility operating record.

   b. The Permittee shall assess the condition of each tank according to the schedule and procedures provided in the approved Part B.

6. Response to Leaks or Spills

In the event of a leak or a spill from the tank system, from a secondary containment system, or if a system becomes unfit for continued use, the Permittee shall follow the procedures specified in the approved Part B and the notification and reporting requirements under 22 CCR 66264.196(b)(5).

7. Closure

At closure of the tank systems, the Permittee shall follow the procedures in the approved Part B.

C. CONDITIONS SPECIFIC TO THE CARBON MONOXIDE BOILERS

1. The Permittee shall manage hazardous waste in the Carbon Monoxide Boilers in accordance with the requirements of 22 CCR 66264.340 - 66264.351 and 40 CFR 266.100 - 266.112.

2. Identification Criteria for Permitted and Prohibited Waste

a. Except during the periods specified in Section V.F of this permit, the Permittee may incinerate only the hazardous wastes listed in Table 1 of this permit under the terms of this permit.

b. The Permittee shall incinerate only hazardous wastes meeting the following criteria:

1) No hazardous constituents shall have a thermal stability ranking higher than that of benzene.
2) The ash content of the waste shall be no greater than 2% by weight.
3) The total chloride and chlorine content of the waste shall be no greater than 1% by weight.
4) Wastes shall always be fed in conjunction with auxiliary fuel.

c. Throughout operation, the Permittee shall conduct sufficient analysis in accordance with Section V.A of this permit to ensure that the criteria above are met.

d. Residue generated from the burning of hazardous waste in the CO Boilers is considered onsite hazardous waste and must be managed according to applicable articles of CCR, Title 22, Division 4.5, Chapter 12.

3. Instrumentation and Operational Performance Requirements

a. The Permittee shall maintain the CO Boilers so that when operated, in accordance with the operating requirements specified in this permit, it will meet the following performance standards:

(1) Each CO Boiler shall achieve destruction and removal efficiency (DRE) of 99.99 percent for each of the principal organic hazardous constituents (POHCs) for each waste feed stream. The DRE value shall be determined using the method specified in 22 CCR 66264.343. Toluene and benzene are identified as POHCs for both waste feed streams, namely DAF Float and sulfinol reclaimer bottoms.

(2) The Permittee shall control hydrogen chloride (HCl) and chlorine (Cl_2) emissions, such that the rate of emissions from all CO Boilers is no greater than 18.3 g/s for HCl and 1.05 g/s for Cl_2.

(3) The boiler shall not emit particulate matter in excess of 0.08 grain per dry standard cubic foot after correction to a stack gas concentration of 7% oxygen, using procedures prescribed in 40 CFR Part 60, Appendix A, Methods 1 through 5, and Appendix IX of Part 266.

(4) The Permittee shall control the emissions of dioxins and furans so that the ratio of the predicted maximum annual average ground level concentration (based on the combined emissions from all three boilers) of 2,3,7,8-TCDD equivalents to the risk-specific dose for 2,3,7,8-TCDD provided in 40 CFR 266, Appendix V does not exceed 1.0.

(5) The mass emission rates of toxic metals from each CO Boiler shall not exceed the following limits:

Metal	Emission Rate (g/sec)	Metal	Emission Rate (g/sec)
Arsenic	6.77×10^{-5}	Thallium	7.60×10^{-2}
Barium	6.00×10^{-1}	Antimony	7.60×10^{-2}
Chromium	6.00×10^{-4}	Lead	7.40×10^{-2}
Beryllium	6.77×10^{-5}	Mercury	5.60×10^{-2}
Cadmium	4.60×10^{-4}	Silver	5.10×10^{-1}

b. Except during the periods specified in Section V of this permit, the Permittee shall feed wastes to the CO Boilers only under the following conditions:

(1) **WASTE LIQUID FEED RATE** - Waste shall only be fed in the firebox through the liquid waste burners at the following limits:

i. An average waste liquid feed rate of 10 gallons per minute (gpm), measured on an hourly rolling average basis shall not be exceeded for each CO boiler.

ii. A maximum waste liquid feed rate of 12.3 gpm, measured on an instantaneous basis, shall not be exceeded for each CO Boiler.

(2) **STACK GAS CO** - The CO concentration in the stack exhaust gas corrected for the amount of oxygen in the stack gas, shall not exceed 100 parts per million by volume (ppmv) measured on an hourly rolling average basis.

(3) **FIREBOX TEMPERATURE** - Firebox temperature shall be at or above 1603 ^{o}F measured on an instantaneous basis.

(4) **COMBUSTION GAS FLOW RATE** - shall be no greater than 154,400 standard cubic feet per minute (scfm) measured on an instantaneous basis.

(5) **FIREBOX PRESSURE** - shall be maintained at a positive pressure not to exceed 6.6 inches water column (w.c.) measured on an hourly rolling average basis.

(6) **DIFFERENTIAL ATOMIZATION FLUID PRESSURE BETWEEN ATOMIZING FLUID AND THE WASTE FEED** - The differential atomization fluid pressure between atomizing fluid and the waste feed shall be no less than 37.6 pounds per squared inch gauge (psig) measured on an instantaneous basis.

(7) **ESP POWER** - The power to the electrostatic precipitator (ESP) for each boiler shall be maintained at no less than 20 kilovolt ampere (KVA) measured on an instantaneous basis.

(8) **DIFFERENTIAL ATOMIZATION FLUID PRESSURE BETWEEN ATOMIZING FLUID AND FUEL** - The differential atomization fluid pressure between atomizing fluid and the fuel oil feed shall be no less than 39.1 psig when fuel oil is being fed to a CO boiler measured on an instantaneous basis.

c. After a power failure or other interruption of operation no waste shall be introduced into a boiler until the levels of the operating parameters comply with Permit Section V.C.

d. Compliance with the operating conditions specified in Sections V.C.3.b.(1)-(8) of this permit will be regarded as compliance with the required performance standards in Section V.C.3.a. of this permit. However, evidence that compliance with these operating conditions is insufficient to ensure compliance with the performance standards, may justify modification or revocation and reissuance of the permit pursuant to 22 CCR 66270.41.

4. Inspection and Monitoring Requirements

a. The Permittee shall follow the procedures for inspecting the CO Boilers and associated equipment in accordance with the approved Part B.

b. The Permittee shall ensure proper operation of all monitoring devices by following the inspection, maintenance, and calibration procedures contained in the approved Part B.

c. The Permittee shall ensure that strip charts are legible and instrument readings are clearly visible. The strip chart scale must be wide enough to avoid off-scale readings for determining compliance with specified permit limits.

d. Upon request of DTSC, the Permittee shall perform sampling and analysis of the waste and exhaust emissions to verify that the operating requirements established in this permit achieve the performance standards.

5. Waste Feed Cut-off Requirements

a. The Permittee shall maintain the Automatic Waste Feed Cut-off (AWFCO) system to automatically cut off the hazardous waste feed to the CO Boilers at the limits specified in Table 2 of this permit.

(1) Hazardous wastes shall be fed to the CO Boilers only when all instruments required by this condition are on line and operating properly.

(2) At a minimum, equipment shall be maintained and tested at the frequencies stipulated in Table 2 of this permit. Testing of the AWFCO shall be conducted according to the procedures in the approved Part B.

b. In the event that the AWFCO is triggered, the Permittee shall comply with the following:

(1) Maintain the minimum firebox temperature while hazardous waste remains in the combustion chamber,

(2) Continue to duct exhaust gas to the air pollution control system operated in accordance with this permit while hazardous waste remains in the combustion chamber, and

(3) Continue to monitor the operating parameters listed in Section V.C.3.b of this permit and the hazardous waste feed shall not be restarted until the levels of those parameters comply with the limits specified in that section.

c. In case of a malfunction of the automatic-waste-feed-cut-off systems, the Permittee shall immediately cease feeding hazardous waste to that CO Boiler. The Permittee shall not restart the hazardous waste feed into the CO Boiler until the problem causing the malfunction has been located and corrected.

d. The Permittee may temporarily deactivate the waste feed cut-off system for only the Carbon Monoxide and Oxygen analyzers while continuing to feed waste to a CO boiler only as necessary while the analyzers are being calibrated. The operating record shall contain the time a cut-off is deactivated and the time when it is reactivated along with the identification of the person(s) taking the action. The Permittee shall follow the procedures described in the approved Part B in conducting and documenting the deactivation and reactivation of the AWFCO system.

e. The Permittee may temporarily bypass the AWFCO to change the thermocouple selector switch setting to verify firebox temperature. The procedures described in the approved Part B shall be followed in conducting and documenting the bypass/reactivation of the AWFCO.

f. The Permittee shall record in the operating record for this permit the date and time of all AWFCO's, including the triggering parameters, reason for the cut-off, and corrective actions taken. The Permittee shall also record all failures of the AWFCO system to function properly and corrective actions taken.

6. Closure

The Permittee must follow the procedures in the Closure Plan in the approved Part B for closure of all regulated storage and treatment units.

7. Record keeping

The Permittee shall record and maintain, in the operating record for this permit, all monitoring and inspection data compiled for the CO Boilers according to Section III.A.2 of this permit.

TABLE 2: CO BOILERS AUTOMATIC WASTE FEED CUT-OFF LIMITS

Parameter	Cut-Off Limits	Test Frequency
Waste Liquid Feed Rate	greater than 10 gpm, measured on an hourly rolling average basis or greater than 12.3 gpm, measured on an instantaneous basis	Monthly
Stack Gas CO	greater than 100 ppmv, measured on an hourly rolling average basis	Monthly
Firebox Temperature	Less than 1603 ^{o}F, measured on an instantaneous basis	Monthly
Firebox Pressure	greater than 6.6" w.c., measured on an hourly rolling average basis	Monthly
Combustion Gas Flow Rate	greater than 154,400 scfm, measured on an instantaneous basis	Monthly
ESP Power	Less than 20 KVA, measured on an instantaneous basis	Monthly
All of the above	If any instrument required for automatic waste feed cut-off is not operational, or if instrument-span is exceeded	Monthly

D. CONDITIONS SPECIFIC TO THE ETP-1 BIOTREATER:

1. The ETP-1 Biotreater is permitted to accept non-hazardous wastewaters only.

2. Groundwater monitoring will continue to be managed under the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) Order 95-234. The SFBRWQCB is the lead agency for sitewide corrective action in accordance with SB1082. Any changes made to Order 95-234 are subject to review by all interested parties including DTSC, providing the DTSC an opportunity to comment on any proposed changes.

3. "The Groundwater Boundary Control Capture Verification Modeling Report" shall continue to be provided to DTSC and SFBRWQCB on an annual basis. This report shall include a section that summarizes the activities that took place during the year as a result of recommendation made in the prior years' report.

4. Permittee is no longer required to comply with the hazardous waste inspection, records keeping, and training requirements for this specific Biotreater unit, since it is no longer processing hazardous waste.

5. Permittee shall notify the Department in writing at least 180 days prior to the date on which the Permittee expects to begin closure of this unit. Within 90 days after receiving a notification, the Department may review the closure plan to determine whether any factor has significantly changed since a prior review was undertaken, or determine whether the plan is otherwise adequate or inadequate, and may prescribe additional requirements or request modification to the plan. The closure of this unit, in accordance with the closure plan in the approved Part B application, shall be completed within 180 days after the unit ceases to operate. The Permittee shall submit the closure certification report for this unit to DTSC within 60 days of completion of closure.

E. RISK ASSESSMENT

The Permittee shall review the risk assessments conducted for the CO Boilers and determine their compliance with current U.S. EPA risk assessment guidance documents. Within ninety (90) calendar days of the effective date of this permit, the Permittee shall submit the results of this review along with a workplan and schedule detailing how the risk assessments will be updated to conform to current guidance. The Permittee shall proceed to update the risk assessments upon receipt of approval of the workplan by DTSC and submit, for review and approval, an updated risk assessment addressing all units.

At any time during the life of this permit, DTSC may request that the risk assessment be updated again in order to incorporate new standards or to evaluate new emission rates measured as a result of tests conducted under Section V.F of this permit.

F. ADDITIONAL CONDITIONS FOR CO BOILERS: SHORT-TERM INCINERATION TEST

1. Applicability

The trial burns are required for the CO Boilers as part of their continued operation. Based on the trial burn results for CO Boiler Nos. 1, 2 and 3, it was confirmed that the three CO Boilers operate in a like manner making it appropriate to apply trial burn results for one boiler to all three boilers. Therefore, a trial burn for only one boiler is required for the test burns required in Section V.C of this permit.

2. Confirmation/Trial Burn

The Permittee shall conduct confirmation burns for the CO Boiler No. 1 within sixty (60) months of the effective date of this permit. The Permittee shall submit confirmation burn plans for each unit,

which includes all the specifications of a trial burn plan (22 CCR 66270.62(b)(2)), to DTSC for approval. A confirmation burn shall be limited to three valid test runs at one operating mode and is intended to further confirm the boiler's compliance with the performance standards specified in Sections V.C.3.a.(2)-(5) of this permit. The confirmation burns shall be conducted within the operating conditions specified in Sections V.C.3.b.(1)-(8) of this permit for CO Boiler No. 1.

The Permittee shall conduct trial burns for CO Boiler No. 2 within 108 months of the effective date of this permit. The Permittee shall submit trial burn plans for each unit pursuant to 22 CCR 66270.62(b)(2) to DTSC for approval. A trial burn will consist of one or more operating modes that the Permittee determines essential to operate under and shall demonstrate compliance over the full range of desired operating modes. A minimum of three valid test runs shall be conducted at each operating mode and shall demonstrate compliance with the performance standards specified in Sections V.C.3.a.(1)-(5) of this permit for the CO Boiler No. 2 and any subsequent applicable standards promulgated in statutes or regulations.

3. Submittal of Confirmation/Trial Burn Plan

A confirmation burn plan (CBP) or trial burn plan (TBP) for each unit identified in Section V.F of this permit shall be submitted at least six (6) months before the trial burn is conducted. The plans must include all applicable EPA-approved test methods and procedures in effect at the time of the submittal. A written approval of the plans must be obtained before any tests are conducted.

4. Conformity to Confirmation/Trial Burn Plan

The Permittee shall operate and monitor the units during the trial burns as specified in the approved CBP or TBP.

5. Trial POHCs

The principal organic hazardous constituent (POHC) for which DRE must be determined for the CO Boilers is toluene. This constituent is present in both DAF Float and sulfinol reclaimer bottoms.

Additional or different POHCs may be selected if DTSC determines it is appropriate to do so.

6. Confirmation/Trial Burn Determinations

During the confirmation or trial burn (or as soon after the trial burn as practicable), the Permittee shall make the applicable determinations required by 22 CCR 66270.62(b)(6)(A)-(J).

7. Confirmation/Trial Burn Data Submissions and Certifications

The Permittee shall submit a copy of all data collected during the confirmation or trial burn to DTSC upon completion of the burn. The Permittee shall submit to DTSC the results of the determinations required by Section V.F of this permit within ninety (90) days of the completion of the confirmation or trial burn. All submissions must be certified in accordance with 22 CCR 66270.11.

8. Reporting Non-Compliance During the Confirmation/Trial Burn

If, based upon the analytical results of the confirmation or trial burn and before submitting the required confirmation or trial burn results, the Permittee determines that the boiler failed to achieve any of the performance standards specified in Section V.C of this permit, the Permittee shall notify DTSC within twenty-four (24) hours of making the determination. Upon the request of DTSC, the Permittee shall cease feeding hazardous waste to the boiler. The Permittee may apply to DTSC for a permit modification pursuant to 22 CCR 66270.41 and for a new confirmation or trial burn pursuant to 22 CCR 66270.62(b).

VI. CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS

A. NEW RELEASES:

In the event the Permittee identifies an immediate or potential threat to human health and/or the environment, discovers new releases of hazardous waste and/or hazardous constituents, or discovers new Solid Waste Management Units (SWMUs) not previously identified, the Permittee shall notify DTSC orally with 24 hours of discovery and notify DTSC in writing within 10 days of such discovery summarizing the findings including the immediacy and magnitude of any potential threat to human health and/or the environment.

DTSC may require the Permittee to investigate, mitigate and/or take other applicable action to address any immediate or potential threats to human health and/or the environment and newly identified releases of hazardous waste and/or hazardous constituents. For newly identified SWMUs, the Permittee is required to conduct corrective action. Corrective action will be carried out either under the Corrective Action Consent Agreement or Unilateral Corrective Action Order pursuant to Health and Safety Code, Section 25187.

B. SUMMARY OF RFA FINDINGS/RESULTS:

1. RFA Results:

A RCRA facility assessment was conducted at the facility and is documented in "RCRA Facility Assessment Report, Shell Oil Company Martinez Manufacturing Complex" completed by A.T. Kearney for EPA, February, 1988. Hereinafter, this document will be referred to as the "RFA Report." The RFA Report identified and evaluated a total of 68 Solid Waste Management Units (SWMUs) listed as Units 4.1 through 4.68 in Appendix 3. Results found in the RFA for each SWMU are as follows:

Inactive Land Disposal and Land Treatment Units (Units 4.1 (a.k.a.: 4.66), 4.2, 4.3, 4.4, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11 4.12, 4.13, 4.14, 4.16, 4.67, 4.68): Releases to the soil and/or groundwater have been documented for all of these units. Wastes and/or contaminated soil still remain in Units 4.1, 4.4, 4.9, 4.10, 4.11, 4.12, 4.13, and 4.14, thus creating an ongoing potential for releases to soil and groundwater. In addition, due to this existing contamination, there is a moderate potential for the generation of subsurface gas from Units 4.4, 4.6, 4.7, and 4.8. Past releases to surface water and air from Units 4.3, 4.4., 4.6, 4.7, and 4.8, could not be evaluated due to lack of information on the units' construction, operation, waste management practices, and release controls. Based on the inactive status of these units, there is no or a very low potential for ongoing releases to surface water and air.

Inactive Oily Water Sump "K" (Unit 4.17): Releases to the soil from this inactive sump have occurred as documented from the site monitoring and the Visual Site Inspection (VSI). Wastes still remain on the site and in addition, the unit collects stormwater runoff from the Crude Hill area. Although the unit contains a process sewer drain in its center, there is a high potential for ongoing releases to surface water. A moderate potential for ongoing releases to soil and groundwater also exists from this unit.

Wastewater Holding/Treatment Ponds (Units 4.32, 4.33, 4.34, 4.38, 4.40, 4.63): Releases of metals to groundwater have occurred in an area down gradient of these holding/treatment ponds. The constituents found in the groundwater are also found in the wastewaters and sediment in these ponds. However, since these ponds are all located in the same area and handle similar waste materials, the specific source of these contaminants has not been identified at this time.

Hazardous Waste Storage Area (Unit 4.18): At the time of the VSI, it was noted that this unit was subject to stormwater run-on from an eroded drainage channel on a steep embankment east of the unit. Sediment had been accumulating behind the curb, allowing a pathway for run-on. This

created a high potential for soil and groundwater releases due to overflow. Since the VSI, the facility has removed the sediment and has extended the height of the curb with wooden boards to reduce the potential for storm run-on into the unit.

Waste Transfer Station (Unit 4.19): The north half of this unit is unpaved and partially bermed and contains the hazardous waste storage bin. There is a high potential for releases to soil and groundwater from this area if spillage or leakage from the waste bin occurs, as this unit is unpaved. The release potentials to surface water and air, as well as the likelihood of subsurface gas generation from this unit are low.

PG&E Sludge Terraces (Unit 4.57): There was a high potential for past releases from this unit based on its topography and waste management practices. Past soil and groundwater releases from this unit were moderate, as the unit was unlined. Although some wastes were present in the unit at the time of the VSI, the wastes appeared to be in a stable, un-reactive form. As a result, the ongoing release potentials to soil, groundwater, and air are considered low.

Oil Collection Tanks and Sumps (Unit 4.5) and Inactive Ballast Water Pond (Unit 4.15): There is little available information concerning the past usage, operation, and waste management practices of these two units. As a result, the past release potentials from these units could not be evaluated.

Units 4.20 to 4.31, 4.35 to 4.37, 4.39, 4.41 to 4.56, 4.58 to 4.62, and 4.64 to 4.65: These units have low or no potential for releases to soil, groundwater, surface water, and air, or for subsurface gas generation based on their construction, operation, waste management practices, or release controls.

2. Subsequent to the RFA, three additional units were identified and are described below:

Unit PS: This unit is an unlined surface impoundment constructed sometime between 1957 and 1966. The unit's function was identified as secondary containment for Tank 1072. Based on the detection of several purgeable and semi-volatile compounds in both the waste extract and the groundwater, it appears that the Unit PS waste constituents may have impacted the groundwater at Unit PS.

Unit TW: This is an inactive land disposal unit covering approximately 0.6 acres. The unit was originally suspected to contain waste materials when a shallow trench excavated to repair a pipe exposed hydrocarbon-affected soils. To confirm the presence of waste materials, an investigation consisting of four soil-borings and five test-pits were performed. Waste materials were not noted in any of the borings or test pits. Based on this finding a petition has been submitted to the RWQCB to remove the unit from the list of waste disposal sites.

Unit JT: This unit is an inactive land disposal unit. Suspected releases from this unit consist of petroleum byproducts. There is no documented release from the unit and an investigation is currently being performed to confirm the presence or absence of contamination.

C. CORRECTIVE ACTION REQUIRED FOR EXISTING SWMUs

The RFA report outlined documented and suspected releases to the environment at the facility. Subsequent to the RFA report, numerous corrective action activities have been required and monitored by the Regional Water Quality Control Board (RWQCB) to address actual and potential releases from each SWMU. Appendix 3 briefly summarizes all corrective action work that has occurred at the facility to date and addresses all SWMUs identified in the RFA and three newly identified SWMUs discovered by the Permittee.

1. For the purpose of determining whether additional corrective action is needed to address the soil and groundwater contamination at the facility, DTSC makes the following findings:

    a. Units 4.5, 4.18 - 4.33, 4.35 - 4.62, 4.64, and 4.65 require no further action at this time.

b. Groundwater monitoring is currently being performed at Units 4.1 (a.k.a.: Unit 4.66), 4.15, 4.34, 4.63, PS, and JT under the direction of the RWQCB.

c. Based on the RCRA Facility Investigation (RFI) conducted at Units 4.2, 4.12, 4.13, 4.14 and 4.67, a petition to waive corrective action requirements has been submitted to the RWQCB by Shell Oil Company. This petition is based on a finding that there is currently no groundwater impact from the units. However, groundwater monitoring to detect future releases will continue to be performed at these units under the direction of the RWQCB.

d. An RFI and a Corrective Measures Study (CMS) have been completed for Units 4.3, 4.4, 4.7, 4.9, 4.10, 4.11 and 4.17 and corrective action is currently being performed under the direction of the RWQCB.

e. Based on the RFI conducted at Units 4.6, 4.68, and TW, a petition to remove the units from the list of waste disposal sites has been submitted to the RWQCB by Shell Oil Company. This petition is based on the investigation which, revealed that the units were no longer in existence or could not be found. However, groundwater monitoring will continue to be performed in the vicinity of the designated units under the direction of the RWQCB.

f. Units 4.8 and 4.16 have undergone closure and the RFI conducted on the units revealed that a CMS was not required. Therefore, a petition to waive corrective action requirements has been submitted to the RWQCB.

2. The Permittee shall continue to comply with those corrective actions required by RWQCB.

APPENDIX 1: HISTORY OF MODIFICATIONS

Note: Class 1 modifications did not require DTSC approval. Class 1*, 2, and 3 modifications required DTSC approval.

1. April 12, 1996: Class 1 Modification

   Installation of a low-flow audible alarm on the waste feed flow to each boiler;

   Installation of a strainer in the main waste feed line to the CO Boilers;

   Modification of the computer control system to optimize waste feed flow to each CO Boiler;

   Installation of air horns and air cannons to the remaining COB hoppers, which did not have them;

   Removal of foreman and duplicate operator signatures from the bottom of the CO Boiler waste events log sheet.

2. November 4, 1996: Class 1 Modification

   Conversion of "Chemical C Area" to a stand-alone facility "Shell Martinez Catalyst Plant". This unit currently operates as a Hazardous Waste generator. The facility has one unit that operates under the Conditionally Exempt - Specified Wastestream treatment tier.

   Replacement of pneumatic control at the boilers with modern Honeywell TDC equipment and relocation of strip chart recorders within the boiler shelter. (Approved 10/1/97)

3. December 27, 1996: Class 2 Modification

   The RM-17 hazardous waste incinerator was closed and is no longer a permitted unit.

4. April 3, 1997: Class 2 Modification

   The Vessel 482 hazardous waste storage tank was closed and is no longer a permitted unit.

5. September 17, 1997: Class 1 Modification

   Change in ownership from Shell Oil Company - Martinez Manufacturing Complex to Shell Martinez Refining Company.

6. October 1, 1997: Class 1 Modification

   Replacing pneumatic controls at the CO Boilers with modern Honeywell Total Distribution Control (TDC) equipment;

   Relocation of the strip chart recorders within the CO Boiler shelter and modification of Table D-5 of the 12/30/95 permit.

7. March 9, 1998: Class 1 Modification

   Modification of NOx emission control system.

8. June 22, 1998: Class 1 Modification

   Physical construction of staged air system (over-fire air distribution);

Refinery Fuel Gas / Natural gas addition system (RFG/NG injection);

Selective non-catalytic reduction (SNCR) system (urea injection).

9. November 4, 1998: Class 2 Modification

An emission test plan for installation of specific NOx reduction equipment for COB 3;

Incineration of hazardous waste in COB 3 (upon approval of forthcoming emission test report);

Adoption of similar retrofits for COB 1 and COB 2.

10. April 20, 1999: Class 1 Modification

See Appendix 3 for details of this modification.

11. July 14, 1999: Class 1 Modification

Effective July 1, 1998, Equilon Enterprises LLC became owner and operator of the Shell Martinez Refining Company, which was renamed "Martinez Refining Company, a Division of Equilon Enterprises LLC". Previously permitted units, RM-17 Incinerator and Vessel 482 were clean closed and removed from the permit.

12. March 31, 2000: Class 1 Modification

Revisions to the Hazardous Waste Facility Training Plan, Logistics, December 1999.

Revisions to the Hazardous Waste Facility Training Plan, Utilities, December 1999.

13. April 6, 2000: Class 1 Modification

Change in Incident Commander Personnel in Contingency Plan.

14. May 1, 2000: Class 1 Modification:

MRC will replace each thermocouple (TC) annually.

MRC shall use their computer database tracking system to generate records for a period of at least 24 hours prior to the "malfunctioning" determination.

15. June 28, 2000: Appeal Resolution

See Appendix 4 for details of Appeal Resolution.

16. May 30, 2001: Class 1 Modification

Updated CO Boiler Operating Procedure and Training Package

17. October 5, 2001: Class 1 Modification

Revisions to Operating Procedures and Training Package to align with New "Human Factors Awareness" Requirements for Procedures Writing

Removed redundant Hazardous Waste Storage Tank Inspection Sheet that is incorporated into the Daily Hazardous Waste Permitted Units Inspection Sheet.

18. November 26, 2001: Class 1 Modification

    Addition of Second Carbon Vent Absorber on Tank 12038 to Comply With Consent Decree Requirements

19. June 14, 2002: Class 1 Modification

    Updated Operating Procedures and Training Packages to Reflect the Name Change of the refinery From Martinez Refining Company to Shell Oil Products US, Martinez Refinery

    Corrected Minor Typographical Errors and Job Title Changes

    Revised Utilities Emergencies Training Section Updating the CCU Feed Outage Section to Reflect Recent Changes in Operating Procedure

20. August 21, 2003: Class 2 Modification (Details)

    See Appendix 5 for details of this modification.

APPENDIX 2: SUMMARY OF CORRECTIVE ACTION ACTIVITIES

UNIT NO.	DESCRIPTION	RECOMMENDED ACTION BY DTSC	CORRECTIVE ACTIONS COMPLETED	ONGOING/PLANNED CORRECTIVE ACTIONS
4.1 (a.k.a.: Unit 4.66)[1]	Land Treatment Area	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 Landfill Disposal Area "Q"	A	M, N	I
4.9	Open Burning and Landfill Area (Unit "W")	A	K	J
4.10	Inactive Landfill 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

1 Unit 4.1 and Unit 4.66 refer to the same area which was used for two different purposes. When referred to as Unit 4.1, it refers to a time when the area was used for drying sludges. When referred to as Unit 4.66, it refers to its current use as stormwater retention ponds.

UNIT NO.	DESCRIPTION	RECOMMENDED ACTION BY DTSC	CORRECTIVE ACTIONS COMPLETED	ONGOING/PLANNED CORRECTIVE ACTIONS
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 "E"	None	None	None
4.27	Sand Boxes, Unit "II"	None	None	None
4.28	Centrifuge System, Unit "F"	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
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	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

UNIT NO.	DESCRIPTION	RECOMMENDED ACTION BY DTSC	CORRECTIVE ACTIONS COMPLETED	ONGOING/PLANNED CORRECTIVE ACTIONS
4.45	Spent Caustic Neutralizer, Unit "V"	None	None	None
4.46	Tank 1068	None	None	None
4.47	CO Boiler Feed Tank 12038, Unit "G"	None	None	None
4.48	Waste Storage Tank 383, Unit "S"	None	None	None
4.49	CO Boilers, Unit "T"	None	None	None
4.50	CO Boilers Dust Storage Hopper	None	None	None
4.51	CO Boilers Dumpster Box	None	None	None
4.52	CO Boilers Dust Storage Area	None	None	None
4.53	Organic Chloride Waste Storage Tank 881T	None	None	None
4.54	Waste Storage Tank 482, Unit "B"	None	None	None
4.55	RM-17 Waste Incinerator, Unit "Z"	None	None	None
4.56	Two ASD Filter Cake Storage Bins	None	None	None
4.57	PG&E Sludge Terraces	E	N	None
4.58	Spent Acid Storage Tank 1216	None	None	None
4.59	Tank 1064	None	None	None
4.60	Tank 1063	None	None	None
4.61	Upper Lake Slobodnik (Stormwater Pond)	None	None	None
4.62	Lower Lake Slobodnik (Stormwater Pond)	None	None	None
4.63	Stormwater Holding Pond (Pond 6)	D	None	F
4.64	Flare Area Stormwater Holding Pond (Unit "FP")	None	K, P	None
4.65	Vine Hill Stormwater Holding Pond	None	None	None
4.66	Stormwater Holding Ponds (Formerly LTA "FF")	A		
4.67	Inactive Unit "YY"	A	K	F, I
4.68	Inactive Unit "ZZ" (Chemical C Area)	A	None	G, H

UNIT NO.	DESCRIPTION	RECOMMENDED ACTION BY DTSC	CORRECTIVE ACTIONS COMPLETED	ONGOING/PLANNED CORRECTIVE ACTIONS
newly identified unit PS	Inactive Waste Unit PS	None	L	G
newly identified unit TW	Inactive Waste Unit TW	None	M	G, H
newly identified unit JT	Inactive Waste Unit JT	None	O	G

A. Defer the lead to RWQCB which is already conducting environmental monitoring and assessment of the unit.

B. Obtain additional information and evaluate past and ongoing release potential.

C. Provide adequate containment.

D. Continue groundwater monitoring and identify specific sources of contamination.

E. Physical and chemical characteristics of residue remaining in unit should be verified to confirm that hazardous constituents are not being released into the environment.

F. Groundwater monitoring is being performed under RWQCB Order 88-146.

G. Groundwater monitoring is being performed under RWQCB Order 87-070.

H. Petition submitted to RWQCB to remove from list of waste disposal sites.

I. Petition to waive corrective action requirements submitted to RWQCB.

J. Corrective action is being performed under RWQCB Order 88-146.

K. RFI conducted under RWQCB Order 88-146.

L. RFI and CMS conducted under RWQCB Order 88-146

M. RFI conducted, CMS not required under RWQCB Order 88-146.

N. Closed pursuant to a closure plan submitted under RWQCB Order 88-146.

O. RFI completed 1/95 as directed by RWQCB.

P. Investigation completed 1/95.

R. Waste materials have been removed according to RWQCB Order 88-146.

Q. RWQCB ordered unit to be investigated under Order 88-146. Investigation concluded that the unit has not affected groundwater.

APPENDIX 3: APRIL 20, 1999 CLASS 1 MODIFICATION DETAILS

1. Thermocouple modifications and compliance data tracking

2. Physically modifying TC ports to facilitate changing TCs;

3. Adding “comparison ...to “certified” TC” to the quarterly calibrations;

4. Installing angle iron deflections at each thermowell;

5. Specification of conditions under which MRC would then be able to switch the permit compliance TC between the east and west TCs without stopping the hazardous waste feed;

6. Usage of computer data for backup to the chart recorder data tracking;

7. This backup proposal was an interim measure;

8. Installation of 3/4" block valves on the atomizing steam lines for eight hazardous-waste (biosludge) feed guns to facilitate steam purging of the hazardous waste feed without going to the COB and manually re-latching the trip solenoid valve.

APPENDIX 4: JUNE 28, 2000 APPEAL RESOLUTION Details

1. Changed the Electrostatic precipitator KVA limit to 20 KVA.

2. Changed particulate limit from 0.015 gr/dscf to 0.08 gr/dscf.

3. Biotreater treatment capacity remained unchanged as Facility applied for delay of Closure of Biotreater unit.

4. Revised the permit to conform to the Department's latest format for permits.

5. Added Section I, entitled "Definitions".

6. Added Section II, entitled "Description of the Facility and Ownership".

7. Deleted the following subsections of Section II:
    a. B (Requirement to Submit Information),
    b. C (Consent to Entry by Department Representatives),
    c. D (Financial Responsibility),
    d. E (General Standards),
    e. F (Land Disposal Restrictions),
    f. G (Permit Actions),
    g. H (Need to Halt or Reduce Activity),
    h. I (Severability),
    i. J (Permit Expiration),
    j. K (24-hour Reporting),
    k. L (Notice of Planned Physical Changes and Certifications of Construction),
    l. M (Operation at Night),
    m. O (General Responsibilities of the Permittee),
    n. P (Signatory Requirements),
    o. S (Recycling),
    p. T (Prohibition of Disposal),
    q. U (Air Emission Standards)

8. Added description of permitted units.

9. Reformatted Section IV (moved into section assigned for specific conditions).

10. Modified Corrective Action Section V. Deleted subsection A, C, D, F, G, H, I, J, K, L, M, N, O, P, Q, and R.

11. Modified Appendices 2 and 3 of the Permit.

12. Added figures showing facility layout and permitted units.

APPENDIX 5: August 21, 2003 CLASS 2 MODIFICATION DETAILS

1. Changed the waste streams that are permitted to be processed in the biotreater unit from hazardous to non-hazardous only. The sections modified include :

    a. Section IV, Table 1,
    b. Section IV, Biotreater
    c. Section V.D, Conditions Specific to the ETP-1 Biotreater

2. Revised the groundwater monitoring, reporting, inspection, record keeping, and training requirements for the ETP-1 Biotreater. The sections modified Section V.D, Conditions Specific to ETP-1 Biotreater to include:

    a. Groundwater monitoring will continue to be managed through San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) Order 95-234
    b. "The Groundwater Boundary Control Capture Verification Modeling Report" will continue to be provided to DTSC and SFBRWQCB on an annual basis.
    c. Permittee is no longer required to comply with the inspection, records keeping, and training requirements.
    d. The closure of this unit will be implemented when the unit ceases to operate.

3. Revised the permit format to include a permit modification history appendix. Also created separate appendices for modification details. The section modified included Appendix 1: History of Modifications.

4. Revised Section V of the Permit to update references to the latest Part B submittal, dated June 15, 2000.

5. Deleted Appendix 2, List of Permit Attachments since a revised Part B Application, dated June 15, 2000 has been received that supercedes all the previously referenced attachments

6. Modified figures with new photographs to show permitted units 1, 2, and 3.

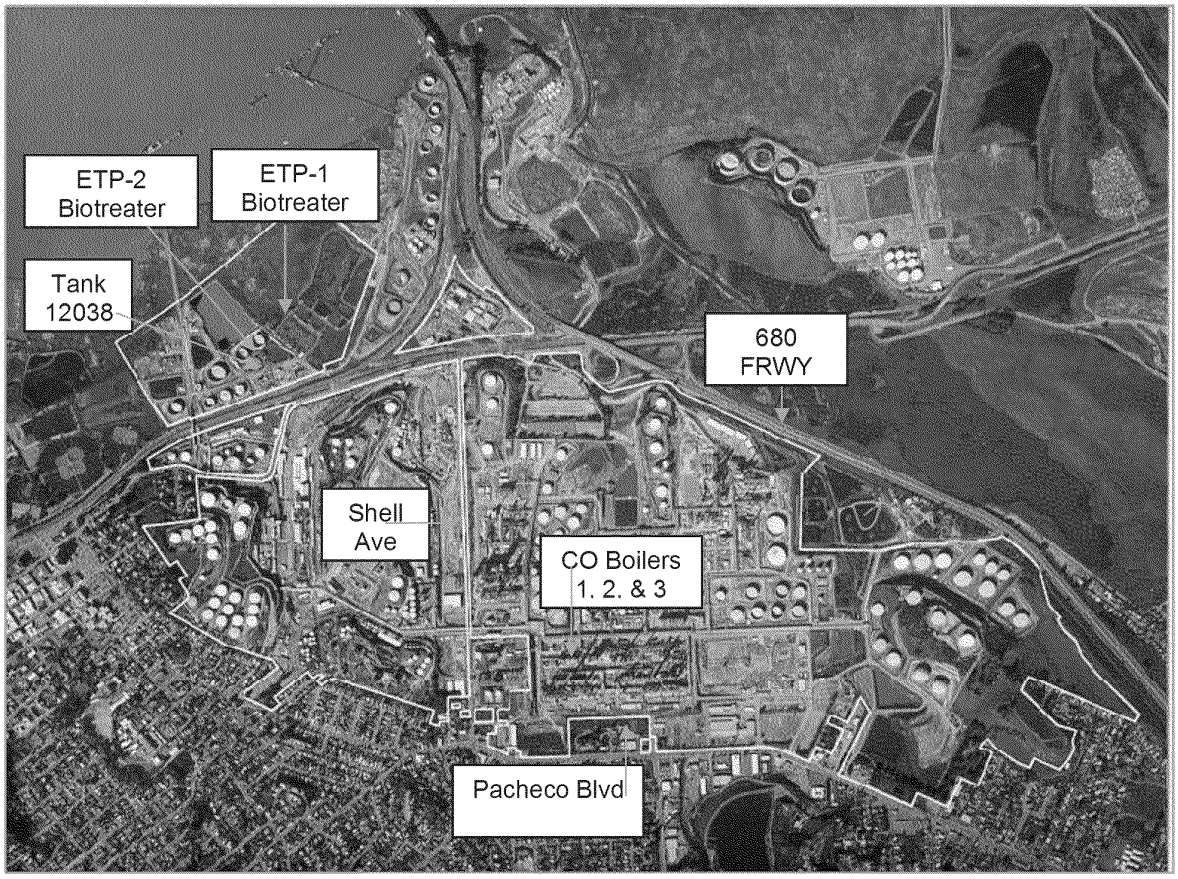


FIGURE 1. FACILITY LAYOUT

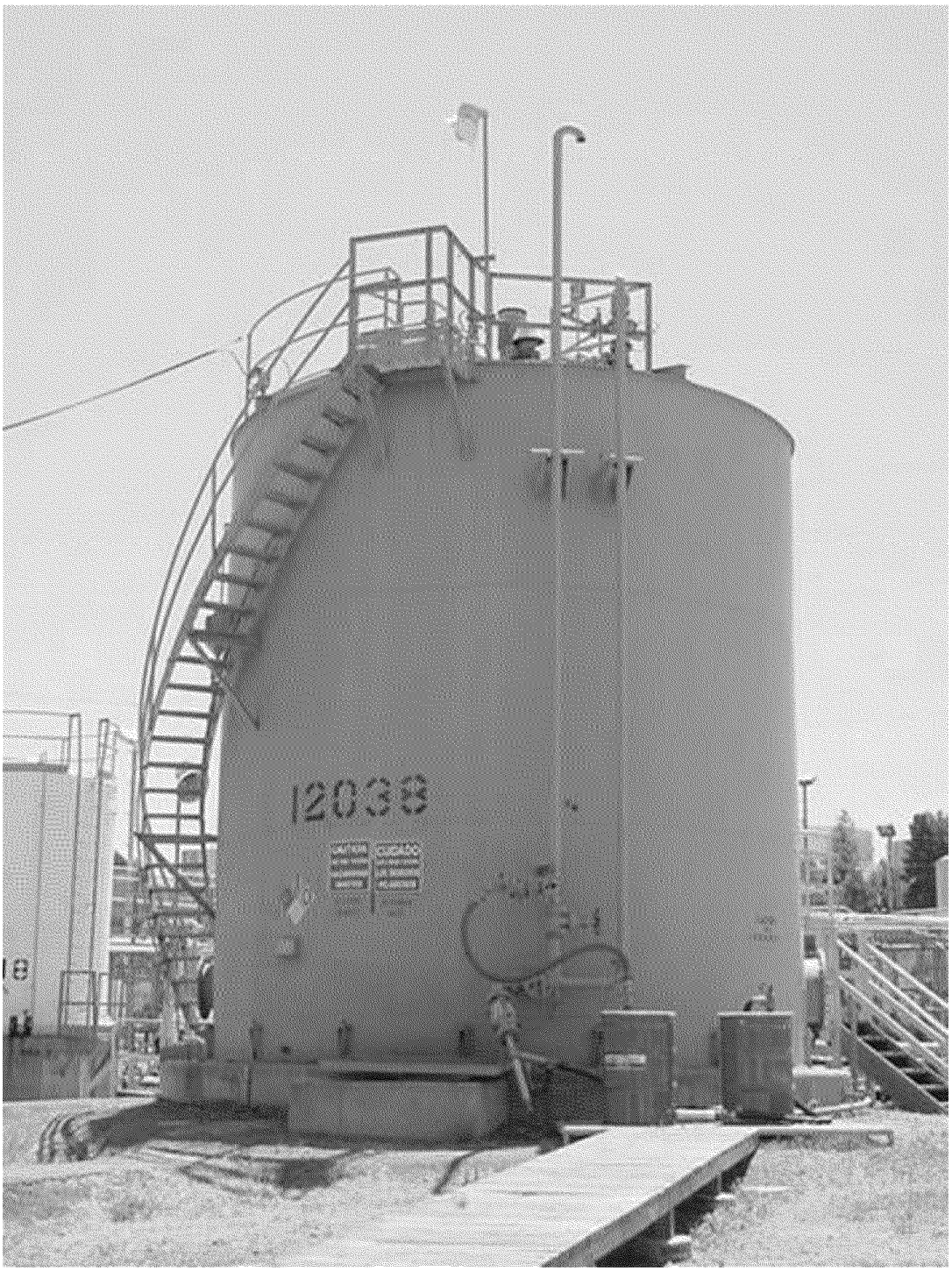


FIGURE 2. PERMITTED UNIT #1 – TANK 12038

FIGURE 3. PERMITTED UNIT #2 - CO BOILERS

FIGURE 4. PERMITTED UNITS #3 – ETP-1 BIOTREATER

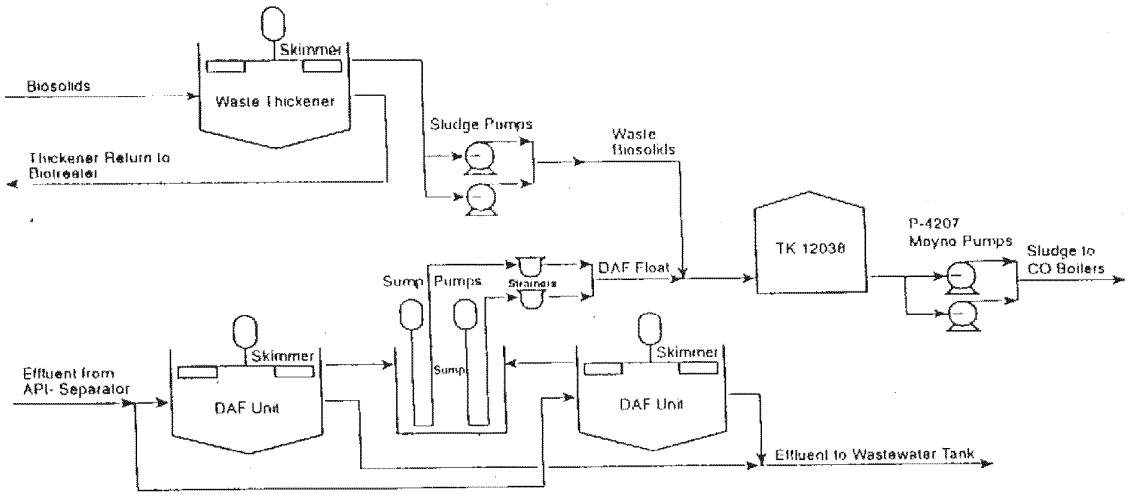


Figure 3. Process Flow Diagram for Tank 12038

FIGURE 5. PROCESS FLOW DIAGRAM FOR PERMITTED UNIT #1 – TANK 12038

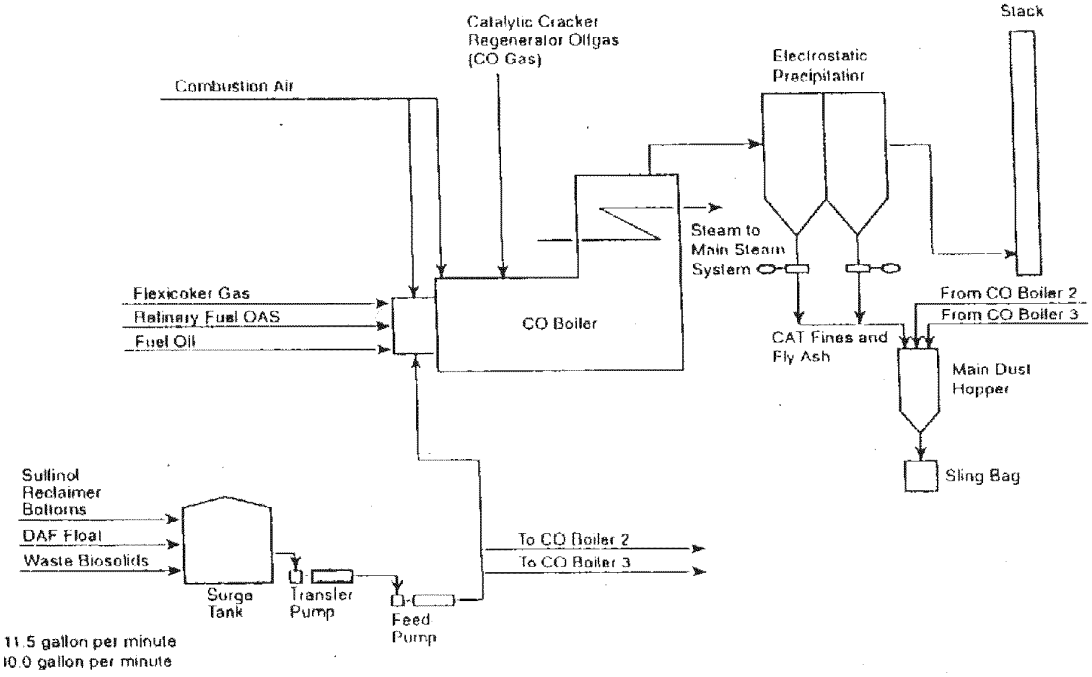


Figure 4. Process Flow Diagram for CO Boilers (MRC).

FIGURE 6. PROCESS FLOW DIAGRAM FOR PERMITTED UNIT #2 – CO BOILERS

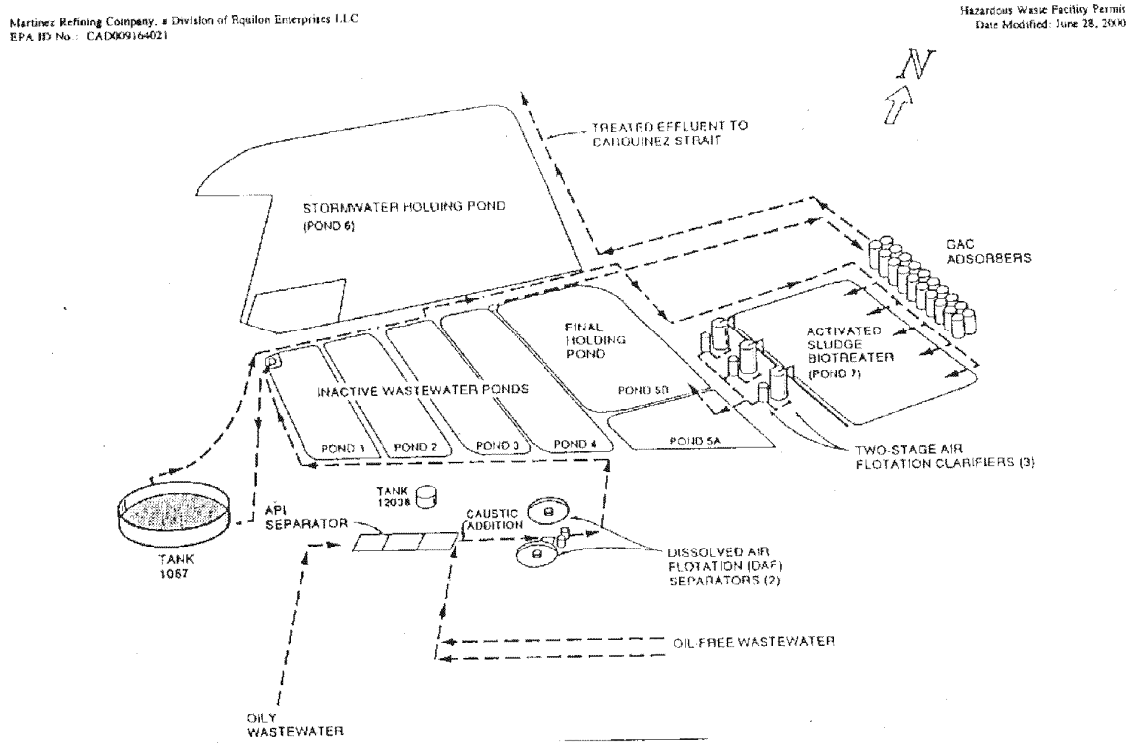


Figure 5. Process Flow Diagram for Biotreater (MRC).

FIGURE 7. PROCESS FLOW DIAGRAM FOR PERMITTED UNIT #3 – ETP-1 BIOTREATER

Department of Toxic Substances Control

Edwin F. Lowry, Director
700 Heinz Ave, Suite 200
Berkeley, California 94710

Winston H. Hickox
Secretary for
Environmental
Protection

Gray Davis
Governor

August 21, 2003

Mr. John Lazorik
Environmental Engineer
Shell Oil Products US, Martinez Refinery
P.O. Box 711
Martinez, CA 94553-0071

APPROVAL OF DELAY OF CLOSURE OF BIOTREATER, MARTINEZ REFINING COMPANY, A DIVISION OF EQUILON ENTERPRISES, LLC, MARTINEZ, CALIFORNIA, EPA ID No. CA 009164021

Dear Mr. Lazorik:

The Department of Toxic Substances Control (DTSC) has reviewed your Class 2 Permit Modification requesting a Delay of Closure for Surface Impoundment, Effluent Treatment Pond 1 - Biotreater.

DTSC has determined that your application is technically complete and hereby approves the Delay of Closure of Biotreater. Please note that

1. The ETP-1 Biotreater is permitted to accept non-hazardous wastewaters only.

2. Groundwater monitoring will continue to be managed under the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) Order 95-234. The SFBRWQCB is the lead agency for sitewide corrective action in accordance with SB1082. Any changes made to Order 95-234 are subject to review by all interested parties including DTSC, providing the DTSC an opportunity to comment on any proposed changes.

3. "The Groundwater Boundary Control Capture Verification Modeling Report" will continue to be provided to DTSC and SFBRWQCB on an annual basis. This report shall include a section that summarizes the activities that took place during the year as a result of recommendation made in the prior years' report.

4. Permittee is no longer required to comply with the hazardous waste inspection, records keeping, and training requirements for this specific Biotreater unit, since it is no longer processing hazardous waste.

5. The closure of this unit in accordance with the approved closure plan in the Part B application will be implemented when the unit ceases to operate.

We have filed a CEQA Notice of Exemption with the Office of Planning and Research. Enclosed is a copy of the Revised Permit.

If you have any questions, please call Waqar Ahmad of my staff at (510) 540-3932.

Sincerely,

Salvatore Ciriello,
Supervising Hazardous Substances Engineer
Standardized Permits and Corrective Action Branch

Attachment

cc: Patti Barni
Statewide Compliance Unit
Department of Toxic Substances Control
700 Heinz Ave, Suite 200
Berkeley, CA 94710

Norman Shopay
Geological Support Services Unit
Department of Toxic Substances Control
700 Heinz Avenue
Berkeley, CA 94710

To: Lin, Sharon[Lin.Sharon@epa.gov]
From: Arora, Asha@DTSC
Sent: Thur 6/18/2015 12:12:37 AM
Subject: RE: Draft Shell Martinez Refinery 3007 Info Request Letter

Hi Sharon,

Thanks for keeping me in the loop. Yes, I will be going with you in August. I was wondering when we will be conducting tiered permitting inspections, i.e. PBR/CE…

This letter is undated. When do you plan to mail this letter? So they have to respond within 30 days of receiving this letter.

Thank you!!

Asha

From: Lin, Sharon [mailto:Lin.Sharon@epa.gov]
Sent: Wednesday, June 17, 2015 4:46 PM
To: Yang, Teng@DTSC
Cc: Arora, Asha@DTSC; Schofield, John
Subject: Draft Shell Martinez Refinery 3007 Info Request Letter

Hi, Andy,

Attached is the draft 3007 information request. Please review and comment by this Friday if possible. Please let me know if you have any questions.

Ccing Asha since she is coming out with us the first of August to Shell. The draft sampling plan

is going through internal review. I hope it will be ready by the end of June. We will share it with DTSC when it is ready. Thanks!

Sharon Lin, P.E.

U.S. Environmental Protection Agency Region 9

Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2
75 Hawthorne Street

San Francisco, CA 94105

Tel: (415) 972-3446

Email: Lin.Sharon@epa.gov

To: Lin, Sharon[Lin.Sharon@epa.gov]
Cc: Chow, Emily[Chow.Emily@epa.gov]
From: Ripp, Thomas
Sent: Wed 6/17/2015 4:00:39 PM
Subject: Re: Preliminary findings from R9 3 RCRA process based inspections

Thanks for the information. I like the fact sheet that the Region has done. I wonder why ECHO did not pick up TRI for the Shell facility when I had done my pull some time ago? I tried to compare production capacities with BR reports and did not get a good correlation regardless what I tried. The r factor was somewhere in the .2 - .3 range. There were a couple of other subset comparisons I was going to do but haven't had the time to do yet, but there still seems to be some outliers in the refinery universe in what they report and what you might expect them to report.

One thing that concerns me with what TRI shows is that while air releases have gone down significantly, water has gone up. That may mean more of a potential that some of it crosses over into the RCRA realm too. This information just helps build a better case for looking at refineries and wastewater in particular.

Does the Region have a similar fact sheet for chemical manufacturing, particularly organic chemical manufacturing?

Tom Ripp
Pesticides, Waste and Toxics Branch
202-564-7003 (Tu & W) 6:45 - 4:15
301-391-6198 (M alternate location) 9:00 - 2:30
Do not work Thursday or Friday

From: Lin, Sharon
Sent: Tuesday, June 16, 2015 5:11 PM
To: Ripp, Thomas
Cc: Chow, Emily
Subject: RE: Preliminary findings from R9 3 RCRA process based inspections

Tom, I have not made the comparison between BR and TRI data.

Here is the most recent TRI fact sheet for California refineries.

Sharon Lin, P.E.

U.S. Environmental Protection Agency Region 9

Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2
75 Hawthorne Street

San Francisco, CA 94105

Tel: (415) 972-3446

Email: Lin.Sharon@epa.gov

From: Ripp, Thomas
Sent: Tuesday, June 16, 2015 1:43 PM
To: Lin, Sharon
Cc: Chow, Emily
Subject: RE: Preliminary findings from R9 3 RCRA process based inspections

Here is some info for Valero and Shell:

Valero (132,000 bpd crude throughput):

TRI: 639,852 lbs 2011 BR tons generated: 2,482 tons managed: 0

Shell (156,400 bpd crude throughput):

TRI: no information 2011 BR tons generated:12,802 tons managed: 11,235

They both appear to have the same major processes (crude, vacuum, cracking …) with Shell having a slightly higher capacity for crude distillation, vacuum distillation, thermal cracking or coking, and catalytic hydrocracking but slightly lower throughput for Cat cracking and Cat reforming, yet their TRI numbers and BR numbers are significantly different.

Does the result of your inspections mean an increase in the amount of hazardous waste they have to report as being generated and possibly treated, stored or disposed?

From: Lin, Sharon
Sent: Tuesday, June 09, 2015 11:50 PM

To: Ripp, Thomas
Cc: Chow, Emily
Subject: RE: Preliminary findings from R9 3 RCRA process based inspections

Hi, Tom,

Valero Benicia – NEIC inspection (May 2014)- Purpose: a joint training opportunity with TRI for new region 9 and state RCRA and TRI inspectors.

Hudson Ranch Geothermal Plant - NEIC inspection (Feb. 2015) – Purpose: We needed help on figuring out the "bentsen exclusions" for oil, gas and geothermal E&P activities as the majority of the geothermal activities in this country are happening in California and the state wanted to learn how to conduct a process based RCRA inspection.

Shell Martinez – Region 9 inspection (with pre- and post-inspection consultations with NEIC) (March 2015) – Purpose: R9 NPDESE inspector came to RCRA to brainstorm with us on how to manage the unlined surface impoundments at the Shell WWTP. R9 management wanted us to replicate a NEIC type of "process based" RCRA inspection at a refinery.

Yes, 3 out of 3 on significant violations for the first 3 process based inspections conducted at Region 9 facilities in the past year (May 2014- March 2015). I was on all of the three inspections. Region 9, on our own, will perform one more refinery inspection (likely in the LA area) by the end of this FY.

Your characterization of Region 9's plan is mostly accurate. I believe Doug communicated the same strategic direction for the R9 RCRA program at the REM meeting in DC too. However, we still need NEIC's help to build our capacity. As our region has not been doing this type of inspection, we need time to build our confidence and knowledge. (focusing on refinery right now).

See my note below on the previous state's inspection for Hudson Ranch.

Please let me know if you have any other questions.

Sharon Lin, P.E.

U.S. Environmental Protection Agency Region 9

Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2
75 Hawthorne Street

San Francisco, CA 94105

Tel: (415) 972-3446

Email: Lin.Sharon@epa.gov

From: Ripp, Thomas
Sent: Tuesday, June 09, 2015 10:12 AM
To: Lin, Sharon
Cc: Chow, Emily
Subject: RE: Preliminary findings from R9 3 RCRA process based inspections

Sharon, it was nice to talk with you yesterday. I got a lot out of the call and hope you did too and I agree we should stay in contact. I do have a couple of quick questions that you can answer for me:

Were these essentially the first three "real" process based inspection in Region 9. In other words are you 3 for 3 in Region 9 for finding significant issues at facilities using process based inspections?

I believe you said NEIC led the inspection at Benicia and I can't remember about the one at Martinez. I think you said the Region conducted the inspection maybe with NEIC consultation? Is that correct. Also the inspection at Hudson Ranch was with NEIC if I recall correctly.

I want to try to characterize it as NEIC is helping you guys build your own capacity to do the "real" process based inspections and the plan is you (Region 9) start taking it from there. Also that so far all 3 process based inspections turned up significant issues that will need to be addressed (yes Martinez is too early to say definitively, but it certainly looks like there will be significant waster/surface impoundment issues). That the Region's plans are to conduct more process based inspections and continue to train CA and their CUPA's to improve their inspection capability.

Here is the 5 year inspection history at those 3 facilities (inspections prior to R9/NEIC):

Valero Benecia (LQG, SQG): 1 state CEI (10/28/13) – no violations found

Hudson Ranch: Zero inspections in previous 5 years. The local CUPA/State did one inspection in June 2013. The data has not been flown into RCRAInfo due to data issues. I think we are close to resolving the data issues.

Shell Martinez (LQG): 4 state CEIs – no violations found, 3 state FCIs – no violations found, 3 State FRRs, 1 found violation(s)

From: Lin, Sharon
Sent: Monday, June 08, 2015 12:47 PM
To: Ripp, Thomas
Subject: Preliminary findings from R9 3 RCRA process based inspections

FYI – enforcement confidential. We will conduct one more refinery inspection by the end of this year.

Jackie will also be consulting on a TSD inspection (Rho Chem) in LA in September.

Sharon Lin, P.E.

U.S. Environmental Protection Agency Region 9

Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2
75 Hawthorne Street

San Francisco, CA 94105

Tel: (415) 972-3446

Email: Lin.Sharon@epa.gov

From: Lin, Sharon
Sent: Thursday, April 23, 2015 2:04 PM
To: McDaniel, Doug
Subject: RE: one more thing

Here is the list. I think there is a theme of the significant violations. I added some details in case the RCRA wonks really wanted details.

sharon

Valero Benicia (May 2014)

•□□□□□□□□ **Treatment and storage hazardous wastes without a permit** (un-permitted unlined surface impoundment; benzene level exceeds TCLP for toxic characteristic waste) – data source: NESHAP Subpart FF monitoring report; violations on multiple days

•□□□□□□□□ **Failure to make a waste determination –** data source: operator's log; Subpart FF Benzene monitoring data

•□□□□□□□□ **Treatment and storage of hazardous wastes without a permit** (heat exchanger bundle cleaning sludge is a RCRA listed wastes; operating the cleaning pad without a permit; cleaning process doesn't meet the conditions for the oil bearing hazardous secondary materials exclusion in the regulations)

•□□□□□□□□ **Failure to minimize unplanned release** (spillage of the listed petroleum refinery wastes throughout the facility)

There will be additional EPCRA TRI violations folded into the penalty calculation.

Hudson Ranch Geothermal Power Plant (Feb. 2015) – preliminary

•□□□□□□□□ **Treatment and storage hazardous waste without a permit** (Horizontal Belt Press Sump exceeded TCLP for lead)

•□□□□□□□□ **Illegal disposal of RCRA wastes**; (lab wastes, spent solvent, mercuric nitrate, lab waste shows TCLP for mercury; still investigating potential underground injection of hazardous wastes into Class V Geothermal UIC well)

•□□□□□□□□ **Failure to make a waste determination** (manifests of D008 wastes)

•□□□□□□□□ **Failure to minimize unplanned release** (spillage of the hazardous wastes at various locations at the facility)

In addition, the State of California personnel joined the EPA team for the process based inspection and provided sampling support. The State cited the facility for additional violations because the state's exemption for Oil , Gas and Geothermal wastes are broader in scope than the federal regulations (the State can regulate more items). The State plans to replicate the process based inspection process at other geothermal power plant LQGs in California.

Shell Martinez Refinery (March 2015) – preliminary

•□□□□□□□□ **Treatment and storage of hazardous wastes without a permit** (lab wastes)

•□□□□□□□□ **Treatment and storage of hazardous wastes without a permit** (Heat exchanger bundle cleaning pad)

•□□□□□□□□ **Failure to make a waste determination** (wastes do not meet conditions for exclusion)

•□□□□□□□□ **Failure to minimize unplanned release** (CO Boiler baghouse dust - listed RCRA wastes)

•□□□□□□□□ **Failure to provide required emergency equipment** (no fire control equipment or fire extinguishers at the 90 day storage areas)

•□□□□□□□□ **Container management issues** (secondary containment; open containers)

The Region 9 Team, along with state and county representatives, plans to return to the facility to sample unlined surface impoundments to determine LDR compliance and to perform a technical review of the tiered permitted hazardous wastes units that were approved by the County.

Sharon Lin, P.E.

U.S. Environmental Protection Agency Region 9

Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2
75 Hawthorne Street

San Francisco, CA 94105

Tel: (415) 972-3446

Email: Lin.Sharon@epa.gov

From: McDaniel, Doug
Sent: Thursday, April 23, 2015 8:02 AM
To: Lin, Sharon
Subject: one more thing

I need for next week:

A list, in short bullets, of what we think are the major violations at each of the three process based inspections.

Thanks for your help

Douglas K. McDaniel

Chief, Waste and Chemical Section

Enforcement Division

U.S. EPA Region 9

(415) 947-4106

To: Lin, Sharon[Lin.Sharon@epa.gov]
Cc: Chow, Emily[Chow.Emily@epa.gov]
From: Ripp, Thomas
Sent: Tue 6/16/2015 8:48:56 PM
Subject: RE: Preliminary findings from R9 3 RCRA process based inspections

I forgot to add, compared to Navajo Refining (105,000 bpd crude throughput which reports 355,236 pounds TRI and 1,033,276 tons of hazardous waste generated (2011 BR) and all but 1,168 tons managed onsite.

Why such a difference? Do shell and Valero not report some wastes that Navajo refining does?

From: Ripp, Thomas
Sent: Tuesday, June 16, 2015 4:43 PM
To: Lin, Sharon
Cc: Chow, Emily
Subject: RE: Preliminary findings from R9 3 RCRA process based inspections

Here is some info for Valero and Shell:

Valero (132,000 bpd crude throughput):

TRI: 639,852 lbs 2011 BR tons generated: 2,482 tons managed: 0

Shell (156,400 bpd crude throughput):

TRI: no information 2011 BR tons generated:12,802 tons managed: 11,235

They both appear to have the same major processes (crude, vacuum, cracking …) with Shell having a slightly higher capacity for crude distillation, vacuum distillation, thermal cracking or coking, and catalytic hydrocracking but slightly lower throughput for Cat cracking and Cat reforming, yet their TRI numbers and BR numbers are significantly different.

Does the result of your inspections mean an increase in the amount of hazardous waste they have to report as being generated and possibly treated, stored or disposed?

From: Lin, Sharon
Sent: Tuesday, June 09, 2015 11:50 PM
To: Ripp, Thomas
Cc: Chow, Emily
Subject: RE: Preliminary findings from R9 3 RCRA process based inspections

Hi, Tom,

Valero Benicia – NEIC inspection (May 2014)- Purpose: a joint training opportunity with TRI for new region 9 and state RCRA and TRI inspectors.

Hudson Ranch Geothermal Plant - NEIC inspection (Feb. 2015) – Purpose: We needed help on figuring out the "bentsen exclusions" for oil, gas and geothermal E&P activities as the majority of the geothermal activities in this country are happening in California and the state wanted to learn how to conduct a process based RCRA inspection.

Shell Martinez – Region 9 inspection (with pre- and post-inspection consultations with NEIC) (March 2015) – Purpose: R9 NPDESE inspector came to RCRA to brainstorm with us on how to manage the unlined surface impoundments at the Shell WWTP. R9 management wanted us to replicate a NEIC type of "process based" RCRA inspection at a refinery.

Yes, 3 out of 3 on significant violations for the first 3 process based inspections conducted at Region 9 facilities in the past year (May 2014- March 2015). I was on all of the three inspections. Region 9, on our own, will perform one more refinery inspection (likely in the LA area) by the end of this FY.

Your characterization of Region 9's plan is mostly accurate. I believe Doug communicated the same strategic direction for the R9 RCRA program at the REM meeting in DC too. However, we still need NEIC's help to build our capacity. As our region has not been doing this type of inspection, we need time to build our confidence and knowledge. (focusing on refinery right now).

See my note below on the previous state's inspection for Hudson Ranch.

Please let me know if you have any other questions.

Sharon Lin, P.E.

U.S. Environmental Protection Agency Region 9

Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2
75 Hawthorne Street

San Francisco, CA 94105

Tel: (415) 972-3446

Email: Lin.Sharon@epa.gov

From: Ripp, Thomas
Sent: Tuesday, June 09, 2015 10:12 AM
To: Lin, Sharon
Cc: Chow, Emily
Subject: RE: Preliminary findings from R9 3 RCRA process based inspections

Sharon, it was nice to talk with you yesterday. I got a lot out of the call and hope you did too and I agree we should stay in contact. I do have a couple of quick questions that you can answer for me:

Were these essentially the first three "real" process based inspection in Region 9. In other words are you 3 for 3 in Region 9 for finding significant issues at facilities using process based inspections?

I believe you said NEIC led the inspection at Benicia and I can't remember about the one at Martinez. I think you said the Region conducted the inspection maybe with NEIC consultation? Is that correct. Also the inspection at Hudson Ranch was with NEIC if I recall correctly.

I want to try to characterize it as NEIC is helping you guys build your own capacity to do the "real" process based inspections and the plan is you (Region 9) start taking it from there. Also that so far all 3 process based inspections turned up significant issues that will need to be addressed (yes Martinez is too early to say definitively, but it certainly looks like there will be significant waster/surface impoundment issues). That the Region's plans are to conduct more process based inspections and continue to train CA and their CUPA's to improve their inspection capability.

Here is the 5 year inspection history at those 3 facilities (inspections prior to R9/NEIC):

Valero Benecia (LQG, SQG): 1 state CEI (10/28/13) – no violations found

Hudson Ranch: Zero inspections in previous 5 years. The local CUPA/State did one inspection in June 2013. The data has not been flown into RCRAInfo due to data issues. I think we are close to resolving the data issues.

Shell Martinez (LQG): 4 state CEIs – no violations found, 3 state FCIs – no violations found, 3 State FRRs, 1 found violation(s)

From: Lin, Sharon
Sent: Monday, June 08, 2015 12:47 PM
To: Ripp, Thomas

Subject: Preliminary findings from R9 3 RCRA process based inspections

FYI – enforcement confidential. We will conduct one more refinery inspection by the end of this year.

Jackie will also be consulting on a TSD inspection (Rho Chem) in LA in September.

Sharon Lin, P.E.

U.S. Environmental Protection Agency Region 9

Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2
75 Hawthorne Street

San Francisco, CA 94105

Tel: (415) 972-3446

Email: Lin.Sharon@epa.gov

From: Lin, Sharon
Sent: Thursday, April 23, 2015 2:04 PM
To: McDaniel, Doug
Subject: RE: one more thing

Here is the list. I think there is a theme of the significant violations. I added some details in case the RCRA wonks really wanted details.

sharon

Valero Benicia (May 2014)

•□□□□□□□□ **Treatment and storage hazardous wastes without a permit** (un-permitted unlined surface impoundment; benzene level exceeds TCLP for toxic characteristic waste) – data source: NESHAP Subpart FF monitoring report; violations on multiple days

•□□□□□□□□ **Failure to make a waste determination –** data source: operator's log; Subpart FF Benzene monitoring data

•□□□□□□□□ **Treatment and storage of hazardous wastes without a permit** (heat exchanger bundle cleaning sludge is a RCRA listed wastes; operating the cleaning pad without a permit; cleaning process doesn't meet the conditions for the oil bearing hazardous secondary materials exclusion in the regulations)

•□□□□□□□□ **Failure to minimize unplanned release** (spillage of the listed petroleum refinery wastes throughout the facility)

There will be additional EPCRA TRI violations folded into the penalty calculation.

Hudson Ranch Geothermal Power Plant (Feb. 2015) – preliminary

•□□□□□□□□ **Treatment and storage hazardous waste without a permit** (Horizontal Belt Press Sump exceeded TCLP for lead)

•□□□□□□□□ **Illegal disposal of RCRA wastes**; (lab wastes, spent solvent, mercuric nitrate, lab waste shows TCLP for mercury; still investigating potential underground injection of hazardous wastes into Class V Geothermal UIC well)

•□□□□□□□□ **Failure to make a waste determination** (manifests of D008 wastes)

•□□□□□□□□ **Failure to minimize unplanned release** (spillage of the hazardous wastes at various locations at the facility)

In addition, the State of California personnel joined the EPA team for the process based inspection and provided sampling support. The State cited the facility for additional violations because the state's exemption for Oil , Gas and Geothermal wastes are broader in scope than the

federal regulations (the State can regulate more items). The State plans to replicate the process based inspection process at other geothermal power plant LQGs in California.

Shell Martinez Refinery (March 2015) – preliminary

- **Treatment and storage of hazardous wastes without a permit** (lab wastes)
- **Treatment and storage of hazardous wastes without a permit** (Heat exchanger bundle cleaning pad)
- **Failure to make a waste determination** (wastes do not meet conditions for exclusion)
- **Failure to minimize unplanned release** (CO Boiler baghouse dust - listed RCRA wastes)
- **Failure to provide required emergency equipment** (no fire control equipment or fire extinguishers at the 90 day storage areas)
- **Container management issues** (secondary containment; open containers)

The Region 9 Team, along with state and county representatives, plans to return to the facility to sample unlined surface impoundments to determine LDR compliance and to perform a technical review of the tiered permitted hazardous wastes units that were approved by the County.

Sharon Lin, P.E.

U.S. Environmental Protection Agency Region 9

Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2
75 Hawthorne Street

San Francisco, CA 94105

Tel: (415) 972-3446

Email: Lin.Sharon@epa.gov

From: McDaniel, Doug
Sent: Thursday, April 23, 2015 8:02 AM
To: Lin, Sharon
Subject: one more thing

I need for next week:

A list, in short bullets, of what we think are the major violations at each of the three process based inspections.

Thanks for your help

Douglas K. McDaniel

Chief, Waste and Chemical Section

Enforcement Division

U.S. EPA Region 9

(415) 947-4106

To: Lin, Sharon[Lin.Sharon@epa.gov]
Cc: Janes, Elizabeth[Janes.Elizabeth@epa.gov]
From: Nelson, Carolyn@DTSC
Sent: Fri 8/14/2015 8:47:19 PM
Subject: RE: RCRA data Qs

Hi Sharon,

I have reviewed your questions and determined that regarding:

Question 1: The only facility information that is available on the public EnviroStor Site is shows TSDF information at this point. There are plans in the future to display Corrective Action type of inspections and generators that are inspected. Kern Oil is considered a generator and isn't available for public view at this time.

Question 2: I have confirmed that all completed inspections that are showing within the internal EnviroStor System have been uploaded to RCRAInfo and are also available for view on the public EnviroStor site. Can you please provide more information regarding which inspections are not appearing?

Question 3: I don't know what the reasoning is for Golden Eagle Refinery in Martinez has two different EPA ID Numbers of CAR000091488 and CAD000072751. Perhaps you should contact Scott Ward, the Permitting Project Manager of this refinery. He can be reached at 916-255-3581 or at Scott.ward@dtsc.ca.gov .

Thank you

Carolyn

Carolyn Nelson

Data Systems Unit

Department of Toxic Substances Control

916-445-2948

From: Lin, Sharon [mailto:Lin.Sharon@epa.gov]
Sent: Thursday, August 13, 2015 10:22 AM
To: Nelson, Carolyn@DTSC
Cc: Janes, Elizabeth
Subject: RCRA data Qs

Hi, Carolyn,

Thanks for the call back. I have a couple of questions.

1. I couldn't locate Kern oil and refining co CAD990724916 in Envirostor.

2. More inspections showed up for the Shell Martinez Refinery – CAD009164021 in the RCRA-Info than the Envirostor

3. Tesoro golden eagle refinery in Martinez should have the RCRA handler ID of CAR000091488. Envirostor is showing a RCRA ID of CAD000072751.

That is all for now. Thanks.

Sharon Lin, P.E.

U.S. Environmental Protection Agency Region 9

Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2
75 Hawthorne Street

San Francisco, CA 94105

Tel: (415) 972-3446

Email: Lin.Sharon@epa.gov

To: Lin, Sharon[Lin.Sharon@epa.gov]
Cc: Chow, Emily[Chow.Emily@epa.gov]
From: Ripp, Thomas
Sent: Tue 6/16/2015 8:43:25 PM
Subject: RE: Preliminary findings from R9 3 RCRA process based inspections

Here is some info for Valero and Shell:

Valero (132,000 bpd crude throughput):

TRI: 639,852 lbs 2011 BR tons generated: 2,482 tons managed: 0

Shell (156,400 bpd crude throughput):

TRI: no information 2011 BR tons generated:12,802 tons managed: 11,235

They both appear to have the same major processes (crude, vacuum, cracking …) with Shell having a slightly higher capacity for crude distillation, vacuum distillation, thermal cracking or coking, and catalytic hydrocracking but slightly lower throughput for Cat cracking and Cat reforming, yet their TRI numbers and BR numbers are significantly different.

Does the result of your inspections mean an increase in the amount of hazardous waste they have to report as being generated and possibly treated, stored or disposed?

From: Lin, Sharon
Sent: Tuesday, June 09, 2015 11:50 PM
To: Ripp, Thomas
Cc: Chow, Emily
Subject: RE: Preliminary findings from R9 3 RCRA process based inspections

Hi, Tom,

Valero Benicia – NEIC inspection (May 2014)- Purpose: a joint training opportunity with TRI for new region 9 and state RCRA and TRI inspectors.

Hudson Ranch Geothermal Plant - NEIC inspection (Feb. 2015) – Purpose: We needed help on figuring out the "bentsen exclusions" for oil, gas and geothermal E&P activities as the majority of the geothermal activities in this country are happening in California and the state wanted to learn how to conduct a process based RCRA inspection.

Shell Martinez – Region 9 inspection (with pre- and post-inspection consultations with NEIC) (March 2015) – Purpose: R9 NPDESE inspector came to RCRA to brainstorm with us on how to manage the unlined surface impoundments at the Shell WWTP. R9 management wanted us to replicate a NEIC type of "process based" RCRA inspection at a refinery.

Yes, 3 out of 3 on significant violations for the first 3 process based inspections conducted at Region 9 facilities in the past year (May 2014- March 2015). I was on all of the three inspections. Region 9, on our own, will perform one more refinery inspection (likely in the LA area) by the end of this FY.

Your characterization of Region 9's plan is mostly accurate. I believe Doug communicated the same strategic direction for the R9 RCRA program at the REM meeting in DC too. However, we still need NEIC's help to build our capacity. As our region has not been doing this type of inspection, we need time to build our confidence and knowledge. (focusing on refinery right now).

See my note below on the previous state's inspection for Hudson Ranch.

Please let me know if you have any other questions.

Sharon Lin, P.E.

U.S. Environmental Protection Agency Region 9

Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2
75 Hawthorne Street

San Francisco, CA 94105

Tel: (415) 972-3446

Email: Lin.Sharon@epa.gov

From: Ripp, Thomas
Sent: Tuesday, June 09, 2015 10:12 AM
To: Lin, Sharon
Cc: Chow, Emily
Subject: RE: Preliminary findings from R9 3 RCRA process based inspections

Sharon, it was nice to talk with you yesterday. I got a lot out of the call and hope you did too and I agree we should stay in contact. I do have a couple of quick questions that you can answer for me:

Were these essentially the first three "real" process based inspection in Region 9. In other words are you 3 for 3 in Region 9 for finding significant issues at facilities using process based inspections?

I believe you said NEIC led the inspection at Benicia and I can't remember about the one at Martinez. I think you said the Region conducted the inspection maybe with NEIC consultation? Is that correct. Also the inspection at Hudson Ranch was with NEIC if I recall correctly.

I want to try to characterize it as NEIC is helping you guys build your own capacity to do the "real" process based inspections and the plan is you (Region 9) start taking it from there. Also that so far all 3 process based inspections turned up significant issues that will need to be addressed (yes Martinez is too early to say definitively, but it certainly looks like there will be significant waster/surface impoundment issues). That the Region's plans are to conduct more process based inspections and continue to train CA and their CUPA's to improve their inspection capability.

Here is the 5 year inspection history at those 3 facilities (inspections prior to R9/NEIC):

Valero Benecia (LQG, SQG): 1 state CEI (10/28/13) – no violations found

Hudson Ranch: Zero inspections in previous 5 years. The local CUPA/State did one inspection in June 2013. The data has not been flown into RCRAInfo due to data issues. I think we are close to resolving the data issues.

Shell Martinez (LQG): 4 state CEIs – no violations found, 3 state FCIs – no violations found, 3 State FRRs, 1 found violation(s)

From: Lin, Sharon
Sent: Monday, June 08, 2015 12:47 PM
To: Ripp, Thomas
Subject: Preliminary findings from R9 3 RCRA process based inspections

FYI – enforcement confidential. We will conduct one more refinery inspection by the end of this year.

Jackie will also be consulting on a TSD inspection (Rho Chem) in LA in September.

Sharon Lin, P.E.

U.S. Environmental Protection Agency Region 9

Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2

75 Hawthorne Street

San Francisco, CA 94105

Tel: (415) 972-3446

Email: Lin.Sharon@epa.gov

From: Lin, Sharon
Sent: Thursday, April 23, 2015 2:04 PM
To: McDaniel, Doug
Subject: RE: one more thing

Here is the list. I think there is a theme of the significant violations. I added some details in case the RCRA wonks really wanted details.

sharon

Valero Benicia (May 2014)

•□□□□□□□□ **Treatment and storage hazardous wastes without a permit** (un-permitted unlined surface impoundment; benzene level exceeds TCLP for toxic characteristic waste) – data source: NESHAP Subpart FF monitoring report; violations on multiple days

•□□□□□□□□ **Failure to make a waste determination –** data source: operator's log; Subpart FF Benzene monitoring data

•□□□□□□□□ **Treatment and storage of hazardous wastes without a permit** (heat exchanger bundle cleaning sludge is a RCRA listed wastes; operating the cleaning pad without a permit; cleaning process doesn't meet the conditions for the oil bearing hazardous secondary materials exclusion in the regulations)

•□□□□□□□□ **Failure to minimize unplanned release** (spillage of the listed petroleum refinery wastes throughout the facility)

There will be additional EPCRA TRI violations folded into the penalty calculation.

Hudson Ranch Geothermal Power Plant (Feb. 2015) – preliminary

•□□□□□□□□ **Treatment and storage hazardous waste without a permit** (Horizontal Belt Press Sump exceeded TCLP for lead)

•□□□□□□□□ **Illegal disposal of RCRA wastes**; (lab wastes, spent solvent, mercuric nitrate, lab waste shows TCLP for mercury; still investigating potential underground injection of hazardous wastes into Class V Geothermal UIC well)

•□□□□□□□□ **Failure to make a waste determination** (manifests of D008 wastes)

•□□□□□□□□ **Failure to minimize unplanned release** (spillage of the hazardous wastes at various locations at the facility)

In addition, the State of California personnel joined the EPA team for the process based inspection and provided sampling support. The State cited the facility for additional violations because the state's exemption for Oil , Gas and Geothermal wastes are broader in scope than the federal regulations (the State can regulate more items). The State plans to replicate the process based inspection process at other geothermal power plant LQGs in California.

Shell Martinez Refinery (March 2015) – preliminary

•□□□□□□□□ **Treatment and storage of hazardous wastes without a permit** (lab wastes)

•□□□□□□□□ **Treatment and storage of hazardous wastes without a permit** (Heat exchanger bundle cleaning pad)

•□□□□□□□□ **Failure to make a waste determination** (wastes do not meet conditions for exclusion)

•□□□□□□□□ **Failure to minimize unplanned release** (CO Boiler baghouse dust - listed RCRA wastes)

•□□□□□□□□ **Failure to provide required emergency equipment** (no fire control equipment or fire extinguishers at the 90 day storage areas)

•□□□□□□□□ **Container management issues** (secondary containment; open containers)

The Region 9 Team, along with state and county representatives, plans to return to the facility to sample unlined surface impoundments to determine LDR compliance and to perform a technical review of the tiered permitted hazardous wastes units that were approved by the County.

Sharon Lin, P.E.

U.S. Environmental Protection Agency Region 9

Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2
75 Hawthorne Street

San Francisco, CA 94105

Tel: (415) 972-3446

Email: Lin.Sharon@epa.gov

From: McDaniel, Doug
Sent: Thursday, April 23, 2015 8:02 AM
To: Lin, Sharon
Subject: one more thing

I need for next week:

A list, in short bullets, of what we think are the major violations at each of the three process based inspections.

Thanks for your help

Douglas K. McDaniel

Chief, Waste and Chemical Section

Enforcement Division

U.S. EPA Region 9

(415) 947-4106

To: Lin, Sharon[Lin.Sharon@epa.gov]
Cc: Suhami, Iren[Iren.Suhami@valero.com]; Cuffel, Donald[Don.Cuffel@valero.com]; Bourbon, Elizabeth[Elizabeth.Bourbon@valero.com]; Bluntzer, Megan[Megan.Bluntzer@valero.com]; Pacheco-Mendez, Marisol[Marisol.Pacheco-Mendez@valero.com]; Crowley, Elizabeth[Lisa.Crowley@valero.com]
From: Lazorik, John
Sent: Tue 2/7/2017 5:10:32 PM
Subject: Valero Benicia Refinery-EOL data from February 2017
R1702028.pdf

Hello Sharon,

Pursuant to item 63 of the Consent Agreement and Final Order negotiated between EPA and Valero (RCRA EPA ID No. CAD063001770, TRI ID No. 94510XXNCS3400E), please see attached for end of line (EOL) sampling point EOL-10 data collected on February 3rd and 4th, 2017. This data was received from the contractor laboratory on February 7, 2017.

The self-diversion was a result of a high intensity rain event that began on February 3, 2017.

Please confirm receipt of this email.

Please contact me if you have any questions.

Regards,

John Lazorik

Sr. Staff Environmental Engineer

Valero Benicia Refinery

3400 East Second Street Benicia, CA 94510

Office: 707-745-7660 Fax: 707-745-7339

john.lazorik@valero.com

February 07, 2017

Analytical Report

Client:	**Valero** 3400 East Second St Benicia, CA 94510
Attn:	**Marisol Pacheco-Mendez**

Work Order #:	1702028
Project:	Wastewater
Project #:	[none]
P.O. Number:	4503523772
Project Received:	February 6, 2017 8:50
Project Reported:	February 7, 2017 8:24

Sincerely,

Hossein Khoshkhoo

H. Khoshkhoo, Ph.D.
Laboratory Director / President

WORK ORDER: 1702028

COC Number:

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Summary

Lab ID	Sample	Matrix	Date Sampled	Date Received
1702028-01	Self Diversion to RP	Aqueous	February 3, 2017 6:55	February 6, 2017 8:50
1702028-02	Self Diversion to RP	Aqueous	February 3, 2017 6:55	February 6, 2017 8:50
1702028-03	Self Diversion to RP	Aqueous	February 4, 2017 12:00	February 6, 2017 8:50

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1702028 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results

Sample Date: February 3, 2017 6:55

Sample: **Self Diversion to RP**
1702028-01 (Aqueous) **Sample Type:** Grab **Prep Date:** February 6, 2017 10:08

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
Semi-Volatile Organic Compounds by EPA 625								
Dimethyl Phthalate	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Acenaphthene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Acenaphthylene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Anthracene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Benzidine	20.0		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Benzoic Acid	20.0		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Benzo (a) anthracene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Benzo (b) fluoranthene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Benzo (k) fluoranthene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Benzo (g,h,i) perylene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Benzo (a) pyrene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Benzyl Alcohol	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Bis (2-chloroethoxy) methane	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Bis (2-chloroethyl) Ether	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Bis (2-chloroisopropyl) Ether	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Bis (2-ethylhexy) Phthalate	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
4-Bromophenyl Phenyl Ether	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Butylbenzyl Phthalate	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
4-Chloroaniline	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
2-Chloronaphthalene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
4-Chlorophenyl Phenyl Ether	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Chrysene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Dibenzo (a,h) anthracene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Dibenzofuran	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Di-n-butyl Phthalate	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
1,2-Dichlorobenzene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
1,3-Dichlorobenzene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
1,4-Dichlorobenzene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
3,3'-Dichlorobenzidine	10.0		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Diethyl Phthalate	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
2,4-Dinitrotoluene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1702028 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results
(Continued)

Sample Date: February 3, 2017 6:55

Sample: Self Diversion to RP (Continued)
1702028-01 (Aqueous) **Sample Type:** Grab **Prep Date:** February 6, 2017 10:08

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
Semi-Volatile Organic Compounds by EPA 625 (Continued)								
2,6-Dinitrotoluene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Di-n-octyl Phthalate	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Fluoranthene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Fluorene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Hexachlorobenzene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Hexachlorobutadiene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Hexachlorocyclopentadiene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Hexachloroethane	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Indeno (1,2,3-cd) pyrene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Isophorone	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
2-Methylnaphthalene	5.00		**116**	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Naphthalene	5.00		**122**	ug/L	1	2/6/17	EPA 625	17B0029/ZT
2-Nitroaniline	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
3-Nitroaniline	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
4-Nitroaniline	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Nitrobenzene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
N-Nitrosodiphenylamine	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
N-Nitrosodi-n-propylamine	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Phenanthrene	5.00		**30.8**	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Pyrene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
1,2,4-Trichlorobenzene	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
4-Chloro-3-methylphenol	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
2-Chlorophenol	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
2,4-Dichlorophenol	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
2,4-Dimethylphenol	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
4,6-Dinitro-2-methylphenol	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
2,4-Dinitrophenol	20.0		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
2-Methylphenol	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
4-Methylphenol	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
2-Nitrophenol	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
4-Nitrophenol	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1702028 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results
(Continued)

Sample Date: February 3, 2017 6:55

Sample: Self Diversion to RP (Continued)
1702028-01 (Aqueous) **Sample Type:** Grab **Prep Date:** February 6, 2017 10:08

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
Semi-Volatile Organic Compounds by EPA 625 (Continued)								
Pentachlorophenol	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Phenol	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
2,4,5-Trichlorophenol	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
2,4,6-Trichlorophenol	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
1,2-Diphenylhydrazine	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
N-Nitrosodimethylamine	5.00		ND	ug/L	1	2/6/17	EPA 625	17B0029/ZT
Surrogate: 2-Fluorophenol	23-91		43.6%			2/6/17	EPA 625	17B0029/ZT
Surrogate: Phenol-d6	5-93		30.2%			2/6/17	EPA 625	17B0029/ZT
Surrogate: Nitrobenzene-d5	34-141		108%			2/6/17	EPA 625	17B0029/ZT
Surrogate: 2-Fluorobiphenyl	32-144		73.6%			2/6/17	EPA 625	17B0029/ZT
Surrogate: 2,4,6-Tribromophenol	22-154		67.5%			2/6/17	EPA 625	17B0029/ZT
Surrogate: p-Terphenyl-d14	29-157		69.2%			2/6/17	EPA 625	17B0029/ZT

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1702028 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results
(Continued)

Sample Results

Sample Date: February 3, 2017 6:55

Sample: **Self Diversion to RP**
1702028-02 (Aqueous) **Sample Type:** Grab

Data Analyzed by: MAI
Prep Date: February 6, 2017 0:00

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
E624 (VOCs)								
Benzene	10		**42**	ug/L	20	2/6/17	E624	133764/JEM
Bromodichloromethane	10		ND	ug/L	20	2/6/17	E624	133764/JEM
Bromoform	10		ND	ug/L	20	2/6/17	E624	133764/JEM
Bromomethane	10		ND	ug/L	20	2/6/17	E624	133764/JEM
Carbon tetrachloride	10		ND	ug/L	20	2/6/17	E624	133764/JEM
Chlorobenzene	10		ND	ug/L	20	2/6/17	E624	133764/JEM
Chloroethane	10		ND	ug/L	20	2/6/17	E624	133764/JEM
Chloroform	10		ND	ug/L	20	2/6/17	E624	133764/JEM
Chloromethane	10		ND	ug/L	20	2/6/17	E624	133764/JEM
Dibromochloromethane	10		ND	ug/L	20	2/6/17	E624	133764/JEM
1,2-Dichlorobenzene	10		ND	ug/L	20	2/6/17	E624	133764/JEM
1,3-Dichlorobenzene	10		ND	ug/L	20	2/6/17	E624	133764/JEM
1,4-Dichlorobenzene	10		ND	ug/L	20	2/6/17	E624	133764/JEM
1,1-Dichloroethane	10		ND	ug/L	20	2/6/17	E624	133764/JEM
1,2-Dichloroethane (1,2-DCA)	10		ND	ug/L	20	2/6/17	E624	133764/JEM
1,1-Dichloroethene	10		ND	ug/L	20	2/6/17	E624	133764/JEM
trans-1,2-Dichloroethene	10		ND	ug/L	20	2/6/17	E624	133764/JEM
1,2-Dichloropropane	10		ND	ug/L	20	2/6/17	E624	133764/JEM
cis-1,3-Dichloropropene	10		ND	ug/L	20	2/6/17	E624	133764/JEM
trans-1,3-Dichloropropene	10		ND	ug/L	20	2/6/17	E624	133764/JEM
Ethylbenzene	10		**160**	ug/L	20	2/6/17	E624	133764/JEM
Methyl-t-butyl ether (MTBE)	10		ND	ug/L	20	2/6/17	E624	133764/JEM
Methylene chloride	10		ND	ug/L	20	2/6/17	E624	133764/JEM
Styrene	10		ND	ug/L	20	2/6/17	E624	133764/JEM
1,1,2,2-Tetrachloroethane	10		ND	ug/L	20	2/6/17	E624	133764/JEM
Tetrachloroethene	10		ND	ug/L	20	2/6/17	E624	133764/JEM
Toluene	10		**410**	ug/L	20	2/6/17	E624	133764/JEM
1,1,1-Trichloroethane	10		ND	ug/L	20	2/6/17	E624	133764/JEM
1,1,2-Trichloroethane	10		ND	ug/L	20	2/6/17	E624	133764/JEM

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1702028 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results
(Continued)

Sample Date: February 3, 2017 6:55

Sample: **Self Diversion to RP (Continued)**
1702028-02 (Aqueous) **Sample Type:** Grab

Data Analyzed by: MAI
Prep Date: February 6, 2017 0:00

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
E624 (VOCs) (Continued)								
Trichloroethene	10		ND	ug/L	20	2/6/17	E624	133764/JEM
Trichlorofluoromethane	10		ND	ug/L	20	2/6/17	E624	133764/JEM
Vinyl chloride	10		ND	ug/L	20	2/6/17	E624	133764/JEM
Surrogate: Dibromofluoromethane	70-130		100%			2/6/17	E624	133764/JEM
Surrogate: Toluene-d8	70-130		105%			2/6/17	E624	133764/JEM
Surrogate: 4-BFB	70-130		96%			2/6/17	E624	133764/JEM

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1702028 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results
(Continued)

Sample Date: February 4, 2017 12:00

Sample: **Self Diversion to RP**
1702028-03 (Aqueous) **Sample Type:** Grab

Data Analyzed by: MAI
Prep Date: February 6, 2017 0:00

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
E624 (VOCs)								
Benzene	2.5		**12**	ug/L	5	2/6/17	E624	133764/JEM
Bromodichloromethane	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
Bromoform	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
Bromomethane	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
Carbon tetrachloride	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
Chlorobenzene	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
Chloroethane	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
Chloroform	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
Chloromethane	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
Dibromochloromethane	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
1,2-Dichlorobenzene	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
1,3-Dichlorobenzene	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
1,4-Dichlorobenzene	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
1,1-Dichloroethane	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
1,2-Dichloroethane (1,2-DCA)	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
1,1-Dichloroethene	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
trans-1,2-Dichloroethene	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
1,2-Dichloropropane	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
cis-1,3-Dichloropropene	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
trans-1,3-Dichloropropene	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
Ethylbenzene	2.5		**59**	ug/L	5	2/6/17	E624	133764/JEM
Methyl-t-butyl ether (MTBE)	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
Methylene chloride	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
Styrene	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
1,1,2,2-Tetrachloroethane	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
Tetrachloroethene	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
Toluene	2.5		**120**	ug/L	5	2/6/17	E624	133764/JEM
1,1,1-Trichloroethane	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
1,1,2-Trichloroethane	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
Trichloroethene	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
Trichlorofluoromethane	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1702028 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results
(Continued)

Sample Date: February 4, 2017 12:00

Sample: **Self Diversion to RP (Continued)**
1702028-03 (Aqueous) **Sample Type:** Grab

Data Analyzed by: MAI
Prep Date: February 6, 2017 0:00

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
E624 (VOCs) (Continued)								
Vinyl chloride	2.5		ND	ug/L	5	2/6/17	E624	133764/JEM
Surrogate: Dibromofluoromethane	70-130		84%			2/6/17	E624	133764/JEM
Surrogate: Toluene-d8	70-130		85%			2/6/17	E624	133764/JEM
Surrogate: 4-BFB	70-130		96%			2/6/17	E624	133764/JEM

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1702028 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Quality Control

Semi-Volatile Organic Compounds by EPA 625 **Prepared & Analyzed: Feb-06-17**

Analyte	Source Result	Result	Qual	Reporting Limit	Unit	Spike Level	% REC	%REC Limits	RPD	RPD Limit
Batch: 17B0029										**Analyst:** ZT
Blank (17B0029-BLK1)										
Dimethyl Phthalate		**ND**		5.00	ug/L					
Acenaphthene		**ND**		5.00	ug/L					
Acenaphthylene		**ND**		5.00	ug/L					
Anthracene		**ND**		5.00	ug/L					
Benzidine		**ND**		20.0	ug/L					
Benzoic Acid		**ND**		20.0	ug/L					
Benzo (a) anthracene		**ND**		5.00	ug/L					
Benzo (b) fluoranthene		**ND**		5.00	ug/L					
Benzo (k) fluoranthene		**ND**		5.00	ug/L					
Benzo (g,h,i) perylene		**ND**		5.00	ug/L					
Benzo (a) pyrene		**ND**		5.00	ug/L					
Benzyl Alcohol		**ND**		5.00	ug/L					
Bis (2-chloroethoxy) methane		**ND**		5.00	ug/L					
Bis (2-chloroethyl) Ether		**ND**		5.00	ug/L					
Bis (2-chloroisopropyl) Ether		**ND**		5.00	ug/L					
Bis (2-ethylhexy) Phthalate		**ND**		5.00	ug/L					
4-Bromophenyl Phenyl Ether		**ND**		5.00	ug/L					
Butylbenzyl Phthalate		**ND**		5.00	ug/L					
4-Chloroaniline		**ND**		5.00	ug/L					
2-Chloronaphthalene		**ND**		5.00	ug/L					
4-Chlorophenyl Phenyl Ether		**ND**		5.00	ug/L					
Chrysene		**ND**		5.00	ug/L					
Dibenzo (a,h) anthracene		**ND**		5.00	ug/L					
Dibenzofuran		**ND**		5.00	ug/L					
Di-n-butyl Phthalate		**ND**		5.00	ug/L					
1,2-Dichlorobenzene		**ND**		5.00	ug/L					
1,3-Dichlorobenzene		**ND**		5.00	ug/L					
1,4-Dichlorobenzene		**ND**		5.00	ug/L					
3,3'-Dichlorobenzidine		**ND**		10.0	ug/L					
Diethyl Phthalate		**ND**		5.00	ug/L					
2,4-Dinitrotoluene		**ND**		5.00	ug/L					
2,6-Dinitrotoluene		**ND**		5.00	ug/L					
Di-n-octyl Phthalate		**ND**		5.00	ug/L					
Fluoranthene		**ND**		5.00	ug/L					

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1702028 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Quality Control
(Continued)

Semi-Volatile Organic Compounds by EPA 625 (Continued) **Prepared & Analyzed: Feb-06-17**

Analyte	Source Result	Result	Qual	Reporting Limit	Unit	Spike Level	% REC	%REC Limits	RPD	RPD Limit
Batch: 17B0029 (Continued)										**Analyst:** ZT
Blank (17B0029-BLK1)										
Fluorene		**ND**		5.00	ug/L					
Hexachlorobenzene		**ND**		5.00	ug/L					
Hexachlorobutadiene		**ND**		5.00	ug/L					
Hexachlorocyclopentadiene		**ND**		5.00	ug/L					
Hexachloroethane		**ND**		5.00	ug/L					
Indeno (1,2,3-cd) pyrene		**ND**		5.00	ug/L					
Isophorone		**ND**		5.00	ug/L					
2-Methylnaphthalene		**ND**		5.00	ug/L					
Naphthalene		**ND**		5.00	ug/L					
2-Nitroaniline		**ND**		5.00	ug/L					
3-Nitroaniline		**ND**		5.00	ug/L					
4-Nitroaniline		**ND**		5.00	ug/L					
Nitrobenzene		**ND**		5.00	ug/L					
N-Nitrosodiphenylamine		**ND**		5.00	ug/L					
N-Nitrosodi-n-propylamine		**ND**		5.00	ug/L					
Phenanthrene		**ND**		5.00	ug/L					
Pyrene		**ND**		5.00	ug/L					
1,2,4-Trichlorobenzene		**ND**		5.00	ug/L					
4-Chloro-3-methylphenol		**ND**		5.00	ug/L					
2-Chlorophenol		**ND**		5.00	ug/L					
2,4-Dichlorophenol		**ND**		5.00	ug/L					
2,4-Dimethylphenol		**ND**		5.00	ug/L					
4,6-Dinitro-2-methylphenol		**ND**		5.00	ug/L					
2,4-Dinitrophenol		**ND**		20.0	ug/L					
2-Methylphenol		**ND**		5.00	ug/L					
4-Methylphenol		**ND**		5.00	ug/L					
2-Nitrophenol		**ND**		5.00	ug/L					
4-Nitrophenol		**ND**		5.00	ug/L					
Pentachlorophenol		**ND**		5.00	ug/L					
Phenol		**ND**		5.00	ug/L					
2,4,5-Trichlorophenol		**ND**		5.00	ug/L					
2,4,6-Trichlorophenol		**ND**		5.00	ug/L					
1,2-Diphenylhydrazine		**ND**		5.00	ug/L					
N-Nitrosodimethylamine		**ND**		5.00	ug/L					

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1702028 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Quality Control
(Continued)

Semi-Volatile Organic Compounds by EPA 625 (Continued) **Prepared & Analyzed: Feb-06-17**

Analyte	Source Result	Result	Qual	Reporting Limit	Unit	Spike Level	% REC	%REC Limits	RPD	RPD Limit
Batch: 17B0029 (Continued)										**Analyst:** ZT
Blank (17B0029-BLK1)										
Surrogate: 2-Fluorophenol		159			ug/L	200	79.5	23-91		
Surrogate: Phenol-d6		166			ug/L	200	83.0	5-93		
Surrogate: Nitrobenzene-d5		111			ug/L	100	111	34-141		
Surrogate: 2-Fluorobiphenyl		109			ug/L	100	109	32-144		
Surrogate: 2,4,6-Tribromophenol		169			ug/L	200	84.5	22-154		
Surrogate: p-Terphenyl-d14		91.8			ug/L	100	91.8	29-157		
LCS (17B0029-BS1)										
Acenaphthene		**35.2**		5.00	ug/L	50.0	70.4	31-123		
1,4-Dichlorobenzene		**41.8**		5.00	ug/L	50.0	83.6	27-113		
2,4-Dinitrotoluene		**43.8**		5.00	ug/L	50.0	87.6	34-128		
N-Nitrosodi-n-propylamine		**47.3**		5.00	ug/L	50.0	94.6	30-139		
Pyrene		**34.3**		5.00	ug/L	50.0	68.6	27-136		
1,2,4-Trichlorobenzene		**43.5**		5.00	ug/L	50.0	87.0	29-105		
4-Chloro-3-methylphenol		**37.2**		5.00	ug/L	50.0	74.4	28-125		
2-Chlorophenol		**35.9**		5.00	ug/L	50.0	71.8	29-104		
4-Nitrophenol		**23.8**		5.00	ug/L	50.0	47.6	0-112		
Pentachlorophenol		**33.7**		5.00	ug/L	50.0	67.4	0-165		
Phenol		**37.3**		5.00	ug/L	50.0	74.6	0.4-70		
Surrogate: 2-Fluorophenol		182			ug/L	200	91.0	23-92		
Surrogate: Phenol-d6		178			ug/L	200	89.0	5-93		
Surrogate: Nitrobenzene-d5		108			ug/L	100	108	34-141		
Surrogate: 2-Fluorobiphenyl		109			ug/L	100	109	32-144		
Surrogate: 2,4,6-Tribromophenol		186			ug/L	200	93.0	22-154		
Surrogate: p-Terphenyl-d14		117			ug/L	100	117	29-157		
LCS Dup (17B0029-BSD1)										
Acenaphthene		**ND**		5.00	ug/L	50.0		31-123		20
1,4-Dichlorobenzene		**ND**		5.00	ug/L	50.0		27-113		20
2,4-Dinitrotoluene		**ND**		5.00	ug/L	50.0		34-128		20
N-Nitrosodi-n-propylamine		**ND**		5.00	ug/L	50.0		30-139		20
Pyrene		**ND**		5.00	ug/L	50.0		27-136		20
1,2,4-Trichlorobenzene		**ND**		5.00	ug/L	50.0		29-105		20
4-Chloro-3-methylphenol		**ND**		5.00	ug/L	50.0		28-125		20

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1702028 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Quality Control
(Continued)

Semi-Volatile Organic Compounds by EPA 625 (Continued)

Prepared & Analyzed: Feb-06-17

Analyte	Source Result	Result	Qual	Reporting Limit	Unit	Spike Level	% REC	%REC Limits	RPD	RPD Limit
Batch: 17B0029 (Continued)										**Analyst:** ZT
LCS Dup (17B0029-BSD1)										
2-Chlorophenol		**ND**		5.00	ug/L	50.0		29-104		20
4-Nitrophenol		**ND**		5.00	ug/L	50.0		0-112		20
Pentachlorophenol		**ND**		5.00	ug/L	50.0		0-165		20
Phenol		**ND**		5.00	ug/L	50.0		0.4-70		20
Surrogate: 2-Fluorophenol		0.00			ug/L	200		23-92		
Surrogate: Phenol-d6		0.00			ug/L	200		5-93		
Surrogate: Nitrobenzene-d5		0.00			ug/L	100		34-141		
Surrogate: 2-Fluorobiphenyl		0.00			ug/L	100		32-144		
Surrogate: 2,4,6-Tribromophenol		0.00			ug/L	200		22-154		
Surrogate: p-Terphenyl-d14		0.00			ug/L	100		29-157		

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1702028 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Quality Control
(Continued)

E624 (VOCs) **Prepared & Analyzed: Feb-06-17**

Analyte	Source Result	Result	Qual	Reporting Limit	Unit	Spike Level	% REC	%REC Limits	RPD	RPD Limit
Batch: 133764										**Analyst:** AK
LCS (LCS-133764)										
Benzene		**18.4**		0.5	ug/L	20	92	37-151		
Bromodichloromethane		**19.5**		0.5	ug/L	20	97	35-155		
Bromoform		**18**		0.5	ug/L	20	90	45-169		
Bromomethane		**16.9**		0.5	ug/L	20	85	1-242		
Carbon tetrachloride		**19.8**		0.5	ug/L	20	99	70-140		
Chlorobenzene		**18.8**		0.5	ug/L	20	94	37-160		
Chloroethane		**16.5**		0.5	ug/L	20	83	14-230		
Chloroform		**18.7**		0.5	ug/L	20	93	51-138		
Chloromethane		**15.2**		0.5	ug/L	20	76	1-273		
Dibromochloromethane		**17.7**		0.5	ug/L	20	89	53-149		
1,2-Dichlorobenzene		**17.8**		0.5	ug/L	20	89	18-190		
1,3-Dichlorobenzene		**20.3**		0.5	ug/L	20	101	59-156		
1,4-Dichlorobenzene		**19.2**		0.5	ug/L	20	96	18-190		
1,1-Dichloroethane		**18.7**		0.5	ug/L	20	93	70-130		
1,2-Dichloroethane (1,2-DCA)		**18**		0.5	ug/L	20	90	49-155		
1,1-Dichloroethene		**19.3**		0.5	ug/L	20	96	1-234		
trans-1,2-Dichloroethene		**19.7**		0.5	ug/L	20	98	54-156		
1,2-Dichloropropane		**18.5**		0.5	ug/L	20	93	1-210		
cis-1,3-Dichloropropene		**18.1**		0.5	ug/L	20	91	1-227		
trans-1,3-Dichloropropene		**17.7**		0.5	ug/L	20	89	17-183		
Ethylbenzene		**18.3**		0.5	ug/L	20	92	37-162		
Methyl-t-butyl ether (MTBE)		**18.6**		0.5	ug/L	20	93	70-130		
Methylene chloride		**14.4**		0.5	ug/L	20	72	1-221		
Styrene		**19.6**		0.5	ug/L	20	98	70-130		
1,1,2,2-Tetrachloroethane		**16.9**		0.5	ug/L	20	85	46-157		
Tetrachloroethene		**20.8**		0.5	ug/L	20	104	64-148		
Toluene		**19.2**		0.5	ug/L	20	96	47-150		
1,1,1-Trichloroethane		**19.5**		0.5	ug/L	20	98	52-162		
1,1,2-Trichloroethane		**18.4**		0.5	ug/L	20	92	52-150		
Trichloroethene		**19.3**		0.5	ug/L	20	97	71-157		
Trichlorofluoromethane		**18.2**		0.5	ug/L	20	91	17-181		
Vinyl chloride		**15.4**		0.5	ug/L	20	77	1-251		
Surrogate: Dibromofluoromethane		23.9			ug/L	25	96	70-130		

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1702028 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Quality Control
(Continued)

E624 (VOCs) (Continued)

Prepared & Analyzed: Feb-06-17

Batch: 133764 (Continued) **Analyst:** AK

Analyte	Source Result	Result	Qual	Reporting Limit	Unit	Spike Level	% REC	%REC Limits	RPD	RPD Limit
LCS (LCS-133764)										
Surrogate: Toluene-d8		23.6			ug/L	25	94	70-130		
Surrogate: 4-BFB		2.52			ug/L	2.5	101	70-130		
LCSD (LCSD-133764)										
Benzene		**18.5**		0.5	ug/L	20	92	37-151	0	20
Bromodichloromethane		**19.5**		0.5	ug/L	20	98	35-155	0.384	20
Bromoform		**17.8**		0.5	ug/L	20	89	45-169	1.52	20
Bromomethane		**16.1**		0.5	ug/L	20	80	1-242	5.03	20
Carbon tetrachloride		**19.8**		0.5	ug/L	20	99	70-140	0	20
Chlorobenzene		**18.7**		0.5	ug/L	20	93	37-160	0.676	20
Chloroethane		**15.3**		0.5	ug/L	20	76	14-230	7.87	20
Chloroform		**18.8**		0.5	ug/L	20	94	51-138	0.514	20
Chloromethane		**15.3**		0.5	ug/L	20	76	1-273	0	20
Dibromochloromethane		**17.6**		0.5	ug/L	20	88	53-149	0.438	20
1,2-Dichlorobenzene		**18**		0.5	ug/L	20	90	18-190	1.11	20
1,3-Dichlorobenzene		**20.3**		0.5	ug/L	20	102	59-156	0.0861	20
1,4-Dichlorobenzene		**19.4**		0.5	ug/L	20	97	18-190	1.1	20
1,1-Dichloroethane		**18.8**		0.5	ug/L	20	94	70-130	0.761	20
1,2-Dichloroethane (1,2-DCA)		**18.6**		0.5	ug/L	20	93	49-155	3.12	20
1,1-Dichloroethene		**19.2**		0.5	ug/L	20	96	1-234	0	20
trans-1,2-Dichloroethene		**19.7**		0.5	ug/L	20	98	54-156	0	20
1,2-Dichloropropane		**18.8**		0.5	ug/L	20	94	1-210	1.4	20
cis-1,3-Dichloropropene		**18**		0.5	ug/L	20	90	1-227	0.861	20
trans-1,3-Dichloropropene		**17.6**		0.5	ug/L	20	88	17-183	0.82	20
Ethylbenzene		**18.3**		0.5	ug/L	20	92	37-162	0	20
Methyl-t-butyl ether (MTBE)		**18.9**		0.5	ug/L	20	94	70-130	1.38	20
Methylene chloride		**14.4**		0.5	ug/L	20	72	1-221	0	20
Styrene		**19.1**		0.5	ug/L	20	95	70-130	2.59	20
1,1,2,2-Tetrachloroethane		**17.4**		0.5	ug/L	20	87	46-157	2.67	20
Tetrachloroethene		**20.6**		0.5	ug/L	20	103	64-148	1.01	20
Toluene		**19.2**		0.5	ug/L	20	96	47-150	0	20
1,1,1-Trichloroethane		**19.6**		0.5	ug/L	20	98	52-162	0	20
1,1,2-Trichloroethane		**18.2**		0.5	ug/L	20	91	52-150	1.14	20
Trichloroethene		**19.4**		0.5	ug/L	20	97	71-157	0	20

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1702028 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Quality Control
(Continued)

E624 (VOCs) (Continued) **Prepared & Analyzed: Feb-06-17**

Analyte	Source Result	Result	Qual	Reporting Limit	Unit	Spike Level	% REC	%REC Limits	RPD	RPD Limit
Batch: 133764 (Continued)										**Analyst:** AK
LCSD (LCSD-133764)										
Trichlorofluoromethane		**18.2**		0.5	ug/L	20	91	17-181	0	20
Vinyl chloride		**15.1**		0.5	ug/L	20	76	1-251	1.64	20
Surrogate: Dibromofluoromethane		24			ug/L	25	96	70-130		
Surrogate: Toluene-d8		23.5			ug/L	25	94	70-130		
Surrogate: 4-BFB		2.55			ug/L	2.5	102	70-130		
MBLK (MB-133764)										
Benzene		**ND**		0.5	ug/L			-		
Bromodichloromethane		**ND**		0.5	ug/L			-		
Bromoform		**ND**		0.5	ug/L			-		
Bromomethane		**ND**		0.5	ug/L			-		
Carbon tetrachloride		**ND**		0.5	ug/L			-		
Chlorobenzene		**ND**		0.5	ug/L			-		
Chloroethane		**ND**		0.5	ug/L			-		
Chloroform		**ND**		0.5	ug/L			-		
Chloromethane		**ND**		0.5	ug/L			-		
Dibromochloromethane		**ND**		0.5	ug/L			-		
1,2-Dichlorobenzene		**ND**		0.5	ug/L			-		
1,3-Dichlorobenzene		**ND**		0.5	ug/L			-		
1,4-Dichlorobenzene		**ND**		0.5	ug/L			-		
1,1-Dichloroethane		**ND**		0.5	ug/L			-		
1,2-Dichloroethane (1,2-DCA)		**ND**		0.5	ug/L			-		
1,1-Dichloroethene		**ND**		0.5	ug/L			-		
trans-1,2-Dichloroethene		**ND**		0.5	ug/L			-		
1,2-Dichloropropane		**ND**		0.5	ug/L			-		
cis-1,3-Dichloropropene		**ND**		0.5	ug/L			-		
trans-1,3-Dichloropropene		**ND**		0.5	ug/L			-		
Ethylbenzene		**ND**		0.5	ug/L			-		
Methyl-t-butyl ether (MTBE)		**ND**		0.5	ug/L			-		
Methylene chloride		**ND**		0.5	ug/L			-		
Styrene		**ND**		0.5	ug/L			-		
1,1,2,2-Tetrachloroethane		**ND**		0.5	ug/L			-		
Tetrachloroethene		**ND**		0.5	ug/L			-		
Toluene		**ND**		0.5	ug/L			-		

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1702028 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Quality Control
(Continued)

E624 (VOCs) (Continued) **Prepared & Analyzed: Feb-06-17**

Analyte	Source Result	Result	Qual	Reporting Limit	Unit	Spike Level	% REC	%REC Limits	RPD	RPD Limit
Batch: 133764 (Continued)										**Analyst:** AK
MBLK (MB-133764)										
1,1,1-Trichloroethane		**ND**		0.5	ug/L			-		
1,1,2-Trichloroethane		**ND**		0.5	ug/L			-		
Trichloroethene		**ND**		0.5	ug/L			-		
Trichlorofluoromethane		**ND**		0.5	ug/L			-		
Vinyl chloride		**ND**		0.5	ug/L			-		
Surrogate: Dibromofluoromethane		23.7			ug/L	25	95	70-130		
Surrogate: Toluene-d8		23.6			ug/L	25	94	70-130		
Surrogate: 4-BFB		2.49			ug/L	2.5	100	70-130		

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1702028 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Notes and Definitions

Item	Definition
Dry	Sample results reported on a dry weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.
%REC	Percent Recovery
DF	Dilution Factor
LCS	Lab Control Sample
LCSD	Lab Control Sample Duplicate
MDL	Minimum Detection Limit
MRL	Minimum Reporting Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated
J	Results > MDL but < MRL

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

ED_001593_00015464

Valero Benicia Refinery
Bioassay Laboratory

Sample Destination: Delta

Date: 6-Feb-17

Report Results To: Marisol.Pacheco-Mendez@Valero.com

Phone: 745-7573

1702028

PO# Delta Benzene - 4503805062-10

Sample Notes or Special Instructions

#	Sample ID	Turn Around	Sample Size	# of Samples	Date	Time	GRAB COMP	Preserve	Temp.	Total Se 200.7	Oil & Grease EPA 1664	NH3 as N SM 4500 -NH3	CA 17 Metals EPA 200.7	Chronic *Mysidopsis bahia*	Benzene 8020	EOL Benzene (EPA 6260)	TOC - SM5310		EPA 624	EPA 625			
										Testing Requested													
1	Self Diversion to RP	ASAP	1L	2	3-Feb	6:55 AM	G	None	4.0											X			
2	Self Diversion to RP	ASAP	VOA	2	3-Feb	6:55 AM	G	HCl	4.0										X				
3	Self Diversion to RP	ASAP	VOA	2	4-Feb	12:00 AM	G	HCl	4.0										X				
4																							
5																							
6																							
7																							
8																							
9																							
10																							

Samples Prepared By: [signature] 2/6/17 0830 D. Johnston
Date/Time Print Name

Relinquished By: [signature] 2/6/17 0850 Received By: Chelsea Feeney @0850 2/6/17
Date/Time

Self Diversi 3-17 RUSH

To: Lin, Sharon[Lin.Sharon@epa.gov]
From: Frazer, Russell
Sent: Wed 7/22/2015 5:29:25 PM
Subject: SBREFA/Show Cause letter - Valero refinery
SBREFA ValeroRefinery.doc

Here is the TRI letter …

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
RECEIPT NO: 7013 1090 0000 1618 3431

Christopher W. Howe
Director – Health, Safety, Environmental
Valero Refining Company
3400 East Second Street
Benicia, California 94510-1005

chris.howe@valero.com
donald.cuffel@valero.com

Re: Alleged Violations of the Emergency Planning and Community Right-to Know Act

Dear Mr. Howe:

This letter is to notify you that the U.S. Environmental Protection Agency ("the EPA" or "the Agency") is prepared to issue a civil administrative complaint against Valero Refining Company pursuant to Section 325(c) of the Emergency Planning and Community Right-to-Know Act ("EPCRA"), 42 U.S.C. § 11045(c). The proposed enforcement action relates to alleged violations of Section 313 of EPCRA, 42 U.S.C. § 11023, at the Valero Benicia Refining facility located at 3400 East Second Street in Benicia, California.

Specifically, EPA alleges that Valero Refining Company violated EPCRA Section 313 by failing to submit timely, complete and correct Toxic Chemical Release Inventory Forms ("Form R reports") for:

- Benzene in reporting years ("RY") 2010, 2011 and 2012;
- Ethylbenzene in RY2012;
- Ethylene in RY2010 and RY2011;
- Toluene in RY2010, RY2011 and RY2012; and
- Xylene (mixed isomers) in RY2010, RY2011 and RY2012.

EPA collected the documents and information evidencing these alleged violations during an inspection of your facility in May 2014. EPA is still investigating potential violations pursuant to other environmental statutes, including the Resource Conservation and Recovery Act.

EPA is extending to you the opportunity to advise the Agency of any factors you believe the Agency should consider prior to filing a civil administrative complaint for the EPCRA violations. Relevant

factors may include any evidence of reliance on compliance assistance provided by the Agency, misidentification of the proper party, or financial factors bearing on your ability to pay a civil penalty.

Even if you are unaware of any mitigating or exculpatory factors, we are extending to you the opportunity to commence settlement discussions concerning the above-described violations. If you are interested in commencing settlement negotiations, please contact Russ Frazer at (415) 947-4220 or have your attorney contact Rebecca Sugerman of the Office of Regional Counsel at (415) 972-3893
In addition, please review the attached Small Business Regulatory Enforcement and Fairness Act ("SBREFA") Information Sheet that is designed to provide information on compliance assistance, as well as to inform small businesses of their rights to comment to the SBREFA Ombudsman concerning EPA enforcement activities. Be aware that SBREFA does not eliminate your responsibility to respond to a complaint, information request, or other enforcement activity within the allowed time nor does it create any new rights or defenses under the law.

Also, we are providing information about the EPA Supplemental Environmental Projects ("SEP") Policy in the event that you are interested in performing a SEP as part of a settlement. A SEP is an environmentally beneficial project that a violator voluntarily agrees to perform as part of an enforcement settlement in addition to actions required to correct the violations. A SEP provides benefits that could not be otherwise obtained as injunctive relief or mitigation. In return, EPA agrees to reduce the monetary penalty that might otherwise apply as a result of the violations. An overview of the requirements for a SEP, plus EPA's full SEP policy, can be found at http://www2.epa.gov/enforcement/supplemental-environmental-projects-seps. Let us know if you would like us to provide to you EPA's full SEP policy or a brochure describing the SEP policy.

If Valero Refining Company has any relevant information to bring to the Agency's attention prior to EPA's filing of a civil administrative penalty complaint, please provide it within **twenty-eight (28) calendar days after this letter is received**. EPA intends to begin the process of filing a civil administrative complaint twenty-eight calendar days after this letter is received unless you first advise us of substantial reasons not to proceed as planned.

Thank you for your prompt attention to this matter. If you wish to discuss this matter or commence settlement negotiations, please contact Russ Frazer at (415) 947-4220 or have your attorney contact Rebecca Sugerman of the Office of Regional Counsel at (415) 972-3893.

Sincerely,

JOEL JONES
Assistant Director, Air, Waste & Toxics Branch
Enforcement Division
U.S. Environmental Protection Agency, Region IX

cc: Donald W. Cuffel, Manager Environmental Engineering, Valero Benicia Refinery

Enclosure

To: Lin, Sharon[Lin.Sharon@epa.gov]
Cc: Yang, Teng@DTSC[Teng.Yang@dtsc.ca.gov]; Agarwal, Mukul@DTSC[Mukul.Agarwal@dtsc.ca.gov]; Kou, Roberto@DTSC[Roberto.Kou@dtsc.ca.gov]
From: Wu, Brian@DTSC
Sent: Thur 11/17/2016 7:03:08 PM
Subject: RE: Notification RCRA Compliance Evaluation Inspection - PBF Energy, Torrance Refining Company, LLC, CAD08354052

Hi Sharon, all files of Torrance Refining Company (PBF Energy) are located in our Clovis office. I tried to contact them to get the information you need. However, the entire enforcement unit from Clovis office was out for a sampling event. But Teng Andy Yang (559-297-3960) will help you to get the information once he get back from the field next week.

The Corrective Action is handled by Water Board, and I don't have any additional information then you have. Currently, David A. Dumais, Deputy Fire Chief, City of Torrance Fire Dept. (310-781-7040) is investigating the Refinery fire. He might have the Tier Permitting information from the CUPA. Thanks,

Brian Wu

818-717-6696

From: Lin, Sharon [mailto:Lin.Sharon@epa.gov]
Sent: Wednesday, November 16, 2016 3:43 PM
To: Soria, Maria@DTSC <Maria.Soria@dtsc.ca.gov>; Schofield, John <Schofield.John@epa.gov>
Cc: Bellamy, Kandice <Bellamy.Kandice@epa.gov>; Lynch, Philip@DTSC <Philip.Lynch@dtsc.ca.gov>; Wu, Brian@DTSC <Brian.Wu@dtsc.ca.gov>; Kou, Roberto@DTSC <Roberto.Kou@dtsc.ca.gov>; Agarwal, Mukul@DTSC <Mukul.Agarwal@dtsc.ca.gov>
Subject: RE: Notification RCRA Compliance Evaluation Inspection - PBF Energy, Torrance Refining Company, LLC, CAD08354052

Hi, Brian,

We look forward to working with you. The facility history description on the EnviroStor website suggests that various units at the facility are covered under the tiered permitting. I couldn't locate the tiered permitting documents in CERS. Hopefully you folks have it.

Also, if you have a point contact for the corrective action for this facility, that would be great too. Thanks!

Sharon

From: Soria, Maria@DTSC [mailto:Maria.Soria@dtsc.ca.gov]
Sent: Wednesday, November 16, 2016 2:49 PM
To: Schofield, John <Schofield.John@epa.gov>
Cc: Lin, Sharon <Lin.Sharon@epa.gov>; Bellamy, Kandice <Bellamy.Kandice@epa.gov>; Lynch, Philip@DTSC <Philip.Lynch@dtsc.ca.gov>; Wu, Brian@DTSC <Brian.Wu@dtsc.ca.gov>; Kou, Roberto@DTSC <Roberto.Kou@dtsc.ca.gov>; Agarwal, Mukul@DTSC <Mukul.Agarwal@dtsc.ca.gov>
Subject: RE: Notification RCRA Compliance Evaluation Inspection - PBF Energy, Torrance Refining Company, LLC, CAD08354052

Hi John, Sharon and Kandice. The DTSC staff person assigned to accompany USEPA is Brian Wu from the DTSC Chatsworth office.

Brian, please follow up with Sharon as requested below. You can coordinate with Dan Lynch on files that may reside in the Clovis office if needed. Thank you.

From: Schofield, John [mailto:Schofield.John@epa.gov]
Sent: Wednesday, November 16, 2016 2:31 PM
To: Soria, Maria@DTSC
Cc: Lin, Sharon; Bellamy, Kandice
Subject: Notification RCRA Compliance Evaluation Inspection - PBF Energy, Torrance Refining Company, LLC, CAD08354052

Maria,

This is a follow-up to this afternoon's call. EPA will be conducting a CEI of the reference facility December 5-8, 2016. As stated in our telephone conversation EPA is requesting DTSC to also participate in the inspection. The EPA Inspection Team will be Kandice Bellamy (415-972-3304) and Sharon Lin (415-972-3346). Sharon is the inspection lead.

The general plan is to arrive at the facility the afternoon of December 5th to start the document/information gathering process. The next two full days will be the site inspection which will include evaluation of the facility processes to determine if these processes generated listed and/or characteristic HW (and how the HWs are managed).

In preparing for the inspection, the EPA Inspection Team is developing a list of documents EPA would like to see if DTSC had on hand that could be shared with Region 9 prior to the inspection.

Once a DTSC staff person(s) has been assigned, please have the person(s) contact Sharon to begin sharing information and coordinating the inspection schedule.

EPA looks forward to working with DTSC on this inspection.

regards,

John

****
John Schofield
U. S. Environmental Protection Agency
Region 9
Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2
75 Hawthorne Street
San Francisco, CA 94105
(415) 972-3386
(415) 947-3530 (fax)
schofield.john@epa.gov
****

NOTE: This email, including any attachments, may contain material that is confidential, privileged and/or attorney work product and is for the sole use of the intended recipient. Any review, reliance or distribution by others or forwarding without expressed permission is strictly prohibited. If you are not the intended recipient, please contact the sender and delete all copies.

To: Lin, Sharon[Lin.Sharon@epa.gov]; Schofield, John[Schofield.John@epa.gov]; Larry.Ramirez@dtsc.ca.gov[Larry.Ramirez@dtsc.ca.gov]; Melissa.Hagen@hsd.cccounty.us[Melissa.Hagen@hsd.cccounty.us]
Cc: michael.monson@shell.com[michael.monson@shell.com]; Natalie.Braden@shell.com[Natalie.Braden@shell.com]
From: michael.monson@shell.com
Sent: Wed 4/15/2015 11:09:01 PM
Subject: Recovered Oil Processing
NTF_20150409_Recovered Oil Processing.docx

The attached describes the reason that the Recovered Oil Processing system does not require a Tiered Permit. Please feel free to forward any follow-up questions.

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

Shell Oil Products US

Martinez Refinery
PO Box 711
Martinez, CA 94553-0071
Tel (925) 313-3000
Fax (925) 313-3065

April 9, 2015

NOTE TO FILE: Recovered Oil Processing
Excluded Recyclable Material

By: Michael Monson

The Recovered Oil Processing unit (see Figure 1) is used to recycle oil-bearing hazardous secondary material (HSM) that is generated in the Brine De-oiling Unit (part of the Crude Unit). After leaving the BDU, the oil-bearing HSM is temporarily stored in Tank 15096 (necessary since the Desalters operate continuously, and the Recovered Oil unit is operated in a batch mode). At the storage tank, a demulsifying agent is added to aid the separation; an acid (for pH control) and an H_2S scavenger is also added as needed. The material is then separated into three phases by a centrifuge: an aqueous phase (which is further processed in the Effluent Treatment Plant), the oil phase (which is sent to the crude mix tank prior to being fed to the Crude Unit), and the solid residuals (which are a hazardous waste). A thermal oxidizer acts as an air pollution control device for the unit.

The oil-bearing hazardous secondary material from the BDU is explicitly excluded from the requirements of the California Hazardous Waste Regulations by the Health and Safety Code §25144(c) (exclusion for oil reintroduced into petroleum refining processes):

§25144 (c) To the extent consistent with the applicable provisions of the federal

act, units, including associated piping, that are part of a system used for the recovery of oil from oil-bearing materials, and the associated storage of oil-bearing materials and the recovered oil, are exempt from this chapter, if all of the following conditions are met:

(1) The oil recovery operations are conducted at a petroleum refinery, or at another facility
owned or operated by the corporate entity that owns or operates the refinery, or a corporate parent or subsidiary of the corporate entity.

(2) The oil-bearing materials are generated at the refinery or at another facility owned or
operated by the corporate entity that owns or operates the refinery, or a corporate parent or subsidiary, including a sister subsidiary, of the corporate entity, or are generated in the course of oil or gas exploration or production operations conducted by an unrelated entity and placed in a common pipeline.

(3) The recovered oil is inserted into petroleum refinery process units to produce fuel or other refined petroleum products. This paragraph does not allow the direct blending, into final petroleum products, of oil-bearing materials or recovered oil that contain constituents that render these materials hazardous under the regulations adopted pursuant to Sections 25140 and 25141, other than those for which the material is being recycled.

(4) The recovered oil is not stored in a surface impoundment or accumulated speculatively at
the refinery or at an offsite facility.

(5) Any residual materials removed from a unit that is exempt under this subdivision are managed in accordance with all other applicable laws.

(6) The oil-bearing materials would be excluded from classification as a waste pursuant to,
or would otherwise meet the requirements for an exemption under, Section 25143.2, except that the following provisions do not apply to those oil-bearing materials:

(A) The prohibitions against prior reclamation in paragraphs (1), (2), and (3) of subdivision
(b) of Section 25143.2.

(B) Subparagraph (C) of paragraph (2) of subdivision (c) of Section 25143.2.

(C) Paragraph (3) of subdivision (e) of Section 25143.2.

(D) Sections 25143.9 and 25143.10.

Additonally, oil-bearing hazardous secondary materials are excluded from the federal definition of solid waste by 40 CFR §261.4(a)(12):

> §261.4 Exclusions
>
> (a) *Materials that are not solids wastes*. The following materials are not solid wastes for the purpose of this part:
>
> (12)(i) Oil-bearing hazardous secondary materials (i.e., sludges, byproducts, or spent materials) that are generated at a petroleum refinery (SIC code 2911)…

Since the oil-bearing HSM is excluded from the definition of hazardous waste, the treatment of the oil-bearing HSM is not subject to the requirements of the Hazardous Waste Regulations.

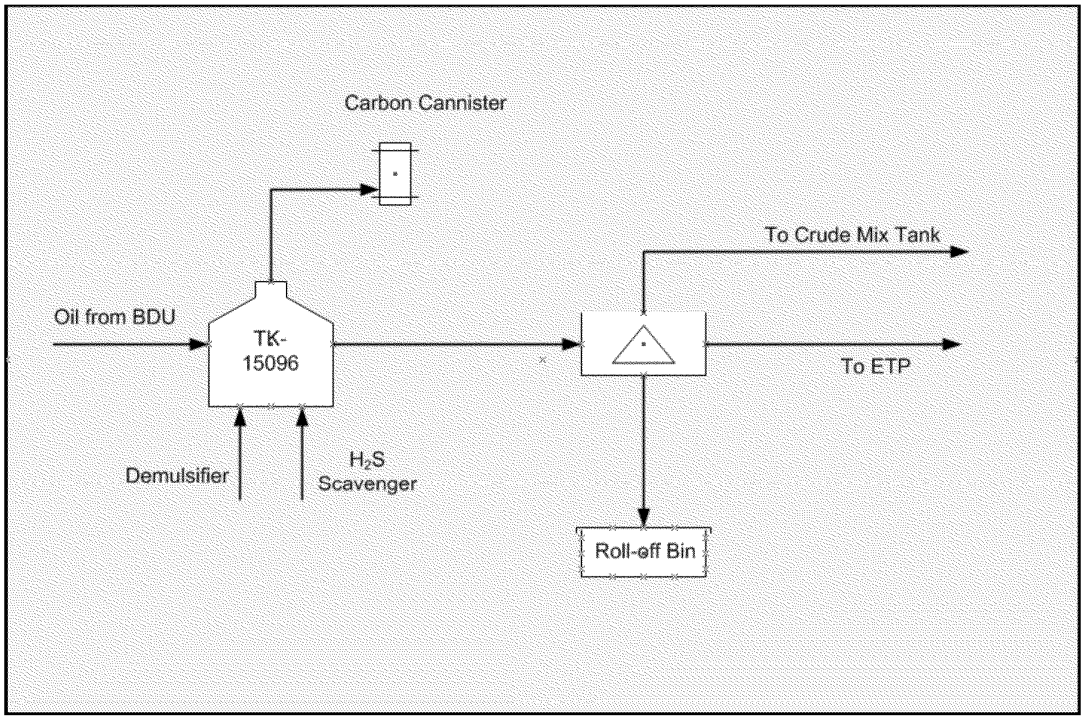

Carbon Cannister
To Crude Mix Tank
Oil from BDU
TK-
15096
To ETP
Demulsifier
H_2S
Scavenger
Roll-off Bin

Figure 1

To: Koch, Lori@DTSC[Lori.Koch@dtsc.ca.gov]
Cc: Lin, Sharon[Lin.Sharon@epa.gov]; Soria, Maria@DTSC[Maria.Soria@dtsc.ca.gov]
From: Schofield, John
Sent: Thur 4/14/2016 5:36:08 PM
Subject: FW: Shell Martinez Refinery - ETP-1 closure package

Lori,

EPA is completing its compliance investigation resulting from a joint EPA Region 9 and DTSC inspection of Shell-Martinez last March 2015. Sharon Lin is the lead inspector/enforcement officer assigned to this case. We are trying to finish our investigation report. One of the issues identified during our investigation is possible benzene releases associated with the ETP-1, in ground biotreater. DTSC approved the delayed closure of this unit in 2003. Region 9 would like to review the Shell Martinez submission package that DTSC reviewed when granting the delayed closure request.

Sharon made a request to Waqar earlier this month. We have not received a response to our earlier request (see below). Our attorney assigned to the case is anxious for Sharon to review the file. Sharon is available anytime to come by your offices to review the files.

Thank you in advance for your help with scheduling the review.

regards,

John

****

John Schofield
U. S. Environmental Protection Agency
Region 9
Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2
75 Hawthorne Street
San Francisco, CA 94105
(415) 972-3386

(415) 947-3530 (fax)
schofield.john@epa.gov
****

NOTE: This email, including any attachments, may contain material that is confidential, privileged and/or attorney work product and is for the sole use of the intended recipient. Any review, reliance or distribution by others or forwarding without expressed permission is strictly prohibited. If you are not the intended recipient, please contact the sender and delete all copies.

From: Lin, Sharon
Sent: Wednesday, April 06, 2016 12:18 PM
To: 'Ahmad, Waqar@DTSC' <Waqar.Ahmad@dtsc.ca.gov>
Subject: Shell Martinez Refinery - ETP-1 closure package

Hi, Waqar,

I am interested in finding more information on the ETP-1 closure. Perhaps if you have the delayed closure request package from the facility, I could come by your office to review it if it is more convenient. Please advise. Thanks.

Sharon

To: Lin, Sharon[Lin.Sharon@epa.gov]
From: Doyle, John M
Sent: Thur 4/27/2017 9:49:05 PM
Subject: Inspection follow-up: Impound Spills
Chevron El Segundo Refinery Impound Spills 2012-2017.xlsx

Sharon,

As requested last week during your visit to the El Segundo Refinery, I am attaching a spreadsheet which summarizes the spills to impounds from 2012-2017. Please let me know if you have any questions.

Also, please note I am still pulling together information regarding the #8 Junction area. Otherwise, all other follow-up materials have been sent out.

Sincerely,

John M. Doyle

Waste & Water Supervisor

Chevron Products Company

El Segundo Refinery

324 W. El Segundo Blvd

El Segundo, CA 90245

Tel (310) 615-5781

Fax (310) 615-4122

jfpi@chevron.com

Warning!

This e-mail transmission, and any documents, files or previous e-mail messages attached to it, may contain confidential information that is legally privileged. If you are not the intended recipient or the person responsible for delivering it to the intended recipient, you are hereby notified that any disclosure, copying, distribution, or use of any of the information contained in or attached to this transmission is STRICTLY PROHIBITED. If you have received this transmission in error, please immediately notify us by telephone at 310-615-5781 and destroy the original transmission and its attachments without reading them. Thank you.

To: aarora@dtsc.ca.gov[aarora@dtsc.ca.gov]; Lin, Sharon[Lin.Sharon@epa.gov]
Cc: michael.monson@shell.com[michael.monson@shell.com]
From: michael.monson@shell.com
Sent: Tue 8/11/2015 11:16:39 PM
Subject: Tiered Permit Units Closure Cost Estimates
TIERED PERMITS CLOSURE COST ESTIMATE 2014.xlsx

Asha,

I had a note to send you the Closure Cost Estimates for the Tiered Permit units.

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

To: Lin, Sharon[Lin.Sharon@epa.gov]
From: Arora, Asha@DTSC
Sent: Fri 5/8/2015 6:43:25 PM
Subject: RE: Recovered Oil Processing (2nd response)

Hi Sharon,

I just wanted to let you that EPA has an exclusion for mixture and derived rule for the heat exchanger cleaning sludge...

Heat Exchanger Bundle Cleaning Sludge. EPA has applied the mixture rule exclusion to only one listed waste from a specific source. The Agency has stated that, in most cases, listed wastes from specific sources constitute a significant portion of wastewater generated at a facility and that an exclusion would pose a substantial hazard to human health and the environment. The Agency has, however, stated that industries may petition to have their listed waste subject to the exclusion.

The sole exclusion EPA adopted is for heat exchanger bundle cleaning sludges from the petroleum refining industry. This exclusion was based on data indicating that the sludges composed a very small percentage of the wastewater flow into the treatment facilities and contained relatively nontoxic trivalent chromium.

Thanks

Asha

From: Lin, Sharon [Lin.Sharon@epa.gov]
Sent: Friday, May 08, 2015 8:28 AM
To: Ramirez, Larry@DTSC; Yang, Teng@DTSC
Cc: Lynch, Philip@DTSC; Arora, Asha@DTSC; Schofield, John
Subject: FW: Recovered Oil Processing

Hi, Larry and Andy,

Just wanted to let you know that I met with Asha to get myself up to speed on the TP units at Shell yesterday. We went over the TP submittals in CERS and the materials that Mellissa had provided to Asha . We also discussed the Recovered Oil processing unit. I just forwarded Shell's memo on the Recovered Oil Processing Unit (attached) to Asha.

Asha is available to join us for a TP units inspection and EPA's field sampling the week of August 3. If you are available to join us, please let us know when it gets closer to the field date . Thanks!

Sharon Lin, P.E.

U.S. Environmental Protection Agency Region 9

Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2
75 Hawthorne Street

San Francisco, CA 94105

Tel: (415) 972-3446

Email: Lin.Sharon@epa.gov

From: michael.monson@shell.com [mailto:michael.monson@shell.com]
Sent: Wednesday, April 15, 2015 4:09 PM
To: Lin, Sharon; Schofield, John; Larry.Ramirez@dtsc.ca.gov; Melissa.Hagen@hsd.cccounty.us
Cc: michael.monson@shell.com; Natalie.Braden@shell.com
Subject: Recovered Oil Processing

The attached describes the reason that the Recovered Oil Processing system does not require a Tiered Permit. Please feel free to forward any follow-up questions.

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

To: Lin, Sharon[Lin.Sharon@epa.gov]
Cc: Suhami, Iren[Iren.Suhami@valero.com]; Cuffel, Donald[Don.Cuffel@valero.com]; Bourbon, Elizabeth[Elizabeth.Bourbon@valero.com]; Bluntzer, Megan[Megan.Bluntzer@valero.com]; Pacheco-Mendez, Marisol[Marisol.Pacheco-Mendez@valero.com]
From: Pacheco-Mendez, Marisol
Sent: Tue 1/31/2017 10:16:31 PM
Subject: Valero Benicia Refinery-EOL data from January
R1701087.pdf

Hello Sharon,

Pursuant to item 63 of the Consent Agreement and Final Order negotiated between EPA and Valero (RCRA EPA ID No. CAD063001770, TRI ID No. 94510XXNCS3400E), please see attached for end of line (EOL) sampling point EOL-10 data collected on January 18,19,20,21,22 and 23, 2017. This data was received from the contractor laboratory on January 27, 2017.

Please recognize that we were experiencing unprecedented rainfall due to the storms at the time of these results.

Please confirm receipt of this email.

Please contact me if you have any questions.

Regards,

Marisol Pacheco-Mendez

Valero Benicia Refinery

Staff Environmental Engineer

707-745-7573

January 27, 2017

Analytical Report

Client:	**Valero** 3400 East Second St Benicia, CA 94510
Attn:	**Marisol Pacheco-Mendez**

Work Order #:	1701087
Project:	Wastewater
Project #:	[none]
P.O. Number:	4503523772
Project Received:	January 23, 2017 16:00
Project Reported:	January 27, 2017 12:45

Sincerely,

Hossein Khoshkhoo

H. Khoshkhoo, Ph.D.
Laboratory Director / President

WORK ORDER: 1701087

COC Number:

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Summary

Lab ID	Sample	Matrix	Date Sampled	Date Received
1701087-01	EOL #10	Aqueous	January 18, 2017 1:50	January 23, 2017 16:00
1701087-02	EOL#10	Aqueous	January 18, 2017 1:50	January 23, 2017 16:00
1701087-03	EOL#10	Aqueous	January 19, 2017 12:00	January 23, 2017 16:00
1701087-04	EOL#10	Aqueous	January 20, 2017 12:00	January 23, 2017 16:00
1701087-05	EOL#10	Aqueous	January 21, 2017 12:00	January 23, 2017 16:00
1701087-06	EOL#10	Aqueous	January 22, 2017 12:00	January 23, 2017 16:00
1701087-07	EOL#10	Aqueous	January 23, 2017 12:00	January 23, 2017 16:00

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results

Sample Date: January 18, 2017 1:50

Sample: EOL #10
1701087-01 (Aqueous) **Sample Type:** Grab **Prep Date:** January 24, 2017 10:10

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
Semi-Volatile Organic Compounds by EPA 625								
Dimethyl Phthalate	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Acenaphthene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Acenaphthylene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Anthracene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Benzidine	20.0		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Benzoic Acid	20.0		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Benzo (a) anthracene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Benzo (b) fluoranthene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Benzo (k) fluoranthene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Benzo (g,h,i) perylene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Benzo (a) pyrene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Benzyl Alcohol	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Bis (2-chloroethoxy) methane	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Bis (2-chloroethyl) Ether	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Bis (2-chloroisopropyl) Ether	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Bis (2-ethylhexy) Phthalate	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
4-Bromophenyl Phenyl Ether	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Butylbenzyl Phthalate	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
4-Chloroaniline	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
2-Chloronaphthalene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
4-Chlorophenyl Phenyl Ether	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Chrysene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Dibenzo (a,h) anthracene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Dibenzofuran	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Di-n-butyl Phthalate	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
1,2-Dichlorobenzene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
1,3-Dichlorobenzene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
1,4-Dichlorobenzene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
3,3'-Dichlorobenzidine	10.0		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Diethyl Phthalate	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
2,4-Dinitrotoluene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results
(Continued)

Sample Date: January 18, 2017 1:50

Sample: EOL #10 (Continued)
1701087-01 (Aqueous) **Sample Type:** Grab **Prep Date:** January 24, 2017 10:10

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
Semi-Volatile Organic Compounds by EPA 625 (Continued)								
2,6-Dinitrotoluene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Di-n-octyl Phthalate	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Fluoranthene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Fluorene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Hexachlorobenzene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Hexachlorobutadiene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Hexachlorocyclopentadiene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Hexachloroethane	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Indeno (1,2,3-cd) pyrene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Isophorone	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
2-Methylnaphthalene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Naphthalene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
2-Nitroaniline	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
3-Nitroaniline	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
4-Nitroaniline	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Nitrobenzene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
N-Nitrosodiphenylamine	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
N-Nitrosodi-n-propylamine	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Phenanthrene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Pyrene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
1,2,4-Trichlorobenzene	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
4-Chloro-3-methylphenol	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
2-Chlorophenol	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
2,4-Dichlorophenol	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
2,4-Dimethylphenol	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
4,6-Dinitro-2-methylphenol	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
2,4-Dinitrophenol	20.0		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
2-Methylphenol	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
4-Methylphenol	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
2-Nitrophenol	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
4-Nitrophenol	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results
(Continued)

Sample Date: January 18, 2017 1:50

Sample: EOL #10 (Continued)
1701087-01 (Aqueous) **Sample Type:** Grab **Prep Date:** January 24, 2017 10:10

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
Semi-Volatile Organic Compounds by EPA 625 (Continued)								
Pentachlorophenol	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Phenol	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
2,4,5-Trichlorophenol	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
2,4,6-Trichlorophenol	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
1,2-Diphenylhydrazine	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
N-Nitrosodimethylamine	5.00		ND	ug/L	1	1/24/17	EPA 625	17A0121/ZT
Surrogate: 2-Fluorophenol	23-91		46.0%			1/24/17	EPA 625	17A0121/ZT
Surrogate: Phenol-d6	5-93		44.4%			1/24/17	EPA 625	17A0121/ZT
Surrogate: Nitrobenzene-d5	34-141		81.5%			1/24/17	EPA 625	17A0121/ZT
Surrogate: 2-Fluorobiphenyl	32-144		84.5%			1/24/17	EPA 625	17A0121/ZT
Surrogate: 2,4,6-Tribromophenol	22-154		109%			1/24/17	EPA 625	17A0121/ZT
Surrogate: p-Terphenyl-d14	29-157		88.5%			1/24/17	EPA 625	17A0121/ZT

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results
(Continued)

Sample Results

Sample Date: January 18, 2017 1:50

Sample: **EOL#10**
1701087-02 (Aqueous) **Sample Type:** Grab

Data Analyzed by: MAI
Prep Date: January 25, 2017 0:00

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
E624 (VOCs)								
Benzene	0.5		**11**	ug/L	1	1/25/17	E624	133168/KF
Bromodichloromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Bromoform	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Bromomethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Carbon tetrachloride	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Chlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Chloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Chloroform	0.5		**3.8**	ug/L	1	1/25/17	E624	133168/KF
Chloromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Dibromochloromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,2-Dichlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,3-Dichlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,4-Dichlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1-Dichloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,2-Dichloroethane (1,2-DCA)	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1-Dichloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
trans-1,2-Dichloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,2-Dichloropropane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
cis-1,3-Dichloropropene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
trans-1,3-Dichloropropene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Ethylbenzene	0.5		**6.4**	ug/L	1	1/25/17	E624	133168/KF
Methyl-t-butyl ether (MTBE)	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Methylene chloride	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Styrene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1,2,2-Tetrachloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Tetrachloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Toluene	0.5		**22**	ug/L	1	1/25/17	E624	133168/KF
1,1,1-Trichloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1,2-Trichloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results
(Continued)

Sample Date: January 18, 2017 1:50

Sample: EOL#10 (Continued)
1701087-02 (Aqueous) **Sample Type:** Grab

Data Analyzed by: MAI
Prep Date: January 25, 2017 0:00

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
E624 (VOCs) (Continued)								
Trichloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Trichlorofluoromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Vinyl chloride	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Surrogate: Dibromofluoromethane	70-130		100%			1/25/17	E624	133168/KF
Surrogate: Toluene-d8	70-130		98%			1/25/17	E624	133168/KF
Surrogate: 4-BFB	70-130		82%			1/25/17	E624	133168/KF

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results
(Continued)

Sample Date: January 19, 2017 12:00

Sample: **EOL#10**
1701087-03 (Aqueous) **Sample Type:** Grab

Data Analyzed by: MAI
Prep Date: January 25, 2017 0:00

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
E624 (VOCs)								
Benzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Bromodichloromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Bromoform	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Bromomethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Carbon tetrachloride	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Chlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Chloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Chloroform	0.5		**2.1**	ug/L	1	1/25/17	E624	133168/KF
Chloromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Dibromochloromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,2-Dichlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,3-Dichlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,4-Dichlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1-Dichloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,2-Dichloroethane (1,2-DCA)	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1-Dichloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
trans-1,2-Dichloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,2-Dichloropropane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
cis-1,3-Dichloropropene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
trans-1,3-Dichloropropene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Ethylbenzene	0.5		**0.54**	ug/L	1	1/25/17	E624	133168/KF
Methyl-t-butyl ether (MTBE)	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Methylene chloride	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Styrene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1,2,2-Tetrachloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Tetrachloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Toluene	0.5		**1**	ug/L	1	1/25/17	E624	133168/KF
1,1,1-Trichloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1,2-Trichloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Trichloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Trichlorofluoromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results
(Continued)

Sample Date: January 19, 2017 12:00

Sample: **EOL#10 (Continued)**
1701087-03 (Aqueous) **Sample Type:** Grab

Data Analyzed by: MAI
Prep Date: January 25, 2017 0:00

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
E624 (VOCs) (Continued)								
Vinyl chloride	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Surrogate: Dibromofluoromethane	70-130		100%			1/25/17	E624	133168/KF
Surrogate: Toluene-d8	70-130		99%			1/25/17	E624	133168/KF
Surrogate: 4-BFB	70-130		81%			1/25/17	E624	133168/KF

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results
(Continued)

Sample Date: January 20, 2017 12:00

Sample: EOL#10
1701087-04 (Aqueous) **Sample Type:** Grab

Data Analyzed by: MAI
Prep Date: January 25, 2017 0:00

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
E624 (VOCs)								
Benzene	0.5		**2**	ug/L	1	1/25/17	E624	133168/KF
Bromodichloromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Bromoform	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Bromomethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Carbon tetrachloride	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Chlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Chloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Chloroform	0.5		**11**	ug/L	1	1/25/17	E624	133168/KF
Chloromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Dibromochloromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,2-Dichlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,3-Dichlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,4-Dichlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1-Dichloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,2-Dichloroethane (1,2-DCA)	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1-Dichloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
trans-1,2-Dichloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,2-Dichloropropane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
cis-1,3-Dichloropropene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
trans-1,3-Dichloropropene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Ethylbenzene	0.5		**27**	ug/L	1	1/25/17	E624	133168/KF
Methyl-t-butyl ether (MTBE)	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Methylene chloride	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Styrene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1,2,2-Tetrachloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Tetrachloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Toluene	0.5		**29**	ug/L	1	1/25/17	E624	133168/KF
1,1,1-Trichloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1,2-Trichloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Trichloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Trichlorofluoromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results
(Continued)

Sample Date: January 20, 2017 12:00

Sample: **EOL#10 (Continued)**
1701087-04 (Aqueous) **Sample Type:** Grab

Data Analyzed by: MAI
Prep Date: January 25, 2017 0:00

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
E624 (VOCs) (Continued)								
Vinyl chloride	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Surrogate: Dibromofluoromethane	70-130		100%			1/25/17	E624	133168/KF
Surrogate: Toluene-d8	70-130		97%			1/25/17	E624	133168/KF
Surrogate: 4-BFB	70-130		96%			1/25/17	E624	133168/KF

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results
(Continued)

Sample Date: January 21, 2017 12:00

Sample: **EOL#10**
1701087-05 (Aqueous) **Sample Type:** Grab

Data Analyzed by: MAI
Prep Date: January 25, 2017 0:00

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
E624 (VOCs)								
Benzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Bromodichloromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Bromoform	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Bromomethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Carbon tetrachloride	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Chlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Chloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Chloroform	0.5		**9.8**	ug/L	1	1/25/17	E624	133168/KF
Chloromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Dibromochloromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,2-Dichlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,3-Dichlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,4-Dichlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1-Dichloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,2-Dichloroethane (1,2-DCA)	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1-Dichloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
trans-1,2-Dichloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,2-Dichloropropane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
cis-1,3-Dichloropropene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
trans-1,3-Dichloropropene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Ethylbenzene	0.5		**4.6**	ug/L	1	1/25/17	E624	133168/KF
Methyl-t-butyl ether (MTBE)	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Methylene chloride	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Styrene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1,2,2-Tetrachloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Tetrachloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Toluene	0.5		**7.6**	ug/L	1	1/25/17	E624	133168/KF
1,1,1-Trichloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1,2-Trichloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Trichloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Trichlorofluoromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results
(Continued)

Sample Date: January 21, 2017 12:00

Sample: EOL#10 (Continued)
1701087-05 (Aqueous) **Sample Type:** Grab

Data Analyzed by: MAI
Prep Date: January 25, 2017 0:00

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
E624 (VOCs) (Continued)								
Vinyl chloride	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Surrogate: Dibromofluoromethane	70-130		101%			1/25/17	E624	133168/KF
Surrogate: Toluene-d8	70-130		98%			1/25/17	E624	133168/KF
Surrogate: 4-BFB	70-130		92%			1/25/17	E624	133168/KF

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results
(Continued)

Sample Date: January 22, 2017 12:00

Sample: EOL#10
1701087-06 (Aqueous) **Sample Type:** Grab

Data Analyzed by: MAI
Prep Date: January 25, 2017 0:00

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
E624 (VOCs)								
Benzene	0.5		**25**	ug/L	1	1/25/17	E624	133168/KF
Bromodichloromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Bromoform	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Bromomethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Carbon tetrachloride	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Chlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Chloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Chloroform	0.5		**7.4**	ug/L	1	1/25/17	E624	133168/KF
Chloromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Dibromochloromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,2-Dichlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,3-Dichlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,4-Dichlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1-Dichloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,2-Dichloroethane (1,2-DCA)	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1-Dichloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
trans-1,2-Dichloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,2-Dichloropropane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
cis-1,3-Dichloropropene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
trans-1,3-Dichloropropene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Ethylbenzene	0.5		**4.1**	ug/L	1	1/25/17	E624	133168/KF
Methyl-t-butyl ether (MTBE)	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Methylene chloride	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Styrene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1,2,2-Tetrachloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Tetrachloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Toluene	0.5		**28**	ug/L	1	1/25/17	E624	133168/KF
1,1,1-Trichloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1,2-Trichloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Trichloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Trichlorofluoromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results
(Continued)

Sample Date: January 22, 2017 12:00

Sample: **EOL#10 (Continued)**
1701087-06 (Aqueous) **Sample Type:** Grab

Data Analyzed by: MAI
Prep Date: January 25, 2017 0:00

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
E624 (VOCs) (Continued)								
Vinyl chloride	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Surrogate: Dibromofluoromethane	70-130		101%			1/25/17	E624	133168/KF
Surrogate: Toluene-d8	70-130		98%			1/25/17	E624	133168/KF
Surrogate: 4-BFB	70-130		90%			1/25/17	E624	133168/KF

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results
(Continued)

Sample Date: January 23, 2017 12:00

Sample: **EOL#10**
1701087-07 (Aqueous) **Sample Type:** Grab

Data Analyzed by: MAI
Prep Date: January 25, 2017 0:00

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
E624 (VOCs)								
Benzene	0.5		**2**	ug/L	1	1/25/17	E624	133168/KF
Bromodichloromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Bromoform	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Bromomethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Carbon tetrachloride	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Chlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Chloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Chloroform	0.5		**5.5**	ug/L	1	1/25/17	E624	133168/KF
Chloromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Dibromochloromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,2-Dichlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,3-Dichlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,4-Dichlorobenzene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1-Dichloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,2-Dichloroethane (1,2-DCA)	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1-Dichloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
trans-1,2-Dichloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,2-Dichloropropane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
cis-1,3-Dichloropropene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
trans-1,3-Dichloropropene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Ethylbenzene	0.5		**0.53**	ug/L	1	1/25/17	E624	133168/KF
Methyl-t-butyl ether (MTBE)	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Methylene chloride	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Styrene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1,2,2-Tetrachloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Tetrachloroethene	0.5		**0.58**	ug/L	1	1/25/17	E624	133168/KF
Toluene	0.5		**2.3**	ug/L	1	1/25/17	E624	133168/KF
1,1,1-Trichloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
1,1,2-Trichloroethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Trichloroethene	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Trichlorofluoromethane	0.5		ND	ug/L	1	1/25/17	E624	133168/KF

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Sample Results
(Continued)

Sample Date: January 23, 2017 12:00

Sample: **EOL#10 (Continued)**
1701087-07 (Aqueous) **Sample Type:** Grab

Data Analyzed by: MAI
Prep Date: January 25, 2017 0:00

Analyte	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
E624 (VOCs) (Continued)								
Vinyl chloride	0.5		ND	ug/L	1	1/25/17	E624	133168/KF
Surrogate: Dibromofluoromethane	70-130		102%			1/25/17	E624	133168/KF
Surrogate: Toluene-d8	70-130		99%			1/25/17	E624	133168/KF
Surrogate: 4-BFB	70-130		87%			1/25/17	E624	133168/KF

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Quality Control

Semi-Volatile Organic Compounds by EPA 625

Prepared & Analyzed: Jan-24-17

Analyte	Source Result	Result	Qual	Reporting Limit	Unit	Spike Level	% REC	%REC Limits	RPD	RPD Limit
Batch: 17A0121										**Analyst:** ZT
Blank (17A0121-BLK1)										
Dimethyl Phthalate		**ND**		5.00	ug/L					
Acenaphthene		**ND**		5.00	ug/L					
Acenaphthylene		**ND**		5.00	ug/L					
Anthracene		**ND**		5.00	ug/L					
Benzidine		**ND**		20.0	ug/L					
Benzoic Acid		**ND**		20.0	ug/L					
Benzo (a) anthracene		**ND**		5.00	ug/L					
Benzo (b) fluoranthene		**ND**		5.00	ug/L					
Benzo (k) fluoranthene		**ND**		5.00	ug/L					
Benzo (g,h,i) perylene		**ND**		5.00	ug/L					
Benzo (a) pyrene		**ND**		5.00	ug/L					
Benzyl Alcohol		**ND**		5.00	ug/L					
Bis (2-chloroethoxy) methane		**ND**		5.00	ug/L					
Bis (2-chloroethyl) Ether		**ND**		5.00	ug/L					
Bis (2-chloroisopropyl) Ether		**ND**		5.00	ug/L					
Bis (2-ethylhexy) Phthalate		**ND**		5.00	ug/L					
4-Bromophenyl Phenyl Ether		**ND**		5.00	ug/L					
Butylbenzyl Phthalate		**ND**		5.00	ug/L					
4-Chloroaniline		**ND**		5.00	ug/L					
2-Chloronaphthalene		**ND**		5.00	ug/L					
4-Chlorophenyl Phenyl Ether		**ND**		5.00	ug/L					
Chrysene		**ND**		5.00	ug/L					
Dibenzo (a,h) anthracene		**ND**		5.00	ug/L					
Dibenzofuran		**ND**		5.00	ug/L					
Di-n-butyl Phthalate		**ND**		5.00	ug/L					
1,2-Dichlorobenzene		**ND**		5.00	ug/L					
1,3-Dichlorobenzene		**ND**		5.00	ug/L					
1,4-Dichlorobenzene		**ND**		5.00	ug/L					
3,3'-Dichlorobenzidine		**ND**		10.0	ug/L					
Diethyl Phthalate		**ND**		5.00	ug/L					
2,4-Dinitrotoluene		**ND**		5.00	ug/L					
2,6-Dinitrotoluene		**ND**		5.00	ug/L					
Di-n-octyl Phthalate		**ND**		5.00	ug/L					
Fluoranthene		**ND**		5.00	ug/L					

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Quality Control
(Continued)

Semi-Volatile Organic Compounds by EPA 625 (Continued) **Prepared & Analyzed: Jan-24-17**

Analyte	Source Result	Result	Qual	Reporting Limit	Unit	Spike Level	% REC	%REC Limits	RPD	RPD Limit
Batch: 17A0121 (Continued)										**Analyst:** ZT
Blank (17A0121-BLK1)										
Fluorene		**ND**		5.00	ug/L					
Hexachlorobenzene		**ND**		5.00	ug/L					
Hexachlorobutadiene		**ND**		5.00	ug/L					
Hexachlorocyclopentadiene		**ND**		5.00	ug/L					
Hexachloroethane		**ND**		5.00	ug/L					
Indeno (1,2,3-cd) pyrene		**ND**		5.00	ug/L					
Isophorone		**ND**		5.00	ug/L					
2-Methylnaphthalene		**ND**		5.00	ug/L					
Naphthalene		**ND**		5.00	ug/L					
2-Nitroaniline		**ND**		5.00	ug/L					
3-Nitroaniline		**ND**		5.00	ug/L					
4-Nitroaniline		**ND**		5.00	ug/L					
Nitrobenzene		**ND**		5.00	ug/L					
N-Nitrosodiphenylamine		**ND**		5.00	ug/L					
N-Nitrosodi-n-propylamine		**ND**		5.00	ug/L					
Phenanthrene		**ND**		5.00	ug/L					
Pyrene		**ND**		5.00	ug/L					
1,2,4-Trichlorobenzene		**ND**		5.00	ug/L					
4-Chloro-3-methylphenol		**ND**		5.00	ug/L					
2-Chlorophenol		**ND**		5.00	ug/L					
2,4-Dichlorophenol		**ND**		5.00	ug/L					
2,4-Dimethylphenol		**ND**		5.00	ug/L					
4,6-Dinitro-2-methylphenol		**ND**		5.00	ug/L					
2,4-Dinitrophenol		**ND**		20.0	ug/L					
2-Methylphenol		**ND**		5.00	ug/L					
4-Methylphenol		**ND**		5.00	ug/L					
2-Nitrophenol		**ND**		5.00	ug/L					
4-Nitrophenol		**ND**		5.00	ug/L					
Pentachlorophenol		**ND**		5.00	ug/L					
Phenol		**ND**		5.00	ug/L					
2,4,5-Trichlorophenol		**ND**		5.00	ug/L					
2,4,6-Trichlorophenol		**ND**		5.00	ug/L					
1,2-Diphenylhydrazine		**ND**		5.00	ug/L					
N-Nitrosodimethylamine		**ND**		5.00	ug/L					

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Quality Control
(Continued)

Semi-Volatile Organic Compounds by EPA 625 (Continued)

Prepared & Analyzed: Jan-24-17

Analyte	Source Result	Result	Qual	Reporting Limit	Unit	Spike Level	% REC	%REC Limits	RPD	RPD Limit
Batch: 17A0121 (Continued)										**Analyst:** ZT
Blank (17A0121-BLK1)										
Surrogate: 2-Fluorophenol		90.2			ug/L	200	45.1	23-91		
Surrogate: Phenol-d6		129			ug/L	200	64.5	5-93		
Surrogate: Nitrobenzene-d5		114			ug/L	100	114	34-141		
Surrogate: 2-Fluorobiphenyl		103			ug/L	100	103	32-144		
Surrogate: 2,4,6-Tribromophenol		95.2			ug/L	200	47.6	22-154		
Surrogate: p-Terphenyl-d14		87.1			ug/L	100	87.1	29-157		
LCS (17A0121-BS1)										
Acenaphthene		**50.3**		5.00	ug/L	50.0	101	31-123		
1,4-Dichlorobenzene		**36.9**		5.00	ug/L	50.0	73.8	27-113		
2,4-Dinitrotoluene		**30.4**		5.00	ug/L	50.0	60.8	34-128		
N-Nitrosodi-n-propylamine		**43.3**		5.00	ug/L	50.0	86.6	30-139		
Pyrene		**26.4**		5.00	ug/L	50.0	52.8	27-136		
1,2,4-Trichlorobenzene		**39.8**		5.00	ug/L	50.0	79.6	29-105		
4-Chloro-3-methylphenol		**43.1**		5.00	ug/L	50.0	86.2	28-125		
2-Chlorophenol		**32.6**		5.00	ug/L	50.0	65.2	29-104		
4-Nitrophenol		**34.3**		5.00	ug/L	50.0	68.6	0-112		
Pentachlorophenol		**29.0**		5.00	ug/L	50.0	58.0	0-165		
Phenol		**20.2**		5.00	ug/L	50.0	40.4	0.4-70		
Surrogate: 2-Fluorophenol		139			ug/L	200	69.5	23-92		
Surrogate: Phenol-d6		142			ug/L	200	71.0	5-93		
Surrogate: Nitrobenzene-d5		109			ug/L	100	109	34-141		
Surrogate: 2-Fluorobiphenyl		98.9			ug/L	100	98.9	32-144		
Surrogate: 2,4,6-Tribromophenol		137			ug/L	200	68.5	22-154		
Surrogate: p-Terphenyl-d14		94.7			ug/L	100	94.7	29-157		

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Quality Control
(Continued)

E624 (VOCs) **Prepared & Analyzed: Jan-25-17**

Batch: 133168 **Analyst:** KF

LCS (LCS-133168)

Analyte	Source Result	Result	Qual	Reporting Limit	Unit	Spike Level	% REC	%REC Limits	RPD	RPD Limit
Benzene		**19.8**		0.5	ug/L	20	99	37-151		
Bromodichloromethane		**19.1**		0.5	ug/L	20	95	35-155		
Bromoform		**23.1**		0.5	ug/L	20	115	45-169		
Bromomethane		**22.8**		0.5	ug/L	20	114	1-242		
Carbon tetrachloride		**21.7**		0.5	ug/L	20	109	70-140		
Chlorobenzene		**19.7**		0.5	ug/L	20	99	37-160		
Chloroethane		**18.3**		0.5	ug/L	20	91	14-230		
Chloroform		**20.1**		0.5	ug/L	20	100	51-138		
Chloromethane		**19.9**		0.5	ug/L	20	100	1-273		
Dibromochloromethane		**20.3**		0.5	ug/L	20	102	53-149		
1,2-Dichlorobenzene		**19.7**		0.5	ug/L	20	99	18-190		
1,3-Dichlorobenzene		**21.8**		0.5	ug/L	20	109	59-156		
1,4-Dichlorobenzene		**20.1**		0.5	ug/L	20	101	18-190		
1,1-Dichloroethane		**19.2**		0.5	ug/L	20	96	70-130		
1,2-Dichloroethane (1,2-DCA)		**19.6**		0.5	ug/L	20	98	49-155		
1,1-Dichloroethene		**20.5**		0.5	ug/L	20	102	1-234		
trans-1,2-Dichloroethene		**21.6**		0.5	ug/L	20	108	54-156		
1,2-Dichloropropane		**18.6**		0.5	ug/L	20	93	1-210		
cis-1,3-Dichloropropene		**18.7**		0.5	ug/L	20	94	1-227		
trans-1,3-Dichloropropene		**20.1**		0.5	ug/L	20	101	17-183		
Ethylbenzene		**18.6**		0.5	ug/L	20	93	37-162		
Methyl-t-butyl ether (MTBE)		**19.7**		0.5	ug/L	20	99	70-130		
Methylene chloride		**18.6**		0.5	ug/L	20	93	1-221		
Styrene		**20.1**		0.5	ug/L	20	100	70-130		
1,1,2,2-Tetrachloroethane		**18.1**		0.5	ug/L	20	91	46-157		
Tetrachloroethene		**21.2**		0.5	ug/L	20	106	64-148		
Toluene		**19.6**		0.5	ug/L	20	98	47-150		
1,1,1-Trichloroethane		**20.6**		0.5	ug/L	20	103	52-162		
1,1,2-Trichloroethane		**18.2**		0.5	ug/L	20	91	52-150		
Trichloroethene		**20.7**		0.5	ug/L	20	103	71-157		
Trichlorofluoromethane		**20.7**		0.5	ug/L	20	103	17-181		
Vinyl chloride		**20.1**		0.5	ug/L	20	101	1-251		
Surrogate: Dibromofluoromethane		25.3			ug/L	25	101	70-130		

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Quality Control
(Continued)

E624 (VOCs) (Continued)

Prepared & Analyzed: Jan-25-17

Batch: 133168 (Continued) **Analyst:** KF

Analyte	Source Result	Result	Qual	Reporting Limit	Unit	Spike Level	% REC	%REC Limits	RPD	RPD Limit
LCS (LCS-133168)										
Surrogate: Toluene-d8		24.8			ug/L	25	99	70-130		
Surrogate: 4-BFB		2.08			ug/L	2.5	83	70-130		
LCSD (LCSD-133168)										
Benzene		**18.7**		0.5	ug/L	20	94	37-151	5.3	20
Bromodichloromethane		**18.1**		0.5	ug/L	20	91	35-155	5.22	20
Bromoform		**21.5**		0.5	ug/L	20	107	45-169	7.1	20
Bromomethane		**21.2**		0.5	ug/L	20	106	1-242	7.39	20
Carbon tetrachloride		**20.7**		0.5	ug/L	20	104	70-140	4.67	20
Chlorobenzene		**18.6**		0.5	ug/L	20	93	37-160	5.79	20
Chloroethane		**17**		0.5	ug/L	20	85	14-230	7.15	20
Chloroform		**19**		0.5	ug/L	20	95	51-138	5.72	20
Chloromethane		**18.9**		0.5	ug/L	20	94	1-273	5.45	20
Dibromochloromethane		**19.1**		0.5	ug/L	20	95	53-149	6.35	20
1,2-Dichlorobenzene		**18.7**		0.5	ug/L	20	93	18-190	5.35	20
1,3-Dichlorobenzene		**20.8**		0.5	ug/L	20	104	59-156	4.72	20
1,4-Dichlorobenzene		**19.1**		0.5	ug/L	20	96	18-190	5.19	20
1,1-Dichloroethane		**18.2**		0.5	ug/L	20	91	70-130	5.25	20
1,2-Dichloroethane (1,2-DCA)		**18.5**		0.5	ug/L	20	93	49-155	5.36	20
1,1-Dichloroethene		**19.4**		0.5	ug/L	20	97	1-234	5.15	20
trans-1,2-Dichloroethene		**20.4**		0.5	ug/L	20	102	54-156	5.92	20
1,2-Dichloropropane		**17.6**		0.5	ug/L	20	88	1-210	5.4	20
cis-1,3-Dichloropropene		**17.6**		0.5	ug/L	20	88	1-227	6.29	20
trans-1,3-Dichloropropene		**18.8**		0.5	ug/L	20	94	17-183	7.16	20
Ethylbenzene		**17.9**		0.5	ug/L	20	89	37-162	4.11	20
Methyl-t-butyl ether (MTBE)		**18.7**		0.5	ug/L	20	93	70-130	5.43	20
Methylene chloride		**17.4**		0.5	ug/L	20	87	1-221	6.62	20
Styrene		**19.5**		0.5	ug/L	20	98	70-130	2.82	20
1,1,2,2-Tetrachloroethane		**16.8**		0.5	ug/L	20	84	46-157	7.42	20
Tetrachloroethene		**20**		0.5	ug/L	20	100	64-148	5.78	20
Toluene		**18.5**		0.5	ug/L	20	92	47-150	5.93	20
1,1,1-Trichloroethane		**19.7**		0.5	ug/L	20	99	52-162	4.54	20
1,1,2-Trichloroethane		**17**		0.5	ug/L	20	85	52-150	6.61	20
Trichloroethene		**19.7**		0.5	ug/L	20	98	71-157	4.81	20

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Quality Control
(Continued)

E624 (VOCs) (Continued) **Prepared & Analyzed: Jan-25-17**

Analyte	Source Result	Result	Qual	Reporting Limit	Unit	Spike Level	% REC	%REC Limits	RPD	RPD Limit
Batch: 133168 (Continued)										**Analyst:** KF
LCSD (LCSD-133168)										
Trichlorofluoromethane		**19.7**		0.5	ug/L	20	98	17-181	4.91	20
Vinyl chloride		**18.8**		0.5	ug/L	20	94	1-251	6.67	20
Surrogate: Dibromofluoromethane		25.2			ug/L	25	101	70-130		
Surrogate: Toluene-d8		24.7			ug/L	25	99	70-130		
Surrogate: 4-BFB		2.08			ug/L	2.5	83	70-130		
MBLK (MB-133168)										
Benzene		**ND**		0.5	ug/L			-		
Bromodichloromethane		**ND**		0.5	ug/L			-		
Bromoform		**ND**		0.5	ug/L			-		
Bromomethane		**ND**		0.5	ug/L			-		
Carbon tetrachloride		**ND**		0.5	ug/L			-		
Chlorobenzene		**ND**		0.5	ug/L			-		
Chloroethane		**ND**		0.5	ug/L			-		
Chloroform		**ND**		0.5	ug/L			-		
Chloromethane		**ND**		0.5	ug/L			-		
Dibromochloromethane		**ND**		0.5	ug/L			-		
1,2-Dichlorobenzene		**ND**		0.5	ug/L			-		
1,3-Dichlorobenzene		**ND**		0.5	ug/L			-		
1,4-Dichlorobenzene		**ND**		0.5	ug/L			-		
1,1-Dichloroethane		**ND**		0.5	ug/L			-		
1,2-Dichloroethane (1,2-DCA)		**ND**		0.5	ug/L			-		
1,1-Dichloroethene		**ND**		0.5	ug/L			-		
trans-1,2-Dichloroethene		**ND**		0.5	ug/L			-		
1,2-Dichloropropane		**ND**		0.5	ug/L			-		
cis-1,3-Dichloropropene		**ND**		0.5	ug/L			-		
trans-1,3-Dichloropropene		**ND**		0.5	ug/L			-		
Ethylbenzene		**ND**		0.5	ug/L			-		
Methyl-t-butyl ether (MTBE)		**ND**		0.5	ug/L			-		
Methylene chloride		**ND**		0.5	ug/L			-		
Styrene		**ND**		0.5	ug/L			-		
1,1,2,2-Tetrachloroethane		**ND**		0.5	ug/L			-		
Tetrachloroethene		**ND**		0.5	ug/L			-		
Toluene		**ND**		0.5	ug/L			-		

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Quality Control
(Continued)

E624 (VOCs) (Continued) **Prepared & Analyzed: Jan-25-17**

Analyte	Source Result	Result	Qual	Reporting Limit	Unit	Spike Level	% REC	%REC Limits	RPD	RPD Limit
Batch: 133168 (Continued)										**Analyst:** KF
MBLK (MB-133168)										
1,1,1-Trichloroethane		**ND**		0.5	ug/L			-		
1,1,2-Trichloroethane		**ND**		0.5	ug/L			-		
Trichloroethene		**ND**		0.5	ug/L			-		
Trichlorofluoromethane		**ND**		0.5	ug/L			-		
Vinyl chloride		**ND**		0.5	ug/L			-		
Surrogate: Dibromofluoromethane		24.9			ug/L	25	100	70-130		
Surrogate: Toluene-d8		25			ug/L	25	100	70-130		
Surrogate: 4-BFB		2.07			ug/L	2.5	83	70-130		

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1701087 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Wastewater
PO Number: 4503523772
Project Manager: Marisol Pacheco-Mendez
Project #:[none]

Notes and Definitions

Item	Definition
Dry	Sample results reported on a dry weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.
%REC	Percent Recovery
DF	Dilution Factor
LCS	Lab Control Sample
LCSD	Lab Control Sample Duplicate
MDL	Minimum Detection Limit
MRL	Minimum Reporting Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated
J	Results > MDL but < MRL

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

1701087

Valero Benicia Refinery
Bioassay Laboratory

Sample Destination: Delta

LabCode: D 17-018

Date: 23-Jan-17

Report Results To: Marisol.Pacheco-Mendez@Valero.com

Phone: 745-7573

Fax 1:

e-mail : David.Johnston@Valero.com

Fax 2:

PO# Delta - 4503806457-10

Cost Center 7319

417190

Sample Notes or Special Instructions

#	Sample ID	Turn Around	Sample Size	# of Samples	Date	Time	GRAB	COMP	Preserve	Temp.	Total Se 200.7	Oil & Grease EPA 1664	NH3 as N SM 4500 -NH3	CA 17 Metals EPA 200.7	Chronic *Mysidopsis bahia*	Benzene 8020	EOL Benzene (EPA 8260)	TOC - SM5310		EPA 624	EPA 625						
											Testing Requested																
1	EOL#10	48 hrs	1L	2	18-Jan	1:50 PM	☑	☐	HCl	4.0											X						
2	EOL#10	48 hrs	VOA	2	18-Jan	1:50 PM	☑	☐	HCl	4.0										X							
3	EOL#10	48 hrs	VOA	2	19-Jan	12:00 AM	☑	☐	HCl	4.0										X							
4	EOL#10	48 hrs	VOA	2	20-Jan	12:00 AM	☑	☐	HCl	4.0										X							
5	EOL#10	48 hrs	VOA	2	21-Jan	12:00 AM	☑	☐	HCl	4.0										X							
6	EOL#10	48 hrs	VOA	2	22-Jan	12:00 AM	☑	☐	HCl	4.0										X							
7	EOL#10	48 hrs	VOA	2	23-Jan	12:00 AM	☑	☐	HCl	4.0										X							
8							☐	☐																			
9							☐	☐																			

Samples Prepared By: 1/23/17 1545 D. John
Date/Time Print Name

Relinquished By: 1/23/17 1555 Received By: Chelsea Feeney 1/23/17 @16:00
Date/Time Date / Time

T=9.1°C

Delta Self Diversion VOC's 1-23

ED_001593_00015540

To: Lin, Sharon[Lin.Sharon@epa.gov]
Cc: Doyle, John M[JFPI@chevron.com]
From: Cepeda-rizo, Gabriela (griz)
Sent: Thur 4/27/2017 1:23:02 PM
Subject: Follow Up on Y2K Valve at Wet Pit

Good Morning Sharon,

This is a follow up email from the audit conducted last week. This is specifically in regards to the question on when the Y2K valve at the Wet Pit was used within the last 5 years. Please see the list below.

Incident Date	Incident Title	Reason for Opening Y2K Valve
6/19/13	Opened Y2K Valve	Power Outage at ETP T-941
4/26/2016	Opened Y2K Valve	Power Outage that included the ETP
5/6/2016	Opened Y2K Valve	Power Outage at ETP
12/23/2016	Y2K valve was opened to the Wet Pit	Heavy rain and Loss of power to 2 pumps at the Wet Pit (P-261 and P-263).
1/22/2017	Y2K valve was opened to the Wet Pit	Heavy rain and Loss of power to 2 pumps at the Wet Pit (P-263 and P-264).

Please let me know if you have any further questions.

Regards,

Gaby Cepeda-Rizo

NPDES Regulatory Engineer

Health, Environmental, & Safety Division

Chevron Products Company

El Segundo Refinery

324 W. El Segundo Blvd.

El Segundo, CA 90245

Tel 310 615 3311

griz@chevron.com

A Chevron Company

To: Lin, Sharon[Lin.Sharon@epa.gov]
Cc: Chow, Emily[Chow.Emily@epa.gov]
From: Ripp, Thomas
Sent: Tue 6/9/2015 5:11:46 PM
Subject: RE: Preliminary findings from R9 3 RCRA process based inspections

Sharon, it was nice to talk with you yesterday. I got a lot out of the call and hope you did too and I agree we should stay in contact. I do have a couple of quick questions that you can answer for me:

Were these essentially the first three "real" process based inspection in Region 9. In other words are you 3 for 3 in Region 9 for finding significant issues at facilities using process based inspections?

I believe you said NEIC led the inspection at Benicia and I can't remember about the one at Martinez. I think you said the Region conducted the inspection maybe with NEIC consultation? Is that correct. Also the inspection at Hudson Ranch was with NEIC if I recall correctly.

I want to try to characterize it as NEIC is helping you guys build your own capacity to do the "real" process based inspections and the plan is you (Region 9) start taking it from there. Also that so far all 3 process based inspections turned up significant issues that will need to be addressed (yes Martinez is too early to say definitively, but it certainly looks like there will be significant waster/surface impoundment issues). That the Region's plans are to conduct more process based inspections and continue to train CA and their CUPA's to improve their inspection capability.

Here is the 5 year inspection history at those 3 facilities (inspections prior to R9/NEIC):

Valero Benecia (LQG, SQG): 1 state CEI (10/28/13) – no violations found

Hudson Ranch: Zero inspections in previous 5 years.

Shell Martinez (LQG): 4 state CEIs – no violations found, 3 state FCIs – no violations found, 3 State FRRs, 1 found violation(s)

From: Lin, Sharon
Sent: Monday, June 08, 2015 12:47 PM
To: Ripp, Thomas
Subject: Preliminary findings from R9 3 RCRA process based inspections

FYI – enforcement confidential. We will conduct one more refinery inspection by the end of this year.

Jackie will also be consulting on a TSD inspection (Rho Chem) in LA in September.

Sharon Lin, P.E.

U.S. Environmental Protection Agency Region 9

Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2
75 Hawthorne Street

San Francisco, CA 94105

Tel: (415) 972-3446

Email: Lin.Sharon@epa.gov

From: Lin, Sharon
Sent: Thursday, April 23, 2015 2:04 PM
To: McDaniel, Doug
Subject: RE: one more thing

Here is the list. I think there is a theme of the significant violations. I added some details in case the RCRA wonks really wanted details.

sharon

Valero Benicia (May 2014)

•□□□□□□□□ **Treatment and storage hazardous wastes without a permit** (un-permitted unlined surface impoundment; benzene level exceeds TCLP for toxic characteristic waste) – data source: NESHAP Subpart FF monitoring report; violations on multiple days

•□□□□□□□□ **Failure to make a waste determination** – data source: operator's log; Subpart FF Benzene monitoring data

•□□□□□□□□ **Treatment and storage of hazardous wastes without a permit** (heat exchanger bundle cleaning sludge is a RCRA listed wastes; operating the cleaning pad without a permit; cleaning process doesn't meet the conditions for the oil bearing hazardous secondary materials exclusion in the regulations)

•□□□□□□□□ **Failure to minimize unplanned release** (spillage of the listed petroleum refinery wastes throughout the facility)

There will be additional EPCRA TRI violations folded into the penalty calculation.

Hudson Ranch Geothermal Power Plant (Feb. 2015) – preliminary

•□□□□□□□□ **Treatment and storage hazardous waste without a permit** (Horizontal Belt Press Sump exceeded TCLP for lead)

•□□□□□□□□ **Illegal disposal of RCRA wastes**; (lab wastes, spent solvent, mercuric nitrate, lab waste shows TCLP for mercury; still investigating potential underground injection of hazardous wastes into Class V Geothermal UIC well)

•□□□□□□□□ **Failure to make a waste determination** (manifests of D008 wastes)

•□□□□□□□□ **Failure to minimize unplanned release** (spillage of the hazardous wastes at various locations at the facility)

In addition, the State of California personnel joined the EPA team for the process based inspection and provided sampling support. The State cited the facility for additional violations because the state's exemption for Oil , Gas and Geothermal wastes are broader in scope than the federal regulations (the State can regulate more items). The State plans to replicate the process based inspection process at other geothermal power plant LQGs in California.

Shell Martinez Refinery (March 2015) – preliminary

•□□□□□□□□ **Treatment and storage of hazardous wastes without a permit** (lab wastes)

•□□□□□□□□ **Treatment and storage of hazardous wastes without a permit** (Heat exchanger bundle cleaning pad)

•□□□□□□□□ **Failure to make a waste determination** (wastes do not meet conditions for exclusion)

•□□□□□□□□ **Failure to minimize unplanned release** (CO Boiler baghouse dust - listed RCRA wastes)

•□□□□□□□□ **Failure to provide required emergency equipment** (no fire control equipment or fire extinguishers at the 90 day storage areas)

•□□□□□□□□ **Container management issues** (secondary containment; open containers)

The Region 9 Team, along with state and county representatives, plans to return to the facility to sample unlined surface impoundments to determine LDR compliance and to perform a technical review of the tiered permitted hazardous wastes units that were approved by the County.

Sharon Lin, P.E.

U.S. Environmental Protection Agency Region 9

Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2
75 Hawthorne Street

San Francisco, CA 94105

Tel: (415) 972-3446

Email: Lin.Sharon@epa.gov

From: McDaniel, Doug
Sent: Thursday, April 23, 2015 8:02 AM
To: Lin, Sharon
Subject: one more thing

I need for next week:

A list, in short bullets, of what we think are the major violations at each of the three process based inspections.

Thanks for your help

Douglas K. McDaniel

Chief, Waste and Chemical Section

Enforcement Division

U.S. EPA Region 9

(415) 947-4106

To: Lin, Sharon[Lin.Sharon@epa.gov]
From: Greenlee, Paris@DTSC
Sent: Wed 3/15/2017 5:10:33 PM
Subject: FW: Selenium treatment dewatering process
removed.txt

Hi Sharon, I'm looking into our records to see if PSC has any pending notifications that haven't been processed. Can you give me the EPA ID numbers for both PSC and the Torrance facility they are operating at.

Also, include your phone number in your response so we can talk about this facilities operations.

Thanks,

Sincerely,

Mr. Paris Greenlee, P.E.

Hazardous Substances Engineer

Policy and Program Support Division

Department of Toxic Substances Control

Phone: (916) 323-2274

From: Greenlee, Paris@DTSC
Sent: Tuesday, March 14, 2017 4:29 PM
To: Arora, Asha@DTSC <Asha.Arora@dtsc.ca.gov>
Subject: Re: Selenium treatment dewatering process

Hi Asha,

PSC has had three TTUs authorized for the last nine years, and there have been several site specific authorizations throughout the state for 2016, although my records don't show a specific site authorization for a refinery in Torrance this year. It is possible that: 1) they did file a notification and it never got to my desk, or 2) they were authorized within the last year and the records are not showing up, or 3) that the waste they are treating is exempt. I have received several inquiries over the last two months from TTU operators claiming they filed notices and have not received a response, and later found notices that didn't get directed properly.

Due to the consistent track record of notification filings from PSC I would not immediately assume that they are out of compliance. I will communicate with Sharon and let her know I'm still looking through the records.

Sincerely,

Mr. Paris Greenlee, P.E.

Hazardous Substances Engineer

Department of Toxic Substances Control

From: Arora, Asha@DTSC
Sent: Tuesday, March 14, 2017 2:03 PM
To: Greenlee, Paris@DTSC
Subject: RE: Selenium treatment dewatering process

Paris,

Yes, they have a fixed treatment unit. In addition, a portion of this treatment (centrifuge) is being operated by PSC. I know that Refineries tend to get TTU for a number of treatments.

Thank you
Asha

From: Greenlee, Paris@DTSC
Sent: Tuesday, March 14, 2017 1:59 PM
To: Arora, Asha@DTSC
Subject: RE: Selenium treatment dewatering process

Asha, this sounds more like a fixed treatment unit. I'll email Sharon for more information.

Sincerely,

Mr. Paris Greenlee, P.E.

Hazardous Substances Engineer

Policy and Program Support Division

Department of Toxic Substances Control

Phone: (916) 323-2274

From: Arora, Asha@DTSC
Sent: Tuesday, March 14, 2017 1:49 PM
To: Greenlee, Paris@DTSC <Paris.Greenlee@dtsc.ca.gov>
Cc: Lin, Sharon <Lin.Sharon@epa.gov>
Subject: RE: Selenium treatment dewatering process

Importance: High

Hi Paris,

This request is from EPA, Region IX to find out if PSC submitted to DTSC, a TTU initial notification and a site specific notification at Torrance Refinery. If yes, please send Sharon a copy of both notifications and DTSC acknowledgement letter, etc.

Thank you

Asha

Asha Arora

Senior Environmental Scientist (Specialist)

Department of Toxic Substances Control

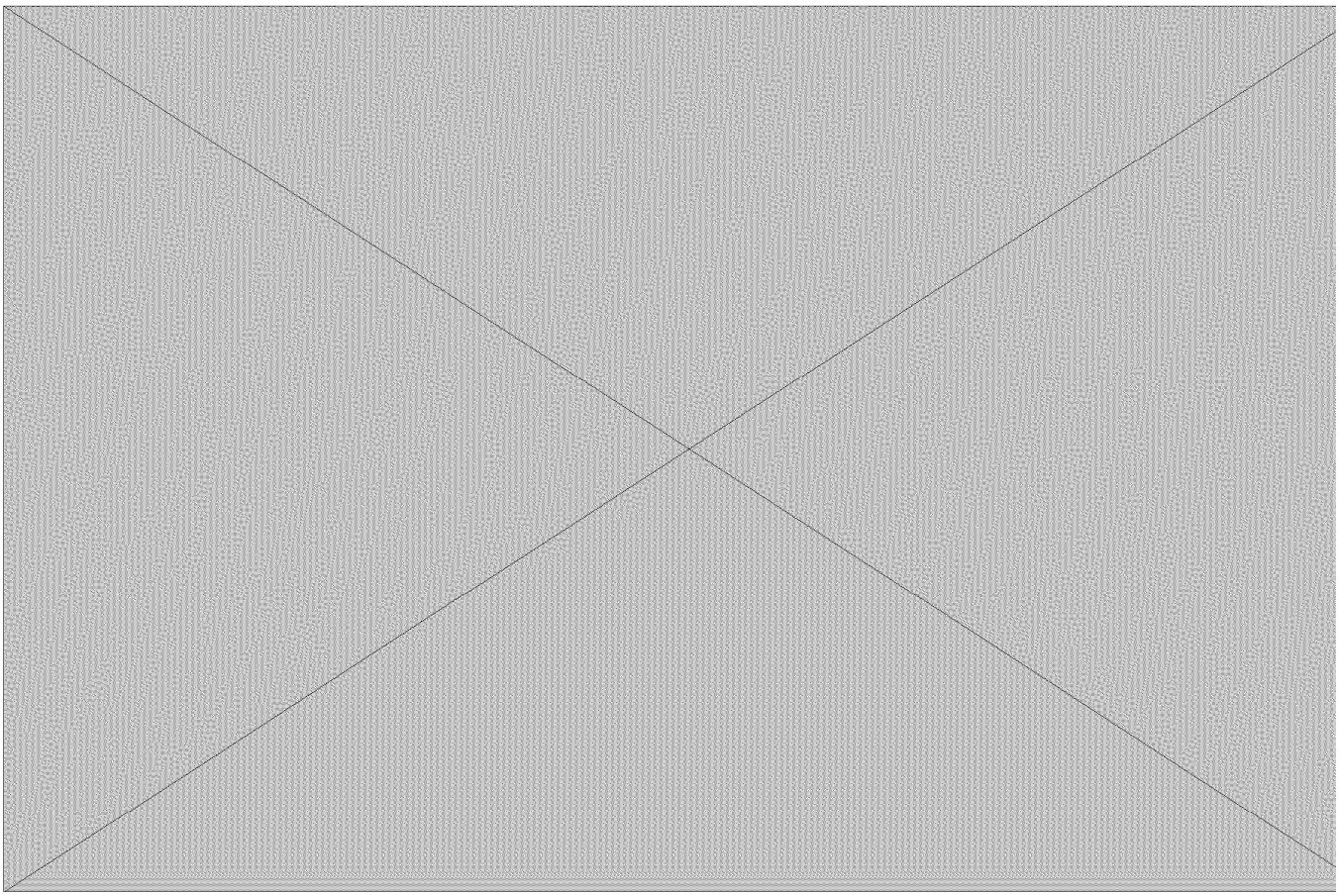
(510) 540-3874

Asha.Arora@dtsc.ca.gov

From: Lin, Sharon [mailto:Lin.Sharon@epa.gov]
Sent: Tuesday, March 14, 2017 1:17 PM
To: Arora, Asha@DTSC
Subject: Selenium treatment dewatering process

Hi, Asha, the Selenium treatment unit at the Torrance Refinery is a CA unit under the California tiered permitting program. The CA unit only includes the three tanks (oxidation, reactor and thickener). The dewatering facilities which consist of a two phase centrifuge is owned and run by PSC, contractor to the refinery. Would you please let me know the status of their permit to run the operation? Thanks.

sharon



To: Ripp, Thomas[Ripp.Tom@epa.gov]
Cc: Lin, Sharon[Lin.Sharon@epa.gov]
From: McDaniel, Doug
Sent: Wed 6/3/2015 8:27:11 PM
Subject: RE: Refinery updates

Hi. We probably will inspect another this FY but haven't scheduled it yet. For the two we've done, you should refer to the NEIC report for Valero Benicia, and we have not yet formulated the violations for Shell Martinez. Feel free to contact Sharon Lin of my staff as she is familiar with the preliminary findings.

Doug

Douglas K. McDaniel

Chief, Waste and Chemical Section

Enforcement Division

U.S. EPA Region 9

(415) 947-4106

From: Ripp, Thomas
Sent: Wednesday, June 03, 2015 1:13 PM
To: McDaniel, Doug
Subject: Refinery updates

Doug, as you are aware, I'm quite interested in what regions find at refineries and you guys have found issues with wastewater recently at two refineries. Is Region 9 planning on any more refinery inspections this year? Do you have any brief summary you can send me of what RCRA issues you found at the two refineries you've already inspected (one was with NEIC)? Thanks.

Tom Ripp
Pesticides, Waste and Toxics Branch

301-391-6198 (M alternate location) Work hours 9:00 to 2:30

202-564-7003 (T & W) Work hours 6:45 to 4:15

Do not work Th or F

All RCRA TSDFs are inspected at least every two years. Finding significant violatioins that may exist at TSDFs in NOT a targeting issue.

One missed waste stream at a relatively small petroleum refinery (26,000 barrels per day capacity) amounted to over 700 million pounds per year of hazardous waste not being properly managed. That is the equivalent of over 26,000 small quantity generators.

To: Greenlee, Paris@DTSC[Paris.Greenlee@dtsc.ca.gov]
Cc: Lin, Sharon[Lin.Sharon@epa.gov]
From: Arora, Asha@DTSC
Sent: Tue 3/14/2017 8:49:13 PM
Subject: RE: Selenium treatment dewatering process
removed.txt

Hi Paris,

This request is from EPA, Region IX to find out if PSC submitted to DTSC, a TTU initial notification and a site specific notification at Torrance Refinery. If yes, please send Sharon a copy of both notifications and DTSC acknowledgement letter, etc.

Thank you

Asha

Asha Arora

Senior Environmental Scientist (Specialist)

Department of Toxic Substances Control

(510) 540-3874

Asha.Arora@dtsc.ca.gov

From: Lin, Sharon [mailto:Lin.Sharon@epa.gov]
Sent: Tuesday, March 14, 2017 1:17 PM
To: Arora, Asha@DTSC
Subject: Selenium treatment dewatering process

Hi, Asha, the Selenium treatment unit at the Torrance Refinery is a CA unit under the California tiered permitting program. The CA unit only includes the three tanks (oxidation, reactor and thickener). The dewatering facilities which consist of a two phase centrifuge is owned and run by PSC, contractor to the refinery. Would you please let me know the status of their permit to run the operation? Thanks.

sharon

To: Lin, Sharon[Lin.Sharon@epa.gov]
From: Arora, Asha@DTSC
Sent: Fri 5/1/2015 3:52:05 PM
Subject: RE: Technical review of TP units at Shell Martinez Refinery with USEPA team (2nd email)

Sharon,

What is their CERS ID#? I wanted to confirm as CERS has three facilities for Shell in Martinez

Thanks
Asha

From: Arora, Asha@DTSC on behalf of Lin, Sharon [Lin.Sharon@epa.gov]
Sent: Thursday, April 30, 2015 4:20 PM
To: Peebler, Diana@DTSC
Subject: FW: Technical review of TP units at Shell Martinez Refinery with USEPA team
When: Monday, August 03, 2015, 12:00 AM to Friday, August 07, 2015, 12:00 AM.
Where: Martinez, CA

Diana,

I accepted this requested as you had approved verbally. Have fun at CSTI!

Thanks
Asha

-----Original Appointment-----
From: Lin, Sharon [mailto:Lin.Sharon@epa.gov]
Sent: Thursday, April 30, 2015 4:10 PM
To: Lin, Sharon; Arora, Asha@DTSC
Subject: Technical review of TP units at Shell Martinez Refinery with USEPA team
When: Monday, August 03, 2015 12:00 AM to Friday, August 07, 2015 12:00 AM (UTC-08:00) Pacific Time (US & Canada).
Where: Martinez, CA

To: Lin, Sharon[Lin.Sharon@epa.gov]
Cc: Schofield, John[Schofield.John@epa.gov]; McDaniel, Doug[McDaniel.Doug@epa.gov]; Reynolds, Rebekah[Reynolds.Rebekah@epa.gov]; Soria, Maria@DTSC[Maria.Soria@dtsc.ca.gov]
From: Koch, Lori@DTSC
Sent: Fri 3/10/2017 6:08:31 PM
Subject: RE: DTSC Letters to Shell Martinez

Hi Sharon

We previously searched our files in response to the same question from Shell. We don't have any evidence in our files that a follow-up letter was sent. Since ETP-1 was permitted in 1995 and again in 2008 (delay of closure), any deficiencies would have been addressed during those permit renewals. If I find any other information related to the exemption from MTRs I will let you know.

Thanks

Lori

From: Lin, Sharon [mailto:Lin.Sharon@epa.gov]
Sent: Thursday, March 09, 2017 9:49 AM
To: Koch, Lori@DTSC <Lori.Koch@dtsc.ca.gov>
Cc: Schofield, John <Schofield.John@epa.gov>; McDaniel, Doug <McDaniel.Doug@epa.gov>; Reynolds, Rebekah <Reynolds.Rebekah@epa.gov>; Soria, Maria@DTSC <Maria.Soria@dtsc.ca.gov>
Subject: DTSC Letters to Shell Martinez

Hi, Lori,

Attached is a copy of DTSC letters that Shell Martinez refinery provided in response to EPA's NOV. 1994 letter indicated that there was going to be another letter that listed deficiencies that Shell needed to address. If you have that "list of deficiencies" letter, please let me know. Thanks.

Sharon

To: Lin, Sharon[Lin.Sharon@epa.gov]
Cc: Kowbel, Nelline@DTSC[Nelline.Kowbel@dtsc.ca.gov]
From: Koch, Lori@DTSC
Sent: Fri 3/10/2017 5:57:54 PM
Subject: RE: DTSC Letters to Shell Martinez

Hi Sharon

Let me know when you would like to meet to discuss this. My branch chief, Nelline Kowbell, would like to be part of the discussion. Our availability is better in about two weeks.

Thanks

Lori

From: Lin, Sharon [mailto:Lin.Sharon@epa.gov]
Sent: Thursday, March 09, 2017 9:49 AM
To: Koch, Lori@DTSC <Lori.Koch@dtsc.ca.gov>
Cc: Schofield, John <Schofield.John@epa.gov>; McDaniel, Doug <McDaniel.Doug@epa.gov>; Reynolds, Rebekah <Reynolds.Rebekah@epa.gov>; Soria, Maria@DTSC <Maria.Soria@dtsc.ca.gov>
Subject: DTSC Letters to Shell Martinez

Hi, Lori,

Attached is a copy of DTSC letters that Shell Martinez refinery provided in response to EPA's NOV. 1994 letter indicated that there was going to be another letter that listed deficiencies that Shell needed to address. If you have that "list of deficiencies" letter, please let me know. Thanks.

Sharon

To: Soria, Maria@DTSC[Maria.Soria@dtsc.ca.gov]
Cc: Lin, Sharon[Lin.Sharon@epa.gov]; McDaniel, Doug[McDaniel.Doug@epa.gov]
From: Schofield, John
Sent: Mon 11/16/2015 9:50:35 PM
Subject: Request for closure and post closure documents for Shell Martinez Refinery CAD009164021 - RM-17 incinerator + Vessel 482
May1990Permit.pdf

Maria,

As part of completing our inspection of the Shell Martinez facility, EPA is requesting the following information: closure report and any post-closure documents for the following closed Shell Martinez Refinery units: RM-17 and Vessel 482.

The RM-17 incinerator was closed on December 27, 1996. Vessel 482 hazardous waste storage tank was closed on April 3, 1997. The RCRAInfo database indicated a clean closure verification date of 2/3//97 for both units. The attached permit contains detailed descriptions of the units.

Could you please forward this request to the appropriate DTSC person that could help us with obtaining this information?

For any questions concerning this request, please have the person contact Sharon Lin at 415-972-3346.

Thank you for your assistance in helping us obtain the information.

regards,

John

****

John Schofield
U. S. Environmental Protection Agency
Region 9
Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2
75 Hawthorne Street
San Francisco, CA 94105
(415) 972-3386
(415) 947-3530 (fax)
schofield.john@epa.gov
****

NOTE: This email, including any attachments, may contain material that is confidential, privileged and/or attorney work product and is for the sole use of the intended recipient. Any review, reliance or distribution by others or forwarding without expressed permission is strictly prohibited. If you are not the intended recipient, please contact the sender and delete all copies.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
PERMIT
FOR A HAZARDOUS WASTE MANAGEMENT FACILITY

Permittee Shell Oil Company
P.O. Box 711
Marina Vista and Shell Ave.
Martinez, CA 94553

Facility Identification Number:
CAD 009 164 021

Pursuant to the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 USC 6901 et seq., commonly known as RCRA) and regulations promulgated thereunder by the U.S. Environmental Protection Agency (EPA) (codified and to be codified in Title 40 of the Code of Federal Regulations), a Permit is issued to Shell Oil Company (hereafter called the Permittee), to operate a hazardous waste storage, and incineration facility located in Martinez, CA on Marina Vista and Shell Avenue (3485 Pacheco Blvd., shipping address), at latitude 38° 01' 18" and longitude 122° 06' 59" summarily described as follows:

The original RCRA Part A application listed many hazardous waste units. The permittee subsequently amended the Part A application requesting the deletion of most of these units. On June 30, 1988 EPA made a determination on the request to delete various units from the Part A. This permit covers those units that are subject to RCRA permitting requirements. This includes the following: (1) the RM-17 incinerator, associated appurtenances, feed tank, and air pollution equipment, and (2) the three CO boilers, associated appurtenances, feed tank, and air pollution equipment. If it is later determined that additional units are subject to RCRA permitting requirements, a permit application for these units will be requested by EPA.

The facility is subject to corrective action requirements under this permit. A corrective action order was issued under RCRA §3008(h) on March 6, 1989. It is intended that this permit eventually replace the order and that any items remaining to be completed under the order will be completed under the requirements of this permit.

The Permittee must comply with all terms and conditions of this Permit. This Permit consists of the conditions contained herein (including those in any attachments) and the applicable regulations contained in 40 CFR Parts 260 through 266, 268, 270, and 124, as specified in the Permit. Applicable regulations are those which are in effect on the date of issuance of the Permit, in accordance with 40 CFR § 270.32(c).

This Permit is based on the assumption that the information submitted in the Part B Permit Application attached to the Permittee's letter dated September 30, 1988, as modified by subsequent amendments dated February 1, 1989 and May 12, 1989; the RM-17 incinerator Trial Burn Report, dated October 28, 1988, revised June 5, 1989; the CO Boiler Trial Burn Plan, dated November 21, 1988; and the CO Boiler Trial Burn Report, dated April 21, 1989, (hereafter collectively referred to as the Application) is accurate and that the facility will be constructed and operated as specified in the Application.

Any inaccuracies found in the submitted information may be grounds for the termination, revocation and reissuance, or modification of this Permit in accordance with 40 CFR §§ 270.41, 270.42, and 270.43 and for enforcement action. The Permittee must inform EPA of any deviation from or changes in the information in the application which would affect the Permittee's ability to comply with the applicable regulations or permit conditions.

CAD 009 164 021

This Permit is effective as of June 30, 1990 and shall remain in effect until June 30, 1995 unless revoked and reissued under 40 CFR § 270.41, terminated under 40 CFR § 270.43, or continued in accordance with 270.51(a).

5-8-90
Date

Jeff Zelikson
Director
Hazardous Waste Management Division

RCRA Hazardous Waste Facility Permit
for Shell Oil Company at Martinez, CA

TABLE of CONTENTS

COVER SHEET/ SIGNATURE PAGE		un-numbered (2pp)
TABLE OF CONTENTS		i
SECTION I - GENERAL PERMIT CONDITIONS		1
I.A.	EFFECT OF PERMIT	1
I.B.	PERMIT ACTIONS	1
I.B.1.	Permit Modification, Revocation and Reissuance, and Termination	1
I.B.2.	Permit Renewal	1
I.C.	SEVERABILITY	1
I.D.	ORDER OF PRECEDENCE	1
I.E.	DEFINITIONS	2
I.F.	DUTIES AND REQUIREMENTS	2
I.F.1.	Duty to Comply	2
I.F.2.	Duty to Reapply	2
I.F.3.	Permit Expiration	2
I.F.4.	Need to Halt or Reduce Activity Not a Defense	2
I.F.5.	Duty to Mitigate	2
I.F.6.	Proper Operation and Maintenance	3
I.F.7.	Duty to Provide Information	3
I.F.8.	Inspection and Entry	3
I.F.9.	Monitoring and Records	3
I.F.10.	Reporting Planned Changes	4
I.F.11.	Reporting Anticipated Noncompliance	4
I.F.12.	Certification of Construction or Modification	4
I.F.13.	Transfer of Permits	5
I.F.14.	Twenty-Four Hour Reporting	5
I.F.15.	Other Noncompliance	6
I.F.16.	Other Information	6
I.G.	SIGNATORY REQUIREMENT	6
I.H.	REPORTS, NOTIFICATIONS, AND SUBMISSIONS TO THE REGIONAL ADMINISTRATOR	6
I.I.	CONFIDENTIAL INFORMATION	6
I.J.	DOCUMENTS TO BE SUBMITTED PRIOR TO OPERATION	7
I.K.	DOCUMENTS TO BE MAINTAINED AT THE FACILITY	7
I.L.	WASTE MINIMIZATION CERTIFICATION AND REPORT	7

ED_001593_00015625

SECTION II - GENERAL FACILITY CONDITIONS 9
II.A. DESIGN AND OPERATION OF FACILITY 9
II.B. REQUIRED NOTICES 9
II.B.1. Hazardous Waste Imports 9
II.B.2. Hazardous Waste from Off-Site Sources 9
II.C. GENERAL WASTE ANALYSIS 9
II.D. SECURITY 9
II.E. GENERAL INSPECTION REQUIREMENTS 10
II.F. PERSONNEL TRAINING 10
II.G. SPECIAL PROVISIONS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTE 10
II.H PREPAREDNESS AND PREVENTION 10
II.H1. Required Equipment 10
II.H2. Testing and Maintenance of Equipment 10
II.H3. Access to Communications or Alarm System 10
II.H4. Required Aisle Space 10
II.H5. Arrangements with Local Authorities 10
II.I. CONTINGENCY PLAN 11
II.I.1. Implementation of Plan 11
II.I.2. Copies of Plan 11
II.I.3. Amendments to Plan 11
II.I.4. Emergency Coordinator 11
II.J. MANIFEST SYSTEM 11
II.K. RECORDKEEPING AND REPORTING 11
II.K.1. Operating Record 11
II.K.2. Biennial Report 11
II.L. GENERAL CLOSURE REQUIREMENTS 11
II.L.1. Performance Standard 11
II.L.2. Amendment to Closure Plan 12
II.L.3. Notification of Closure 12
II.L.4. Time Allowed For Closure 12
II.L.5. Disposal or Decontamination of Equipment, Structures, and Soils 12
II.L.6. Certification of Closure 12
II.L.7. Survey Plat 12
II.M. COST ESTIMATE FOR FACILITY CLOSURE 12
II.N. FINANCIAL ASSURANCE FOR FACILITY CLOSURE 13
II.O. LIABILITY REQUIREMENTS 13
II.P. INCAPACITY OF OWNERS OR OPERATORS, GUARANTORS, OR FINANCIAL INSTITUTIONS 13
II.Q. RISK ASSESSMENT 13

ED_001593_00015625

SECTION III - VESSEL 482 14
III.A. SECTION HIGHLIGHTS 14
III.B. PERMITTED AND PROHIBITED WASTE IDENTIFICATION 14
III.C. SECONDARY CONTAINMENT AND INTEGRITY ASSESSMENTS 14
III.D. OPERATING REQUIREMENTS 14
III.E. RESPONSE TO LEAKS OR SPILLS 15
III.F. INSPECTION SCHEDULES AND PROCEDURES 16
III.G. RECORDKEEPING AND REPORTING 16
III.H. CLOSURE AND POST-CLOSURE CARE 17
III.I. SPECIAL TANK PROVISIONS FOR IGNITABLE OR REACTIVE WASTES 17
SECTION IV - TANKS 1065, 383, & 12038 18
IV.A. SECTION HIGHLIGHTS 18
IV.B. PERMITTED AND PROHIBITED WASTE IDENTIFICATION 18
IV.C. SECONDARY CONTAINMENT AND INTEGRITY ASSESSMENTS 18
IV.D. OPERATING REQUIREMENTS 19
IV.E. RESPONSE TO LEAKS OR SPILLS 19
IV.F. INSPECTION SCHEDULES AND PROCEDURES 20
IV.G. RECORDKEEPING AND REPORTING 21
IV.H. CLOSURE AND POST-CLOSURE CARE 21
IV.I. SPECIAL TANK PROVISIONS FOR IGNITABLE OR REACTIVE WASTES 22
IV.J. COMPLIANCE SCHEDULE 22
SECTION V - INCINERATION - RM-17 23
V.A SECTION HIGHLIGHTS 23
V.B. IDENTIFICATION CRITERIA FOR PERMITTED AND PROHIBITED WASTE 24
V.C. CONSTRUCTION, INSTRUMENTATION, AND OPERATIONAL PERFORMANCE REQUIREMENTS 25
V.D. INSPECTION REQUIREMENTS 27
V.E. MONITORING REQUIREMENTS 28
V.F. WASTE FEED CUT-OFF REQUIREMENTS 29
V.G. CLOSURE 30
V.H. RECORDKEEPING 31
V.I. COMPLIANCE SCHEDULE 31
SECTION VI - INCINERATION - CO BOILERS 32
VI.A SECTION HIGHLIGHTS 32

ED_001593_00015625

VI.B. IDENTIFICATION CRITERIA FOR PERMITTED AND PROHIBITED WASTE 33
VI.C. CONSTRUCTION, INSTRUMENTATION, AND OPERATIONAL PERFORMANCE REQUIREMENTS 34
VI.D. INSPECTION REQUIREMENTS 36
VI.E. MONITORING REQUIREMENTS 37
VI.F. WASTE FEED CUT-OFF REQUIREMENTS 38
VI.G. CLOSURE 39
VI.H. RECORDKEEPING 39
VI.I. COMPLIANCE SCHEDULE 39

SECTION VII - SHORT-TERM TEST INCINERATION 40
VII.A. SECTION HIGHLIGHTS 40
VII.B. TRIAL BURN PHASE 40
VII.B.1. CONFORMITY TO TRIAL BURN PLAN 40
VII.B.2. TRIAL BURN POHCs 40
VII.B.3. TRIAL BURN DETERMINATIONS 41
VII.B.4. TRIAL BURN DATA SUBMISSIONS AND CERTIFICATIONS 41
VII.C. REPORTING NON-COMPLIANCE DURING THE TRIAL BURN 41
VII.D. COMPLIANCE SCHEDULE 42

SECTION - VIII CORRECTIVE ACTION 43
VIII.A. SUMMARY OF FINDINGS & RFA RESULTS 43
VIII.B. DEFINITIONS 51
VIII.C. STANDARD CONDITIONS 52
VIII.D. REPORTING REQUIREMENTS 53
VIII.E. NOTIFICATION REQUIREMENTS FOR AND ASSESSMENT OF NEWLY IDENTIFIED SOLID WASTE MANAGEMENT UNITS(S) 53
VIII.F. NOTIFICATION REQUIREMENTS FOR NEWLY-DISCOVERED RELEASES AT SWMUS 54
VIII.G. WORK TO BE PERFORMED 55
VIII.H. QUALITY ASSURANCE 58
VIII.I. PUBLIC COMMENT AND PARTICIPATION 58
VIII.J. ON-SITE AND OFF-SITE ACCESS 59
VIII.K. SAMPLING AND DATA/DOCUMENT AVAILABILITY 59
VIII.K. RECORD PRESERVATION 60
VIII.M. PROJECT COORDINATOR 60
VIII.N. SUBSEQUENT MODIFICATION 60
VIII.O. TERMINATION AND SATISFACTION 61
VIII.P. FACILITY SUBMISSION SUMMARY 62

ED_001593_00015625

SECTION I - GENERAL PERMIT CONDITIONS

I.A. EFFECT OF PERMIT

The Permittee is allowed to store, treat and incinerate hazardous waste in accordance with the conditions of this Permit. Any storage, treatment or incineration of hazardous waste not authorized in this Permit is prohibited. Subject to 40 CFR § 270.4, compliance with this Permit generally constitutes compliance, for purposes of enforcement, with Subtitle C of RCRA. Issuance of this Permit does not convey any property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of state or local law or regulations. Compliance with the terms of this Permit does not constitute a defense to any order issued or any action brought under Sections 3008(a), 3008(h), 3013, or 7003 of RCRA; Sections 106(a), 104 or 107 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601 et seq., commonly known as CERCLA), or any other law providing for protection of public health or the environment. [40 CFR § 270.4, 270.30(g)]

I.B. PERMIT ACTIONS

I.B.1. Permit Modification, Revocation and Reissuance, and Termination

This Permit may be modified, revoked and reissued, or terminated for cause, as specified in 40 CFR § 270.41, 270.42, and 270.43. The filing of a request for a permit modification, revocation and reissuance, or termination, or the notification of planned changes or anticipated noncompliance on the part of the Permittee, does not stay the applicability or enforceability of any permit condition. [40 CFR § 270.4(a) and 270.30(f)]

I.B.2. Permit Renewal

This Permit may be renewed as specified in 40 CFR § 270.30(b) and Permit Condition I.F.2. Review of any application for a Permit renewal shall consider improvements in the state of control and measurement technology, as well as changes in applicable regulations. [40 CFR § 270.30(b), HSWA Sec. 212]

I.C. SEVERABILITY

The provisions of this Permit are severable, and if any provision of this Permit, or the application of any provision of this Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this Permit shall not be affected thereby. [40 CFR § 124.16(a)]

I.D. ORDER OF PRECEDENCE

In the event of any inconsistency between the permit and the permit attachments, the permit shall govern. In the event of any inconsistency between the permit attachments and the permit application, the permit attachments shall govern.

ED_001593_00015625

I.E. DEFINITIONS

For purposes of this Permit, terms used herein shall have the same meaning as those in 40 CFR Parts 124, 260, 264, 266, 268, and 270, unless this Permit specifically provides otherwise; where terms are not defined in the regulations or the Permit, the meaning associated with such terms shall be defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term. "Director" means the Director of the Hazardous Waste Management Division, EPA Region 9, or his designee or authorized representative.

I.F. DUTIES AND REQUIREMENTS

I.F.1. Duty to Comply

The Permittee shall comply with all conditions of this Permit, except to the extent and for the duration such noncompliance is authorized by an emergency Permit. Any Permit noncompliance, other than noncompliance authorized by an emergency Permit, constitutes a violation of RCRA and is grounds for enforcement action; for Permit termination, revocation and reissuance, or modification; or for denial of a Permit renewal application. [40 CFR § 270.30(a)]

I.F.2. Duty to Reapply

If the Permittee wishes to continue an activity allowed by this Permit after the expiration date of this Permit, the Permittee shall submit a complete application for a new Permit at least 180 days prior to Permit expiration. [40 CFR § 270.10(h), 270.30(b)]

I.F.3. Permit Expiration

Pursuant to 40 CFR § 270.50, this Permit shall be effective for a fixed term not to exceed ten years. As long as EPA is the Permit-issuing authority, this Permit and all conditions herein will remain in effect beyond the Permit's expiration date, if the Permittee has submitted a timely, complete application (see 40 CFR § 270.10, 270.13 through 270.29) and, through no fault of the Permittee, the Director has not issued a new Permit, as set forth in 40 CFR § 270.51.

I.F.4. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for the Permittee, in an enforcement action that it would have been necessary, to halt or reduce the Permitted activity in order to maintain compliance with the conditions of this Permit. [40 CFR § 270.30(c)]

I.F.5. Duty to Mitigate

In the event of noncompliance with this Permit, the Permittee shall take all reasonable steps to minimize releases to the environment and shall carry out such measures, as are reasonable, to prevent significant adverse impacts on human health or the environment. [40 CFR § 270.30(d)]

ED_001593_00015625

I.F.6. Proper Operation and Maintenance

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this Permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance/quality control procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this Permit. [40 CFR § 270.30(e)]

I.F.7. Duty to Provide Information

The Permittee shall furnish to the Director, within a reasonable time, any relevant information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit. The Permittee shall also furnish to the Director, upon request, copies of records required to be kept by this Permit. [40 CFR § 264.73, 264.74(a), 270.30(h)]

I.F.8. Inspection and Entry

Pursuant to 40 CFR § 270.30(i), the Permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents, as may be required by law, to:

I.F.8.a. Enter at reasonable times upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Permit;

I.F.8.b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Permit;

I.F.8.c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Permit; and

I.F.8.d. Sample or monitor, at reasonable times, for the purposes of assuring Permit compliance or as otherwise authorized by RCRA, any substances or parameters at any location.

I.F.9. Monitoring and Records

I.F.9.a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The method used to obtain a representative sample of the waste to be analyzed must be the appropriate method from Appendix I of 40 CFR Part 261 or an equivalent method approved by the Director. Laboratory methods must be those specified in Test Methods for Evaluating Solid Waste: Physical/Chemical Methods SW-846, Standard Methods of Wastewater Analysis, or an equivalent method, as specified in the

ED_001593_00015625

Waste Analysis Plan (See Permit Attachment 1). [40 CFR § 270.30(j)(1)]

I.F.9.b. The Permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports and records required by this Permit, the certification required by 40 CFR § 264.73(b)(9), and records of all data used to complete the application for this Permit for a period of at least 3 years from the date of the sample, measurement, report, record, certification, or application. These periods may be extended by request of the Director at any time and are automatically extended during the course of any unresolved enforcement action regarding this facility. The Permittee shall maintain records from all ground-water monitoring wells and associated ground-water surface elevations for the active life of the facility. [40 CFR § 264.74(b) and 270.30(j)(2)]

I.F.9.c. Pursuant to 40 CFR § 270.30(j)(3), records of monitoring information shall specify:

i. The dates, exact place, and times of sampling or measurements;

ii. The individuals who performed the sampling or measurements;

iii. The dates analyses were performed;

iv. The individuals who performed the analyses;

v. The analytical techniques or methods used; and

vi. The results of such analyses.

I.F.10. Reporting Planned Changes

The Permittee shall give notice to the Director, as soon as possible, of any planned physical alterations or additions to the Permitted facility. [40 CFR § 270.30(l)(1)]

I.F.11. Reporting Anticipated Noncompliance

The Permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR § 270.30(l)(2)]

I.F.12. Certification of Construction or Modification

The Permittee may not commence storage, treatment or incineration of hazardous waste in the modified portion of the facility until the Permittee has submitted to the Director, by certified mail or hand delivery, a letter signed by the Permittee and a registered professional engineer stating that

ED_001593_00015625

the facility has been constructed or modified in compliance with the Permit; and

I.F.12.a. The Director has inspected the modified or newly constructed facility and finds it is in compliance with the conditions of the Permit; or

I.F.12.b. The Director has either waived the inspection or has not within 15 days notified the Permittee of his intent to inspect. [40 CFR § 270.30(l)(2)]

I.F.13. Transfer of Permits

This Permit is not transferable to any person, except after notice to the Director. The Director may require modification or revocation and reissuance of the Permit pursuant to 40 CFR § 270.40. Before transferring ownership or operation of the facility during its operating life, the Permittee shall notify the new owner or operator in writing of the requirements of 40 CFR Parts 264 and 270 and this Permit. [40 CFR § 270.30(l)(3), 264.12(c)]

I.F.14. Twenty-Four Hour Reporting

I.F.14.a. The Permittee shall report to the Director any noncompliance which may endanger health or the environment. Any such information shall be reported orally within 24 hours from the time the Permittee becomes aware of the circumstances. The report shall include the following:

i. Information concerning release of any hazardous waste that may cause an endangerment to public drinking water supplies.

ii. Any information of a release or discharge of hazardous waste, or of a fire or explosion from the hazardous waste management facility which could threaten the environment or human health outside the facility.

I.F.14.b. The description of the occurrence and its cause shall include:

i. Name, address, and telephone number of the owner or operator;

ii. Name, address, and telephone number of the facility;

iii. Date, time, and type of incident;

iv. Name and quantity of materials involved;

v. The extent of injuries, if any;

vi. An assessment of actual or potential hazards to the environment and human health outside the facility, where this is applicable; and

ED_001593_00015625

vii. Estimated quantity and disposition of recovered material that resulted from the incident.

I.F.14.c. A written submission shall also be provided within five days of the time the Permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period(s) of noncompliance (including exact dates and times); whether the noncompliance has been corrected; and, if not, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. The Director may waive the five-day written notice requirement in favor of a written report within 15 days. [40 CFR § 270.30(l)(6)]

I.F.15. Other Noncompliance

The Permittee shall report all other instances of noncompliance not otherwise required to be reported above, Permit Conditions I.F.10. - 15., annually by February 15 of each year to cover noncompliance of the previous calendar year.. The reports shall contain the information listed in Permit Condition I.F.14 [40 CFR § 270.30(l)(10)]

I.F.16. Other Information

Whenever the Permittee becomes aware that it failed to submit any relevant facts in the Permit application, or submitted incorrect information in a Permit application or in any report to the Director, the Permittee shall promptly submit such facts or information. [40 CFR § 270.30(l)(11)]

I.G. SIGNATORY REQUIREMENT

All applications, reports, or information submitted to or requested by the Director, his designee, or authorized representative, shall be signed and certified in accordance with 40 CFR § 270.11 and 270.30(k).

I.H. REPORTS, NOTIFICATIONS, AND SUBMISSIONS TO THE REGIONAL ADMINISTRATOR

All reports, notifications, or other submissions which are required by this Permit to be sent or given to the Director should be sent by certified mail or given to:

Division Director (attn: H-3-3)
Hazardous Waste Management Division
U.S. Environmental Protection Agency
1235 Mission Street
San Francisco, CA 94103.

I.I. CONFIDENTIAL INFORMATION

In accordance with 40 CFR § 270.12, the Permittee may claim confidential any information required to be submitted by this Permit.

ED_001593_00015625

I.J. DOCUMENTS TO BE SUBMITTED PRIOR TO OPERATION

Prior to operation, the Permittee shall submit as-built plans and the engineer's certification of Tank 12038. At a minimum, these plans shall indicate: Wall thicknesses, overflow controls, secondary containment, and appurtenant equipment to the unit.

I.K. DOCUMENTS TO BE MAINTAINED AT THE FACILITY

The Permittee shall maintain at the facility, until closure is completed and certified by an independent, registered professional engineer, the following documents and all amendments, revisions and modifications to these documents:

1. Waste Analysis Plan, as required by 40 CFR § 264.13 and this Permit.
2. Inspection schedules, as required by 40 CFR § 264.15(b)(2) and this Permit.
3. Personnel training documents and records, as required by 40 CFR § 264.16(d) and this Permit.
4. Contingency Plan, as required by 40 CFR § 264.53(a) and this Permit.
5. Operating record, as required by 40 CFR § 264.73 and this Permit.
6. Closure Plan, as required by 40 CFR § 264.112(a) and this Permit.
7. Post-Closure Plan, as required by 40 CFR § 264.118(a) and this Permit.
8. Annually-adjusted cost estimate for facility closure, as required by 40 CFR § 264.142(d) and this Permit.
9. All other documents required by Permit Conditions I.F.9 , III.E.5.,.III.F&G., IV.E.5., IV.F&G, V.D, E, F, H, & I, VI.D, E, F, H, &I, VII.B, C, & D, and Section VIII.

I.L. WASTE MINIMIZATION CERTIFICATION AND REPORT

I.L.1. The Permittee shall retain original signed copies for the last three years from the date of certification of the following statement on waste minimization:

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

The permittee shall make this certification at least annually and shall retain these copies as part of the facility's written operation record as required in Permit Condition I.K.5.

I.L.2. The permittee shall prepare a biennial report detailing the specific waste minimization efforts in place that support the waste minimization

ED_001593_00015625

certification of Permit Condition I.L.1. This report shall also describe further waste minimization efforts that could be undertaken at the facility. This report shall be maintained at the facility as a part of the operating record, and the first such report shall be submitted to the Director no later that October 1, 1990. At a minimum, this report shall describe the following:

a. Any written policy or statement that outlines goals, objectives, and/or methods for source reduction and recycling of hazardous waste at the facility.

b. Any employee training or incentive programs designed to identify and implement source reduction and recycling opportunities.

c. Any source reduction and/or recycling assessments or audits conducted in the last five years or planned in the near future.

d. Any source reduction and/or recycling measures implemented in the last five years or planned for the near future.

e. The dollar amount of capital expenditures (plant and equipment) and operating costs devoted to source reduction and recycling of hazardous wastes.

f. Factors that prevented implementation of source reduction and/or recycling opportunities.

g. Sources of information on source reduction and/or recycling received at the facility (e.g. local government, trade associations, suppliers, etc.)

h. An investigation of additional waste minimization efforts which could be implemented at the facility. This investigation shall analyze the potential for reducing the quantity and toxicity of each waste stream through production process change, production reformulation, recycling, and all other appropriate means. The analysis shall include an assessment of the technical feasibility, cost, and potential waste reduction for each option.

I.L.3. The Director may, consistant with 40 CFR 270.41 and 40 CFR Part 124, require the permittee to implement waste reduction alternatives, based upon the Director's determination that such alternatives are feasible and necessary for improved protection of public health and the environment.

I.L.4. The permittee is limited to treatment by incineration of no more than 15,380 tons per calendar year of waste, combined in RM-17 incineration and CO Boilers. Such limit may be exceeded only if facility production exceeds 221,000 barrels per day on an annual basis and the total hazardous waste generation rate as a ratio to total product production does not exceed the rate that existed in 1987 (ref. Table XVII.1, page XVII.4 of Part B Application)

ED_001593_00015625

SECTION II - GENERAL FACILITY CONDITIONS

II.A. DESIGN AND OPERATION OF FACILITY

The Permittee shall construct, maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned, sudden or nonsudden release of hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment, as required by 40 CFR § 264.31.

II.B. REQUIRED NOTICES

II.B.1. Hazardous Waste Imports

The Permittee shall notify the Director in writing at least four weeks in advance of the date the Permittee expects to receive hazardous waste from a foreign source, as required by 40 CFR § 264.12(a). Notice of subsequent shipments of the same waste from the same foreign source in the same calendar year is not required.

II.B.2. Hazardous Waste from Off-Site Sources

When the Permittee is to receive hazardous waste from an off-site source (except where the Permittee is also the generator), he must inform the generator in writing that he has the appropriate Permits, and will accept the waste the generator is shipping. The Permittee must keep a copy of this written notice as part of the operating record. [40 CFR § 264.12(b)]

II.C. GENERAL WASTE ANALYSIS

The Permittee shall follow the waste analysis procedures required by 40 CFR § 264.13, as described in the attached Waste Analysis Plan, Permit Attachment 1.

The Permittee shall verify the analysis of each waste stream twice annually, except as noted below, as part of its quality assurance program, in accordance with Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA Publication SW-846, or equivalent methods approved by the Director. At a minimum, the Permittee shall maintain proper functional instruments, use approved sampling and analytical methods, verify the validity of sampling and analytical procedures, and perform correct calculations. If the Permittee uses a contract laboratory to perform analyses, then the Permittee shall inform the laboratory in writing that it must operate under the waste analysis conditions set forth in this Permit.

Sulfinol Reclaimer Bottoms shall be analyzed each time it is generated, not always annually. RM-17 waste shall be analyzed each production run, and every six months if production runs exceed six months.

II.D. SECURITY

The Permittee shall comply with the security provisions of 40 CFR § 264.14(b)(2) and (c) and Permit Attachment 2.

ED_001593_00015625

II.E. GENERAL INSPECTION REQUIREMENTS

The Permittee shall follow the inspection schedule set out in Permit Attachment 3. The Permittee shall remedy any deterioration or malfunction discovered by an inspection, as required by 40 CFR § 264.15(c). Records of inspection shall be kept, as required by 40 CFR § 264.15(d).

II.F. PERSONNEL TRAINING

The Permittee shall conduct personnel training, as required by 40 CFR § 264.16. This training program shall follow the attached outline, Permit Attachment 4. The Permittee shall maintain training documents and records, as required by 40 CFR § 264.16(d) and (e).

II.G. SPECIAL PROVISIONS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTE

The Permittee shall comply with the requirements of 40 CFR § 264.17(a). The Permittee shall follow the procedures for handling ignitable, reactive, and incompatible wastes set forth in Permit Attachment 23.

II.H PREPAREDNESS AND PREVENTION

II.H1. Required Equipment

At a minimum, the Permittee shall maintain at the facility the equipment set forth in the Contingency Plan, Permit Attachment 5, as required by 40 CFR § 264.32.

II.H2. Testing and Maintenance of Equipment

The Permittee shall test and maintain the equipment specified in Permit Condition II.H1, as necessary, to assure its proper operation in time of emergency, as required by 40 CFR § 264.33.

II.H3. Access to Communications or Alarm System

The Permittee shall maintain access to the communications or alarm system, as required by 40 CFR § 264.34.

II.H4. Required Aisle Space

At a minimum, the Permittee shall maintain aisle space, as required by 40 CFR § 264.35.

II.H5. Arrangements with Local Authorities

The Permittee shall maintain arrangements with state and local authorities, as required by 40 CFR § 264.37. If state or local officials refuse to enter into preparedness and prevention arrangements with the Permittee, the Permittee must document this refusal in the operating record.

ED_001593_00015625

II.I. CONTINGENCY PLAN

II.I.1. Implementation of Plan

The Permittee shall immediately carry out the provisions of the Contingency Plan, Permit Attachment 5, whenever there is a fire, explosion, or release of hazardous waste or constituents which could threaten human health or the environment.

II.I.2. Copies of Plan

The Permittee shall comply with the requirements of 40 CFR § 264.53.

II.I.3. Amendments to Plan

The Permittee shall review and immediately amend, if necessary, the Contingency Plan, as required by 40 CFR § 264.54.

II.I.4. Emergency Coordinator

A trained emergency coordinator shall be available at all times in case of an emergency, as required by 40 CFR § 264.55.

The names, addresses, and phone numbers of all persons qualified to act as emergency coordinators shall be supplied to the Director at the time of certification. [40 CFR § 264.52(d)].

II.J. MANIFEST SYSTEM

The Permittee shall comply with the manifest requirements of 40 CFR § 264.71, 264.72, and 264.76.

II.K. RECORDKEEPING AND REPORTING

In addition to the recordkeeping and reporting requirements specified elsewhere in this Permit, the Permittee shall do the following:

II.K.1. Operating Record

The Permittee shall maintain a written operating record at the facility, in accordance with 40 CFR § 264.73.

II.K.2. Biennial Report

The Permittee shall comply with the biennial reporting requirements of 40 CFR § 264.75.

II.L. GENERAL CLOSURE REQUIREMENTS

II.L.1. Performance Standard

The Permittee shall close the facility, as required by 40 CFR § 264.111 and in accordance with the Closure Plan, Permit Attachment 6.

ED_001593_00015625

II.L.2. Amendment to Closure Plan

The Permittee shall amend the Closure Plan, in accordance with 40 CFR § 264.112(c), whenever necessary.

II.L.3. Notification of Closure

The Permittee shall notify the Director in writing at least 60 days prior to the date on which he expects to begin closure of any of the following: tank or incinerator, or final closure of the facility, as required by 40 CFR § 264.112(d).

II.L.4. Time Allowed For Closure

After receiving the final volume of hazardous waste, the Permittee shall treat, remove from the unit or facility, or dispose of on site all hazardous waste and shall complete closure activities, in accordance with 40 CFR § 264.113 and the schedules specified in the Closure Plan, Permit Attachment 6.

II.L.5. Disposal or Decontamination of Equipment, Structures, and Soils

The Permittee shall decontaminate and/or dispose of all contaminated equipment, structures, and soils, as required by 40 CFR § 264.114 and the Closure Plan, Permit Attachment 6.

II.L.6. Certification of Closure

The Permittee shall certify that the facility has been closed in accordance with the specifications in the Closure Plan, as required by 40 CFR § 264.115.

II.L.7. Survey Plat

The Permittee shall submit a survey plat no later than the submission of certification of closure of each hazardous waste disposal unit, in accordance with 40 CFR § 264.116.

II.M. COST ESTIMATE FOR FACILITY CLOSURE

II.M.1. The Permittee's most recent closure cost estimate, prepared in accordance with 40 CFR § 264.142 264.144, and 264.197(c)(3) and (5), is specified in Permit Attachment 7.

II.M.2. The Permittee must adjust the closure cost estimate for inflation within 60 days prior to the anniversary date of the establishment of the financial instrument(s) used to comply with 40 CFR § 264.143 and Permit Condition II.N or when using an approved state-required mechanism, upon such date as required by the state. [40 CFR § 264.142(b)],

or, if a financial guarantee or corporate guarantee is used,

ED_001593_00015625

the Permittee must adjust the closure cost estimate for inflation within 30 days after the close of the firm's fiscal year and before submission of updated information to the Director, as specified in 40 CFR § 264.142(b).

II.M.3. The Permittee must revise the closure cost estimate whenever there is a change in the facility's Closure Plan, as required by 40 CFR § 264.142(c).

II.M.4. The Permittee must keep at the facility the latest closure cost estimate as required by 40 CFR § 264.142(d).

II.N. FINANCIAL ASSURANCE FOR FACILITY CLOSURE

The Permittee shall demonstrate continuous compliance with 40 CFR 264.143 and 264.146 by providing documentation of financial assurance, as required by 40 CFR § 264.151 or 264.149, in at least the amount of the cost estimates required by Permit Condition II.M. Changes in financial assurance mechanisms must be approved by the Director pursuant to 40 CFR § 264.143 or 264.149.

II.O. LIABILITY REQUIREMENTS

The Permittee shall demonstrate continuous compliance with the requirement of 40 CFR § 264.147(a) to have and maintain liability coverage for sudden and accidental occurrences in the amount of at least $1 million per occurrence, with an annual aggregate of at least $2 million, exclusive of legal defense costs.

II.P. INCAPACITY OF OWNERS OR OPERATORS, GUARANTORS, OR FINANCIAL INSTITUTIONS

The Permittee shall comply with 40 CFR § 264.148, whenever necessary.

II.Q. RISK ASSESSMENT

The Permittee shall update the risk assessment to incorporate changes in assessment procedures, cancer potencies, and facility operations as a part of the application for a renewal of this permit. The assessment shall be submitted a minimum of 12 months prior to expiration of this permit, unless otherwise directed by the Director.

ED_001593_00015625

SECTION III - VESSEL 482

III.A. SECTION HIGHLIGHTS

This Section concerns Vessel 482, which is an aboveground feed tank for the RM-17 incinerator system and ancillary equipment. Vessel 482 is not classified as a hazardous waste storage tank under RCRA since it is completely emptied of waste every 90 days. Vessel 482 is included in the permit as part of the RM-17 Incinerator system and must comply with Subpart J of 40 CFR, except Section 265.197(c) and 265.200. The age of the Vessel 482 system is about 22 years old. It is used only to contain RM-17 wastes for feed into the RM-17 incinerator. The RM-17 wastes are a mixture of Toluene recycle and light ends. The secondary containment system contains 6200 gallons, which is adequate for all of the waste. Special permit conditions for this tank include required submittals of several items of documentation .

III.B. PERMITTED AND PROHIBITED WASTE IDENTIFICATION

III.B.1. The Permittee may store a total volume of 3985 gallons of hazardous waste in Vessel 482, subject to the terms of this Permit and as follows:

Tank No	Capacity (Gallons)	Dimensions of Tank	Secondary Containment Required	Description of Hazardous Waste	Hazardous Waste No.
Vessel 482	3985	9 ft(diam) x 8 ft 4.5" height	yes-in place	RM-17 waste (toluene recycle and light ends)	D001, U220

III.B.2. The Permittee is prohibited from storing or treating hazardous waste that is not identified in Permit Condition III.B.1.

III.C. SECONDARY CONTAINMENT AND INTEGRITY ASSESSMENTS

The Permittee shall operate the secondary containment system, in accordance with the detailed design plans and descriptions contained in Permit Attachment 8. [40 CFR § 264.193(b)-(f)]

III.D. OPERATING REQUIREMENTS

III.D.1. The Permittee shall not place hazardous wastes or treatment reagents in the tank system if they could cause the tank, its ancillary equipment, or a containment system to rupture, leak, corrode, or otherwise fail. [40 CFR § 264.194(a)]

III.D.2. The Permittee shall prevent spills and overflows from the tank or containment systems using the methods described in Permit Attachment 10. [40 CFR § 264.194(b)]

ED_001593_00015625

III.E. RESPONSE TO LEAKS OR SPILLS

In the event of a leak or a spill from the tank system, from a secondary containment system, or if a system becomes unfit for continued use, the Permittee shall remove the system from service immediately and complete the following actions: [40 CFR § 264.196(a)-(f)]

III.E.1. Stop the flow of hazardous waste into the system and inspect the system to determine the cause of the release.

III.E.2. Remove waste and accumulated precipitation from the system within 24 hours of the detection of the leak to prevent further release and to allow inspection and repair of the system. If the Permittee finds that it will be impossible to meet this time period, the Permittee shall notify the Director and demonstrate that the longer time period is required.

If the collected material is a RCRA hazardous waste, it must be managed in accordance with all applicable requirements of 40 CFR Parts 262-264. The Permittee shall note that if the collected material is discharged through a point source to U.S. waters or to a POTW, it is subject to requirements of the Clean Water Act. If the collected material is released to the environment, it may be subject to reporting under 40 CFR Part 302.

III.E.3. Contain visible releases to the environment. The Permittee shall immediately conduct a visual inspection of all releases to the environment and based on that inspection: (1) prevent further migration of the leak or spill to soils or surface water and (2) remove and properly dispose of any visible contamination of the soil or surface water.

III.E.4. Close the system in accordance with the Closure Plan, Permit Attachment 6, unless the following actions are taken:

III.E.4.a. For a release caused by a spill that has not damaged the integrity of the system, the Permittee shall remove the released waste and make any necessary repairs to fully restore the integrity of the system before returning the tank system to service.

III.E.4.b. For a release caused by a leak from the primary tank system to the secondary containment system, the Permittee shall repair the primary system prior to returning it to service.

III.E.4.c. If the Permittee replaces a component of the tank system to eliminate the leak, that component must satisfy the requirements for new tank systems or components in 40 CFR § 264.192 and CFR § 40 264.193.

III.E.5. For all major repairs to eliminate leaks or restore the integrity of the tank system, the Permittee must obtain a certification by an independent, qualified, registered professional engineer that the repaired system is capable of handling hazardous wastes without release for the intended life of the system before returning the system to service. Examples of major repairs are: installation of an internal liner, repair of a ruptured tank, or repair or replacement of a secondary containment vault.

ED_001593_00015625

III.F. INSPECTION SCHEDULES AND PROCEDURES

III.F.1. The Permittee shall inspect the tank systems, in accordance with the Inspection Schedule, Permit Attachment 3, and shall complete the items in Permit Conditions III.F.2. and III.F.3. as part of those inspections:

III.F.2. The Permittee shall inspect the overfill controls, in accordance with the schedule in Permit Attachment 3. [40 CFR § 264.195(a)]

III.F.3. The Permittee shall visually inspect the following components of the tank system once each operating day: [40 CFR § 264.195(b)]

III.F.3.a. Aboveground portions of the tank system, if any, to detect corrosion or releases of waste;

III.F.3.b. Data gathered from monitoring and leak detection equipment (e.g., pressure or temperature gauges, monitoring wells) to ensure that the tank system is being operated according to its design;

III.F.3.c. Construction materials and the area immediately surrounding the externally accessible portion of the tank system, including the secondary containment system, to detect erosion or signs of releases of hazardous waste (e.g., wet spots, dead vegetation).

III.F.4. The Permittee shall inspect cathodic protection systems, in accordance with the following schedule: [40 CFR § 264.195(c)]

III.F.4.a. The proper operation of the cathodic protection system must be confirmed within six months from initial installation and annually thereafter and

III.F.4.b. All sources of impressed current must be inspected and tested every other month.

III.F.5. The Permittee shall document compliance with Permit Conditions III.F.2. through III.F.4. and place this documentation in the operating record for the facility. [40 CFR § 264.195(d)]

III.G. RECORDKEEPING AND REPORTING

III.G.1. The Permittee shall report to the Director, within 24 hours of detection, when a leak or spill occurs from the tank system or secondary containment system to the environment. [40 CFR § 264.196(d)(1)] (A leak or spill of one pound or less of hazardous waste, that is immediately contained and cleaned-up, need not be reported.) [40 CFR § 264.196(d)(2)] (Releases that are contained within a secondary containment system need not be reported). If the Permittee has reported the release pursuant to 40 CFR Part 302, this report satisfies the requirements of this Permit Condition. [40 CFR § 264.196(d)(1)]

III.G.2. Within 30 days of detecting a release to the environment from the tank system or secondary containment system, the Permittee shall report the following information to the Director: [40 CFR § 264.196(d)(3)]

ED_001593_00015625

a. Likely route of migration of the release;

b. Characteristics of the surrounding soil (including soil composition, geology, hydrogeology, and climate);

c. Results of any monitoring or sampling conducted in connection with the release. If the Permittee finds it will be impossible to meet this time period, the Permittee should provide the Director with a schedule of when the results will be available. This schedule must be provided before the required 30-day submittal period expires;

d. Proximity of down gradient drinking water, surface water, and populated areas; and

e. Description of response actions taken or planned.

III.G.3. The Permittee shall submit to the Director all certifications of major repairs to correct leaks within seven days from returning the tank system to use. [40 CFR § 264.196(f)]

III.G.4. The Permittee shall obtain, and keep on file at the facility, the written statements by those persons required to certify the design and installation of the tank system. [40 CFR § 264.192(g)]

III.G.5. The Permittee shall keep on file at the facility the written assessment of the tank system's integrity. [40 CFR § 264.191(a)]

III.H. CLOSURE AND POST-CLOSURE CARE

III.H.1. At closure of the tank system(s), the Permittee shall follow the procedures in the Closure Plan, Permit Attachment 6. [40 CFR § 264.197(a)]

III.H.2. If the Permittee demonstrates that not all contaminated soils can be practically removed or decontaminated, in accordance with the Closure Plan, then the Permittee shall close the tank system(s) and perform post-closure care following the contingent procedures in the Closure Plan. [40 CFR § 264.197(b) and (c)]

III.I. SPECIAL TANK PROVISIONS FOR IGNITABLE OR REACTIVE WASTES

III.I.1. The Permittee shall not place ignitable or reactive waste in the tank system or in the secondary containment system, unless the procedures specified in Permit Attachment 11 are followed. [40 CFR § 264.198(a)]

III.I.2. The Permittee shall comply with the requirements for the maintenance of protective distances between the waste management area and any public ways, streets, alleys, or an adjoining property line that can be built upon, as required in Tables 2-1 through 2-6 of the National Fire Protection Association's "Flammable and Combustible Liquids Code" (1977 or 1981). [40 CFR § 264.198(b)]

ED_001593_00015625

SECTION IV - TANKS 1065, 383, & 12038

IV.A. SECTION HIGHLIGHTS

This Section concerns tanks 1065, 383, and 12038. Tanks 1065 and 383 have been existing through 1989; but are being closed in accordance with an approved closure plan. The hazardous waste liquids consist of waste biosolids, DAF float and sulfinol reclaimer bottoms, which were previously mixed in Tank 1065 and pumped and stored in Tank 383 prior to being fed into the boilers. Tank 12038 is a new aboveground tank which replaces tank 1065, in location and replaces both tanks in function. Certification of closure of Tanks 1065 and 383 is required and engineering certification of Tank 12038 is required in Permit Condition IV.J.

IV.B. PERMITTED AND PROHIBITED WASTE IDENTIFICATION

IV.B.1. The Permittee may store and mix a total volume of 47,750 gallons of hazardous waste in one tank, subject to the terms of this Permit and as follows:

Tank No	Capacity (Gallons)	Dimensions of Tank	Secondary Containment Required	Description of Hazardous Waste	Hazardous Waste No.
12038	47,750	20 ft(diam) x 20 ft	yes, double shelled vessel	DAF float, Sulfinol Reclaimer Bottoms, Waste biosolids	K048, D007

IV.B.2. The Permittee is prohibited from storing or treating hazardous waste that is not identified in Permit Condition IV.B.1.

IV.B.3. The Permittee shall design, construct, and operate Tank 12038 in accordance with the detailed design plans and descriptions contained in Permit Attachment 9 and not operate the tank until an engineer's construction certification has been submitted and approved.

IV.C. SECONDARY CONTAINMENT AND INTEGRITY ASSESSMENTS

IV.C.1. For tank systems used to store or treat materials that are defined as hazardous waste in the future, the Permittee must obtain a written assessment of the existing tank system integrity within 12 months from the date the waste is defined as hazardous. [40 CFR § 264.191(c)] The assessment shall be certified by an independent, qualified, registered professional engineer. [40 CFR § 264.191(a) and (b)]

IV.C.2. The Permittee shall design, construct, and operate the secondary containment system, in accordance with the detailed design plans and descriptions contained in Permit Attachment 12. [40 CFR § 264.193(b)-(f)]

ED_001593_00015625

IV.D. OPERATING REQUIREMENTS

IV.D.1. The Permittee shall not place hazardous wastes or treatment reagents in the tank system if they could cause the tank, its ancillary equipment, or a containment system to rupture, leak, corrode, or otherwise fail. [40 CFR § 264.194(a)]

IV.D.2. The Permittee shall prevent spills and overflows from the tank or containment systems using the methods described in Permit Attachment 14. [40 CFR § 264.194(b)]

IV.E. RESPONSE TO LEAKS OR SPILLS

In the event of a leak or a spill from the tank system, from a secondary containment system, or if a system becomes unfit for continued use, the Permittee shall remove the system from service immediately and complete the following actions: [40 CFR § 264.196(a)-(f)]

IV.E.1. Stop the flow of hazardous waste into the system and inspect the system to determine the cause of the release.

IV.E.2. Remove waste and accumulated precipitation from the system within 24 hours of the detection of the leak to prevent further release and to allow inspection and repair of the system. If the Permittee finds that it will be impossible to meet this time period, the Permittee shall notify the Director and demonstrate that the longer time period is required.

If the collected material is a RCRA hazardous waste, it must be managed in accordance with all applicable requirements of 40 CFR Parts 262-264. The Permittee shall note that if the collected material is discharged through a point source to U.S. waters or to a POTW, it is subject to requirements of the Clean Water Act. If the collected material is released to the environment, it may be subject to reporting under 40 CFR Part 302.

IV.E.3. Contain visible releases to the environment. The Permittee shall immediately conduct a visual inspection of all releases to the environment and based on that inspection: (1) prevent further migration of the leak or spill to soils or surface water and (2) remove and properly dispose of any visible contamination of the soil or surface water.

IV.E.4. Close the system in accordance with the Closure Plan, Permit Attachment 6, unless the following actions are taken:

IV.E.4.a. For a release caused by a spill that has not damaged the integrity of the system, the Permittee shall remove the released waste and make any necessary repairs to fully restore the integrity of the system before returning the tank system to service.

IV.E.4.b. For a release caused by a leak from the primary tank system to the secondary containment system, the Permittee shall repair the primary system prior to returning it to service.

IV.E.4.c. For a release to the environment caused by a leak from a component of the tank system that is below ground and does not have secondary containment, the Permittee must provide this component

ED_001593_00015625

with secondary containment that meets the requirements of 40 CFR § 264.193 before the component can be returned to service.

IV.E.4.d. For a release to the environment caused by a leak from the aboveground portion of the tank system that does not have secondary containment, and can be visually inspected, the Permittee shall repair the tank system before returning it to service.

IV.E.4.e. For a release to the environment caused by a leak from the portion of the tank system component that is not readily available for visual inspection, the Permittee shall provide secondary containment that meets the requirements of 40 CFR § 264.193 before the component can be returned to service.

IV.E.4.f. If the Permittee replaces a component of the tank system to eliminate the leak, that component must satisfy the requirements for new tank systems or components in 40 CFR § 264.192 and 40 CFR § 264.193.

IV.E.5. For all major repairs to eliminate leaks or restore the integrity of the tank system, the Permittee must obtain a certification by an independent, qualified, registered professional engineer that the repaired system is capable of handling hazardous wastes without release for the intended life of the system before returning the system to service. Examples of major repairs are: installation of an internal liner, repair of a ruptured tank, or repair or replacement of a secondary containment vault.

IV.F. INSPECTION SCHEDULES AND PROCEDURES

IV.F.1. The Permittee shall visually inspect the tank systems, in accordance with the Inspection Schedule, Permit Attachment 3, and shall complete the items in Permit Conditions IV.F.2. and IV.F.3. as part of those inspections:

IV.F.2. The Permittee shall inspect the overfill controls, in accordance with the schedule in Permit Attachment 3. [40 CFR § 264.195(a)]

IV.F.3. The Permittee shall inspect the following components of the tank system once each operating day: [40 CFR § 264.195(b)]

IV.F.3.a. Aboveground portions of the tank system, if any, to detect corrosion or releases of waste;

IV.F.3.b. Data gathered from monitoring and leak detection equipment (e.g., pressure or temperature gauges, monitoring wells) to ensure that the tank system is being operated according to its design;

IV.F.3.c. Construction materials and the area immediately surrounding the externally accessible portion of the tank system, including the secondary containment system, to detect erosion or signs of releases of hazardous waste (e.g., wet spots, dead vegetation).

IV.F.4. The Permittee shall document compliance with Permit Conditions IV.F.2. through IV.F.4. and place this documentation in the operating record for the facility. [40 CFR § 264.195(d)]

ED_001593_00015625

IV.G. RECORDKEEPING AND REPORTING

IV.G.1. The Permittee shall report to the Director, within 24 hours of detection, when a leak or spill occurs from the tank system or secondary containment system to the environment. [40 CFR § 264.196(d)(1)] (A leak or spill of one pound or less of hazardous waste, that is immediately contained and cleaned-up, need not be reported.) [40 CFR § 264.196(d)(2)] (Releases that are contained within a secondary containment system need not be reported). If the Permittee has reported the release pursuant to 40 CFR Part 302, this report satisfies the requirements of this Permit Condition. [40 CFR § 264.196(d)(1)]

IV.G.2. Within 30 days of detecting a release to the environment from the tank system or secondary containment system, the Permittee shall report the following information to the Director: [40 CFR § 264.196(d)(3)]

a. Likely route of migration of the release;

b. Characteristics of the surrounding soil (including soil composition, geology, hydrogeology, and climate);

c. Results of any monitoring or sampling conducted in connection with the release. If the Permittee finds it will be impossible to meet this time period, the Permittee should provide the Director with a schedule of when the results will be available. This schedule must be provided before the required 30-day submittal period expires;

d. Proximity of down gradient drinking water, surface water, and populated areas; and

e. Description of response actions taken or planned.

IV.G.3. The Permittee shall submit to the Director all certifications of major repairs to correct leaks within seven days from returning the tank system to use. [40 CFR § 264.196(f)]

IV.G.4. The Permittee shall obtain, and keep on file at the facility, the written statements by those persons required to certify the design and installation of the tank system. [40 CFR § 264.192(g)]

IV.G.5. The Permittee shall keep on file at the facility the written assessment of the tank system's integrity. [40 CFR § 264.191(a)]

IV.H. CLOSURE AND POST-CLOSURE CARE

IV.H.1. At closure of the tank system(s), the Permittee shall follow the procedures in the Closure Plan, Permit Attachment 6. [40 CFR § 264.197(a)]

IV.H.2. If the Permittee demonstrates that not all contaminated soils can be practically removed or decontaminated, in accordance with the Closure Plan, then the Permittee shall close the tank system(s) and perform post-closure care following the contingent procedures in the Closure Plan. [40 CFR § 264.197(b) and (c)]

ED_001593_00015625

IV.I. SPECIAL TANK PROVISIONS FOR IGNITABLE OR REACTIVE WASTES

IV.I.1. The Permittee shall not place ignitable or reactive waste in the tank system or in the secondary containment system. [40 CFR § 264.198(a)]

IV.I.2. The Permittee shall comply with the requirements for the maintenance of protective distances between the waste management area and any public ways, streets, alleys, or an adjoining property line that can be built upon, as required in Tables 2-1 through 2-6 of the National Fire Protection Association's "Flammable and Combustible Liquids Code" (1977 or 1981). [40 CFR § 264.198(b)]

IV.J. COMPLIANCE SCHEDULE

The Permittee shall provide the following information to the Director:

	Item	Date Due to the Director
1.	Documentation of Tank 383 closure and certification being completed	30 days after completion of closure
2.	Documentation of Tank 1065 closure and certification being completed	30 days after completion of closure
3.	Documentation of completion of construction on Tank 12038, including submittal of as-built drawings, and engineer's certification	30 days after completion of construction / installation

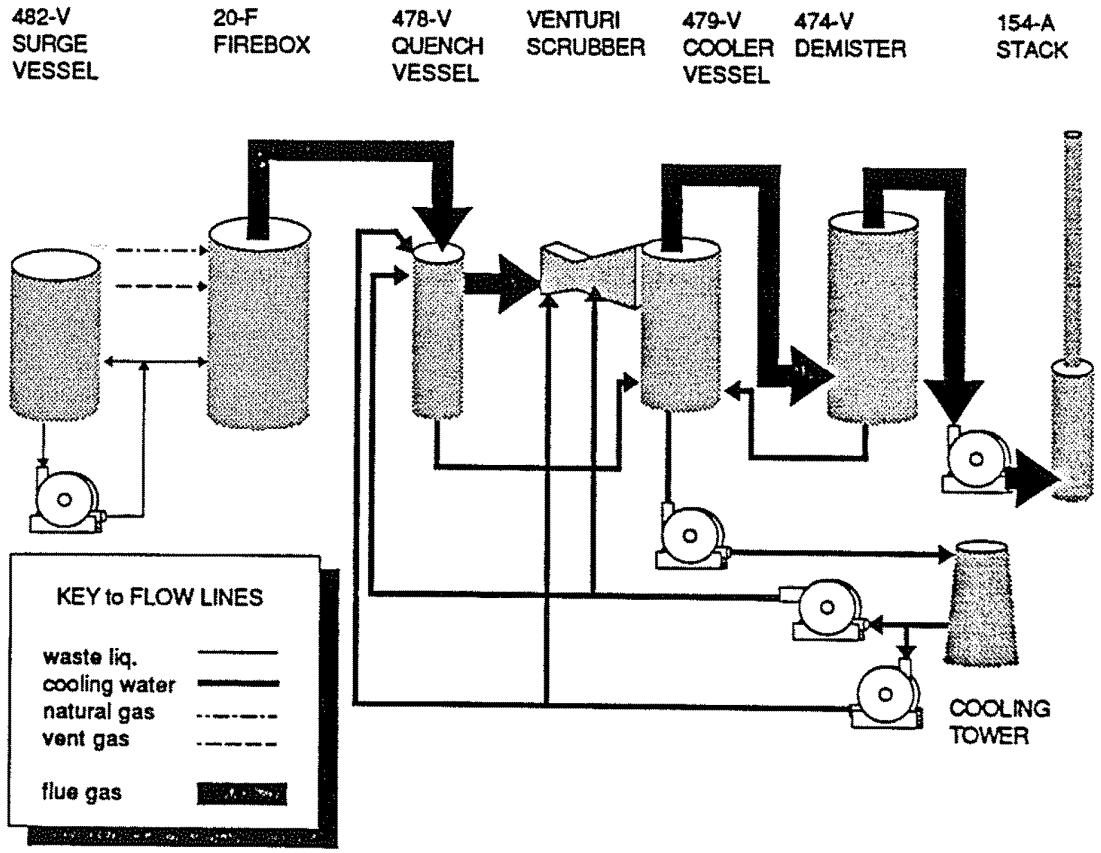
ED_001593_00015625

SECTION V - INCINERATION - RM-17

V.A SECTION HIGHLIGHTS

The RM-17 incinerator is a liquid injection incinerator with a nominal heat rating of 12 million BTUs per hour. Air and combustion gasses are moved by an induced draft fan designed for a suction flowrate of 8,400 actual cubic feet per minute at 90°F and 75 inches water column. The air pollution controls consist of a quench vessel, a venturi scrubber, a cooler vessel and a demister vessel. Flue gas exits the stack at about 140°F. The schematic below shows the units that make up the RM-17 incinerator.

Schematic - Sketch of RM-17 Incinerator



ED_001593_00015625

The permit allows a maximum waste feed rate of 0.85 gallons /minute (approximately 408 pounds per hour) and requires a minimum temperature of 1450°F be maintained in the firebox.

The incinerator burns two organic liquid waste streams and process vent gas, such wastes being from the manufacturing of RM-17. Only the toluene recycle waste stream is an EPA waste (U-220). This waste is generated intermittently at a rate of 10 to 30 tons per month and at an annual rate of 35 to 140 tons per year.

V.B. IDENTIFICATION CRITERIA FOR PERMITTED AND PROHIBITED WASTE

The Permittee may incinerate the following hazardous wastes, as specified in this Permit and only under the terms of this Permit. The Permittee may only feed the hazardous wastes as identified below at the facility subject to Permit Conditions V.C. through V.F., and V.H.

V.B.1. The Permittee shall incinerate only hazardous wastes meeting the following criteria:

V.B.1.a. No hazardous constituents shall have a heat of combustion less than that of Toluene (18,450 BTU/lb). The light ends waste stream is non-hazardous, under RCRA, and has a heat of combustion of 20,053 BTUs/lb.

V.B.1.b. The waste shall have no solids present.

V.B.1.c. The waste shall contain no halogens.

V.B.1.d. The physical state of the waste feed shall be liquids or gasses.

V.B.1.e. No waste, or combination of wastes, with a heating value of less than 18,400 BTU/lb shall be fed to the incinerator unless fed in conjunction with auxiliary fuel.

V.B.1.f The viscosity of U-220 waste as fed to the liquid injection incinerator, including light ends, shall not exceed 10 cp.

V.B.1.g. Wastes containing tetramethyl succinonitrile (TMSN) shall not be fed at any time to this incinerator.

V.B.1.h. No hazardous wastes other than those generated on site at the Shell Oil Company, Martinez Manufacturing Complex, will be fed to this incinerator .

ED_001593_00015625

V.B.2. The Permittee may incinerate only the following waste streams:

Hazardous Waste No.	Description	Maximum Feed Rate
U-220, D001, (CWC 343)	Toluene Recycle	0.85 gallons/minute, hourly average, as a total of U-220 & CWC 223
CWC 223*	Light ends	0.85 gallons/minute, hourly average, as a total of U-220 & CWC 223
CWC 223, CWC 343	Vent Gas	as produced
* CWC = California Waste Code		

V.B.3. The Permittee shall conduct waste feed analysis once each production run, and every six months if production runs exceed six months (General Waste Analysis, II.C), in accordance with the Waste Analysis Plan, Permit Attachment 1, to verify that waste fed to the incinerator is within the physical and chemical composition limits specified in this Permit, including Condition V.C.10. Wastes shall be as described by Table V.A.7.1 , ppV-5 & 6, and Table V.A.8, p V.9, and Table V.A.7.2, pp V.7 & 8, and Table V.A.8, p V.9, in the September 30, 1988 Part B application, only, as revised May 12, 1989. (Note: these pages contain Confidential Business Information and the Tables will not be found in the public review copies of the Part B permit application)

V.C. CONSTRUCTION, INSTRUMENTATION, AND OPERATIONAL PERFORMANCE REQUIREMENTS

V.C.1. The Permittee shall maintain the incinerator in accordance with the design plans and specifications contained in Permit Attachment 15.

V.C.2. The Permittee shall install and test all instrumentation in accordance with the design plans, performance specifications, and maintenance procedures contained in Permit Attachment 15 within six months after effective date of permit.

The Permittee shall maintain the incinerator so that when operated, in accordance with the operating requirements specified in this permit, it will meet the performance standards specified in Permit Conditions V.C.3. through V.C.5. [40 CFR § 264.343]

V.C.3. The incinerator shall achieve a destruction and removal efficiency (DRE) of at least 99.99 percent for each of the following principal organic hazardous constituents (POHC) for each waste feed. The DRE value shall be determined using the method specified in 40 CFR § 264.343(a)(1). [40 CFR § 264.343(a)(1)]

ED_001593_00015625

Waste Feed:	POHC:
Toluene Recycle	Toluene
Light Ends	Toluene

V.C.4. The Permittee shall control hydrogen chloride (HCl) emissions, such that the rate of emissions is no greater than the larger of either 1.8 kilograms per hour (4 pounds/hour) or one percent of the HCl in the stack gas, prior to entering any pollution control equipment. [40 CFR § 264.343(b)]

V.C.5. The incinerator shall not emit particulate matter in excess of 180 milligrams per dry standard cubic meter (0.08 grains per dry standard cubic foot) when corrected for the amount of oxygen in the stack gas, in accordance with the formula specified in 40 CFR § 264.343(c). [40 CFR § 264.343(c)]

Except during the periods specified in the Permit Conditions for Short-Term Incineration under the Trial Burn Period, the Permittee shall feed the wastes described in Permit Condition V.B. to the incinerator only under the following conditions: [40 CFR § 264.345]

V.C.6. Carbon monoxide concentration in the stack exhaust gas, monitored as specified in Permit Condition V.E., and corrected to 7% oxygen in the stack gas, shall not exceed 100 ppm at any time. The correction for oxygen will be made using the following formula and a constant oxygen concentration (% 02) determined at the start of each RM-17 production run while operating the unit at representative operating conditions: Corrected CO = Stack Exhaust Gas CO x 14 / (21 - % 02) The determination shall be made by performing 3 two hour runs at the operating conditions planned for the production run. The oxygen meter shall be properly calibrated, and all operating conditions during the runs shall be documented and placed in the operating record.

V.C.7. The Permittee shall be limited to the following waste feed rates in the following locations. Wastes shall only be fed to the firebox. The limits below are based on the combined feed of the Toluene Recycle and Light Ends waste streams.

V.C.7.a. Maximum instantaneous firebox chamber organic liquid waste feed rate of 0.95 gallons per minute.

V.C.7.b. Average firebox chamber organic liquid waste feed rate not to exceed 0.85 gallons per minute, over a one hour averaging period.

V.C.8. Combustion temperature, monitored as specified in Permit Condition V.E., shall be maintained between 1450° F and 1800°F, on an hourly average.

V.C.9. Combustion gas flow, monitored as specified in Permit Condition V.E., shall be no greater than 4,700 standard cubic feet per minute (scfm).

ED_001593_00015625

V.C.10. The mass feed rates of toxic metals to the incinerator shall not exceed:

Metal	Feed Rate	Metal	Feed Rate
Arsenic	<1 mg/kg	Antimony	<5 mg/kg
Barium:	2.4 mg/kg	Lead:	<5 mg/kg
Chromium	<1 mg/kg	Mercury	<0.1 mg/kg
Beryllium	<1 mg/kg	Silver:	2.6 mg/kg
Cadmium	<1 mg/kg	Thallium:	<5 mg/kg
Nickel	3.3 mg/kg		

V.C.11. The differential atomization steam pressure between atomizing steam and waste feed shall be no less than 15 psig.

V.C.12. The quench water flow rate shall be maintained at 40 gpm minimum.

V.C.13. Pressure drop across the venturi scrubber, monitored as specified in Permit Condition V.E., shall be maintained at no less than 9 inches H_2O

V.C.14. The scrubber recirculation rate shall be maintained at no less than 100 gpm.

V.C.15. The Permittee shall control fugitive emissions from the combustion zone of the incinerator by maintaining the pressure in the firebox chamber, monitored as specified in Permit Condition V.E., at or above 0.3 inches of H_2O draft. [40 CFR § 264.345(d)]

V.C.16. Compliance with the operating conditions specified in Permit Conditions V.C.6. through V.C.15. will be regarded as compliance with the required performance standards in Permit Conditions V.C.3. through V.C.5. However, evidence that compliance with these operating conditions is insufficient to ensure compliance with the performance standards, may justify modification, revocation, or reissuance of the Permit pursuant to 40 CFR § 270.41. [40 CFR § 264.343(d)]

V.D. INSPECTION REQUIREMENTS

The Permittee shall inspect the incineration unit in accordance with the Inspection Schedule, Permit Attachment 3, and shall complete the following as part of these inspections:

V.D.1. The Permittee shall visually inspect the incinerator and associated equipment (including pumps, valves, conveyors, pipes, etc.) at least daily for leaks, spills, fugitive emissions, and signs of tampering in accordance with Permit Attachment 3. [40 CFR § 264.347(b)]

V.D.2. The Permittee shall visually inspect the instrumentation and strip charts which display and record the operating parameters specified in Conditions

ED_001593_00015625

V.C.6 through V.C.15 at least daily for out-of-tolerance monitored and/or recorded operational data.

V.D.3. The Permittee shall test the emergency waste feed cut-off system and associated alarm at least monthly to verify operability, as specified in Permit Condition V.F.1. The waste feed cut-off system shall be tested by shutting off the waste feed in a controlled manner, temporarily blocking in the waste feed line, and reopening the waste liquid shutoff valve and then testing the shutoff alarm and operation of the shutoff valve. [40 CFR § 264.347(c)]

V.E. MONITORING REQUIREMENTS

V.E.1. The Permittee shall maintain, calibrate, and operate monitoring equipment and record the data while incinerating hazardous waste, as specified below:

ED_001593_00015625

System Parameter	Monitor Type	Location	Recording Process	Calibration Details
Waste feed rate	flow meter	upstream from waste feed nozzle	Continuous strip chart	Monthly, within 5% of positively measured flow
Firebox Temperature	Shielded Thermocouple (TC)	at exit of firebox	Continuous strip chart	monthly - calibrate recorder per manufacturer's specification; cease waste feed operations and replace TC if TC fails
Atomizing Steam/Waste Feed	Differential Pressure	waste feed nozzle	Continuous strip chart	Quarterly, per manufacturer's specification
Carbon Monoxide	Gas filter IR correlation detector	upstream from induced draft fan	Continuous strip chart	Daily, per manufacturer's specification; yearly per 40 CFR 60 Appendix B, Performance Specification 4, & using 100 ppmv span value
Oxygen		upstream from induced draft fan	Continuous strip chart during start of each production run, not permanent installation	At start of production run, per 40 CFR 60 Appendix B, Performance Specification 3
Venturi ΔP	pressure	venturi throat	Continuous strip chart	Quarterly, within 5% of inclined manometer
Firebox Draft	pressure	firebox	Continuous strip chart	Quarterly, within 5% of inclined manometer
Quench Water Flow Rate	flow meter	water line into vessel	Continuous strip chart	Yearly, within 5% of positively measured flow
Combustion Gas Flow	Hot wire	stack	Continuous strip chart	Quarterly, per manufacturer's specification

V.E.2 Upon request of the Agency, the Permittee shall perform sampling and analysis of the waste and exhaust emissions to verify that the operating requirements established in the Permit achieve the performance standards. [40 CFR § 264.347(a)(3)]

V.F. WASTE FEED CUT-OFF REQUIREMENTS

V.F.1. The Permittee shall construct and maintain the systems specified below to automatically cut off the hazardous waste feed to the incinerator at the levels specified below. Hazardous wastes shall be fed to the incinerator only

ED_001593_00015625

when all instruments required by this condition are on line and operating properly. Additional cutoff limits utilized by the facility are listed in Table 2-1, page 2-7, of the June 5, 1989 Trial Burn Report. These additional limits shall be followed except as they may conflict with more stringent limits set in this permit. At a minimum equipment shall be tested and maintained at the frequencies stipulated below

Parameter	Cut-Off Limits *	Test Frequency
Waste flow measurement	greater than 0.95 gallons per minute	Monthly
High CO	greater than 100 ppm	Monthly
Low Temperature	less than 1420°F	Monthly
Loss of Firebox Draft	less than 0.3 inch water column	Monthly
Pressure Drop Across Venturi Scrubber	less than 9 inches water column	Monthly
Combustion Gas Flow	greater than 4,700 scfm	Monthly
All of the above	if any instrument required for cutoff system is not operational, or if instrument span is exceeded	Monthly
	* Cut-offs to be based on instantaneous instrument readings, initiated at second instrument reading where cut-off value is exceeded.	

V.F.2. In case of a malfunction of the automatic waste feed cut-off systems, the Permittee shall perform manual shut downs in accordance with the approved procedures in Permit Attachment 16. The Permittee shall not restart the incinerator until the problem causing the malfunction has been located and corrected.

V.F.3. The Permittee may deactivate the waste liquid shutoff system, temporarily, for an analyzer or instrument while the analyzer or instrument is being calibrated. A log sheet shall be maintained upon which the deactivation and reactivation of the waste feed cut-off system is documented. Alternatively the continuous chart for the instrument shall be stamped with a "reactivation stamp. If automatic activation and deativation of the waste feed cutoff system is installed as part of the calibration system, the system shall have indicator lights to show the operational condition of the cutoff system to assist the operator in documenting that the cutoff system is always active during normal operations.

V.G. CLOSURE

The Permittee shall follow the procedures in the Closure Plan, Permit Attachment 6. [40 CFR § 264.351]

ED_001593_00015625

V.H. RECORDKEEPING

V.H.1. The Permittee shall record and maintain, in the operating record for this permit, all monitoring and inspection data compiled under the requirements of this Permit (see Permit Condition I.E.9.b.). [40 CFR § 264.73 and 40 CFR § 264.347(d)]

V.H.2. The Permittee shall record in the operating record for this permit the date and time of all automatic waste feed shut-offs, including the triggering parameters, reason for the shut-off, and corrective actions taken. The Permittee shall also record all failures of the automatic waste feed shut-offs to function properly and corrective actions taken.

V.I. COMPLIANCE SCHEDULE

The Permittee shall provide the following information to the Director:

	Item	Date Due to the Director
1.	Documentation that CO meter is installed and certification has been completed	Six months after the permit's effective date
2.	Submittal of inspection schedule for internal components of incinerator and air pollution control devices	Four months after the permit's effective date
3.	Documentation that all other cutoffs listed in Table on Section V.F.1. are installed and fully operational	Six months after the permit's effective date

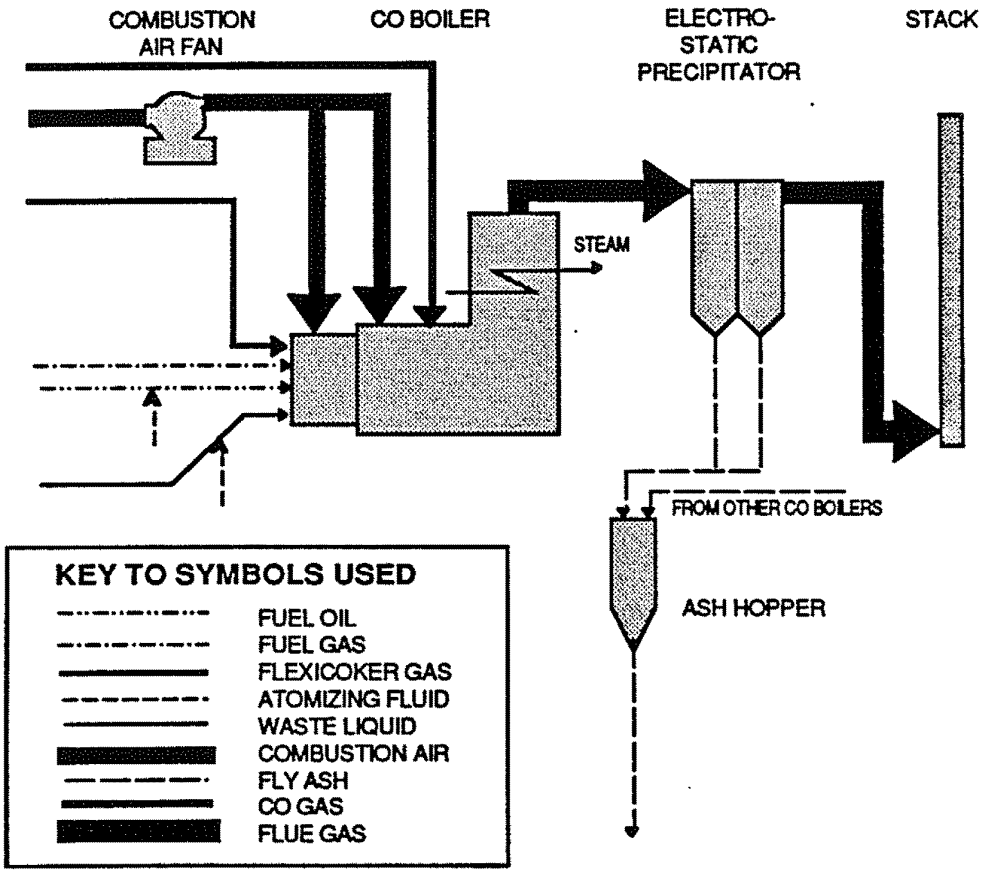
ED_001593_00015625

SECTION VI - INCINERATION - CO BOILERS

VI.A SECTION HIGHLIGHTS

There are three CO boilers, each essentially the same in design and operation.The hazardous waste liquids consist of waste biosolids, DAF float and sulfinol reclaimer bottoms, which are mixed and stored in Tank 12038 prior to being fed into the boilers. The boilers operate under positive pressure. They each have an electrostatic precipitator for air pollution control of particulates, followed by individual stacks. The sketch below provides a schematic of a typical unit.

Schematic Sketch of CO Boiler



The units operate on multiple feeds. These include the hazardous waste liquids, fuel gas, fuel oil, flexicoker gas, and regenerator (CO) gas. The hazardous waste liquids account for about 2% of the total heat load and about 1% of the mass input and are fed into Burners 1 and 4 of each boiler.

ED_001593_00015625

The permit allows a waste feed rate of up to 10 gallons per minute to each CO Boiler and requires a minimum firebox temperature of 1630°F. The CO limit is 100 ppm, 60 minutes rolling average. The trial burn tested CO Boiler 1 only. Trial burns are required on the other CO boiler units during the life of the permit (see Permit Condition VI.I.). The permit also requires upgrading of the continuous emission monitoring CO equipment on the three units (see Permit Condition VI.I.).

VI.B. IDENTIFICATION CRITERIA FOR PERMITTED AND PROHIBITED WASTE

Except during the periods specified in the conditions for Short-Term Incineration under the Trial Burn, the Permittee may incinerate the following hazardous wastes, as specified in this Permit and only under the terms of this Permit. The Permittee may only feed the hazardous wastes as identified below or further described in Permit Attachment 17, List of Wastes at the facility subject to Permit Conditions VI.C. through VI.F., and VI.H.

VI.B.1. The Permittee shall incinerate only hazardous wastes meeting the following criteria:

VI.B.1.a. No hazardous constituents shall have a heat of combustion less than that of Toluene (18,450 BTU/lb).

VI.B.1.b. The ash content of the waste shall be no greater than two (2) percent by weight.

VI.B.1.c. There shall be no organic chloride or other halogens in the waste feed.

VI.B.1.d. The physical state of the waste feed shall be liquid with a viscosity not exceeding 50 centipoise.

VI.B.1.e. Wastes shall always be fed in conjunction with auxiliary fuel.

VI.B.1.f. No hazardous wastes other than those generated on site at the Shell Oil Company, Martinez Manufacturing Complex, will be fed to this incinerator.

VI.B.2. The Permittee may incinerate only the following hazardous waste:

Hazardous Waste No.	Description	Feed Rate
K048	DAF float	10 gallons per minute as a combined total of the three waste stream elements, to each CO Boiler
D007	Sulfinol Reclaimer Bottoms	see above
none	Waste biosolids	see above

ED_001593_00015625

VI.B.3. Throughout operation, the Permittee shall conduct waste analysis in accordance with the General Waste Analysis, II.C and the Waste Analysis Plan, Permit Attachment 1, to verify that waste fed to the incinerator is within the physical and chemical composition limits specified in this Permit.

VI.C. CONSTRUCTION, INSTRUMENTATION, AND OPERATIONAL PERFORMANCE REQUIREMENTS

VI.C.1. The Permittee shall maintain the incinerator in accordance with the design plans and specifications contained in Permit Attachment 18.

VI.C.2. The Permittee shall install and test all instrumentation in accordance with the design plans, performance specifications, and maintenance procedures contained in Permit Attachment 18 prior to handling hazardous wastes in the incinerator unit.

The Permittee shall maintain the incinerator so that when operated, in accordance with the operating requirements specified in this permit, it will meet the performance standards specified in Permit Conditions VI.C.3 through VI.C.5. [40 CFR § 264.343]

VI.C.3. The incinerator shall achieve a destruction and removal efficiency (DRE) of at least 99.99 percent for each designated principal organic hazardous constituent (POHC) for each waste feed. The DRE value shall be determined using the method specified in 40 CFR § 264.343(a)(1).

Waste Feed:	POHC:
DAF Float	Toluene
Sulfinol Reclaimer Bottoms	Toluene

VI.C.4. The Permittee shall control hydrogen chloride (HCl) emissions, such that the rate of emissions is no greater than the larger of either 1.8 kilograms per hour (4 pounds/hour) or one percent of the HCl in the stack gas, prior to entering any pollution control equipment. [40 CFR § 264.343(b)]

VI.C.5. The incinerator shall not emit particulate matter in excess of 180 milligrams per dry standard cubic meter (0.08 grains per dry standard cubic foot) when corrected for the amount of oxygen in the stack gas, in accordance with the formula specified in 40 CFR § 264.343(c). [40 CFR § 264.343(c)]

Except during the periods specified in the Permit Conditions for Short-Term Incineration under the Trial Burn Period, the Permittee shall feed the wastes described in Permit Condition VI.B. to the incinerator only under the following conditions: [40 CFR § 264.345]

VI.C.6. Carbon monoxide concentration in the stack exhaust gas, monitored as specified in Permit Condition VI.E., and corrected for the amount of oxygen in the stack gas, shall not exceed 100 ppm on a one hour rolling average.

ED_001593_00015625

VI.C.7. The Permittee shall be limited to the following waste feed rates in the following locations: 10 gallons per minute of the combined waste feed at the firebox liquid waste burners of each CO Boiler (that is 30 gpm, total waste feed rate).

VI.C.8. Combustion temperature, monitored as specified in Permit Condition VI.E., shall be maintained at 1600°F or greater.

VI.C.9. Combustion gas flow, monitored as specified in Permit Condition VI.E., shall be no greater than 155,000 scfm.

VI.C.10. The mass emission rates of toxic metals from each incinerator shall not exceed:

Metal	Emission Rate	Metal	Emission Rate
Arsenic	2.4×10^{-5}(grams/sec)	Antimony	2.4×10^{-5}(grams/sec)
Barium:	2.4×10^{-5}(grams/sec)	Lead:	3.3×10^{-4}(grams/sec)
Chromium	1.03×10^{-5}(grams/sec)	Mercury	* feed rate limit
Beryllium	2.4×10^{-5}(grams/sec)	Silver:	2.0×10^{-4}(grams/sec)
Cadmium	3.3×10^{-4}(grams/sec)	Thallium:	2.4×10^{-5}(grams/sec)

* Metal Feed Rate for Mercury shall be < 0.22 grams/minute from all feed sources.

Emission rates are based on boiler stack emissions from all feed sources to a single CO boiler. Testing frequency shall be every two years at the time of trial burns. Testing shall be done using the most current EPA approved metals testing protocol(s). For compliance purposes, values for emission rates shall be the averages of a metal for all runs that are accepted by EPA as valid runs during a trial burn.

VI.C.11. The differential atomization fluid pressure (e.g., steam, air) between atomizing fluid and the waste feed shall be no less than 15 psig.

VI.C.12. The atomization fluid pressure for the fuel oil feed shall be no less than 20 psig when fuel oil is being fed to a CO boiler.

VI.C.13. The power to the electrostatic precipitator (ESP) for each boiler, monitored as specified in Permit Condition VI.E., shall be maintained at no less than 20 KVA.

VI.C.14. The Permittee shall control fugitive emissions from the combustion zone of the incinerator by inspecting the unit daily for leaks, and personnel shall wear a CO alarm during such inspections. Further the unit must maintain a positive pressure in the boiler, monitored as specified in Permit Condition VI.E., at less than 6 inches of water. [40 CFR § 264.345(d)]

VI.C.15. No waste shall be fed to the incinerator until the boiler operation is fully stabilized. A period of at least 24 hours from the time a boiler is restarted

ED_001593_00015625

after a boiler shutdown after a power failure or other interuption of boiler operation shall lapse before waste is introduced into a boiler.

VI.C.16. Compliance with the operating conditions specified in Permit Conditions VI.C.6. through VI.C.15. will be regarded as compliance with the required performance standards in Permit Conditions VI.C.3. through VI.C.5. However, evidence that compliance with these operating conditions is insufficient to ensure compliance with the performance standards, may justify modification, revocation, or reissuance of the Permit pursuant to 40 CFR § 270.41. [40 CFR § 264.343(d)]

VI.D. INSPECTION REQUIREMENTS

The Permittee shall inspect the incineration unit in accordance with the Inspection Schedule, Permit Attachment 3, and shall complete the following as part of these inspections:

VI.D.1. The Permittee shall visually inspect the incinerator and associated equipment (including pumps, valves, conveyors, pipes, etc.) at least daily for leaks, spills, fugitive emissions, and signs of tampering in accordance with Permit Attachment 3. [40 CFR § 264.347(b)]

VI.D.2. The Permittee shall visually inspect the strip charts which record the operating parameters specified in Item VI.C.6 through VI.C.15 at least daily for out-of-tolerance monitored and/or recorded operational data.

VI.D.3. The Permittee shall test the emergency waste feed cut-off system and associated alarm at least monthly to verify operability, as specified in Permit Condition VI.F.1. The waste feed cut-off system shall not be tested while waste is being fed into boiler. The waste feed cut-off system shall be tested by shutting off the waste feed in a controlled manner, temporarily blocking off the waste feed line, and reopening the waste liquid shutoff valve and then testing the shutoff alarm and operation of the shutoff valve. [40 CFR § 264.347(c)]

ED_001593_00015625

VI.E. MONITORING REQUIREMENTS

VI.E.1. The Permittee shall maintain, calibrate, and operate monitoring equipment and record the data while incinerating hazardous waste, as specified below:

System Parameter	Monitor Type	Location	Recording Process	Calibration Details
Waste feed rate	flow meter	upstream from waste feed nozzle	Continuous strip chart	Monthly, within 5% of positively measured flow
Temperature	Shielded Thermocouple (TC)	at exit of boiler	Continuous strip chart	monthly - calibrate recorder per manufacturer's specification
Atomizing Fluid	Differential Pressure	Fuel oil nozzle	Continuous strip chart	Quarterly, per manufacturer's specification
Atomizing Fluid/Waste Feed	Differential Pressure	Waste feed nozzle	Continuous strip chart	Quarterly, per manufacturer's specification
Carbon Monoxide	gas filter correlation w/ IR detector	In stack	Continuous strip chart	Daily, per manufacturer's specification; yearly per 40 CFR 60 Appendix B, Performance Specification 4, & using 500 ppmv span value
Oxygen	Micro fuel cell	At exit of boiler heat exchange section	Continuous strip chart	Daily, per manufacturer's specification; yearly per 40 CFR 60 Appendix B, Performance Specification 3
Firebox Pressure	pressure	firebox	Continuous strip chart	Quarterly, within 5% of inclined manometer
ESP Power	KVA	ESP	Continuous strip chart	Quarterly, per manufacturer's specification
Combustion Gas Flow	annubar flow meter (COB1) or pitot tube (COB 2 & 3)	stack	Continuous strip chart	Quarterly, per manufacturer's specification

VI.E.2 Upon request of the Agency, the Permittee shall perform sampling and analysis of the waste and exhaust emissions to verify that the operating requirements established in the Permit achieve the performance standards. [40 CFR § 264.347(a)(3)]

ED_001593_00015625

VI.F. WASTE FEED CUT-OFF REQUIREMENTS

VI.F.1. The Permittee shall construct and maintain the systems specified below to automatically cut off the hazardous waste feed to the incinerator at the levels specified below. Hazardous wastes shall be fed to the incinerator only when all instruments required by this condition are on line and operating properly. Additional cutoff limits utilized by the facility are listed in Table 7, page 21, of the November 21, 1988 Trial Burn Plan. These additional limits shall be followed except as they may conflict with more stringent limits set in this permit. At a minimum equipment shall be tested and maintained at the frequencies stipulated below

Parameter	Cut-Off Limits	Test Frequency
Waste flow measurement	greater than 10 gallons per minute *	monthly
High CO	greater than 100 ppm, rolling 60 minute average	monthly
Low Temperature	less than 1600°F *	monthly
High Firebox Pressure	more than 6 inches water column *	monthly
Combustion Gas Flow	greater than 180,000 scfm *	monthly
All of the above	if any instrument required for cutoff system is not operational, or if instrument span is exceeded	monthly
	* Cut-offs to be based on instantaneous instrument readings, initiated at second instrument reading where cut-off value is exceeded.	

VI.F.2. In case of a malfunction of the automatic waste feed cut-off systems, the Permittee shall perform manual shut downs in accordance with the approved procedures in Permit Attachment 19. The Permittee shall not restart the incinerator until the problem causing the malfunction has been located and corrected.

VI.F.3. In accordance with approved procedures, as provided for in the following paragraph, the Permittee may temporarily deactivate the waste feed cut-off system for an analyzer or instrument while continuing to feed waste to a boiler only as necessary while the analyzer or instrument is being calibrated. The operating record shall contain the time a cutoff is deactivated and the time when it is reactivated along with the identification of the person(s) taking the action.

Proposed procedures to manage and document the deactivation and reactivation of the cut-off system shall be submitted for each analyzer or instrument needing cut-off deactivation and reactivation controls and upon approval the procedures shall become part of the Part B application

ED_001593_00015625

/Operations Plan. The proposal shall include analysis documenting the necessity for the deactivation.

VI.F.4. The Permittee shall not feed any hazardous waste to the boilers until all the monitors specified in Section VI.E.1, operating controls specified in Section VI.E.3, and all the waste feed cut-off controls specified in Section VI.F.1 are installed and documentation certifying their installation is sent to the Director.

VI.G. CLOSURE

The Permittee shall follow the procedures in the Closure Plan, Permit Attachment 6. [40 CFR § 264.351]

VI.H. RECORDKEEPING

VI.H.1. The Permittee shall record and maintain, in the operating record for this permit, all monitoring and inspection data compiled under the requirements of this Permit (see Permit Condition I.E.9.b.). [40 CFR § 264.73 and 40 CFR § 264.347(d)]

VI.H.2. The Permittee shall record in the operating record for this permit the date and time of all automatic waste feed shut-offs, including the triggering parameters, reason for the shut-off, and corrective actions taken. The Permittee shall also record all failures of the automatic waste feed shut-offs to function properly and corrective actions taken.

VI.I. COMPLIANCE SCHEDULE

The Permittee shall provide the following information to the Director:

Item	Date Due to the Director
1. Documentation that CO meters are installed and certification is completed	See Condition VI.F.3.
2. Documentation that O_2 meters are installed and certification are completed	See Condition VI.F.3.
3. Documentation that all cutoffs listed in Table on Section VI.F.1. are installed and properly operating.	See Condition VI.F.3.

ED_001593_00015625

SECTION VII - SHORT-TERM TEST INCINERATION

VII.A. SECTION HIGHLIGHTS

A trial burn is required for the RM-17 Incinerator permit renewal. It is scheduled for late in 1993.

A trial burn is required for each hazardous waste incinerator (CO Boiler) during the permit period. CO Boiler 1 was tested during December 1988 and January 1989. The two remaining CO Boilers were not tested. This section requires testing/retesting on a two year interval for the three units, a six year interval for each.

VII.B. TRIAL BURN PHASE

VII.B.1. CONFORMITY TO TRIAL BURN PLAN

The Permittee shall operate and monitor the incinerator during the trial burn phase as specified in the Trial Burn Plan, Permit Attachment 20. The Trial Burn Plan shall be updated, revised, and resubmitted by the Permittee six (6) months prior to conducting the trial burn or a performance test required under Permit Condition V.E.2. or VI.E.2. of this permit. Upon EPA approval, the revised trial burn plan becomes the current Attachment 20 to this permit. The revised Trial Burn Plan must include all applicable EPA-approved test methods and procedures in effect at the time of the resubmittal. EPA may require additional testing and/or different test methods than were used in the original trial burns, based upon changes in policy and guidance.

VII.B.2. TRIAL BURN POHCs

The principal organic hazardous constituents (POHCs) for which DREs must be determined for the RM-17 Incinerator are:

Waste Feed:	POHC:
Toluene Recycle	Toluene
Light Ends	Toluene

ED_001593_00015625

The principal organic hazardous constituents (POHCs) for which DREs must be determined for the CO Boilers are:

Waste Feed:	POHC:
DAF Float	Toluene
Sulfinol Reclaimer Bottoms	Toluene

Additional, or different, POHCs may be selected if the Director determines it is appropriate to do so. If additional or different POHC's are selected, based on review of the revised trial burn plan, the trial burn schedule (for a particular unit) specified in Permit Condition VII.E may be postponed for ninety days from the date of POHC designation by the Director.

VII.B.3. TRIAL BURN DETERMINATIONS

During the trial burn (or as soon after the trial burn as practicable), the Permittee shall make the determinations required by 40 CFR § 270.62(b)(6)(i)-(ix).

VII.B.4. TRIAL BURN DATA SUBMISSIONS AND CERTIFICATIONS

The Permittee shall submit a copy of all data collected during the trial burn to the Director upon completion of the burn. The Permittee shall submit to the Director the results of the determinations required by Condition VII.B.3 within ninety (90) days of the completion of the trial burn. All submissions must be certified in accordance with 40 CFR § 270.11. [40 CFR § 270.62(b)(7) and (9)]

VII.C. REPORTING NON-COMPLIANCE DURING THE TRIAL BURN

If based upon the analytical results of the trial burn and before submitting the required trial burn results, the Permittee determines that the incinerator failed to achieve any of the performance standards specified in 40 CFR § 264.343, the Permittee shall notify the Director within twenty-four (24) hours of making the determination. Upon the request of the Director, the Permittee shall cease feeding hazardous waste to the incinerator. The Permittee may apply to the Director for a permit modification pursuant to 40 CFR § 270.41 and for a new trial burn pursuant to 40 CFR § 270.62(b).

ED_001593_00015625

VII.D. COMPLIANCE SCHEDULE

The Permittee shall provide information to the Director demonstrating compliance with the following items and time schedule for their completion:

	Item	Date Due to the Director
1.	Submit revised trial burn plan for CO Boiler 2	January 15, 1991
2.	Conduct a trial burn on CO Boiler 2.	July 15, 1991
3.	Submit trial burn report for CO Boiler 2.	November 1, 1991
4.	Submit revised trial burn plan for CO Boiler 3	January 15, 1993
5.	Conduct a trial burn on CO Boiler 3.	July 15, 1993
6.	Submit trial burn report for CO Boiler 3.	November 1, 1993
7.	Submit revised trial burn plan for RM-17	March 1, 1993
8.	Conduct a trial burn on RM-17.	September 1, 1993
9.	Submit trial burn report for RM-17.	December 15, 1993

ED_001593_00015625

SECTION - VIII
CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS - SCHEDULE OF COMPLIANCE

STATEMENT OF PURPOSE

This Permit Section directs the Permittee (1) to perform a RCRA Facility Investigation (RFI) to determine fully the nature and extent of any release of hazardous wastes and hazardous constituents at or from the Facility, and (2) to perform a Corrective Measure Study (CMS) to identify and evaluate alternatives for corrective action necessary to prevent or mitigate any migration or releases of hazardous wastes or hazardous constituents at or from the Facility. This section will replace the March 6, 1989 §3008(h) Corrective Action Order.

VIII.A. SUMMARY OF FINDINGS & RFA RESULTS

VIII.A.1. In its Part A permit application, dated November 12, 1980, and in its Notification of Hazardous Waste Activity, dated July 22, 1980, Permittee identified itself as handling the following hazardous wastes at the Facility:

VIII.A.1a. Hazardous wastes that exhibit the characteristic of ignitability, identified at 40 C.F.R. §261.21 (D001).

VIII.A.1b. Hazardous wastes that exhibit the characteristic of corrosivity, identified at 40 C.F.R. §261.22 (D002).

VIII.A.1c. Hazardous wastes that exhibit the characteristic of reactivity, identified at 40 C.F.R. §261.23 (D003).

VIII.A.1d. Hazardous wastes containing spent non-halogenated solvents from non-specific sources, as identified at 40 C.F.R. §261.31 (F003).

VIII.A.1e. Hazardous wastes containing dissolved air flotation float from the petroleum refining industry, identified at 40 C.F.R. §261.32 (K048).

VIII.A.1f. Hazardous wastes containing slop oil emulsion solids from the petroleum refining industry, identified at 40 C.F.R. §261.32 (K049).

VIII.A.1g. Hazardous wastes containing heat exchanger bundle cleaning sludge from the petroleum refining industry, identified at 40 C.F.R. §261.32 (K050).

VIII.A.1h. Hazardous waste containing API separator sludge from the petroleum refining industry, identified at 40 C.F.R. §261.32 (K051).

VIII.A.1i. Hazardous waste containing tank bottoms (leaded) from the petroleum refining industry, identified at 40 C.F.R. §261.32 (K052).

VIII.A.1j. Commercial chemical products, manufacturing chemical intermediates, off-specification commercial chemical products, or chemical intermediates identified at 40 C.F.R. Section 261.33(e) (P053, P110).

ED_001593_00015625

VIII.A.1k Commercial chemical products, manufacturing chemical intermediates, off-specification commercial chemical products, or chemical intermediates identified at 40 C.F.R. Section 261.33(f) (U013, U052, U056, U122, U125, U031, U188, U220, U239, U140, U154, U159).

VIII.A.2. On or about April 14, 1987, Permittee modified the Part A permit application for the Facility. In the revised Part A, Permittee identified treatment and storage of the following wastes at the Facility:

VIII.A.2a. Hazardous wastes that exhibit the characteristic of EP Toxicity for Chromium, identified at 40 C.F.R. §261.24 (D007).

VIII.A.2b. Hazardous wastes containing spent non-halogenated solvents from non-specific sources, as identified at 40 C.F.R. §261.31 (F005).

VIII.A.2c. Hazardous wastes containing dissolved air flotation float from the petroleum refining industry, identified at 40 C.F.R. §261.32 (K048).

VIII.A.3. Facility Description

(Unless otherwise noted, information in this Section and in Sections VIII.A.4 and VIII.A.5 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 California Department of Health Services (DHS), 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 (VSI) performed November 11, 12, and 13, 1987 to evaluate the potential for releases of hazardous constituents from solid waste management units and areas of concern at the Facility.)

VIII.A.3a. Operational History: The Facility was established at its present location in 1913 with a product terminal. In 1916, Permittee commenced refining operations at this site, at which time it processed 20,000 barrels of crude oil per day. In 1931 Permittee constructed a chemical plant at this site for the production of secondary butyl alcohol. Since 1913, Permittee has produced up to 50 different chemicals at the Facility, including alcohols, peroxides, solvents, and catalysts. Currently, most chemical production areas are now inactive and some have been dismantled. Permittee presently continues catalyst production and refining operations at the Facility.

VIII.A.3b. Facility Location: Permittee 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 (see Figures 1 and 2, attached hereto and incorporated by reference). The areas surrounding the Facility to the west, south, and southeast are generally residential and light industrial. A 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.

ED_001593_00015625

VIII.A.3c. Products: The Facility currently maintains a crude-run throughput of 107,400 barrels per day, and manufactures gasoline, intermediate fuels (jet, diesel, stove, kerosene), industrial fuels, spray oils, lubricants, gasoline additives, asphalts, and catalysts.

VIII.A.3d. Facility Units: The Facility consists of crude oil refining process units, several chemical production areas (many of which are currently inactive), hazardous waste transfer and storage areas, oil-water separator systems, and wastewater treatment units. Table 1, attached hereto and incorporated by reference, lists the active and inactive waste management units present at the Facility. The location of each unit is shown in Figures 3 through 11, attached hereto and incorporated by reference. A summary of wastes managed at each unit is given in the RFA report.

VIII.A.3e. Topography and Meteorology: The local topography varies from hilly south of and onto the Facility, to tidal flats north and northeast of the Facility (see Figure 2). 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 degrees Fahrenheit and an average low in January of 42 degrees. 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.

VIII.A.3f. Surface Water and Floodplain: The Facility is divided into two watersheds. Surface and process waters in the west watershed are collected by the sewer system which drains to the effluent treating area north of Marina Vista Boulevard (see Figure 2). Process waste waters in the east watershed are 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 to storm ponds equipped with oil baffles and weirs. After separation, the water is discharged through ditches, eventually entering Suisun Bay at Bulls Head Point.

VIII.A.3g. 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 areal extent. 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 which overlies the bedrock, 3) within unconsolidated alluvial fill which blankets the lower elevations, and 4) within the pore spaces of the low permeability bay muds which 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 basins which border the Facility on the east and west are used as water supply sources.

ED_001593_00015625

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 the water moves to areas of lower potential at the base of the hills. Many of the unconsolidated alluvial sediments which 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 the 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 Hambre Groundwater Basin, whereas groundwater flowing east from the Facility discharges to the Ygnacio Valley Groundwater Basin. Groundwater which flows north from the central portion of the refinery complex discharges to Carquinez Strait.

VIII.A.3h. Groundwater Monitoring: As part of prior site investigation efforts and on-going quarterly groundwater monitoring, Permittee has drilled numerous groundwater monitoring wells at the Facility. The locations of these wells are shown in Figures 12 and 13, attached hereto and incorporated by reference.

VIII.A.3i. Recent Regulatory Activities: In 1983 the California Regional Water Quality Control Board (RWQCB) issued a Waste Discharge Permit to Permittee for operation of three sludge drying ponds (Unit 4.1). Pursuant to the Permit requirements, Permittee began a site characterization study of this unit in 1984.

To address the California Water Code Calderon Requirements (Division 7, Chapter 4, Article 4, Section 13273), Permittee has initiated an environmental monitoring program for 17 inactive waste disposal units which it used to dispose of process-generated refinery wastes. These activities are overseen by RWQCB. Permittee submitted a Solid Waste Assessment Test (SWAT) report on these activities to RWQCB in June, 1987.

Permittee also submitted to RWQCB in August, 1987 a Report of Waste Discharge which examined the effects of 16 land disposal units on groundwater quality. Permittee further conducted a surface impoundment sampling and analysis study to determine if the wastewater treatment ponds and stormwater ponds were subject to the California Toxic Pits Cleanup Act of 1985. Permittee submitted this report to RWQCB in June, 1987. Permittee currently performs quarterly groundwater monitoring at the Facility.

Permittee submitted a Part B permit application to DHS and EPA in 1983 for operation of a hazardous waste incinerator (Unit 4.55) at the Facility. Permittee modified the Part B permit application in 1986 to include three carbon monoxide boilers (Unit 4.49) and associated tanks (Units 4.47 and 4.48) for waste disposal.

ED_001593_00015625

VIII.A.4. Documentation of Releases

VIII.A.4a. Soils:

Unit 4.1: An investigation by Permittee in response to Waste Discharge Permit requirements found elevated levels of chromium in soils along the western and southern perimeter of Unit 4.1 (Land Treatment Area "FF"). In addition, soil borings also showed high concentrations of petroleum hydrocarbons along the western side of the unit, indicating the further release of wastes from this unit. This area is now the location of stormwater retention ponds (Unit 4.66). Chromium is a hazardous constituent identified at 40 C.F.R. §261 Appendix VIII.

Units 4.2, 4.4, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11, 4.12, 4.13, 4.14, 4.16, and 4.17: As part of site investigation efforts in 1986, Permittee sampled soils underneath several units at the Facility. Soil samples were taken at depths ranging from 5.5 to 46.5 feet. Soils underneath the following units were found to have elevated levels of barium, chromium, nickel, and lead:

4.2 Inactive Unit "H"
4.4 Inactive Unit "L"
4.6 Landfill Area "M"
4.7 Landfill Area "O"
4.8 Land Disposal Area "Q"
4.9 Open Burning and Landfill Area
4.10 Land Disposal Area "X"
4.11 Impoundment "Y"
4.12 Landfill Area "Z"
4.13 Pond Area "AA"
4.14 Land Disposal Area "DD"
4.16 Oily Water Sump "N"
4.17 Oily Water Sump "K"

Barium, chromium, nickel, and lead are hazardous constituents identified at 40 C.F.R. §261 Appendix VIII.

Unit 4.4: During the Visual Site Inspection (VSI) for the RCRA Facility Assessment, a seep was observed at the toe of the containment dam where the dam at Unit 4.4 (Inactive Unit "L") intersects the water table. EPA believes this seep contains hydrocarbons and tetraethyl lead, which are components of wastes managed at this unit. Tetraethyl lead is a hazardous constituent identified at 40 C.F.R. §261 Appendix VIII.

Unit 4.15: Unit 4.15 (Ballast Water Pond) received ship ballast containing heavy metals and complex hydrocarbons. Crude oil and fuel hydrocarbons contain benzene, a hazardous constituent identified at 40 C.F.R. §261 Appendix VIII. During the VSI, oily sludges were observed in the unit. EPA believes that the oily sludges observed in the unit contain benzene and may contain other hazardous constituents identified at 40 C.F.R. §261 Appendix VIII. The unit is not covered, nor does it have a liner underneath. Since the unit contained liquids and is not lined, EPA believes that hazardous constituents from materials in the unit have migrated from the unit into the soils beneath the unit.

ED_001593_00015625

Unit 4.32: Unit 4.32 (Biotreater Equalization Feed Ponds, Unit "D") receives wastewater from the final pH adjustment unit (Unit 4.31). Wastewater in this unit contains the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: antimony, barium, chromium, dimethylphenol, naphthalene, and phenol. Sediments at this unit contain the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: arsenic, barium, chromium, lead, nickel, mercury, silver, benzene, chrysene, and naphthalene. Since the unit has no liner underneath, and contains liquids, EPA believes that hazardous constituents have migrated from the unit into soils beneath the unit.

Unit 4.33: Wastewater in Unit 4.33 (Emergency Waste-water Holding Ponds, Unit "C") contains the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: nickel, selenium, silver, toluene, aniline, 2,4-dimethylphenol, naphthalene, and phenol. Sediments at this unit contain the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: arsenic, barium, chromium, lead, nickel, mercury, silver, benzene, toluene, benzo(a)pyrene, chrysene, 2-chloronaphthalene, fluoranthene, and naphthalene. Since the unit has no liner underneath, and contains liquids, EPA believes that hazardous constituents have migrated from the unit into soils beneath the unit.

Unit 4.34: Wastewater in Unit 4.34 (Activated Sludge Biotreater) contains the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: cadmium, selenium, thallium, and phenol. Since the unit has no liner underneath, and contains liquids, EPA believes that hazardous constituents have migrated from the unit into soils beneath the unit.

Unit 4.38: Wastewater in Unit 4.38 (Sand Filter Feed Pond) contains the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: chromium, nickel, lead, selenium, and silver. Sediments at this unit contain the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: arsenic, chromium, mercury, nickel, selenium, and silver. Since the unit has no liner underneath, and contains liquids, EPA believes that hazardous constituents have migrated from the unit into soils beneath the unit.

Unit 4.40: Wastewater in Unit 4.40 (Final Holding Pond) contains the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: chromium, nickel, and silver. Sediments at this unit contain the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: arsenic, barium, chromium, lead, mercury, nickel, and selenium. Since the unit has no liner underneath, and contains liquids, EPA believes that hazardous constituents have migrated from the unit into soils beneath the unit.

Unit 4.57: Unit 4.57 (PG&E Sludge Terraces) contains sludges with high pH (8.5-9.0) and the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: arsenic, barium, cadmium, chromium, nickel, and selenium. The unit is unlined, and rainwater falls on wastes in the unit. EPA believes that rainwater percolating through the sludge in the unit has leached heavy metal hazardous constituents from the sludge and carried them into the soils underlying the unit.

ED_001593_00015625

Unit 4.63: Wastewater in Unit 4.63 (Stormwater Holding Pond) contains the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: selenium, silver, benzene, toluene, aniline, chrysene, 2,4-dimethylphenol, naphthalene, and phenol. Sediments at this unit contain the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: arsenic, barium, chromium, lead, nickel, mercury, selenium, silver, toluene, chrysene, phenol, and naphthalene. Since the unit has no liner underneath, and contains liquids, EPA believes that hazardous constituents have migrated from the unit into soils beneath the unit.

Unit 4.66: Sediments in Unit 4.66 (Stormwater Holding Ponds - Formerly Land Treatment Area "FF") contain the following hazardous constituents identified at 40 C.F.R. §261 Appendix VIII: arsenic, barium, chromium, lead, mercury, nickel, silver, and toluene. Since the unit has no liner underneath, and contains liquids, EPA believes that hazardous constituents have migrated from the unit into soils beneath the unit.

Units 4.67 and 4.68: Pursuant to Solid Waste Assessment Test requirements, Permittee tested soils 2.5 to 5.5 feet underneath Unit 4.67 (Inactive Unit "YY") and 5 to 15 feet underneath Unit 4.68 (Inactive Unit "ZZ"). Barium, chromium, nickel, lead, and thallium were found in soils underneath both units. Barium, chromium, nickel, lead, and thallium are hazardous constituents as identified at 40 C.F.R. §261 Appendix VIII.

VIII.A.4b. Groundwater:

Facility: In 1987, Permittee conducted quarterly groundwater monitoring of 159 wells at the Facility for water level measurements and sampled 59 wells at the Facility for metals, Total Organic Carbon (TOC), benzene, toluene, xylene, sulfate, total phosphorous, and ammonia. According to the "Quarterly Groundwater Monitoring Report for Shell Oil Company Martinez Manufacturing Complex" prepared by EMCON Associates and submitted to RWQCB in September, 1987, third quarter monitoring showed widespread groundwater contamination (benzene, toluene, nickel, lead, xylene/ethylbenzene) in several geologic units underlaying the Facility. This information is summarized in Table 2, attached hereto and incorporated by reference. Benzene, toluene, lead, and nickel are hazardous constituents identified at 40 C.F.R. §261 Appendix VIII.

In addition, the RFA Report and EMCON's 1987 third quarterly monitoring data also have identified several areas of groundwater overlain with plumes of hydrocarbon material. These include two larger plumes and four smaller size plumes. (See Table 2 for a list of wells containing overlying hydrocarbon, and Figures 12 and 13 for the location of these wells.) One of the larger plumes, located approximately in the center of the refinery between Reservoirs #1 and #2 and Lake Slobodnick (Figure 7 and 8), contains approximately 15,000 barrels of crude oil, while the other large plume, located under Crude Hill (Figure 6), contains at least 5000 barrels of jet fuel. Crude oil and jet fuel both contain benzene, a hazardous constituent identified at 40 C.F.R. §261 Appendix VIII.

Units 4.9, 4.11, 4.12 and 4.13: Elevated levels of acetone and 1,2-dichloropropane have been detected in groundwater (well 177) down gradient of Unit 4.9 (Open Burning and Landfill area), elevated levels of phenols have been

ED_001593_00015625

detected in groundwater (well 66) near Unit 4.11 (Impoundment "Y"), elevated levels of nickel have been detected in groundwater (well 148) down gradient of Unit 4.12 (Inactive Landfill "Z"), and elevated levels of nickel have been detected in groundwater (well 90) near Unit 4.13 (Inactive Pond Area "AA"). Acetone, phenol, nickel and 1,2-dichloropropane are hazardous constituents identified at 40 C.F.R. §261 Appendix VIII.

Units 4.32, 4.33, 4.38, 4.38, 4.40, and 4.63: These units are all part of the wastewater treatment system at the Facility (see Figure 3). The units contain liquids but have no underlying liners to retard the migration of wastes from the units to the underlying soils and groundwater (see Paragraph 8.a.). Groundwater samples taken during Quarterly Groundwater Monitoring in 1987 show that samples from wells down gradient of these units have elevated levels of lead, benzene, and xylenes compared to wells up gradient of the units. These compounds have also been identified in wastewater and sediments in these units. Lead and benzene are hazardous constituents identified at 40 C.F.R. §261 Appendix VIII.

VIII.A.4c. Surface Water:

Unit 4.1: Sludge in Unit 4.1 (Inactive Land Treatment Area "FF") has been found to contain nickel and lead, which are hazardous constituents identified at 40 C.F.R. §261 Appendix VIII. Since the unit is located in marshland and portions of the containment dikes have been constructed from permeable material, EPA believes that hazardous constituents have escaped from this unit and have contaminated the marshland.

Unit 4.57: Sludge in Unit 4.57 (PG&E sludge terrace) contains arsenic, cadmium, chromium, nickel, and selenium, which are hazardous constituents identified at 40 C.F.R. §261 Appendix VIII. The terraces are unlined and have no storm water run-off control. EPA believes that uncontrolled run-off from this unit has released to surface water metals which are Appendix VIII hazardous constituents.

VIII.A.4d. Air:

Unit 4.32: Unit 4.32 (Biotreater Equalization Pond) has been shown to contain the following volatile organic compounds which have also been identified at 40 C.F.R. §261 Appendix VIII: toluene, 2,4-dimethylphenol, naphthalene, and phenol. This unit is open and aerated, and, therefore, EPA believes that volatile hazardous constituents have been released from this unit to the air.

VIII.A.5. Releases of hazardous constituents to the soil are likely to continue due to water percolating through the soils and carrying hazardous constituents into the underlying groundwater, since the depth to underlying groundwater is small. According to the 1987 Quarterly Groundwater Monitoring Report, at many locations the groundwater is less than 5 feet below the surface.

Although groundwater under the Facility is generally of poor quality and is not used for industrial or domestic purposes, contaminated groundwater under the Facility can impact surrounding bodies of groundwater and surface water. Since the Facility is located on a groundwater divide, groundwater contamination under the Facility can migrate in several directions and impact groundwater and surface water bodies. Groundwater contamination moving east could contaminate the Ygnacio Valley Groundwater Basin, which is used as a water supply source.

ED_001593_00015625

Groundwater contamination moving west could contaminate the Arroyo del Hambre Groundwater Basin, which is also used as a public water supply.

In addition, groundwater from the central part of the Facility flows north to the nearby Carquinez Strait and Suisun Bay, which are used for recreational purposes including boating, fishing, and swimming. Since the Facility is located on the shore of the Carquinez Strait, contaminated storm-water surface run-off from the Facility may also impact the Strait.

VIII.A.6. The hazardous constituents identified in Section VIII.A.4, above, have impacts on human health. According to "Chemical, Physical, and Biological Properties of Compounds Present at Hazardous Waste Sites, Final Report" prepared by Clement Associates (September, 1985), Chromium VI compounds have been found to be carcinogenic in rats and can cause DNA and chromosome damage in animals and humans; soluble barium salts are highly toxic after acute exposure; epidemiological evidence has shown an excess of lung and nasal cancers for workers at nickel refineries; exposure to lead has been shown to cause kidney damage, anemia, and central nervous system damage; acute exposure to toluene causes depression and potential damage to the central nervous system; 1,2-dichloropropane has been shown to cause adenomas and carcinomas in rats and has been found to be mutagenic according to the Ames assay; subchronic exposure to phenol caused liver, kidney, heart, and lung damage in animal tests. According to the Superfund Public Health Evaluation Manual, benzene is a human carcinogen by ingestion or inhalation, and chrysene and benzo(a)pyrene are probable human carcinogens by ingestion or inhalation.

VIII.A.7. Contamination in soils at the Facility are likely to cause continuing contamination of the groundwater. Existing and continuing contamination of the groundwater presents a potential contamination threat to neighboring groundwater basins which are used as public water supplies. This contamination therefore may pose a threat to human health. In addition, contaminated groundwater and storm-water run-off threatens to contaminate and degrade the quality of the Carquinez Strait, Suisun Bay and nearby marshlands. The marshlands are habitat for water fowl. In addition, Suisun Bay is used as a habitat for migratory fish and birds. Recreational uses of Suisun Bay include aesthetic enjoyment and navigation. Releases of hazardous constituents to the air poses a potential threat to the health of Facility workers and people living in residences near the Facility.

VIII.B. DEFINITIONS

For purposes of this Corrective Action Schedule of Compliance the following definitions shall apply:

"Facility" means all contiguous property under the control of the owner or operator seeking a permit under Subtitle C of RCRA.

"Release" means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous wastes (including hazardous constituents) into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing hazardous wastes or hazardous constituents).

"Solid waste management unit" means any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released.

"Hazardous waste" means a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or

ED_001593_00015625

incapacitating reversible, illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed. The term hazardous waste includes hazardous constituent as defined below.

"Hazardous constituent" means any constituent identified in Appendix VIII of 40 CFR Part 261, or any constituent identified in Appendix VIII of 40 CFR Part 264.

VIII.C. STANDARD CONDITIONS

VIII.C.1 Section 3004(u) of RCRA, as amended by HSWA, and 40 CFR § 264.101 require that permits issued after November 8, 1984, address corrective action for releases of hazardous wastes including hazardous constituents from any solid waste management unit (SWMU) at the facility, regardless of when the waste was placed in the unit.

VIII.C.2 Failure to submit the information required in this Corrective Action Schedule of Compliance, or falsification of any submitted information, is grounds for termination of this Permit (40 CFR § 270.43). The Permittee shall ensure that all plans, reports, notifications, and other submissions to the Director required in this Corrective Action Schedule of Compliance are signed and certified in accordance with 40 CFR § 270.11. Five (5) copies of these plans, reports, notifications or other submissions shall be submitted to the Director and sent by certified mail or hand delivered to:

U.S. Environmental Protection Agency, Region 9
Hazardous Waste Management Division
State Programs Branch, T-2A
215 Fremont Street
San Francisco, CA 94105

VIII.C.3 All plans and schedules required by the conditions of this Corrective Action Schedule of Compliance are, upon approval of the Director, incorporated into this Schedule of Compliance by reference and become an enforceable part of this Permit. Any noncompliance with such approved plans and schedules shall be termed noncompliance with this Permit. Extensions of the due dates for submittals may be granted by the Director in accordance with the permit modification processes under 40 CFR § 270.41.

VIII.C.4 If the Director determines that further actions beyond those provided in this Corrective Action Schedule of Compliance, or changes to that which is stated herein, are warranted, the Director shall modify the Schedule of Compliance either according to procedures in Section VIII.C.3 of this Permit, or according to the permit modification processes under 40 CFR § 270.41.

VIII.C.5 All raw data, such as laboratory reports, drilling logs, bench-scale or pilot-scale data, and other supporting information gathered or generated during activities undertaken pursuant to this Corrective Action Schedule of Compliance shall be maintained at the facility [or other location approved by the Director] during the term of this Permit, including any reissued Permits.

ED_001593_00015625

VIII.D. REPORTING REQUIREMENTS

VIII.D.1 The Permittee shall submit to the Director signed quarterly progress reports of all activities (i.e., SWMU Assessment, Interim Measures, RCRA Facility Investigation, Corrective Measures Study) conducted pursuant to the provisions of this Corrective Action Schedule of Compliance, beginning no later than ninety (90) calendar days after the Permitted is first required to begin implementation of any requirement herein. These reports shall contain:

VIII.D.1.a A description of the work completed;

VIII.D.1.b Summaries of all findings, including summaries of laboratory data;

VIII.D.1.c Summaries of all problems or potential problems encountered during the reporting period and actions taken to rectify problems; and

VIII.D.1.d Projected work for the next reporting period.

VIII.D.2 Copies of other reports (e.g., inspection reports), drilling logs and laboratory data shall be made available to the Director upon request.

VIII.D.3 As specified under Permit Condition VIII.C.4, the Director may require the Permittee to conduct new or more extensive assessments, investigations, or studies, as needed, based on information provided in these progress reports or other supporting information.

VIII.E. NOTIFICATION REQUIREMENTS FOR AND ASSESSMENT OF NEWLY IDENTIFIED SOLID WASTE MANAGEMENT UNITS(S)

VIII.E.1 The Permittee shall notify the Director in writing of any newly-identified SWMU(s) (i.e., a unit not specifically identified during the RFA (and listed in Section VIII.A), discovered during the course of ground- water monitoring, field investigations, environmental audits, or other means, no later than fifteen (15) calendar days after discovery.

VIII.E.2 After such notification, the Director may request, in writing, that the Permittee prepare a Solid Waste Management Unit (SWMU) Assessment Plan and a proposed schedule of implementation and completion of the Plan for any additional SWMU(s) discovered subsequent to the issuance of this Permit.

VIII.E.3 Within sixty (60) calendar days after receipt of the Director's request for a SWMU Assessment Plan, the Permittee shall prepare a SWMU Assessment Plan for determining past and present operations at the unit, as well as any sampling and analysis of ground water, land surface and subsurface strata, surface water or air, as necessary to determine whether a release of hazardous waste including hazardous constituents from such unit(s) has occurred, is likely to have occurred, or is likely to occur. The SWMU Assessment Plan must demonstrate that the sampling and analysis program, if applicable, is capable of yielding representative samples and must include parameters sufficient to identify migration of hazardous waste including hazardous constituents from the newly- discovered SWMU(s) to the environment.

ED_001593_00015625

VIII.E.4 After the Permittee submits the SWMU Assessment Plan, the Director shall either approve or disapprove the Plan in writing.

If the Director approves the Plan, the Permittee shall begin to implement the Plan within fifteen (15) calendar days of receiving such written notification.

If the Director disapproves the Plan, the Director shall either (1) notify the Permittee in writing of the Plan's deficiencies and specify a due date for submittal of a revised Plan, or (2) revise the Plan and notify the Permittee of the revisions. This Director-revised Plan becomes the approved SWMU Assessment Plan. The Permittee shall implement the Plan within fifteen (15) calendar days of receiving written approval.

VIII.E.5 The Permittee shall submit a SWMU Assessment Report to the Director no later than twenty-five (25) calendar days from completion of the work specified in the approved SWMU Assessment Plan. The SWMU Assessment Report shall describe all results obtained from the implementation of the approved SWMU Assessment Plan. At a minimum, the Report shall provide the following information for each newly-identified SWMU:

VIII.E.5.a The location of the newly-identified SWMU in relation to other SWMUs;

VIII.E.5.b The type and function of the unit;

VIII.E.5.c The general dimensions, capacities, and structural description of the unit (supply any available drawings);

VIII.E.5.d The period during which the unit was operated;

VIII.E.5.e The specifics on all wastes that have been or are being managed at the SWMU, to the extent available; and

VIII.E.5.f The results of any sampling and analysis required for the purpose of determining whether releases of hazardous wastes including hazardous constituents have occurred, are occurring, or are likely to occur from the unit.

VIII.E.6 Based on the results of this Report, the Director shall determine the need for further investigations at specific unit(s) covered in the SWMU Assessment. If the Director determines that such investigations are needed, the Director may require the Permittee to prepare a plan for such investigations. This plan will be reviewed for approval as part of the RFI Workplan under Permit Condition VIII.G.1 of this Corrective Action Schedule of Compliance.

VIII.F. NOTIFICATION REQUIREMENTS FOR NEWLY-DISCOVERED RELEASES AT SWMUS

The Permittee shall notify the Director, in writing, of any release(s) of hazardous waste including hazardous constituents discovered during the course of ground-water monitoring, field investigation, environmental auditing, or other activities undertaken after the commencement of the

ED_001593_00015625

RFI, no later than fifteen (15) calendar days after discovery. Such newly-discovered releases may be from newly-identified units, from units for which, based on the findings of the RFA, the Director had previously determined that no further investigation was necessary, or from units investigated as part of the RFI. The Director may require further investigation of the newly-identified release(s). A plan for such investigation will be reviewed for approval as part of the RFI Workplan under Permit Condition. VIII.G.1.

VIII.G. WORK TO BE PERFORMED

Section 3004(u) of RCRA, as amended by HSWA, and 40 CFR § 264.101 require that permits issued after November 8, 1984, address corrective action for releases of hazardous wastes including hazardous constituents from any solid waste management unit (SWMU) at the facility, regardless of when the waste was placed in the unit.

Pursuant to Section 3008(h) of RCRA, 42 U.S.C. Section 6928(h), EPA issued an Order on March 6, 1989, the requirements of which are essentially incorporated herein, under which the Permittee is hereby ordered to perform the following acts in the manner and by the time schedule specified herein.

It is Permittee's position that much of the "work to be performed" sections of the initial March 6, 1989 3008(h) Order and this Permit has been completed pursuant to the Orders of the RWQCB. EPA and Permittee are currently attempting to negotiate a Consent Order pursuant to Section 3008(h) of RCRA. It is the intent of EPA that eventually the permit will fully replace the 3008(h) order and any subsequent orders, decrees, or agreements thereto.

All work undertaken pursuant to Permit Condition VIII.G. shall be performed in a manner consistent with, at a minimum: the attached Scopes of Work, the EPA-approved RCRA Facility Investigation Workplan and Corrective Measures Study Workplan; RCRA and its implementing regulations; and applicable EPA guidance documents. Relevant guidance includes, but is not limited to: the "RCRA Facility Investigation (RFI) Guidance" (EPA 530/SW-87-001), "RCRA Groundwater Monitoring Technical Enforcement Guidance Document" (OSWER Directive 9950.1, September 1986), "Test Methods For Evaluating Solid Waste" (SW-846, November 1986) and "Construction Quality Assurance for Hazardous Waste Land Disposal Facilities" (EPA 530/SW-85-031, July 1986).

VIII.G.1 RCRA FACILITY INVESTIGATION (RFI)

a. The Permittee shall submit to EPA a Workplan for a RCRA Facility Investigation ("RFI Workplan") forty five(45) days after being notified by the Director. The RFI Workplan is subject to approval by EPA and shall be performed in a manner consistent with the generic RFI Scope of Work contained in Permit Attachment 21. Based on the types of releases documented in permit section VIII, EPA believes that all sections of Permit Attachment 21 are applicable to the Facility. Permit Attachment 21 is incorporated by reference as if fully set forth herein.

b. The RFI Workplan shall be designed to define the presence, magnitude, extent, direction, and rate of movement of any hazardous wastes or hazardous constituents from the releases documented in Permit Section VIII.A.4 above, entitled "Documentation of Releases." The RFI Workplan shall document the procedures the Permittees shall use to conduct those investigations necessary to: (1) characterize the geology and hydrogeology in and around the Facility; (2) characterize the existence, nature and extent of any groundwater and surface water contamination in and around the

ED_001593_00015625

Facility; (3) characterize the existence, nature and extent of any soils contamination in and around the Facility; (4) characterize the existence, nature and extent of any air and subsurface gas contamination; (5) characterize the potential pathways of contaminant migration; (6) characterize the sources of contamination; (7) identify actual or potential receptors; and (8) support the development of alternatives from which a corrective measure will be selected by EPA. A specific schedule for implementation of all activities shall be included in the RFI Workplan.

c. In accordance with the provisions of Permit Attachment 21 herein, the RFI Workplan shall include: (1) a Project Management Plan; (2) a Data Collection Quality Assurance Plan; (3) a Data Management Plan; (4) a Health and Safety Plan; and (5) a Public Involvement Plan.

VIII.G.2 CORRECTIVE MEASURES STUDY

Within thirty (30) days of EPA's written approval of the final RFI report, Permittee shall submit to EPA a Corrective Measures Study (CMS) Workplan. The CMS Workplan and activities conducted pursuant to this Permit Section are subject to approval by EPA and shall be performed in a manner consistent with the Scope of Work for a Corrective Measures Study contained in Permit Attachment 22. Permit Attachment 22 is incorporated by reference as if fully set forth herein.

VIII.G.3 CORRECTIVE MEASURES IMPLEMENTATION

Upon EPA's selection of the corrective measure, if Permittee has complied with the terms of this Permit Section, EPA shall provide a ninety (90) day period for negotiation of an administrative order on consent (or a judicial consent decree) for implementation of the selected corrective measure(s). If agreement is not reached during this period, EPA reserves all rights it has to implement the corrective measure or other remedial response and to take any other appropriate actions under RCRA, CERCLA, or any other available legal authority, including the issuance of a unilateral administrative order directing Permittee to implement the corrective measure.

VIII.G.4 SUBMISSIONS/AGENCY APPROVAL/ADDITIONAL WORK

a. EPA will review all draft and final Workplans, and notify Permittee in writing of EPA's approval/disapproval or modification of the Workplan or any part thereof. In the event of a disapproval or modification, EPA shall specify in writing the deficiencies and reasons for disapproval or modification. Within thirty (30) days of the receipt of EPA's disapproval or modification of any Workplan, Permittee shall amend and submit a revised Workplan. EPA approved Workplans shall be deemed incorporated into and part of this Permit Section.

b. Within thirty (30) days of approval or modification by EPA of any Workplans, Permittee shall commence work and implement the tasks required by the Workplans submitted pursuant to the Scopes of Work contained in Attachments 1 and 2 in accordance with the requirements, specifications and schedules stated in the Workplans as approved or modified by EPA.

ED_001593_00015625

c. Beginning with the month following the effective date of this Permit Section, Permittee shall provide EPA with progress reports for each quarter on the tenth day of the following month of the end of the quarter. The progress reports shall conform to requirements in relevant Scopes of Work contained in Attachments 1 and 2.

d. Permittee shall provide draft and final RCRA Facility Investigation and Corrective Measure Study reports to EPA in accordance with the schedule contained in this Permit Section and its attachments.

e. EPA will review all draft or final reports, and notify Permittee in writing of EPA's approval/disapproval or modification of the report or any part thereof. In the event of any disapproval, EPA shall specify in writing the deficiencies and reasons for such disapproval or modification. Within thirty (30) days of receipt of EPA's disapproval or modification of any report, Permittee shall amend and submit a revised report. EPA approved reports shall be deemed incorporated into and part of this Permit Section.

f. Two (2) copies of all documents, including Workplans, Program Plans, preliminary and final reports, progress reports, and other correspondence to be submitted pursuant to this Permit Section shall be hand delivered or sent by certified mail, return receipt requested, to the Project Coordinators designated pursuant to Permit Condition VIII.M.

g. All work performed pursuant to this Permit Section shall be under the direction and supervision of a professional engineer or geologist with expertise in hazardous waste site cleanup. Within sixty (60) days from the effective date of this Permit Section Permittee shall notify EPA in writing of the name, title, and qualifications of the engineer or geologist, and of any contractors, subcontractors and their personnel to be used in carrying out the terms of this Permit Section.

h. EPA may determine that certain tasks, including investigatory work or engineering evaluation, are necessary in addition to the tasks and deliverables included in the RFI Workplan and/or CMS Workplan when new information indicates that such additional work is necessary. EPA shall request in writing that Permittee perform the additional work in this situation and shall specify the basis and reasons for EPA's determination that the additional work is necessary. Within fourteen (14) days after the receipt of such request, Permittee may request a meeting with EPA to discuss the additional work. Within forty-five (45) days after the receipt of such request, Permittee must submit to EPA for approval a revised Workplan. Upon EPA approval of the revised Workplan, Permittee shall perform the additional work EPA has requested according to the revised Workplan. All additional work performed by Permittee under this paragraph shall be performed in a manner consistent with this Permit Section.

ED_001593_00015625

VIII.H. QUALITY ASSURANCE

Throughout all sample collection and analysis activities, Permittee shall use EPA-approved quality assurance, quality control, and chain-of-custody procedures as specified in the approved Workplans and Scopes of Work. In addition, Permittee shall:

VIII.H.1. Ensure that laboratories used by Permittee for analyses perform such analyses according to the EPA methods included in the third edition of "Test Methods for Evaluating Solid Waste (SW-846, November 1986) or other methods deemed satisfactory to EPA. If methods other than the EPA methods are to be used, Permittee shall submit all protocols to be used for analyses to EPA for approval sixty (60) days prior to the commencement of analyses.

VIII.H.2. Ensure that laboratories used by Permittee for analyses participate in a quality assurance/quality control program equivalent to that which is followed by EPA. As part of such a program, and upon request by EPA, such laboratories shall perform analyses of samples provided by EPA to demonstrate the quality of analytical data.

VIII.H.3. Inform the EPA Project Coordinator thirty (30) days in advance which laboratories will be used by Permittee and ensure that EPA personnel and EPA authorized representatives have reasonable access to the laboratories and personnel used for analyses.

VIII.H.4. Use the EPA guidance to evaluate all data to be used in the proposed plans required by Permit Condition VIII.E. This evaluation shall be provided to EPA as part of the RFI Workplan and CMS Workplan required by Permit Condition VIII.E, and shall be updated as required by EPA.

VIII.I. PUBLIC COMMENT AND PARTICIPATION

VIII.I.1. Upon approval by EPA of a Corrective Measure Study Final Report, EPA shall make both the RCRA Facility Investigation Final Report (or summary of report) and the Corrective Measure Study Final Report (or summary of report) and a summary of EPA's proposed corrective measure(s) and EPA's justification for proposing selection of that (those) corrective measure(s) available for public review and comment for at least twenty-one (21) days.

VIII.I.2. Following the public review and comment period, EPA shall notify Permittee of the corrective measure selected by EPA. If the corrective measure recommended in the Corrective Measure Study Final Report is not the corrective measure selected by EPA after consideration of public comments, EPA will inform Permittee in writing of the reasons for such decision, and Permittee shall modify the RFI/CMS as directed to do so by EPA.

VIII.I.3. The Administrative Record supporting the selection of the corrective measure(s) will be available for public review at the U.S. EPA Region 9 library, Sixth Floor, 215 Fremont Street, San Francisco, California, from 8 a.m. to 4:30 p.m., weekdays.

ED_001593_00015625

VIII.J. ON-SITE AND OFF-SITE ACCESS

VIII.J.1. EPA and/or any EPA representative, including EPA contractors, are authorized to enter and freely move about all property at the Facility during the effective dates of this Permit Section for the purposes of, inter alia: interviewing Facility personnel and contractors; inspecting records, operating logs, and contracts related to the Facility; reviewing the progress of the Permittee in carrying out the terms of this Permit Section; conducting such tests, sampling, or monitoring as EPA or its Project Coordinator deems necessary; using a camera, sound recording, or other documentary type equipment; and verifying the reports and data submitted to EPA by Permittee. Permittee shall permit such persons to inspect and copy all records, files, photographs, documents, and other writings, including all sampling and monitoring data, that pertain to work undertaken pursuant to this Permit Section.

VIII.J.2. To the extent that work required by any approved Scopes of Work and/or Workplans prepared pursuant hereto must be done on property not owned or controlled by Permittee, Permittee will use its best efforts to obtain site access agreements from the present owner(s) of such property within sixty (60) days of approval of the plans for which site access is required. Best efforts as used in this Section shall include, at a minimum, a certified letter from Permittee to the present owners of such property requesting access agreements to permit Permittee and EPA and its authorized representatives to access such property. Any such access agreement shall be incorporated by reference into this Permit Section. In the event that agreements for site access are not obtained within sixty (60) days of the effective date of such plans, Permittee shall notify EPA regarding both the lack of and its failure to obtain such agreements within seven (7) days thereafter. In the event that EPA obtains access, Permittee shall undertake EPA approved work on such property.

VIII.J.3. Nothing in this section limits or otherwise affects EPA's right of access and entry pursuant to applicable law, including RCRA and CERCLA.

VIII.K. SAMPLING AND DATA/DOCUMENT AVAILABILITY

VIII.K.1. Permittee shall submit to EPA the results of sampling and/or tests or other data generated by, or on behalf of Permittee, in accordance with the requirements of this Permit Section and its attachments.

VIII.K.2. Permittee shall notify EPA at least fourteen (14) days before engaging in any field activities, any well drilling, installation of equipment, or sampling. At the request of EPA, Permittee shall provide or allow EPA or its authorized representative to take split samples of all samples collected by Permittee pursuant to this Permit Section.

VIII.J.3. Permittee may assert a business confidentiality claim under 40 CFR 260.2(b) covering all or part of any information submitted to EPA pursuant to this Permit Section. Any assertion of confidentiality shall be adequately substantiated by Permittee when the assertion is made. Information determined to be confidential by EPA shall be disclosed only to the extent permitted by 40 CFR Part 2. If no such confidentiality claim accompanies the information when it is submitted to EPA, it may be made available to the

ED_001593_00015625

public by EPA without further notice to Permittee. Physical or analytical data shall not be deemed confidential.

VIII.K. RECORD PRESERVATION

Permittee shall preserve, during the life of this Permit and for a minimum of ten (10) years after its termination, all data, records, and documents in its possession or in the possession of its divisions, employees, agents, consultants, contractors, successors and assigns which relate in any way to this Permit Section or to hazardous waste management and/or disposal at the Facility. After ten (10) years, Permittee shall make such records available to EPA for inspection or shall provide copies of any such records to EPA. Permittee shall notify EPA thirty (30) days prior to the destruction of any such records, and shall provide EPA with the opportunity to take possession of any such records.

VIII.M. PROJECT COORDINATOR

VIII.M.1. Within thirty (30) days of the effective date of this Permit Section, EPA and Permittee shall each designate a Project Coordinator. Permittee shall notify EPA in writing of the Project Coordinator they have selected. Each Project Coordinator shall be responsible for overseeing the implementation of this Permit Section. The EPA Project Coordinator will be EPA's designated representative at the Facility. All communications between Permittee and EPA, and all documents, reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Permit Section, shall be directed through the Project Coordinators.

VIII.M.2. Permittee shall provide EPA at least fourteen (14) days written notice prior to changing Project Coordinators.

VIII.M.3. If EPA determines that activities in compliance or noncompliance with this Permit Section have caused or may cause a release of hazardous waste, hazardous constituent, or a pollutant or contaminant, or have caused or may cause a threat to human health or the environment, or if EPA determines that Permittee is not capable of undertaking any studies or corrective measures ordered, EPA may order Permittee to stop further implementation of this Permit Section for such period of time as EPA determines may be needed to abate any such releases or threat and/or to undertake any action which EPA determines is necessary to abate such releases or threat.

VIII.M.4. The absence of the EPA Project Coordinator from the Facility shall not be cause for the stoppage of work.

VIII.N. SUBSEQUENT MODIFICATION

VIII.N.1. This Permit Section may be amended by EPA to ensure protection of human health or the environment. Such amendments shall be in writing, shall have as their effective date the date on which they are signed by EPA, and shall be incorporated into this Permit Section.

VIII.N.2. Any reports, plans, specifications, schedules, and attachments required by this Permit Section are, upon written approval by EPA, incorporated into this Permit Section. Any non-compliance with such EPA-approved reports, plans, specifications, schedules, and attachments shall be considered a

ED_001593_00015625

violation of this Permit and shall subject Permittee to the penalty provisions provided under the Resource Conservation and Recovery Act

VIII.N.3. No informal advice, guidance, suggestions, or comments by EPA regarding reports, plans, specifications, schedules, and any other written material submitted by Permittee will be construed as relieving Permittee of its obligation to obtain written approval, if and when required by this Permit Section.

VIII.O. TERMINATION AND SATISFACTION

The provisions of this Permit Section shall be deemed satisfied upon Permittee's receipt of written notice from EPA that Permittee has demonstrated, to the satisfaction of EPA, that the terms of this Permit Section, including any additional tasks determined by EPA to be required pursuant to this Permit Section, or any continuing obligation or promises (e.g. Record Retention, Reservation of Rights) have been satisfactorily completed.

ED_001593_00015625

VIII.P. FACILITY SUBMISSION SUMMARY

Below is a summary of the planned reporting requirements pursuant to this Schedule of Compliance:

	Item	Date Due to the Director
1.	Report of qualifications of engineers, geologists, contractors, subcontractors, and personnel used in corrective action work	sixty (60) calendar days after the effective date of the permit
2.	Progress reports on all activities	quarterly, no later than ninety (90) calendar days after Permittee is required to begin implementation
3.	RFI Workplan for SWMU(s) identified at time of permit issuance	forty-five (45) calendar days after the effective date of the permit
4.	Revised RFI Workplan	forty-five (45) calendar days after notification of deficiency
5.	RFI Report and Summary Report	sixty (60) calendar days after completion of RFI
6.	Revised RFI Report and Summary Report	thirty (30) calendar days after notification of deficiency
7.	CMS Plan	forty-five (45) calendar days after notification of requirement to perform CMS
8.	Revised CMS Plan	forty-five (45) calendar days after notification of deficiency
9.	CMS Report	sixty (60) calendar days after completion of CMS
10.	Revised CMS Report	thirty (30) calendar days after notification of deficiency
11.	Demonstration of financial assurance	one hundred twenty (120) days after permit modification for remedy

ED_001593_00015625

List of Attachments

Permit Attachment No.	Plan or Document (from the Part B Permit Application)
1	Waste Analysis Plan (Section V from the Part B Permit Application, Volume 1)
2	Security Plan (page VII.5 from the Part B Permit Application, Volume 3)
3	Inspection Activities and Schedule (page VI.13,from the Part B Permit Application, Volume 1, VI.D.8, from each trial burn plan, and Section VIII.D from the Part B Permit Application, Volume 3)
4	Personnel Training Outline (Section IX from the Part B Permit Application, Volume 3)
5	Contingency Plan (Trial Burn Plan for RM-17 Incinerator, Attachment 1, in the Part B Permit Application, Volume 2 andSection X from the Part B Permit Application, Volume 3)
6	Closure Plan (Section XIII from the Part B Permit Application, Volume 3)
7	Closure Cost Estimate (Pages XIII.4, XIII.7, and XIII.8 from the Part B Permit Application, Volume 3)
8	Detailed plans and other information describing secondary containment systems, submitted in response to draft Permit, August 18, 1989
9	Detailed plans and other information describing Tank 12038 (Section VI.C from the Part B Permit Application, Volume 1.)
10	Procedures for preventing spills and overflows from the tanks or containment systems (Compliance Schedule supplement to the Part B Permit Application)
11	Procedures for handling ignitable or reactive waste (Compliance Schedule supplement to the Part B Permit Application)
12	Detailed plans and other information describing secondary containment systems (page VI.B.3.& 4 from the Part B Permit Application, Volume 3)
13	deleted

ED_001593_00015625

List of Attachments (continued)

Permit Attachment No.	Plan or Document (from the Part B Permit Application)
14	Procedures for preventing spills and overflows from the tanks or containment systems (page VI.B.4 from the Part B Permit Application, Volume 3)
15	Design Plans and Specifications for RM-17 Incinerator
16	Description of Automatic Waste Feed Cut-Off Systems (Trial Burn Plan for RM-17 Incinerator, Table 2, page 15, in the Part B Permit Application, Volume 2)
17	List of Allowable Wastes (Section V from the Part B Permit Application, Volume 1)
18	Design Plans and Specifications for CO Boilers
19	Description of Waste Feed Cut-Off Systems (Trial Burn Plan for CO Boiler 1, Table 7, page 21, in the Part B Permit Application, Volume 2)
20	Trial Burn Plans (The Part B Permit Application, Volume 2)
21	Scope of Work for a RCRA Facility Investigation (RFI) at Shell Oil Company, Martinez Manufacturing Complex
22	Scope of Work for Corrective Measure Study at Shell Oil Company, Martinez Manufacturing Complex
23	Procedures for Handling Ignitable, Reactive, or Incompatible Waste

ED_001593_00015625

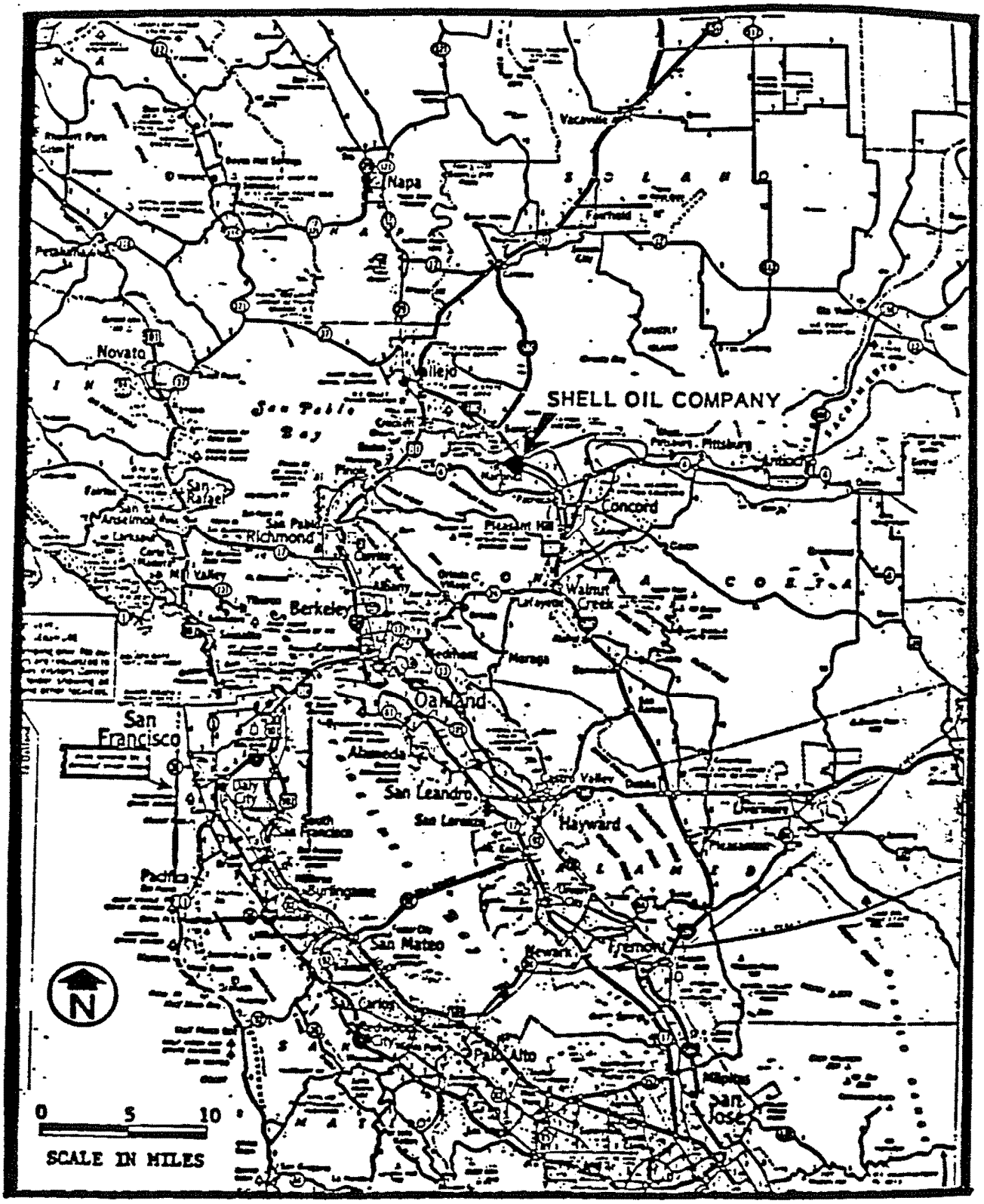


Figure 1

REGIONAL LOCATION OF SHELL OIL
Base Map: San Francisco Map H.M. Gousha Company

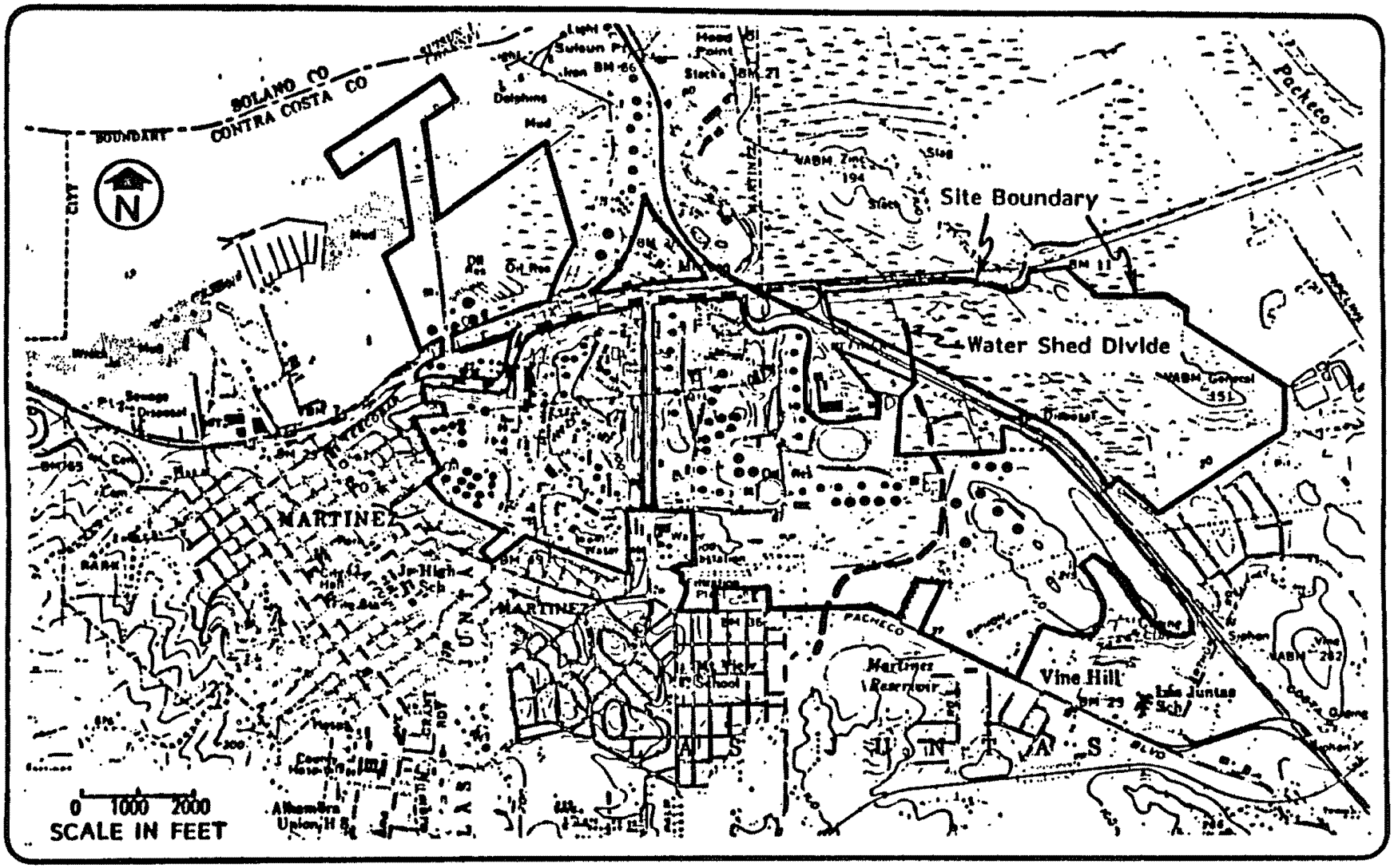


Figure 2

LOCATION MAP OF SHELL OIL COMPANY
Sources: USGS Benicia Quad, 1980 and Port Chicago Quad, 1968

ED_001593_00015625

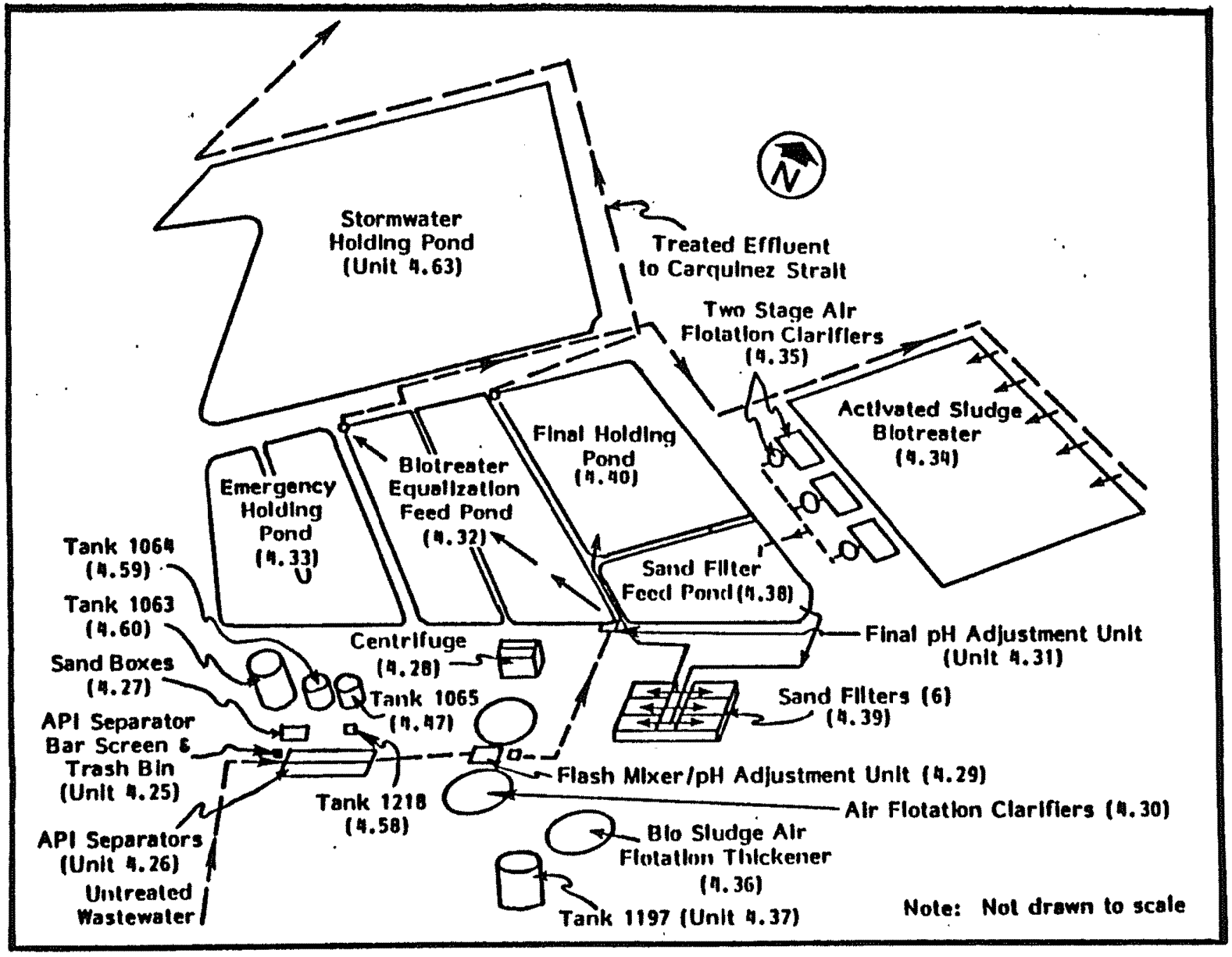


Figure 3

WASTEWATER TREATMENT SYSTEM - SHELL OIL COMPANY
Source: Reference 18 of the RFA Report

ED_001593_00015625

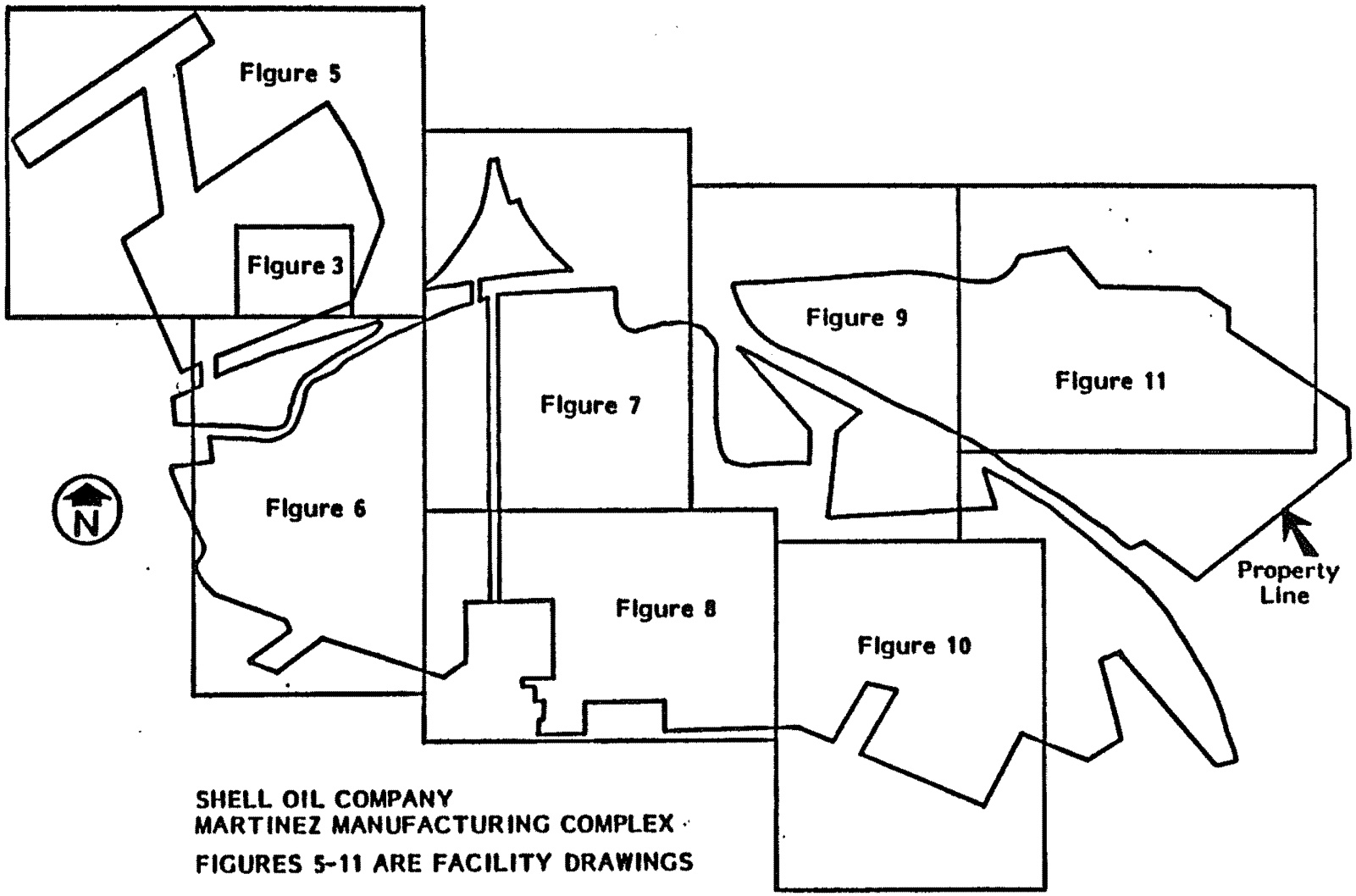


Figure 4

FACILITY INDEX MAP

ED_001593_00015625

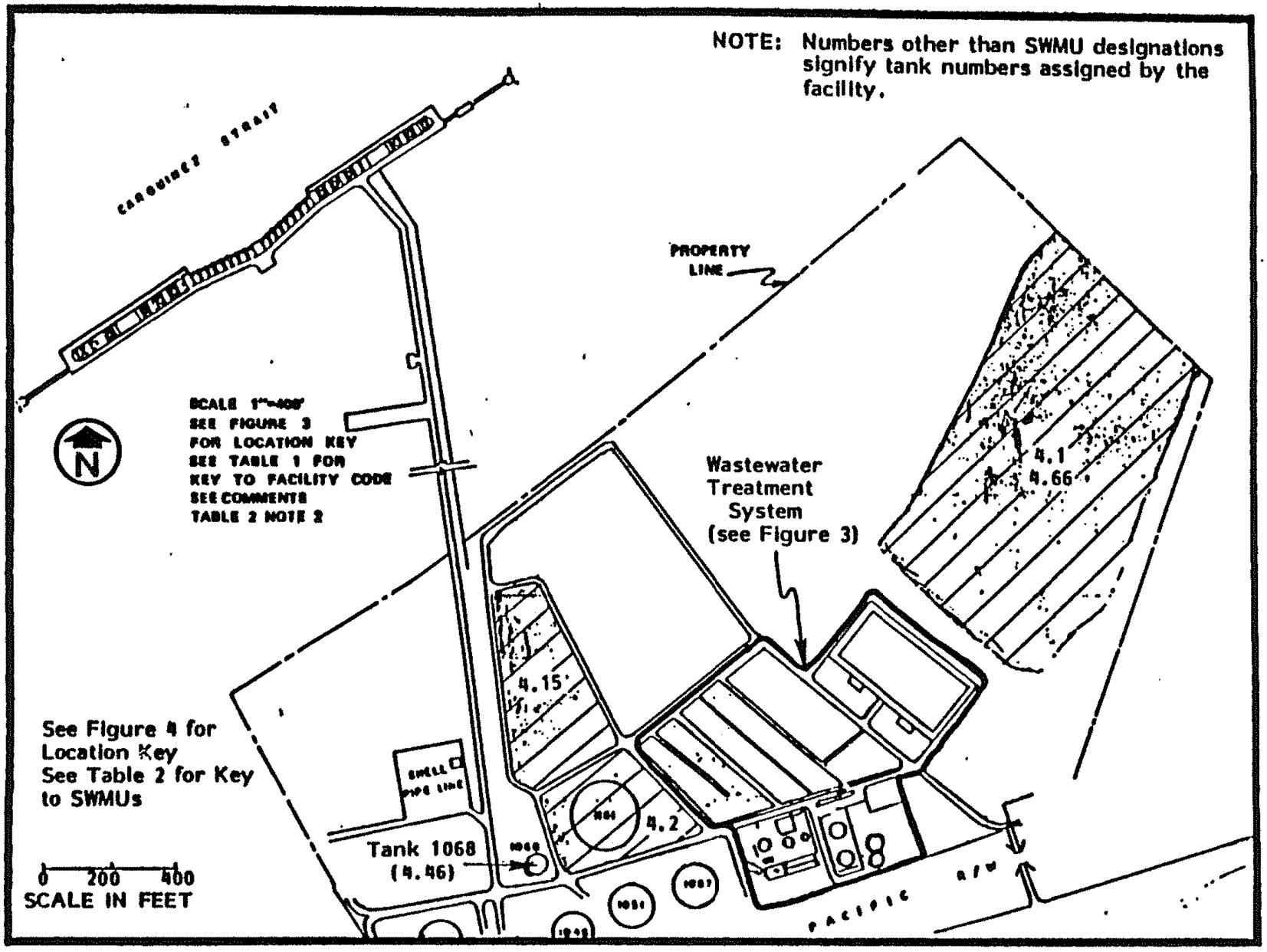


Figure 5

SHELL OIL COMPANY SWMUs

ED_001593_00015625

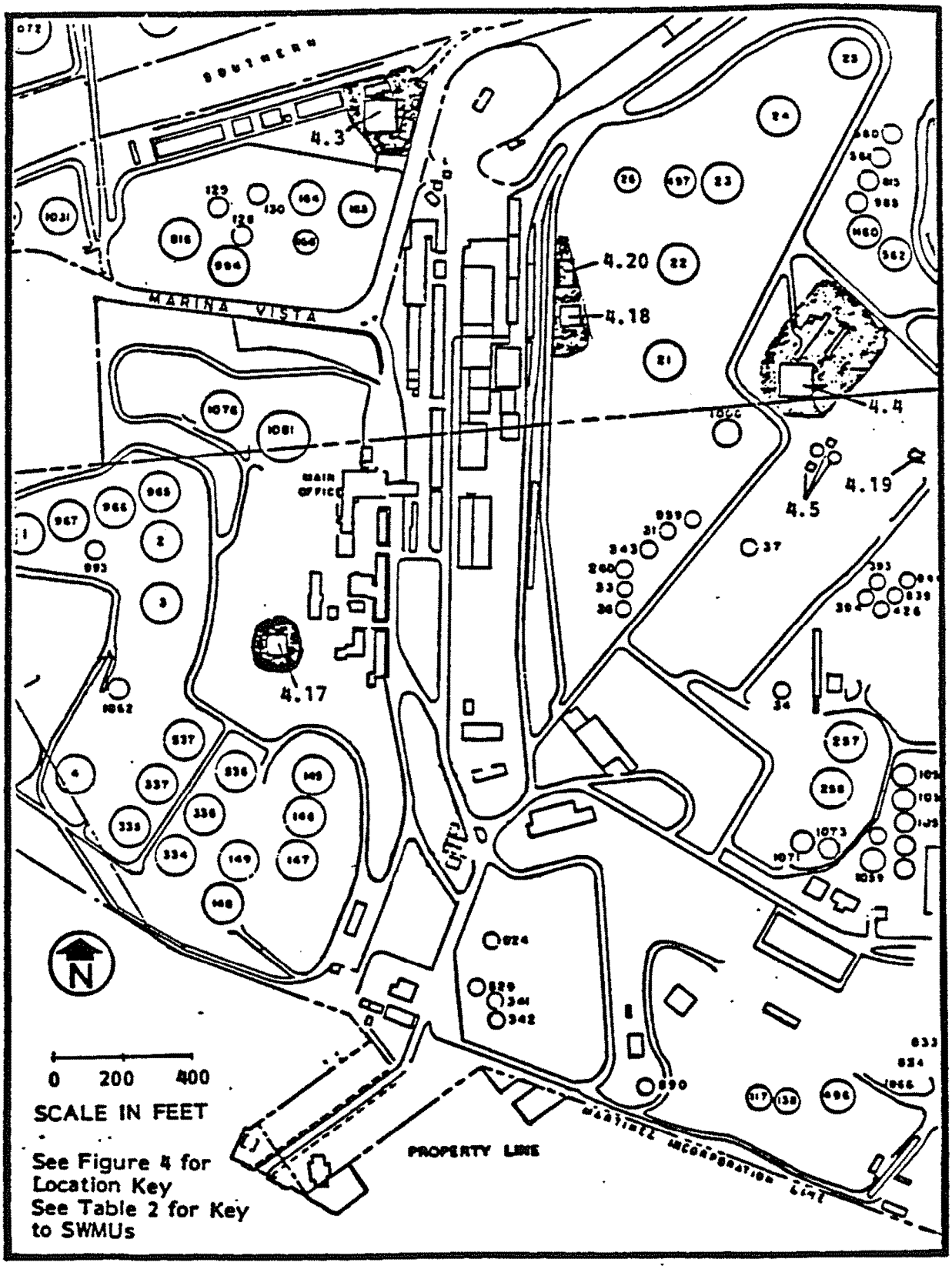


Figure 6

SHELL OIL COMPANY SWMUs

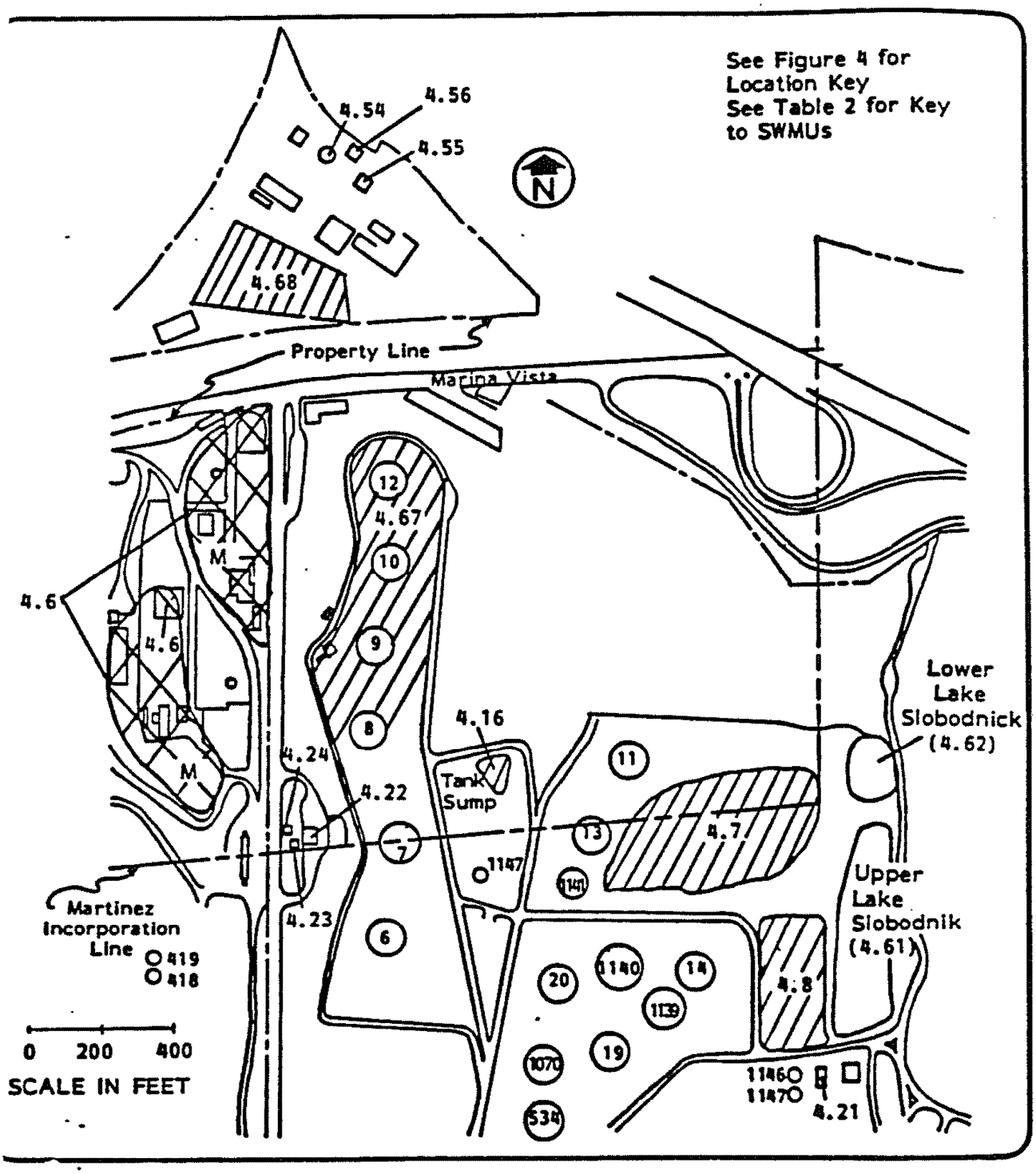


Figure 7

SHELL OIL COMPANY SWMUs

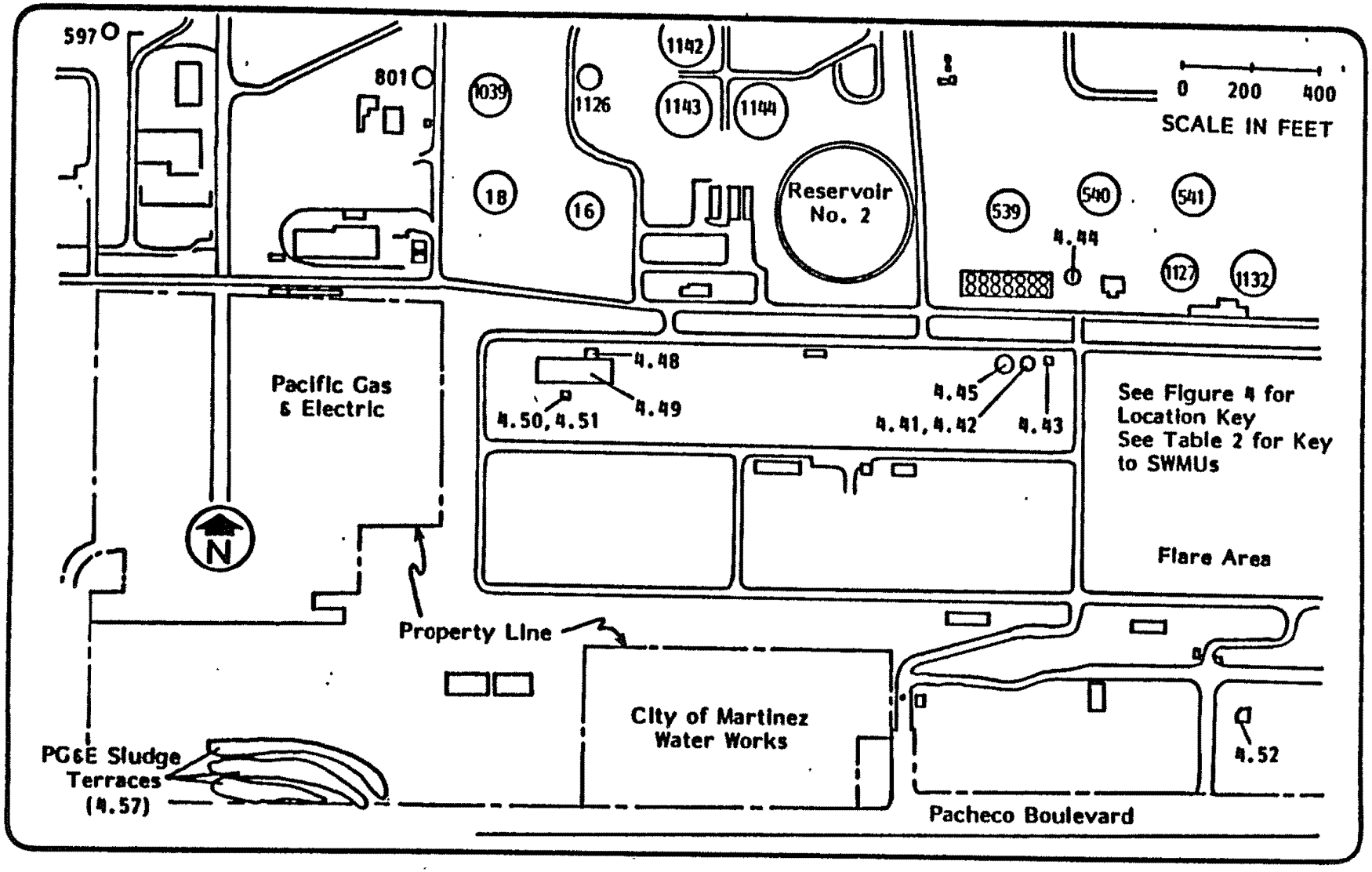


Figure 8

SHELL OIL COMPANY SWMUs

ED_001593_00015625

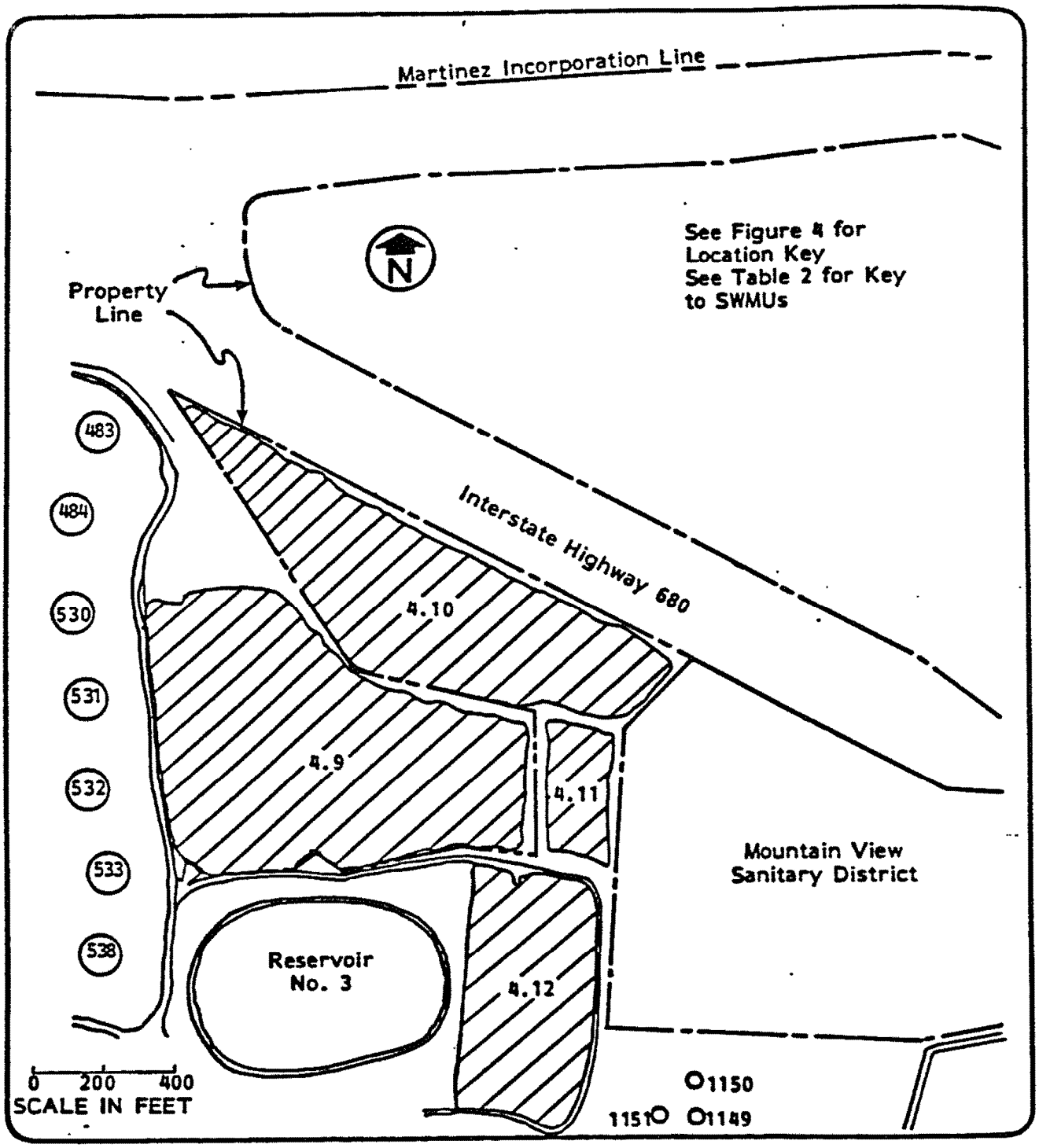


Figure 9

SHELL OIL COMPANY SWMUs

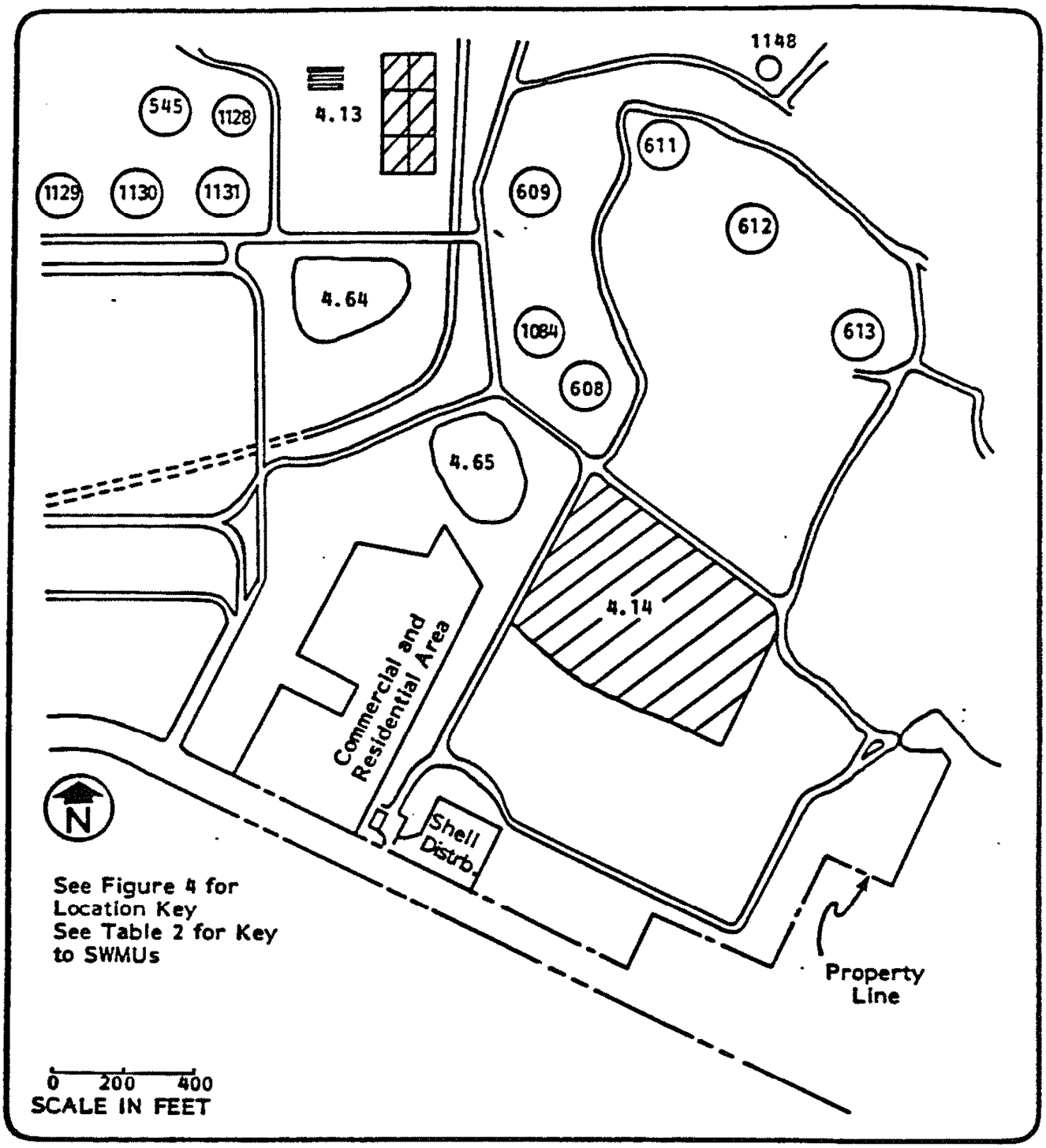


Figure 10

SHELL OIL COMPANY SWMUs

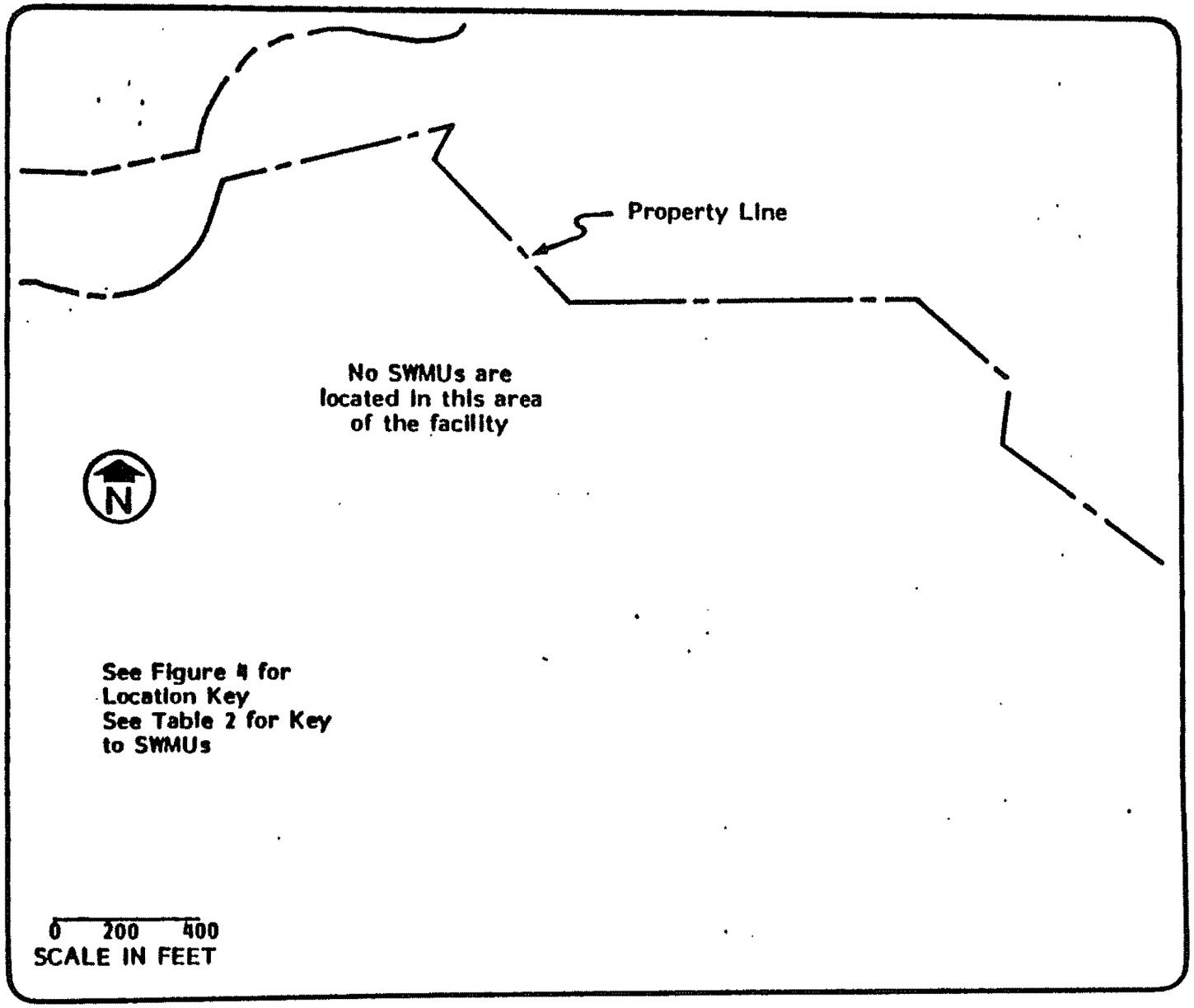


Figure 11

SHELL OIL COMPANY SWMUs

ED_001593_00015625

Table 1[a]
List of Active and Inactive Waste Management Units
Shell Oil Company, Martinez

Unit Label[b]	Unit Name	Unit Type[c]	Status[d]
4.1	Land Treatment Area "FF"	SWMU	I
4.2	Inactive Unit "H"	SWMU	I
4.3	Inactive Unit "I"	SWMU	I
4.4	Inactive Unit "L"	SWMU	I
4.5	Oil Collection Tanks and Sumps	SWMU	I
4.6	Landfill Area "M"	SWMU	I
4.7	Landfill Area "O"	SWMU	I
4.8	Land Disposal Area "Q"	SWMU	I
4.9	Open Burning and Landfill Area	SWMU	I
4.10	Land Disposal Area "X"	SWMU	I
4.11	Impoundment "Y"	SWMU	I
4.12	Landfill Area "Z"	SWMU	I
4.13	Pond Area "AA"	SWMU	I
4.14	Land Disposal Area "DD"	SWMU	I
4.15	Ballast Water Pond	SWMU	I
4.16	Oily Water Sump "N"	SWMU	I
4.17	Oily Water Sump "K"	SWMU	I
4.18	Hazardous Waste Drum Storage Area "J"	SWMU	A
4.19	Waste Transfer Station "MM"	SWMU	A
4.20	PCB Storage Area	SWMU	A
4.21	Gross Oil Separator, Unit "U"	SWMU	A
4.22	Corrugated Plate Interceptor, Unit "TT"	SWMU	A
4.23	CPI Trash Screen and Waste Bin	SWMU	A
4.24	CPI Dumpster Boxes	SWMU	A
4.25	API Separator Bar Screen and Trash Bin	SWMU	A
4.26	API Separator, Unit "E"	SWMU	A
4.27	Sand Boxes, Unit "II"	SWMU	A
4.28	Centrifuge System, Unit "F"	SWMU	I
4.29	Flash Mixer/pH Adjustment, Unit "P"	SWMU	A
4.30	Dissolved Air Flotation, Unit "HH"	SWMU	A
4.31	Final pH Adjustment Unit	SWMU	A
4.32	Biotreater Equalization Feed Ponds, Unit "D"	SWMU	A
4.33	Emergency Wastewater Holding Ponds, Unit "C"	SWMU	A
4.34	Activated Sludge Biotreater	SWMU	A
4.35	Two-Stage Dissolved Air Floatation Clarifiers	SWMU	A
4.36	Biotreater Sludge Thickener, Unit "GG"	SWMU	A
4.37	Biosludge Storage Tank 1197	SWMU	I
4.38	Sand Filter Feed Pond	SWMU	A
4.39	Sand Filters	SWMU	A

Table 1 (Continued)
List of Active and Inactive Waste Management Units
Shell Oil Company, Martinez

Unit Label	Unit Name	Unit Type	Status
4.40	Final Holding Pond	SWMU	A
4.41	Sulfide Caustic Flash Pot	SWMU	A
4.42	Caustic Knock-Out Pot	SWMU	A
4.43	Caustic Sump	SWMU	A
4.44	Spent Caustic Storage Tank 952 (Unit "PP")	SWMU	A
4.45	Spent Caustic Neutralizer, Unit "V"	SWMU	A
4.46	Tank 1068	SWMU	A
4.47	Waste Storage Tank 1065, Unit "G"	HWMU	A
4.48	Waste Storage Tank 383, Unit "S"	HWMU	A
4.49	CO Boilers, Unit "T"	HWMU	A
4.50	CO Boilers Dust Storage Hopper	SWMU	A
4.51	CO Boilers Dumpster Box	SWMU	I
4.52	CO Boilers Dust Storage Area	SWMU	A
4.53	Organic Chloride Waste Storage Tank 881T	SWMU	I
4.54	Waste Storage Tank 482, Unit "B"	SWMU	A
4.55	Waste Incinerator, Unit "Z"	HWMU	A
4.56	Two ASD Filter Cake Storage Bins	SWMU	A
4.57	PG&E Sludge Terraces	SWMU	I
4.58	Spent Acid Storage Tank 1218	SWMU	A
4.59	Tank 1064	SWMU	A
4.60	Tank 1063	SWMU	A
4.61	Upper Lake Slobodnik (Stormwater Retention Pond)	SWMU	A
4.62	Lower Lake Slobodnik (Stormwater Retention Pond)	SWMU	A
4.63	Stormwater Holding Pond	SWMU	A
4.64	Flare Area Stormwater Holding Pond	SWMU	A
4.65	Vine Hill Stormwater Holding Pond	SWMU	A
4.66	Stormwater Holding Ponds (Formerly LTA "FF")	SWMU	A
4.67	Inactive Unit "YY"	SWMU	I
4.68	Inactive Unit "ZZ"	SWMU	I

[a] From "RCRA Facility Assesment, Shell Oil Company martinez Manufacturing Complex" by A.T. Kearney, February, 1988.
[b] Unit number as designated in Figures 3 through 12.
[c] SWMU = Solid Waste Management Unit (a unit that was not reported as managing RCRA-regulated hazardous wastes, but may have managed hazardous constituents), HWMU = Hazardous Waste Management Unit (a unit that is reported to have managed RCRA-regulated hazardous wastes).
[d] I = inactive, A = active.

Table 2
Ground-water Contamination Found During
Third Quarter Monitoring (1987) at
Shell Oil Company Martinez Manufacturing Complex[a]

Geologic Formation	Maximum Levels Detected of: Organics[b] TOC mg/l	B ug/l	T ug/l	X ug/l	Metals[c] Mn mg/l	Pb mg/l	Ni mg/l
Bay Mud	483	11	10	9	18	.26	.16
Bedrock-Sandstone	18	1.6	3	4	1.3	.36	---
Alluvium-Sand	48	710	2700	3200	7.8	---	---
Alluvium- and/or Silt	390	620	16	560	21	.58	.06
Bedrock-Claystone and/or Siltstone	38	36	2	13	11	.13	2.4

a From "Quarterly Groundwater Monitoring Report for Shell Oil Company Martinez Manufacturing Complex" prepared by EMCON Associates and submitted in September, 1987.

b TOC = total organic carbon, B = benzene, T = toluene, X = xylene/ethylbenzene.

c Mn = manganese, Pb = lead, Ni = nickel.

Identification Numbers of Wells in Which Ground-water Samples Taken During Quarterly Ground-water Monitoring Contained Benzene, Toluene, or Xylene (See Figures 12 and 13 for well locations):

37 60A 61 63 72 74 127 129 136 140
141 148 149 155 163 172 177 178 179 181

Identification Numbers of Wells Containing Floating Hydrocarbon During Quarterly Ground-water Monitoring (See Figures 12 and 13 for well locations):

2 11 12 21 23 24 38 39 53 57
60 62 69 73 102 111 115 124 132 137
139 145 151 165 168 179

Attachment 21

SCOPE OF WORK FOR A RCRA FACILITY INVESTIGATION (RFI) AT SHELL OIL COMPANY, MARTINEZ MANUFACTURING COMPLEX

PURPOSE

The purpose of this RCRA Facility Investigation is to determine the nature and extent of releases of hazardous waste or constituents, identified in Paragraph IV.8 of this Order, from regulated units, solid waste management units, and other source areas at the facility and to gather all necessary data to support the Corrective Measures Study. The Respondent shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RCRA remedial investigation at Shell Oil Company, Martinez Manufacturing Complex.

SCOPE

The RCRA Facility Investigation consists of seven tasks:

Task I: Description of Current Conditions

- A. Facility Background
- B. Nature and Extent of Contamination
- C. Implementation of Interim Measures

Task II: Pre-Investigation Evaluation of Corrective Measure Technologies

Task III: RFI Workplan Requirements

- A. Project Management Plan
- B. Data Collection Quality Assurance Plan
- C. Data Management Plan
- D. Health and Safety Plan
- E. Community Relations Plan

Task IV: Facility Investigation

- A. Environmental Setting
- B. Source Characterization
- C. Contamination Characterization
- D. Potential Receptor Identification

Task V: Investigation Analysis

- A. Data Analysis
- B. Protection Standards

Task VI: Laboratory and Bench-Scale Studies

Task VII: Reports

- A. Preliminary and Workplan
- B. Progress
- C. Draft and Final

TASK I: DESCRIPTION OF CURRENT CONDITIONS

Respondent shall submit for U.S. EPA approval a report providing the background information pertinent to the Facility, contamination and interim measures as set forth below. The data gathered during any previous investigations or inspections and other relevant data shall be included.

A. Facility Background

Respondent's report shall summarize the regional location, pertinent boundary features, general Facility physiography, hydrogeology, and historical use of the Facility for the treatment, storage or disposal of solid and hazardous waste. Respondent's report shall include:

1. Map(s) depicting the following:
   a. General geographic location;
   b. Property lines, with the owners of all adjacent property clearly indicated;
   c. Topography and surface drainage (with a contour interval of 10 feet and a scale of 1 inch = 100 feet) depicting all waterways, wetlands, floodplains, water features, drainage patterns, and surface-water containment areas;
   d. All tanks, buildings, utilities, paved areas, easements, rights-of-way, and other features;
   e. All solid or hazardous waste treatment, storage or disposal areas active after November 19, 1980;
   f. All known past solid or hazardous waste treatment, storage or disposal areas regardless of whether they were active on November 19, 1980;
   g. All known past and present product and waste underground tanks or piping;
   h. Surrounding land uses (residential, commercial, agricultural, recreational); and
   i. The location of all production and ground-water monitoring wells. These wells shall be clearly labeled and ground and top of casing elevations and construction details included (these elevations and details may be included as an attachment).

   All maps shall be consistent with the requirements set forth in 40 CFR §270.14 and be of sufficient detail and accuracy to locate and report all current and future work performed at the site;

2. A history and description of ownership and operation, solid and hazardous waste generation, treatment, storage and disposal activities at the Facility;

ED_001593_00015625

3. Approximate dates or periods of past product and waste spills, identification of the materials spilled, the amount spilled, the location where spilled, and a description of the response actions conducted (local, state, or federal response units or private parties), including any inspection reports or technical reports generated as a result of the response; and

4. A summary of past permits requested and/or received, any enforcement actions and their subsequent responses and a list of documents and studies prepared for the Facility.

B. Nature and Extent of Contamination

Respondent shall prepare and submit for U.S. EPA approval a preliminary report describing the existing information on the nature and extent of contamination.

1. Respondent's report shall summarize all possible source areas of contamination. This, at a minimum, should include all regulated units, solid waste management units, spill areas, and other suspected source areas of contamination. For each area, Respondent shall identify the following:

   a. Location of unit/area (which shall be depicted on a facility map);
   b. Quantities of solid and hazardous wastes;
   c. Hazardous waste or constituents, to the extent known; and
   d. Identification of areas where additional information is necessary.

2. Respondent shall prepare an assessment and description of the existing degree and extent of contamination. This should include:

   a. Available monitoring data and qualitative information on locations and levels of contamination at the Facility;
   b. All potential migration pathways including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality; and
   c. The potential impact(s) on human health and the environment, including demography, ground-water and surface-water use, and land use.

C. Implementation of Interim Measures

Respondent's report shall document interim measures which were or are being undertaken at the Facility. This shall include:

ED_001593_00015625

1. Objectives of the interim measures: how the measure is mitigating a potential threat to human health and the environment and/or is consistent with and integrated into any long term solution at the Facility;
2. Design, construction, operation, and maintenance requirements;
3. Schedules for design, construction and monitoring; and
4. Schedule for progress reports.

ED_001593_00015625

TASK II: PRE-INVESTIGATION EVALUATION OF CORRECTIVE MEASURE TECHNOLOGIES

Prior to starting the Facility investigation, Respondent shall submit to EPA a report that identifies the potential corrective measure technologies that may be used on-site or off-site for the containment, treatment, remediation, and/or disposal of contamination. This report shall also identify any field data that needs to be collected in the Facility investigation to facilitate the evaluation and selection of the final corrective measure or measures (e.g., compatibility of waste and construction materials, information to evaluate effectiveness, treatability of wastes, etc.).

ED_001593_00015625

TASK III: RFI WORKPLAN REQUIREMENTS

Respondent shall prepare a RCRA Facility Investigation (RFI) Workplan. This RFI Workplan shall include the development of several plans, which shall be prepared concurrently. During the RCRA Facility Investigation, it may be necessary to revise the RFI Workplan to increase or decrease the detail of information collected to accommodate the Facility-specific situation. The RFI Workplan includes the following:

A. Project Management Plan

Respondent shall prepare a Project Management Plan which will include a discussion of the technical approach, schedules, budget, and personnel. The Project Management Plan will also include a description of qualifications of personnel performing or directing the RFI, including contractor personnel. This plan shall also document the overall management approach to the RCRA Facility Investigation.

B. Data Collection Quality Assurance Plan

Respondent shall prepare a plan to document all monitoring procedures: sampling, field measurements and sample analysis performed during the investigation to characterize the environmental setting, source, and contamination, so as to ensure that all information, data and resulting decisions are technically sound, statistically valid, and properly documented.

1. Data Collection Strategy

The strategy section of the Data Collection Quality Assurance Plan shall include but not be limited to the following:

a. Description of the intended uses for the data, and the necessary level of precision and accuracy for these intended uses;
b. Description of methods and procedures to be used to assess the precision, accuracy and completeness of the measurement data;
c. Description of the rationale used to assure that the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition or an environmental condition. Examples of factors which shall be considered and discussed include:

   i) Environmental conditions at the time of sampling;
   ii) Number of sampling points;
   iii) Representativeness of selected media; and

ED_001593_00015625

iv) Representativeness of selected analytical parameters.

d. Description of the measures to be taken to assure that the following data sets can be compared to each other:

i) RFI data generated by Respondent over some time period;
ii) RFI data generated by an outside laboratory or consultant versus data generated by Respondent;
iii) Data generated by separate consultants or laboratories; and
iv) Data generated by an outside consultant or laboratory over some time period.

e. Details relating to the schedule and information to be provided in quality assurance reports. The reports should include but not be limited to:

i) Periodic assessment of measurement data accuracy, precision, and completeness;
ii) Results of performance audits;
iii) Results of system audits;
iv) Significant quality assurance problems and recommended solutions; and
v) Resolutions of previously stated problems.

2. Sampling

The Sampling section of the Data Collection Quality Assurance Plan shall discuss:

a. Selecting appropriate sampling locations, depths, etc.;
b. Providing a statistically sufficient number of sampling sites;
c. Measuring all necessary ancillary data;
d. Determining conditions under which sampling should be conducted;
e. Determining which media are to be sampled (e.g., ground water, air, soil, sediment, etc.);
f. Determining which parameters are to be measured and where;
g. Selecting the frequency of sampling and length of sampling period;
h. Selecting the types of sample (e.g., composites vs. grabs) and number of samples to be collected;
i. Measures to be taken to prevent contamination if the sampling equipment and cross contamination between sampling points;
j. Documenting field sampling operations and procedures, including;

ED_001593_00015625

i) Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters, and adsorbing reagents);
ii) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;
iii) Documentation of specific sample preservation method;
iv) Calibration of field devices;
v) Collection of replicate samples;
vi) Submission of field-biased blanks, where appropriate;
vii) Potential interferences present at the Facility;
viii) Construction materials and techniques, associated with monitoring wells and piezometers;
ix) Field equipment listing and sample containers;
x) Sampling order; and
xi) Decontamination procedures.

k. Selecting appropriate sample containers;
l. Sample preservation; and
m. Chain-of-custody, including:

i) Standardized field tracking reporting forms to establish sample custody in the field prior to and during shipment; and
ii) Pre-prepared sample labels containing all information necessary for effective sample tracking.

3. Field Measurements

The Field Measurements section of the Data Collection Quality Assurance Plan shall discuss:

a. Selecting appropriate field measurement locations, depths, etc.;
b. Providing a statistically sufficient number of field measurements;
c. Measuring all necessary ancillary data;
d. Determining conditions under which field measurement should be conducted;
e. Determining which media are to be addressed by appropriate field measurements (e.g., ground water, air, soil, sediment, etc.);
f. Determining which parameters are to be measured and where;
g. Selecting the frequency of field measurement and length of field measurements period; and

ED_001593_00015625

h. Documenting field measurement operations and procedures, including:

i) Procedures and forms for recording raw data and the exact location, time, and facility-specific considerations associated with the data acquisition;
ii) Calibration of field devices;
iii) Collection of replicate measurements;
iv) Submission of field-biased blanks, where appropriate;
v) Potential interferences present at the Facility;
vi) Construction materials and techniques associated with monitoring wells and piezometers use to collect field data;
vii) Field equipment listing;
viii) Order in which field measurements were made; and
ix) Decontamination procedures.

4. Sample Analysis

The Sample Analysis section of the Data Collection Quality Assurance Plan shall specify the following:

a. Chain-of-custody procedures, including:

i) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment, and verify the data entered onto the sample custody records;
ii) Provision for a laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and
iii) Specification of laboratory sample custody procedures for sample handling, storage, and dispersement for analysis.

b. Sample storage procedures and storage times;
c. Sample preparation methods;
d. Analytical procedures, including:

i) Scope and application of the procedure;
ii) Sample matrix;
iii) Potential interferences;
iv) Precision and accuracy of the methodology; and
v) Method detection limits.

e. Calibration procedures and frequency;
f. Data reduction, validation and reporting;

ED_001593_00015625

g. Internal quality control checks, laboratory performance and systems audits and frequency, including:

i) Method blank(s);
ii) Laboratory control sample(s);
iii) Calibration check sample(s);
iv) Replicate sample(s);
v) Matrix-spiked sample(s);
vi) "Blind" quality control sample(s);
vii) Control charts;
viii) Surrogate samples;
ix) Zero and span gases; and
x) Reagent quality control checks.

h. Preventive maintenance procedures and schedules;
i. Corrective action (for laboratory problems); and
j. Turnaround time.

c. Data Management Plan

Respondent shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

1. Data Record

The data record shall include the following:

a. Unique sample or field measurement code;
b. Sampling or field measurement location and sample or measurement type;
c. Sampling or field measurement raw data;
d. Laboratory analysis ID number;
e. Property or component measured; and
f. Result of analysis (e.g., concentration).

2. Tabular Displays

The following data shall be presented in tabular displays:

a. Unsorted (raw) data;
b. Results for each medium, or for each constituent monitored;
c. Data reduction for statistical analysis;
d. Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and
e. Summary data.

ED_001593_00015625

3. Graphical Displays

The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

a. Display sampling location and sampling grid;
b. Indicate boundaries of sampling area, and areas where more data are required;
c. Displays levels of contamination at each sampling location;
d. Display geographical extent of contamination;
e. Display contamination levels, averages, and maxima;
f. Illustrate changes in concentration in relation to distance from the source, time, depth or other parameters; and
g. Indicate features affecting intramedia transport and show potential receptors.

D. Health and Safety Plan

Respondent shall prepare a Facility Health and Safety Plan.

1. Major elements of the Health and Safety Plan shall include:

a. Facility description including availability of resources such as roads, water supply, electricity and telephone service;
b. Describe the known hazards and evaluate the risks associated with the incident and with each activity conducted;
c. List key personnel and alternates responsible for site safety, responses operations, and for protection of public health;
d. Delineate work area;
e. Describe levels of protection to be worn by personnel in work area;
f. Establish procedures to control site access;
g. Describe decontamination procedures for personnel and equipment;
h. Establish site emergency procedures;
i. Address emergency medical care for injuries and toxicological problems;
j. Describe requirements for an environmental surveillance program;
k. Specify any routine and special training required for responders; and
l. Establish procedures for protecting workers from weather-related problems.

ED_001593_00015625

2. The Facility Health and Safety Plan shall be consistent with:

   a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);
   b. EPA Order 1440.1 - Respiratory Protection;
   c. EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;
   d. Facility Contingency Plan;
   e. EPA Standard Operating Safety Guide (1984); f. OSHA regulations particularly in 29 C.F.R. §1910 and §1926;
   g. State and local regulations; and
   h. Other EPA guidance as provided.

E. Community Relations Plan

Respondent shall prepare a plan, for the dissemination of information to the public regarding investigation activities and results.

ED_001593_00015625

TASK IV: FACILITY INVESTIGATION

Respondent shall conduct those investigations necessary to: characterize the Facility (Environmental Setting); define the source (Source Characterization); define the degree and extent of contamination (Contamination Characterization); and identify actual or potential receptors.

The investigations should result in data of adequate technical quality to support the development and evaluation of the corrective measure alternative or alternatives during the Corrective Measures Study.

The site investigation activities shall follow the plans set forth in Task III. All sampling and analyses shall be conducted in accordance with the Data Collection Quality Assurance Plan. All sampling locations shall be documented in a log and identified on a detailed site map.

A. Environmental Setting

Respondent shall collect information to supplement and verify existing information on the environmental setting at the Facility. Respondent shall characterize the following:

1. Hydrogeology

   Respondent shall conduct a program to evaluate hydrogeologic conditions at the Facility. This program shall provide the following information:

   a. A description of the regional and Facility-specific geologic and hydrogeologic characteristics affecting ground-water flow beneath the Facility, including:

      i) Regional and Facility-specific stratigraphy: description of strata including strike and dip, identification of stratigraphic contacts;
      ii) Structural geology: description of local and regional structural features (e.g., folding, faulting, tilting, jointing, etc.);
      iii) Depositional history;
      iv) Identification and characterization of areas and amounts of recharge and discharge.
      v) Regional and Facility-specific ground-water flow patterns; and
      vi) Characterize seasonal variations in the ground-water flow regime.

   b. An analysis of any topographic features that might influence the ground-water flow system.

ED_001593_00015625

c. Based on field data, test, and cores, a representative and accurate classification and description of the hydrogeologic units which may be part of the migration pathways at the Facility (i.e., the aquifers and any intervening saturated and unsaturated units), including:

i) Hydraulic conductivity and porosity (total and effective);
ii) Lithology, grain size, sorting, degree of cementation;
iii) An interpretation of hydraulic interconnections between saturated zones; and
iv) The attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content etc.).

d. Based on field studies and cores, structural geology and hydrogeologic cross sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units which may be part of the migration pathways identifying:

i) Sand and gravel deposits in unconsolidated deposits;
ii) Zones of fracturing or channeling in consolidated or unconsolidated deposits;
iii) Zones of higher permeability or low permeability that might direct and restrict the flow of contaminants;
iv) The uppermost aquifer: geologic formation, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs; and
v) Water-bearing zones above the first confining layer that may serve as a pathway for contaminant migration including perched zones of saturation.

e. Based on data obtained from ground-water monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source, a representative description of water level or fluid pressure monitoring including:

i) Water-level contour and/or potentiometric maps;
ii) Hydrologic cross sections showing vertical gradients;
iii) The flow system, including the vertical and horizontal components of flow; and

ED_001593_00015625

iv) Any temporal changes in hydraulic gradients, for example, due to tidal or seasonal influences.

f. A description of manmade influences that may affect the hydrogeology of the site, identifying:

i) Active and inactive local water-supply and production wells with an approximate schedule of pumping; and

ii) Manmade hydraulic structures (pipelines, french drains, ditches, unlined ponds, septic tanks, NPDES outfalls, retention areas, etc.).

2. Soils

Respondent shall conduct a program to characterize the soil and rock units above the water table in the vicinity of the contaminant release(s). Such characterization shall include but not be limited to, the following information:

a. SCS soil classification;
b. Surface soil distribution;
c. Soil profile, including ASTM classification of soils;
d. Transects of soil stratigraphy;
e. Hydraulic conductivity (saturated and unsaturated);
f. Relative permeability;
g. Bulk density;
h. Porosity;
i. Soil sorptive capacity;
j. Cation exchange capacity (CEC);
k. Soil organic content;
l. Soil pH;
m. Particle size distribution;
n. Depth of water table;
o. Moisture content;
p. Effect of stratification on unsaturated flow;
q. Infiltration
r. Evapotranspiration;
s. Storage capacity;
t. Vertical flow rate; and
u. Mineral content.

3. Surface Water and Sediment

Respondent shall conduct a program to characterize the surface - water bodies in the vicinity of the Facility. Such characterization shall include, but not be limited to, the following activities and information:

ED_001593_00015625

a. Description of the temporal and permanent surface-water bodies including:

i) For lakes and estuaries: location, elevation, surface area, inflow, outflow, depth, temperature stratification, and volume;
ii) For impoundments: location, elevation, surface area, depth, volume, freeboard, and purpose of impoundment;
iii) For streams, ditches, drains, swamps and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, and flooding tendencies (i.e., 100 year event);
iv) Drainage patterns; and
v) Evapotranspiration.

b. Description of the chemistry of the natural surface water and sediments. This includes determining the pH, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients (NH_3, NO_3^-/NO_2^-, PO_4^{-3}), chemical oxygen demand, total organic carbon, specific contaminant concentrations, etc.

c. Description of sediment characteristics including:

i) Deposition area;
ii) Thickness profile; and
iii) Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity, pH, etc.)

4. Air

Respondent shall provide information characterizing the climate in the vicinity of the Facility. Such information shall include, but not be limited to:

a. A description of the following parameters:

i) Annual and monthly rainfall averages;
ii) Monthly temperature averages and extremes;
iii) Wind speed and direction;
iv) Relative humidity/dew point;
v) Atmospheric pressure;
vi) Evaporation data;
vii) Development of inversions; and
viii) Climate extremes that have been known to occur in the vicinity of the Facility, including frequency of occurrence.

ED_001593_00015625

b. A description of topographic and manmade features which affect air flow and emission patterns, including:

i) Ridges, hills or mountain areas;
ii) Canyons or valleys;
iii) Surface water bodies (e.g. rivers, lakes, bays, etc.);
iv) Wind breaks and forests; and
v) Buildings.

B. Source Characterization

Respondent shall collect analytical data to completely characterize the wastes and the areas where wastes have been placed, collected or removed including: type; quantity; physical form; disposition (containment or nature of deposits); and Facility characteristics affecting release (e.g., Facility security, and engineered barriers). This shall include quantification of the following specific characteristics, at each source area:

1. Unit/Disposal Area characteristics:

a. Location of unit/disposal area;
b. Type of unit/disposal area;
c. Design features;
d. Operating practices (past and present);
e. Period of operation;
f. Age of unit/disposal area;
g. General physical conditions; and
h. Method used to close the unit/disposal area.

2. Waste Characteristics:

a. Type of waste placed in the unit;

i) Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing or reducing agent);
ii) Quantity; and
iii) Chemical composition.

b. Physical and chemical characteristics;

i) Physical form (solid, liquid, gas);
ii) Physical description (e.g., powder, oily sludge);
iii) Temperature;
iv) pH;
v) General chemical class (e.g., acid, base, solvent);
vi) Molecular weight;
vii) Density;

viii) Boiling point;
ix) Viscosity;
x) Solubility in water;
xi) Cohesiveness of the waste;
xii) Vapor pressure.
xiii) Flash point

c. Migration and dispersal characteristics of the waste;

i) Sorption;
ii) Biodegradability, bioconcentration, biotransformation;
iii) Photodegradation rates;
iv) Hydrolysis rates; and
v) Chemical transformations.

Respondent shall document the procedures used in making the above determinations.

C. Contamination Characterization

Respondent shall collect analytical data on ground-water, soils, surface water, sediment, and subsurface gas contamination in the vicinity of the Facility. This data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data shall include time and location of sampling, media sampled, concentrations found, and conditions during sampling, and the identity of the individuals performing the sampling and analysis. Respondent shall address the following types of contamination at the Facility:

1. Ground-water Contamination

Respondent shall conduct a Ground-water Investigation to characterize any plumes of contamination at the Facility. This investigation shall at a minimum provide the following information:

a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the Facility;
b. The horizontal and vertical direction of contamination movement;
c. The velocity of contaminant movement;
d. The horizontal and vertical concentration profiles of 40 C.F.R. §264 Appendix IX constituents in the plume(s);
e. An evaluation of factors influencing the plume movement; and
f. An extrapolation of future contaminant movement.

ED_001593_00015625

Respondent shall document the procedures used in making the above determinations (e.g., well design, well construction, geophysics, modeling, etc.).

2. Soil Contamination

Respondent shall conduct an investigation to characterize the contamination of the soil and rock units above the water table in the vicinity of the contaminant release. The investigation shall include the following information:

a. A description of the vertical and horizontal extent of contamination.
b. A description of contaminant and soil chemical properties within the contaminant source area and plume. This includes contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation and other factors that might affect contaminant migration and transformation.
c. Specific contaminant concentrations.
d. The velocity and direction of contaminant movement.
e. An extrapolation of future contaminant movement.

Respondent shall document the procedures used in making the above determinations.

3. Surface-Water and Sediment Contamination

Respondent shall conduct a surface-water investigation to characterize contamination in surface-water bodies resulting from contaminant releases at the Facility. The investigation shall include, but not be limited to, the following information:

a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the Facility, and the extent of contamination in underlying sediments;
b. The horizontal and vertical direction of contaminant movement;
c. The contaminant velocity;
d. An evaluation of the physical, biological and chemical factors influencing contaminant movement;

ED_001593_00015625

e. An extrapolation of future contaminant movement; and
f. A description of the chemistry of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, specific contaminant concentrations, etc.;

Respondent shall document the procedures used in making the above determinations.

4. Air Contamination

Respondent shall conduct an investigation to characterize the particulate and gaseous contaminants released into the atmosphere. This investigation shall provide the following information:

a. A description of the horizontal and vertical direction and velocity of contaminant movement;
b. The rate and amount of the release; and
c. The chemical and physical composition of the contaminants(s) released, including horizontal and vertical concentration profiles.

Respondent shall document the procedures used in making the above determinations.

5. Subsurface Gas Contamination

Respondent shall conduct an investigation to characterize subsurface gases emitted from buried hazardous waste and hazardous constituents in the ground water. This investigation shall include the following information:

a. A description of the horizontal and vertical extent of subsurface gases mitigation;
b. The chemical composition of the gases being emitted;
c. The rate, amount, and density of the gases being emitted; and
d. Horizontal and vertical concentration profiles of the subsurface gases emitted.

Respondent shall document the procedures used in making the above determinations.

ED_001593_00015625

D. Potential Receptors

Respondent shall collect data describing the human populations and environmental systems that are susceptible to contaminant exposure from the Facility. Chemical analysis of biological samples may be needed. Data on observable effects in ecosystems may also be obtained. The following characteristics shall be identified:

1. Local uses and possible future uses of ground water:

   a. Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial); and
   b. Location of groundwater users including wells and discharge areas.

2. Local uses and possible future uses of surface waters draining the Facility:

   a. Domestic and municipal (e.g. potable and lawn/gardening watering);
   b. Recreational (e.g. swimming, fishing);
   c. Agricultural;
   d. Industrial; and
   e. Environmental (e.g. fish and wildlife propagation).

3. Human use of or access to the Facility and adjacent lands, including but not limited to:

   a. Recreation;
   b. Hunting;
   c. Residential;
   d. Commercial;
   e. Zoning; and
   f. Relationship between population locations and prevailing wind direction.

4. A description of the biota in surface water bodies on, adjacent to, or affected by the Facility.

5. A description of the ecology overlying and adjacent to the Facility.

6. A demographic profile of the people who use or have access to the Facility and adjacent land, including, but not limited to: age; sex; and sensitive subgroups.

7. A description of any endangered or threatened species near the Facility.

ED_001593_00015625

TASK V: INVESTIGATION ANALYSIS

Respondent shall prepare an analysis and summary of all Facility investigations and their results. The objective of this task shall be to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support the Corrective Measures Study.

A. Data Analysis

Respondent shall analyze all Facility investigation data outlined in Task IV and prepare a report on the type and extent of contamination at the Facility including sources and migration pathways. The report shall describe the extent of contamination (qualitative/ quantitative) in relation to background levels indicative for the area.

B. Protection Standards [where applicable]

1. Ground-water Protection Standards

For regulated units Respondent shall provide information to support the Agency's selection/development of Ground-water Protection Standards for all of the Appendix VIII constituents found in the ground-water during the Facility Investigation (Task IV).

a. The Groundwater Protection Standards shall consist of:

i) for any constituents listed in Table 1 of 40 C.F.R. §264.94, the respective value given in that table (MCL) if the background level of the constituent is below the given in Table 1; or
ii) the background level of that constituent in the groundwater; or
iii) a U.S. EPA approved Alternate Concentration Limit (ACL).

b. Information to support the Agency's subsequent selection of Alternate Concentration Limits (ACL's) shall be developed by Respondent in accordance with U.S. EPA guidance. For any proposed ACL's Respondent shall include a justification based upon the criteria set forth in 40 C.F.R. §264.94(b).

ED_001593_00015625

c. Within thirty (30) days of receipt of any proposed ACL's. The U.S. EPA shall notify Respondent in writing of approval, disapproval or modifications, the U.S. EPA shall specify in writing the reason(s) for any disapproval or modification.

d. Within thirty days of receipt of the U.S. EPA's notification or disapproval of any proposed ACL, Respondent shall amend and submit revisions to the U.S. EPA.

2. Other Relevant Protection Standards

Respondent shall identify all relevant and applicable standards for the protection of human health and the environment (e.g. National Ambient Air Quality Standards, Federally-approved state water quality standards, etc.).

ED_001593_00015625

TASK VI: LABORATORY AND BENCH-SCALE STUDIES

Respondent shall conduct laboratory and/or bench scale studies to determine the applicability of a corrective measure technology or technologies to Facility conditions. Respondent shall analyze the technologies, based on literature review, vendor contracts, and past experience to determine the testing requirements.

Respondent shall develop a testing plan identifying the types(s) and goal(s) of the study(ies), the level of effort needed, and the procedures to be used for data management and interpretation.

Upon completion of the testing, Respondent shall evaluate the testing results to assess the technology or technologies with respect to the site-specific questions identified in the test plan.

Respondent shall prepare a report summarizing the testing program and its results, both positive and negative.

ED_001593_00015625

TASK VII: REPORTS

A. Preliminary and Workplan

Respondent shall submit to the EPA reports on Tasks I and II when it submits the RCRA Facility Investigation Workplan (Task III).

B. Progress

Respondent shall at a minimum provide the EPA with signed, bimonthly progress reports containing:

1. A description and estimate of the percentage of the RFI completed;
2. Summaries of all findings;
3. Summaries of all changes made in the RFI during the reporting period;
4. Summaries of all contacts with representative of the local community, public interest groups or State government during the reporting period;
5. Summaries of all problems or potential problems encountered during the reporting period;
6. Actions being taken to rectify problems;
7. Changes in personnel during the reporting period;
8. Projected work for the next reporting period; and
9. Copies of daily reports, inspection reports, laboratory/ monitoring data, etc.

C. Draft and Final

Upon EPA approval, Respondent shall prepare a RCRA Facility Investigation Report to present Tasks IV-V. The RCRA Facility investigation Report shall be developed in draft form for U.S. EPA review. The RCRA Facility Investigation Report shall be developed in final format incorporating comments received on the Draft RCRA Facility Investigation Report. Task VI shall be submitted as a separate report when the Final RCRA Facility Investigation Report is submitted.

Three copies of all reports, including the Task I report, Task II report, Task III workplan, Task VI report and both the Draft and Final RCRA Facility Investigation Reports (Task IV-V) shall be provided by Respondent to U.S. EPA. One additional copy of each report will be provided by Respondent to the California Department of Health Services and the Regional Water Quality Control Board.

ED_001593_00015625

Facility Submission Summary

A summary of the information reporting requirements contained in the RCRA Facility Investigation Scope of Work is presented below:

Facility Submission	Due Date
Description of Current Situation (Task I)	one hundred and eighty (180) days from the eff tive date of this Order
Pre-Investigation Evaluation of Corrective Measure Technologies (Task II)	one hundred and eighty (180) days from the eff tive date of this Order
Preliminary RFI Workplan (Task III)	one hundred and eighty (180) days from the eff tive date of this Order
Final RFI Workplan (Task III)	thirty (30) days from t receipt of EPA comments the draft Workplan, unl otherwise specified
Draft RFI Report (Tasks IV and V)	according to the approv schedule in the RFI Workplan, or alternate date approved by EPA
Final RFI Report (Tasks IV and V)	thirty (30) days after EPA comment on Draft RFI Report
Laboratory and Bench-Scale Studies (Task VI)	Concurrent with Final RFI Report
Progress Reports on Tasks I through VI	BI-MONTHLY

ED_001593_00015625

Attachment 22

SCOPE OF WORK FOR A CORRECTIVE MEASURE STUDY AT SHELL OIL COMPANY, MARTINEZ MANUFACTURING COMPLEX

PURPOSE

The purpose of this Corrective Measure Study (CMS) is to develop and evaluate the corrective action alternative or alternatives and to recommend the corrective measure or measures to be taken at Shell Oil Company, Martinez Manufacturing Complex. Respondent will furnish the personnel, materials, and services necessary to prepare the corrective measure study, except as otherwise specified.

SCOPE

The Corrective Measure Study consists of four tasks:

Task VIII: Identification and Development of the Corrective Measure Alternative or Alternatives

- A. Description of Current Situation
- B. Establishment of Corrective Action Objectives
- C. Screening of Corrective Measures Technologies
- D. Identification of the Corrective Measure Alternative or Alternatives

Task IX: Evaluation of the Corrective Measure Alternative or Alternatives

- A. Technical/Environmental/Human Health/Institutional
- B. Cost Estimate

Task X: Justification and Recommendation of the Corrective Measure or Measures

- A. Technical
- B. Environmental
- C. Human Health

Task XI: Reports

- A. Progress
- B. Draft
- C. Final

TASK VIII: IDENTIFICATION AND DEVELOPMENT OF THE CORRECTIVE ACTION ALTERNATIVE OR ALTERNATIVES

Based on the results of the RCRA Facility Investigation and consideration of the identified Preliminary Corrective Measure Technologies (Task II), Respondent shall identify, screen and develop the alternative or alternatives for removal, containment, treatment and/or other remediation of the contamination based on the objectives established for the corrective action.

A. Description of Current Situation

Respondent shall submit an update to the information describing the current situation at the Facility and the known nature and extent of the contamination as documented by the RCRA Facility Investigation Report. Respondent shall provide an update to information presented in Task I of the RFI to the Agency regarding previous response activities and any interim measures which have or are being implemented at the Facility. Respondent shall also make a Facility-specific statement of the purpose for the response, based on the results of the RCRA Facility Investigation. The statement of purpose should identify the actual or potential exposure pathways that should be addressed by corrective measures.

B. Establishment of Corrective Action Objectives

Respondent, in conjunction with the U.S. EPA, shall establish site specific objectives for the corrective action. These objectives shall be based on public health and environmental criteria, information gathered during the RCRA Facility Investigation, EPA guidance, and the requirements of any applicable Federal statutes. At a minimum, all corrective actions concerning ground water releases from regulated units must be consistent with, and as stringent as, those required under 40 C.F.R. §264.100.

C. Screening of Corrective Measure Technologies

Respondent shall review the results of the RCRA Facility Investigation and reassess the technologies specified in Task II and to identify additional technologies which are applicable at the Facility. Respondent shall screen the preliminary corrective measure technologies identified in Task II of the RCRA Facility investigation and any supplemental technologies to eliminate those that may prove unfeasible to implement, that rely on technologies unlikely to perform satisfactorily or reliably, or that do not achieve the corrective measure objective within a reasonable time period. This screening process focuses on eliminating those technologies which have severe limitations for a given set

ED_001593_00015625

of waste and site-specific conditions. The screening step may also eliminate technologies based on inherent technology limitations.

Site, waste, and technology characteristics which are used to screen inapplicable technologies are described in more detail below:

1. Site Characteristics

   Site data should be reviewed to identify conditions that may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by site characteristics should be eliminated from further consideration;

2. Waste Characteristics

   Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process. Technologies clearly limited by these waste characteristics should be eliminated from consideration. Waste characteristics particularly affect the feasibility of in-situ methods, direct treatment methods, and land disposal (on/off-site); and

3. Technology Limitations

   During the screening process, the level of technology development, performance record, and inherent construction, operation, and maintenance problems should be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process. For example, certain treatment methods have been developed to a point where they can be implemented in the field without extensive technology transfer or development.

D. <u>Identification of the Corrective Measure Alternative or Alternatives</u>

Respondent shall develop the Corrective measure alternative or alternatives based on the corrective action objectives and analysis of Preliminary Corrective Measure Technologies, as presented in Task II of the RCRA Facility investigation and as supplemented following the preparation of the RFI Report. Respondent shall rely on engineering practice to determine which of the previously identified technologies appear most suitable for the site. Technologies can be combined to form the overall corrective action alternative or alternatives. The alternative or alternatives developed should represent a workable number of option(s) that each

ED_001593_00015625

appear to adequately address all site problems and corrective action objectives. Each alternative may consist of an individual technology or a combination of technologies. Respondent shall document the reasons for excluding technologies, identified in Task II, as supplemented in the development of the alternative or alternatives.

ED_001593_00015625

TASK IX: EVALUATION OF THE CORRECTIVE MEASURE ALTERNATIVE OR ALTERNATIVES

Respondent shall describe each corrective measure alternative that passes through the Initial Screening in Task VIII and evaluate each corrective measure alternative and it's components. The evaluation shall be based on technical, environmental, human health and institutional concerns. Respondent shall also develop cost estimates of each corrective measure.

A. Technical/Environmental/Human Health/Institutional

Respondent shall provide a description of each corrective measure alternative which includes but is not limited to the following: preliminary process flow sheets; preliminary sizing and type of construction for buildings and structures; and rough quantities of utilities required. Respondent shall evaluate each alternative in the four following areas:

1. Technical;

Respondent shall evaluate each corrective measure alternative based on performance, reliability, implementability and safety.

a. Respondent shall evaluate performance based on the effectiveness an useful life of the corrective measure:

i) Effectiveness shall be evaluated in terms of the ability to perform intended functions, such as containment, diversion, removal, destruction, or treatment. The effectiveness of each corrective measure shall be determined either through design specifications or by performance evaluation. Any specific waste or site characteristics which could potentially impede effectiveness shall be considered. The evaluation should also consider the effectiveness of combinations of technologies; and

ii) Useful life is defined as the length of time the level of effectiveness can be maintained. Most corrective measure technologies, with the exception of destruction, deteriorate with time. Often, deterioration can be slowed through proper system operation and maintenance, but the technology eventually may require replacement. Each corrective measure shall be evaluated in terms of the projected service lives of its component technologies. Resource availability in the

ED_001593_00015625

future life of the technology, as well as appropriateness of the technologies, must be considered in estimating the useful life of the project.

b. Respondent shall provide information on the reliability of each corrective measure including their operation and maintenance requirements and their demonstrated reliability:

   i) Operation and maintenance requirements include the frequency and complexity of necessary operation and maintenance. Technologies requiring frequent or complex operation and maintenance activities should be regarded as less reliable than technologies requiring little or straightforward operation and maintenance. The availability of labor and materials to meet these requirements shall also be considered; and

   ii) Demonstrated and expected reliability is a way of measuring the risk and effect of failure. Respondent should evaluate whether the technologies have been used effectively under analogous conditions; whether the combination of technologies have been used together effectively; whether failure of any one technology has an immediate impact on receptors; and whether the corrective measure has the flexibility to deal with uncontrollable changes at the site.

c. Respondent shall describe the implementability of each corrective measure including the relative ease of installation (constructability) and the time required to achieve a given level of response:

   i) Constructability is determined by conditions both internal and external to the Facility conditions and include such items as location of underground utilities, depth to water table, heterogeneity of subsurface materials, and location of the Facility (i.e., remote location vs. a congested urban area). Respondent shall evaluate what measures can be taken to facilitate construction under these conditions. External factors which affect implementation include the need for special permits or agreements, equipment availability, and the location of suitable off-site treatment or disposal facilities; and

ED_001593_00015625

ii) Time has two components that shall be addressed: the time it takes to implement a corrective measure and the time it takes to actually see beneficial results. Beneficial results are defined as the reduction of contaminants to some acceptable, pre-established level.

d. Respondent shall evaluate each corrective measure alternative with regard to safety. This evaluation shall include threats to the safety of nearby communities and environments as well as those to workers during implementation. Factors to consider are fire, explosion, and exposure to hazardous substances.

2. Environmental;

Respondent shall perform an Environmental Assessment for each alternative. The Environmental Assessment shall focus on the Facility conditions and pathways of contamination actually addressed by each alternative. The Environmental Assessment for each alternative will include, at a minimum, an evaluation of: the short- and long-term beneficial and adverse effects of the response alternative; any adverse effects on environmentally sensitive areas; and an analysis of measures to mitigate adverse effects.

3. Human Health; and

Respondent shall assess each alternative in terms of the extent of which it mitigates short- and long-term potential exposure to any residual contamination and protects human health both during and after implementation the corrective measure. The assessment will describe the levels and characterizations of contaminants on-site, potential exposure routes, and potentially affected population. Each alternative will be evaluated to determine the level of exposure to contaminants and the reduction over time. For management of mitigation measures, the relative reduction of impact will be determined by comparing residual levels of each alternative with existing criteria, standards, or guidelines acceptable to EPA.

4. Institutional.

Respondent shall assess relevant institutional needs for each alternative. Specifically, the effects of Federal, state and local environmental and public health standards, regulations, guidance, advisories, ordinances, or community relations on the design, operation, and timing of each alternative.

ED_001593_00015625

B. Cost Estimate

Respondent shall develop an estimate of the cost of each corrective measure alternative (and for each phase or segment of the alternative). The cost estimate shall include both capital and operation and maintenance costs.

1. Capital costs consist of direct (construction) and indirect (non-construction and overhead) costs.

   a. Direct capital costs include:

      i) Construction costs: Costs of materials, labor (including fringe benefits and worker's compensation), and equipment required to install the corrective measure.
      ii) Equipment costs: Costs of treatment, containment, disposal and/or service equipment necessary to implement the action; these materials remain until the corrective action is complete;
      iii) Land and site-development costs: Expenses associated with purchase of land and development of existing property; and
      iv) Buildings and services costs: Costs of process and non-process buildings, utility connections, purchased services, and disposal costs.

   b. Indirect capital costs include:

      i) Engineering expenses: Costs of administration, design, construction supervision, drafting, and testing of corrective measure alternatives;
      ii) Legal fees and license or permit costs: Administrative and technical costs necessary to obtain licenses and permits for installation and operation;
      iii) Startup and shakedown costs: Costs incurred during corrective measure startup; and
      iv) Contingency allowances: Funds to cover costs resulting from unforeseen circumstances, such as adverse weather conditions, strikes, and inadequate Facility characterization.

2. Operation and maintenance costs are post-construction costs necessary to ensure continued effectiveness of a corrective measure. Respondent shall consider the following operation and maintenance cost components:

ED_001593_00015625

a. Operating labor costs: Wages, salaries, training, overhead, and fringe benefits associated with the labor needed for post-construction operations;
b. Maintenance materials and labor costs: Costs for labor, parts, and other resources required for routine maintenance of facilities and equipment;
c. Auxiliary materials and energy: Costs of such items as chemicals and electricity for treatment plant operations, water and sewer service, and fuel;
d. Purchased services: Sampling costs, laboratory fees, and professional fees for which the need can be predicted;
e. Disposal and treatment costs: Costs of transporting, treating, and disposing of waste materials, such as treatment plant residues, generated during operations;
f. Administrative costs: Costs associated with administration of corrective measure operation and maintenance not included under other categories;
g. Insurance, taxes, and licensing costs: Costs of such items as liability and sudden accidental insurance; real estate taxes on purchased land or rights-of-way; licensing fees for certain technologies; and permit renewal and reporting costs;
h. Maintenance reserve and contingency funds: Annual payments into escrow funds to cover (1) costs of anticipated replacement or rebuilding of equipment and (2) any large unanticipated operation and maintenance costs; and
i. Other costs: Items that do not fit any of the above categories.

ED_001593_00015625

TASK X: JUSTIFICATION AND RECOMMENDATION OF THE CORRECTIVE MEASURE OR MEASURES

Respondent shall justify and recommend a corrective measure alternative using technical, human health, and environmental criteria. This recommendation shall include summary tables which allow the alternative or alternatives to be understood easily. Tradeoffs among health risks, environmental effects, and other pertinent factors shall be highlighted. The U.S. EPA will select the corrective measure alternative or alternatives to be implemented based on the results of Tasks IX and X. At a minimum, the following criteria will be used to justify the final corrective measure or measures.

A. Technical

1. Performance - corrective measure or measures which are most effective at performing their intended functions and maintaining the performance over extended periods of time will be given preference;
2. Reliability - corrective measure or measures which do not require frequent or complex operation and maintenance activities and that have proven effective under waste and Facility conditions similar to those anticipated will be given preference;
3. Implementability - corrective measure or measures which can be constructed and operating to reduce levels of contamination to attain or exceed applicable standards in the shortest period of time will be preferred; and
4. Safety - corrective measure or measures which pose the least threat to the safety of nearby residents and environments as well as workers during implementation will be preferred.

B. Human Health

The corrective measure or measures must comply with existing U.S. EPA criteria, standards, or guidelines for the protection of human health. Corrective measures which provide the minimum level of exposure to contaminants and the maximum reduction in exposure with time are preferred.

C. Environmental

The corrective measure or measures posing the least adverse impact (or greatest improvement) over the shortest period of time on the environment will be favored.

ED_001593_00015625

TASK XI: REPORTS

A. Corrective Measures Study Workplan

Respondent shall submit to EPA a Preliminary Corrective Measures Study Workplan within thirty (30) days of approval of the final RFI Report. Respondent will finalize its Workplan within thirty (30) days of receipt of comments from EPA.

B. Progress

Respondent shall at a minimum provide the EPA with signed, bimonthly progress reports containing:

1. A description and estimate of the percentage of the CMS completed;
2. Summaries of all findings;
3. Summaries of all changes made in the CMS during the reporting period;
4. Summaries of all contacts with representative of the local community, public interest groups or State government during the reporting period;
5. Summaries of all problems or potential problems encountered during the reporting period;
6. Actions being taken to rectify problems;
7. Changes in personnel during reporting period;
8. Projected work for the next reporting period; and
9. Copies of daily reports, inspection reports, laboratory/ monitoring data, etc.

C. Draft

Respondent shall prepare a Corrective Measure Study Report presenting the results of Task VIII through X and recommending a corrective measure alternative or alternatives. Three copies of the preliminary report shall be provided by Respondent to EPA. The Report shall at a minimum include:

1. A description of the Facility;

   a. Site topographic map & preliminary layouts.

2. A summary of the corrective measure or measures;

   a. Description of the corrective measure or measures and rationale for selection;
   b. Performance expectations;
   c. Preliminary design criteria and rationale;
   d. General operation and maintenance requirements; and
   e. Long-term monitoring requirements.

ED_001593_00015625

3. A summary of the RCRA Facility Investigation and impact on the selected corrective measure or measures;

   a. Field studies (ground-water, surface water, soil, air); and
   b. Laboratory studies (bench scale, pick scale).

4. Design and Implementation Precautions;

   a. Special technical problems;
   b. Additional engineering data required;
   c. Permits and regulatory requirements;
   d. Access, easements, right-of-way;
   e. Health and safety requirements; and
   f. Community relations activities.

5. Cost Estimates and Schedules;

   a. Capital cost estimate;
   b. Operation and maintenance cost estimate; and
   c. Project schedule (design, construction, operation).

C. Final

Respondent shall finalize the Corrective Measure Study Report incorporating comments received from EPA on the Draft Corrective Measure Study Report.

ED_001593_00015625

Facility Submission Summary

A summary of the information reporting requirements contained in the Corrective Measure Study Scope of Work is presented below:

Facility Submission	Due Date
Preliminary CMS Workplan	thirty (30) days after approval of RFI report
Final CMS Workplan	thirty (30) days from the receipt of EPA comments on the draft Workplan
Draft CMS Report (Tasks VIII, IX, and X)	according to the approved schedule in the CMS Workplan
Final CMS Report (Tasks VIII, IX, and X)	thirty (30) days after EPA comments on the Draft CMS
Progress Reports on Tasks VIII, IX, and X	BI-MONTHLY

ED_001593_00015625

To: Lin, Sharon[Lin.Sharon@epa.gov]
From: Arora, Asha@DTSC
Sent: Tue 9/8/2015 9:11:40 PM
Subject: RE: Total, TCLP, and STLC metals results for sediment and solid samples from the Shell Martinez Refinery RCRA Haz Waste Sampling SDG 15216A

Sharon,

Yes, I know that TTLC stands for Total Threshold Limits Concentration.

Sorry, I must be not looking, but I do not see total metals report as TTLC units are mg/kg. The two reports you sent me do not say "total metals."

My understanding is that 200 series is not for TTLC as we EPA method 6010 for metals.

Please advise. Thanks
Asha

From: Lin, Sharon [Lin.Sharon@epa.gov]
Sent: Tuesday, September 08, 2015 1:28 PM
To: Arora, Asha@DTSC
Subject: FW: Total, TCLP, and STLC metals results for sediment and solid samples from the Shell Martinez Refinery RCRA Haz Waste Sampling SDG 15216A

From: Berges, Jack
Sent: Tuesday, September 08, 2015 1:27 PM
To: Lin, Sharon
Subject: RE: Total, TCLP, and STLC metals results for sediment and solid samples from the Shell Martinez Refinery RCRA Haz Waste Sampling SDG 15216A

Sharon,

The total metals are the TTLC results. TTLC stands for Total Threshold Limits Concentration.

From: Lin, Sharon
Sent: Tuesday, September 08, 2015 10:20 AM
To: Berges, Jack

Subject: RE: Total, TCLP, and STLC metals results for sediment and solid samples from the Shell Martinez Refinery RCRA Haz Waste Sampling SDG 15216A

Hi, Jack, just wanted to confirm that we still have the TTLC results to report. Thanks.

sharon

From: Berges, Jack
Sent: Thursday, September 03, 2015 3:47 PM
To: Lin, Sharon
Subject: Total, TCLP, and STLC metals results for sediment and solid samples from the Shell Martinez Refinery RCRA Haz Waste Sampling SDG 15216A

Total, TCLP, and STLC metals results for sediment and solid samples from the Shell Martinez Refinery RCRA Haz Waste Sampling SDG 15216A, project R15E03, are attached.

Jack Berges

Chemist, US EPA Region 9 Laboratory

1337 South 46th Street Bldg 201

Richmond, CA 94804

P: 510-412-2332 F: 510-412-2302

berges.jack@epa.gov

To: Asha.Arora@dtsc.ca.gov[Asha.Arora@dtsc.ca.gov]
Cc: Lin, Sharon[Lin.Sharon@epa.gov]; michael.monson@shell.com[michael.monson@shell.com]
From: michael.monson@shell.com
Sent: Tue 8/11/2015 9:13:42 PM
Subject: RE: Hazardous Waste Training
Training Records.pdf

Asha,

See attached training records for the below mentioned employees. The first page are the Haz Waste Generator requirements, the 2nd page are the ETP-2/3 unit specific training.

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

From: Arora, Asha@DTSC [mailto:Asha.Arora@dtsc.ca.gov]
Sent: Tuesday, August 11, 2015 10:06 AM
To: Monson, Michael J SOPUS-DMW/323
Cc: lin.sharon@epa.gov
Subject: RE: Hazardous Waste Training

Hi Michael,

Thank you so much for sending these documents to us. I would like to review detailed training documents for the following employees:

-M. Vakuren
-T. Crippen
-Denzel Smith
-B. Loomis

In addition, please send us documentation for your ERM claim for the selenium sludge. During the inspection you provided us with a "Final Regulatory and Legal Review of Se Sludge Raw material" without attachments. Please send us the referred supporting attachments.

Thank you
Asha

Asha Arora
Senior Environmental Scientist (Specialist)
Department of Toxic Substances Control
Berkeley Office
(510) 540-3874
Asha.Arora@dtsc.ca.gov

From: michael.monson@shell.com [michael.monson@shell.com]
Sent: Tuesday, August 11, 2015 9:55 AM
To: Arora, Asha@DTSC; lin.sharon@epa.gov
Cc: michael.monson@shell.com
Subject: Hazardous Waste Training

Asha & Sharon,

See the attached training content and tests for the training modules for the Generator requirements. Have you determined the list of personnel for which you want to see the detailed training records?

Thanks,

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

Full Name	Computer User ID	Saba Learner Status	Organisation Name	Manager Full Name	Course Code	Course Name	Course Owner	Delivery Type	Date Marked Completed On	Offering Action - Action Status Description	Offering Score
Crippen, Terri	USTCRI	Active	Logistics Team 1	Foss, Daniel	00023690	MZR EP 5.1 and 5.9 Waste Management [DNE]	Braden, Natalie	e-Learning	30 Apr 2015	Successful	100
Crippen, Terri	USTCRI	Active	Logistics Team 1	Foss, Daniel	00023681	MZR EP 5.3 Waste in Portable Containers [DNE]	Braden, Natalie	e-Learning	30 Apr 2015	Successful	100
Crippen, Terri	USTCRI	Active	Logistics Team 1	Foss, Daniel	00023679	MZR EP 5.7 Weekly Insp of Haz Waste [DNE]	Braden, Natalie	e-Learning	14 Jun 2015	Successful	100
Crippen, Terri	USTCRI	Active	Logistics Team 1	Foss, Daniel	00023947	MZR Hazardous Waste Containers [DNE]	Ayala, Michelle	e-Learning	12 Nov 2014	Successful	100
Loomis, Bradley	USBLO9	Active	Logistics Team 3	Foss, Daniel	00023690	MZR EP 5.1 and 5.9 Waste Management [DNE]	Braden, Natalie	e-Learning	7 Jan 2015	Successful	100
Loomis, Bradley	USBLO9	Active	Logistics Team 3	Foss, Daniel	00023681	MZR EP 5.3 Waste in Portable Containers [DNE]	Braden, Natalie	e-Learning	25 Jan 2015	Successful	100
Loomis, Bradley	USBLO9	Active	Logistics Team 3	Foss, Daniel	00023679	MZR EP 5.7 Weekly Insp of Haz Waste [DNE]	Braden, Natalie	e-Learning	7 Jan 2015	Successful	100
Loomis, Bradley	USBLO9	Active	Logistics Team 1	Foss, Daniel	00023947	MZR Hazardous Waste Containers [DNE]	Ayala, Michelle	e-Learning	20 Apr 2015	Successful	100
Smith, Denzil	SMITHDR	Active	Logistics Team 1	Foss, Daniel	00023690	MZR EP 5.1 and 5.9 Waste Management [DNE]	Braden, Natalie	e-Learning	7 Apr 2015	Successful	100
Smith, Denzil	SMITHDR	Active	Logistics Team 1	Foss, Daniel	00023681	MZR EP 5.3 Waste in Portable Containers [DNE]	Braden, Natalie	e-Learning	7 Apr 2015	Successful	100
Smith, Denzil	SMITHDR	Active	Logistics Team 1	Foss, Daniel	00023679	MZR EP 5.7 Weekly Insp of Haz Waste [DNE]	Braden, Natalie	e-Learning	6 Apr 2015	Successful	100
Smith, Denzil	SMITHDR	Active	Logistics Team 1	Foss, Daniel	00023947	MZR Hazardous Waste Containers [DNE]	Ayala, Michelle	e-Learning	28 Mar 2015	Successful	100
Van Keuren, Mark	USMVAJ	Active	Logistics Team 2	Mingus, Richard	00023690	MZR EP 5.1 and 5.9 Waste Management [DNE]	Braden, Natalie	e-Learning	24 Nov 2014	Successful	100
Van Keuren, Mark	USMVAJ	Active	Logistics Team 2	Mingus, Richard	00023681	MZR EP 5.3 Waste in Portable Containers [DNE]	Braden, Natalie	e-Learning	26 Dec 2014	Successful	100
Van Keuren, Mark	USMVAJ	Active	Logistics Team 2	Mingus, Richard	00023679	MZR EP 5.7 Weekly Insp of Haz Waste [DNE]	Braden, Natalie	e-Learning	24 Nov 2014	Successful	100
Van Keuren, Mark	USMVAJ	Active	Logistics Team 2	Mingus, Richard	00023947	MZR Hazardous Waste Containers [DNE]	Ayala, Michelle	e-Learning	26 Mar 2015	Successful	100

Full Name	Computer User ID	Saba Learner Status	Organisation Name	Manager Full Name	Course Code	Course Name	Course Owner	Delivery Type	Date Marked Completed On	Offering Action Status Description	Offering Score
Crippen, Terri	USTCRI	Active	Logistics Team 1	Foss, Daniel	00006538	MZR Log Effluent Treating [DNE]	Johnson, James	Face-to-Face Training	29 Apr 2014	Completed	100
Loomis, Bradley	USBLO9	Active	Logistics Team 3	Foss, Daniel	00006538	MZR Log Effluent Treating [DNE]	Johnson, James	Face-to-Face Training	1 Dec 2010	Completed	100
Loomis, Bradley	USBLO9	Active	Logistics Team 3	Foss, Daniel	00006538	MZR Log Effluent Treating [DNE]	Johnson, James	Face-to-Face Training	2 Dec 2013	Completed	100
Smith, Denzil	SMITHDR	Active	Logistics Team 1	Foss, Daniel	00006538	MZR Log Effluent Treating [DNE]	Johnson, James	Face-to-Face Training	9 Sep 2014	Completed	100
Van Keuren, Mark	USMVAJ	Active	Logistics Team 2	Mingus, Richard	00006538	MZR Log Effluent Treating [DNE]	Johnson, James	Face-to-Face Training	3 Jun 2011	Completed	100
Van Keuren, Mark	USMVAJ	Active	Logistics Team 2	Mingus, Richard	00006538	MZR Log Effluent Treating [DNE]	Johnson, James	Face-to-Face Training	16 Jun 2014	Completed	100

To: Asha.Arora@dtsc.ca.gov[Asha.Arora@dtsc.ca.gov]
Cc: Lin, Sharon[Lin.Sharon@epa.gov]
From: michael.monson@shell.com
Sent: Tue 8/11/2015 8:32:57 PM
Subject: RE: Hazardous Waste Training (2nd response)

That is our environmental department:

Natalie Braden, Environmental Manager

Michael Monson, Hazardous Waste Engineer

Michael Armour, Water Engineer

Lynley Harris, Air Engineer

Kathy Wheeler, Air Engineer

Gordon Johnson, Permitting Engineer

Liz Rosales, Environmental Specialist

Ashley Taylor, USW Environmental Representative

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

From: Arora, Asha@DTSC [mailto:Asha.Arora@dtsc.ca.gov]
Sent: Tuesday, August 11, 2015 10:45 AM
To: Monson, Michael J SOPUS-DMW/323
Cc: Lin.Sharon@epa.gov
Subject: RE: Hazardous Waste Training (2nd response)

Who are in environmental affairs (EA)? I just wanted to clarify who is a part of EA and their names etc...

Thanks
Asha

From: Arora, Asha@DTSC
Sent: Tuesday, August 11, 2015 10:28 AM
To: michael.monson@shell.com
Cc: Lin.Sharon@epa.gov
Subject: RE: Hazardous Waste Training (2nd response)

Thank you, Michael!
Asha

From: michael.monson@shell.com [michael.monson@shell.com]
Sent: Tuesday, August 11, 2015 10:27 AM
To: Arora, Asha@DTSC
Subject: RE: Hazardous Waste Training (2nd response)

Environmental Affairs.

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

From: Arora, Asha@DTSC [mailto:Asha.Arora@dtsc.ca.gov]
Sent: Tuesday, August 11, 2015 10:26 AM
To: Monson, Michael J SOPUS-DMW/323
Cc: lin.sharon@epa.gov
Subject: RE: Hazardous Waste Training (2nd response)

Hi Michael,

What does "EA" means in the two documents (EP.5 and EP.3)?

Thank you

Asha

From: michael.monson@shell.com [michael.monson@shell.com]
Sent: Tuesday, August 11, 2015 9:55 AM
To: Arora, Asha@DTSC; lin.sharon@epa.gov
Cc: michael.monson@shell.com
Subject: Hazardous Waste Training

Asha & Sharon,

See the attached training content and tests for the training modules for the Generator requirements. Have you determined the list of personnel for which you want to see the detailed training records?

Thanks,

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

To: michael.monson@shell.com[michael.monson@shell.com]
Cc: Lin, Sharon[Lin.Sharon@epa.gov]
From: Arora, Asha@DTSC
Sent: Tue 8/11/2015 5:45:15 PM
Subject: RE: Hazardous Waste Training (2nd response)

Who are in environmental affairs (EA)? I just wanted to clarify who is a part of EA and their names etc...

Thanks
Asha

From: Arora, Asha@DTSC
Sent: Tuesday, August 11, 2015 10:28 AM
To: michael.monson@shell.com
Cc: Lin.Sharon@epa.gov
Subject: RE: Hazardous Waste Training (2nd response)

Thank you, Michael!
Asha

From: michael.monson@shell.com [michael.monson@shell.com]
Sent: Tuesday, August 11, 2015 10:27 AM
To: Arora, Asha@DTSC
Subject: RE: Hazardous Waste Training (2nd response)

Environmental Affairs.

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

From: Arora, Asha@DTSC [mailto:Asha.Arora@dtsc.ca.gov]
Sent: Tuesday, August 11, 2015 10:26 AM
To: Monson, Michael J SOPUS-DMW/323
Cc: lin.sharon@epa.gov
Subject: RE: Hazardous Waste Training (2nd response)

Hi Michael,

What does "EA" means in the two documents (EP.5 and EP.3)?

Thank you
Asha

From: michael.monson@shell.com [michael.monson@shell.com]
Sent: Tuesday, August 11, 2015 9:55 AM
To: Arora, Asha@DTSC; lin.sharon@epa.gov
Cc: michael.monson@shell.com
Subject: Hazardous Waste Training

Asha & Sharon,

See the attached training content and tests for the training modules for the Generator requirements. Have you determined the list of personnel for which you want to see the detailed training records?

Thanks,

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

To: michael.monson@shell.com[michael.monson@shell.com]
Cc: Lin, Sharon[Lin.Sharon@epa.gov]
From: Arora, Asha@DTSC
Sent: Tue 8/11/2015 5:28:24 PM
Subject: RE: Hazardous Waste Training (2nd response)

Thank you, Michael!
Asha

From: michael.monson@shell.com [michael.monson@shell.com]
Sent: Tuesday, August 11, 2015 10:27 AM
To: Arora, Asha@DTSC
Subject: RE: Hazardous Waste Training (2nd response)

Environmental Affairs.

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

From: Arora, Asha@DTSC [mailto:Asha.Arora@dtsc.ca.gov]
Sent: Tuesday, August 11, 2015 10:26 AM
To: Monson, Michael J SOPUS-DMW/323
Cc: lin.sharon@epa.gov
Subject: RE: Hazardous Waste Training (2nd response)

Hi Michael,

What does "EA" means in the two documents (EP.5 and EP.3)?

Thank you
Asha

From: michael.monson@shell.com [michael.monson@shell.com]
Sent: Tuesday, August 11, 2015 9:55 AM

To: Arora, Asha@DTSC; lin.sharon@epa.gov
Cc: michael.monson@shell.com
Subject: Hazardous Waste Training

Asha & Sharon,

See the attached training content and tests for the training modules for the Generator requirements. Have you determined the list of personnel for which you want to see the detailed training records?

Thanks,

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

To: michael.monson@shell.com[michael.monson@shell.com]
Cc: Lin, Sharon[Lin.Sharon@epa.gov]
From: Arora, Asha@DTSC
Sent: Tue 8/11/2015 5:26:03 PM
Subject: RE: Hazardous Waste Training (2nd response)

Hi Michael,

What does "EA" means in the two documents (EP.5 and EP.3)?

Thank you
Asha

From: michael.monson@shell.com [michael.monson@shell.com]
Sent: Tuesday, August 11, 2015 9:55 AM
To: Arora, Asha@DTSC; lin.sharon@epa.gov
Cc: michael.monson@shell.com
Subject: Hazardous Waste Training

Asha & Sharon,

See the attached training content and tests for the training modules for the Generator requirements. Have you determined the list of personnel for which you want to see the detailed training records?

Thanks,

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

To: michael.monson@shell.com[michael.monson@shell.com]
Cc: Lin, Sharon[Lin.Sharon@epa.gov]
From: Arora, Asha@DTSC
Sent: Tue 8/11/2015 5:06:28 PM
Subject: RE: Hazardous Waste Training

Hi Michael,

Thank you so much for sending these documents to us. I would like to review detailed training documents for the following employees:

-M. Vakuren
-T. Crippen
-Denzel Smith
-B. Loomis

In addition, please send us documentation for your ERM claim for the selenium sludge. During the inspection you provided us with a "Final Regulatory and Legal Review of Se Sludge Raw material" without attachments. Please send us the referred supporting attachments.

Thank you
Asha

Asha Arora
Senior Environmental Scientist (Specialist)
Department of Toxic Substances Control
Berkeley Office
(510) 540-3874
Asha.Arora@dtsc.ca.gov

From: michael.monson@shell.com [michael.monson@shell.com]
Sent: Tuesday, August 11, 2015 9:55 AM
To: Arora, Asha@DTSC; lin.sharon@epa.gov
Cc: michael.monson@shell.com
Subject: Hazardous Waste Training

Asha & Sharon,

See the attached training content and tests for the training modules for the Generator requirements. Have you determined the list of personnel for which you want to see the detailed training records?

Thanks,

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

To: aarora@dtsc.ca.gov[aarora@dtsc.ca.gov]; Lin, Sharon[Lin.Sharon@epa.gov]
Cc: michael.monson@shell.com[michael.monson@shell.com]
From: michael.monson@shell.com
Sent: Tue 8/11/2015 4:55:30 PM
Subject: Hazardous Waste Training
MZR Hazardous Waste Containers Training.docx
Environmental Procedure - EP 5.7 Training.docx
Environmental Procedure EP - 5.3 Training.docx
EP5.1 & EP5.9 Training.docx

Asha & Sharon,

See the attached training content and tests for the training modules for the Generator requirements. Have you determined the list of personnel for which you want to see the detailed training records?

Thanks,

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

Table of Contents

Environmental Procedure - EP 5.7 - Hazardous Waste Drum Inspection

Training Package

Objectives

Why Train on E.P. 5.7?

Where to Get More Information on E.P. 5.7?

Video Script

OBJECTIVES

- At the end of this training you should:
- Know the definition of a hazardous waste container.
- Know how to properly label portable containers.
- Know what special requirements exist for containers of hazardous waste.
- Know how often hazardous waste containers need to be inspected.
- Know how to use the Hazardous Waste Weekly Inspection Log to document that you performed an inspection.
- Know who to contact for questions concerning hazardous waste containers.

WHY TRAIN ON E.P. 5.7?

- To prevent non-compliance with State and Federal Regulations.
- To ensure the safety of employees who deal with the handling, storage, disposal and inspection of hazardous waste containers.

WHERE TO GET MORE INFORMATION ON E.P. 5.7?

- Environmental Procedure Manual - Section 5.3 & 5.7
- Departmental Focal Point
- Environmental Affairs
- Health and Safety Department

VIDEO SCRIPT

REQUIREMENTS FOR PORTABLE CONTAINERS

Part I: LABELING PORTABLE CONTAINERS

- All containers in the Complex, whether the container holds a waste, product, or any other type of material, must be labeled with the type of material in the container, and any hazards associated with it. All labels, except for trash and turnaround supplies, require an MSDS number.
- Containers include, but are not limited to drums, bins, temporary tanks,

lugger bins and paint cans.

• The white "nonhazardous waste" labels are for containers that hold nonhazardous office or other type waste. The type of waste in the container must be legibly written on the label. In most cases, the word "trash" may be used.

• When writing on any adhesive label, only permanent ink marks may be use. When writing on magnetic labels, only China markers may be used.

• Under no circumstances should ball-point pen or pencil be used on any label. Otherwise, writing will fade when exposed to sunlight or moisture. All writing should be legible.

• It is also important never to cross out information on a label, since it creates confusion.

• If a mistake is made, erase the error, or obtain a new label.

• Some examples of trash are non-oily paper, plastic, cloth, empty aerosol cans and light bulbs. Fluorescent light bulbs are limited to 10 bulbs per trash container.

• The orange "designated waste" labels are for nonhazardous industrial waste, which is waste generated by an operating process or maintenance on operating equipment. Only EA should classify designated waste and approve the use of this label.

• The type of waste in the container must be legibly written on the label, with the correct MSDS number.

• Some examples are refractory, except from the CO Boilers and Flexicoker gasifier, inerts and Denstones, hot process softener solids, biosolids, discarded asphalt, spent Claus catalyst, nonhazardous contaminated soil and man-made mineral fiber.

• The yellow "hazardous waste" labels are for containers that hold wastes classified as hazardous by EA or any not yet classified by EA.

• The information on the hazardous waste label must be complete.

• Guidance on hazardous waste labels is available in Environmental Procedure 5.3, which will be addressed in PART II of this video.

• The blue "product" labels are for containers that hold purchased materials, materials to be sold or materials to be recycled on site.

• Blue labels should be used on half drums and pails used for accumulating hydrocarbon drips from processing equipment. If the supplier has labeled the container properly, a blue "product" label is not required. If a blue "product" label is used, the type of material in the container must be legibly

ωριττεν ον τηε λαβελ, ωιτη τηε χορρεχτ ΜΣΔΣ νυμβερ.

- Some examples of products are fresh catalyst to be placed in reactors, lubricating oil, chemical additives to be used in a process, and wet coke fines to be sold.

- The silver "turnaround material and supplies" label is for containers that hold articles used during a turnaround. It is not to be used for any wastes generated during a turnaround.

- The type of article in the container must be legibly written on the label. No MSDS number is necessary. Some examples are tools, bolts, nails, brackets and scaffolding materials.

- If a material is not a waste and not a product, what do you do? The green "special" labels are for any container holding a material that does not fit into one of the previous categories. Use of these labels must be approved by EA.

- The type of materials in the containers must be legibly written on the label, with the correct MSDS number. Periodically, other labels will be required for off site shipments. At that time, EA or product accounting will provide instruction. These labels include flammable solids, flammable liquids, corrosive materials and oxidizers.

- A supply of labels is maintained in EA. Contact the hazardous waste coordinator for labels.

PART II: HAZARDOUS WASTE HANDLING

- State and federal laws regulate the management of hazardous waste in portable containers. Portable containers are defined as any container, open or closed, "which can be moved", including, but not limited to drums, bins, temporary tanks and sling bags.

- A few of the hazardous wastes in the refinery are: all process sewer sludges, boiler fines, asbestos, oily debris, spent abrasive grit, most spent catalysts, equipment cleanout sludge and contaminated soil.

- Classification and disposal of hazardous wastes is a lengthy process. Laboratory analysis and disposal approval take at least a month to complete. It is important to coordinate with EA any anticipated waste disposal as far in advance as possible.

- All hazardous waste must be placed in containers. It may not be accumulated on asphalt, concrete pads, or the

γρουνδ. Χηοοσινγ τηε προπερ χονταινερ ωιλλ σαϖε δουβλε ηανδλινγ ανδ δισποσαλ χοστσ.

• Disposing of a drum of waste is more expensive than a bin of waste, yet some hazardous wastes MUST be drummed, such as wastes that can only be safely handled in drums and wastes that exist in too small a volume to be handled otherwise.

• For advice in selecting a container, contact the Hazardous Waste Coordinator (Ext. 3492).

• When choosing a container, it is the generating department's responsibility to ensure that the container is in good condition and compatible with the waste.

• The waste should not react with the container nor should the container corrode. The waste generator must secure the lids of drums with rings and bolts, and make sure that all bungs are present and securely closed.

• All hazardous waste containers must be labeled with a hazardous waste label. Bins and temporary tanks are to be labeled with temporary magnetic labels. The waste generator must remove all magnetic labels before the container leaves the Complex.

• Drums to be shipped off site require pre-printed hazardous waste labels, acquired from the Hazardous Waste Coordinator, 15 days in advance.

• The generator must make sure the information on the labels matches the waste before placing the labels on the containers. The generator may not change any information that is on the label. If it is incorrect, the waste generator must obtain a new and correct label. The generator must also add the Accumulation Start Date and the Manifest Number.

• The generator is to place two permanent hazardous waste labels on each drum: one on the top lid, and the other on the side. All previous markings and labels must be removed or painted over. The generating department is to provide a storage area, for its waste containers, and conduct weekly container inspections. The storage area must have eyewash and shower access, and drums must be arranged in aisles at least two feet apart and only two drums wide.

• Waste may only be on site for 90 days. Waste in containers with a capacity of greater than 5000 gallons must be removed within 60 days. The 90 or 60 day period begins when hazardous calendar waste first starts to accumulate in

τηε χονταινερ. Αλλ δεπαρτμεντσ μυστ βε συρε το βεγιν τηε ωαστε δισποσαλ προχεσσ ιν ενουγη τιμε το ενσυρε χομπλιανχε.

• The generating department is responsible for hazardous waste containers while they are on site until they are loaded for shipment offsite. Each department must ensure that the containers holding hazardous waste generated by its department are labeled and inspected weekly.

• The only containers that the departments are not responsible for are the containers moved to the Central Drum Area or the Central Bin Area. EA is responsible for the containers in these areas. Hazardous waste regulations require weekly inspections of all hazardous waste containers documented on the Hazardous Waste Container Weekly Inspection Log. This is to ensure containers are properly managed and shipped off site before the 90 day deadline.

• During the inspection, each container must be checked to ensure that the container is closed and labeled, the label is properly completed, the container is not leaking or deteriorating and the container is not standing in water. Any deficiencies found must be corrected.

• Two part list: (1) name and signature (2) date and time (3) location (4) container type and number (5) type of waste

• The inspection log sheet must be completed, using the words "yes" and "no". Check marks and ditto marks are not acceptable. Documentation must include: Name and signature of the person completing the inspection, date and time of the inspection, location, container type and number of containers, type of waste in the containers (just the words "hazardous waste" are not acceptable)

• (6) accumulation start date (7) container and label condition (8) condition of area (9) corrective action, accumulation start date, condition of the containers and labels, condition of container area, corrective action taken (signing a work order and verifying completion is necessary), date and time the corrective action was completed, name and signature of the person completing the corrective action or verifying that the corrective action was done.

• The original inspection sheets are to be retained by departments for three years. Copies of inspection sheets should be sent to the Hazardous Waste Coordinator when all corrections have been completed. This video summary will help you understand the basic requirements for portable

χονταινερσ. Φορ μορε δεταιλεδ ινφορματιον, χονσυλτ τηε Ενϖιρονμενταλ Προχεδυρε Μανυαλ ορ ΕΑ.

TEST

Select the Best Answer:

Use the Hazardous Waste Container _____ Inspection Log to document that you performed an inspection.

- ✔ A. Daily
  N
- ✔ B. Weekly
  N
- ✔ C. Bi-weekly
  N
- ✔ D. Monthly
  N

Select the Best Answer:

You must write the word _____ or no on the log. Checks and ditto marks are not acceptable.

- ✔ A. undetermined
  N
- ✔ B. yes
  N
- ✔ C. negative
  N
- ✔ D. uncertain

Select the Best Answer:

Containers of hazardous waste must be inspected _____.

- ✔ A. daily
  N
- ✔ B. weekly
  N
- ✔ C. monthly
  N
- ✔ D. yearly

You Scored 3 / 3 = 100%

You need to score **100%** in order to pass. If you've scored **below** 100%, you need to retake the quiz.

If you've scored **below 80%** you are being advised to retake the total course and ask for coaching!

Table of Contents

Environmental Procedure EP - 5.3 Handling, Storage and Disposal of Hazardous Waste in Portable Containers

Training Package

Objectives

Why Train on EP 5.3?

Where to Get More Information on EP 5.3?

Video Script

OBJECTIVES

- At the end of this training you should:
- Know the definition of a hazardous waste container.
- Know how to properly label portable containers.
- Know what special requirements exist for containers of hazardous waste.
- Know how often hazardous waste containers need to be inspected.
- Know how to use the Hazardous Waste Weekly Inspection Log to document that you performed an inspection.
- Know who to contact for questions concerning hazardous waste containers.

WHY TRAIN ON E.P. 5.3?

- To prevent non-compliance with State and Federal Regulations.
- To ensure the safety of employees who deal with the handling, storage, disposal and inspection of hazardous waste containers.

WHERE TO GET MORE INFORMATION ON E.P. 5.3?

- Environmental Procedure Manual - Section 5.3
- Departmental Focal Point
- Environmental Conservation Department
- Health and Safety Department

VIDEO SCRIPT

REQUIREMENTS FOR PORTABLE CONTAINERS

- Show video tape entitled, "Requirements for Portable Containers" - 15 minutes.

Part I: LABELING PORTABLE CONTAINERS

- All containers in the Complex, whether the container holds a waste, product, or any other type of material, must be labeled with the type of material in the container, and any hazards associated with it. All labels, except for trash and turnaround supplies, require an MSDS number.

- Containers include, but are not limited to drums, bins, temporary tanks, lugger bins and paint cans. Hazardous Waste containers need to be of a type approved by EA.
- The white "nonhazardous waste" labels are for containers that hold nonhazardous office or other type waste. The type of waste in the container must be legibly written on the label. In most cases, the word "trash" may be used.
- When writing on any adhesive label, only permanent ink marks may be use. When writing on magnetic labels, only China markers may be used.
- Under no circumstances should ball-point pen or pencil be used on any label. Otherwise, writing will fade when exposed to sunlight or moisture. All writing should be legible.
- It is also important never to cross out information on a label, since it creates confusion.
- If a mistake is made, erase the error, or obtain a new label.
- Some examples of trash are non-oily paper, plastic, cloth and empty aerosol cans.
- The orange "designated waste" labels are for nonhazardous industrial waste, which is waste generated by an operating process or maintenance on operating equipment. Only EA should classify designated waste and approve the use of this label.
- The type of waste in the container must be legibly written on the label, with the correct MSDS number.
- Some examples are refractory, except from the CO Boilers and Flexicoker gasifier, inerts and Denstones, hot process softener solids, biosolids, discarded asphalt, ASD filter cake, spent Claus catalyst, nonhazardous contaminated soil and man-made mineral fiber.
- The yellow "hazardous waste" labels are for containers that hold wastes classified as hazardous by EA or any not yet classified by EA.
- The information on the hazardous waste label must be complete.
- Guidance on hazardous waste labels is available in Environmental Procedure 5.3, which will be addressed in PART II of this video.
- The blue "product" labels are for containers that hold purchased materials, materials to be sold or materials to be recycled on site.
- Blue labels should be used on half drums and pails used for accumulating hydrocarbon drips from processing equipment. If the supplier has labeled the container properly, a blue "product" label is not required. If a blue "product" label is used, the type of material in the container must be legibly written on the label, with the correct MSDS number.

- Some examples of products are fresh catalyst to be placed in reactors, lubricating oil, chemical additives to be used in a process, and wet coke fines to be sold.

- The silver "turnaround material and supplies" label is for containers that hold articles used during a turnaround. It is not to be used for any wastes generated during a turnaround.

- The type of article in the container must be legibly written on the label. No MSDS number is necessary. Some examples are tools, bolts, nails, brackets and scaffolding materials.

- If a material is not a waste and not a product, what do you do? The green "special" labels are for any container holding a material that does not fit into one of the previous categories. Use of these labels must be approved by EA.

- The type of materials in the containers must be legibly written on the label, with the correct MSDS number. Periodically, other labels will be required for off site shipments. At that time, EA or Product Accounting will provide instruction. These labels include flammable solids, flammable liquids, corrosive materials and oxidizers.

- A supply of labels is maintained in EA. Contact the hazardous waste coordinator for labels.

PART II: HAZARDOUS WASTE HANDLING

- State and federal laws regulate the management of hazardous waste in portable containers. Portable containers are defined as any container, open or closed, "which can be moved", including, but not limited to drums, bins, temporary tanks and sling bags.

- A few of the hazardous wastes in the refinery are: all process sewer sludges, boiler fines, asbestos, oily debris, spent abrasive grit, most spent catalysts, equipment cleanout sludge and contaminated soil.

- Classification and disposal of hazardous wastes is a lengthy process. Laboratory analysis and disposal approval take at least a month to complete. It is important to coordinate with EA any anticipated waste disposal as far in advance as possible.

- All hazardous waste must be placed in containers. It may not be accumulated on asphalt, concrete pads, or the ground. Choosing the proper container will save double handling and disposal costs.

- Disposing of a drum of waste is more expensive than a bin of waste, yet some hazardous wastes MUST be drummed, such as wastes that can only be safely handled in drums and wastes that exist in too small a volume to be handled otherwise.

- For advice in selecting a container, contact the Hazardous Waste Coordinator (Ext. 3329).

- When choosing a container, it is the generating department's responsibility to ensure that the container is in good condition and compatible with the waste.

- The waste should not react with the container nor should the container corrode. The waste generator must secure the lids of drums with rings and bolts, and make sure that all bungs are present and securely closed.

- All hazardous waste containers must be labeled with a hazardous waste label. Bins and temporary tanks are to be labeled with temporary magnetic labels. The waste generator must remove all magnetic labels before the container leaves the Complex.

- Drums to be shipped off site require pre-printed hazardous waste labels, acquired from the Hazardous Waste Coordinator, 15 days in advance.

- The generator must make sure the information on the labels matches the waste before placing the labels on the containers. The generator may not change any information that is on the label. If it is incorrect, the waste generator must obtain a new and correct label. The generator must also add the Accumulation Start Date and the Manifest Number.

- The generator is to place two permanent hazardous waste labels on each drum: one on the top lid, and the other on the side. All previous markings and labels must be removed or painted over. The generating department is to provide a storage area, for its waste containers, and conduct weekly container inspections. The storage area must have eyewash and shower access, and drums must be arranged in aisles at least two feet apart and only two drums wide.

- Waste may only be on site for 90 days. Waste in containers with a capacity of greater than 5000 gallons must be removed within 60 days. The 90 or 60 day period begins when hazardous calendar waste first starts to accumulate in the container. All departments must be sure to begin the waste disposal process in enough time to ensure compliance.

- The generating department is responsible for hazardous waste containers while they are on site until they are loaded for shipment offsite. Each department must ensure that the containers holding hazardous waste generated by its department are labeled and inspected weekly.

- The only containers that the departments are not responsible for are the containers moved to the Central Drum Area or the Central Bin Area. EA is responsible for the containers in these areas. Hazardous waste regulations require weekly inspections of all hazardous waste containers. This is to ensure containers are properly managed and shipped off site before the 90 day deadline.

- During the inspection, each container must be checked to ensure that the container is closed and labeled, the label is properly completed, the container is not leaking or deteriorating and the container is not standing in

ωατερ. Ανψ δεφιχιενχιεσ φουνδ μυστ βε χορρεχτεδ.

- Two part list: (1) name and signature (2) date and time (3) location (4) container type and number (5) type of waste

- The inspection log sheet must be completed, using the words "yes" and "no". Check marks and ditto marks are not acceptable. Documentation must include: Name and signature of the person completing the inspection, date and time of the inspection, location, container type and number of containers, type of waste in the containers (just the words "hazardous waste" are not acceptable)

- (6) accumulation start date (7) container and label condition (8) condition of area (9) corrective action, accumulation start date, condition of the containers and labels, condition of container area, corrective action taken (signing a work order and verifying completion is necessary), date and time the corrective action was completed, name and signature of the person completing the corrective action or verifying that the corrective action was done.

- The original inspection sheets are to be retained by departments for three years. Copies of inspection sheets should be sent to the Hazardous Waste Coordinator when all corrections have been completed. This video summary will help you understand the basic requirements for portable containers. For more detailed information, consult the Environmental Procedure Manual or EA.

TEST

Select The Best Answer:
Every container of hazardous waste must have a hazardous waste _____ and be covered unless adding or removing waste.

✔ A. number
N
✔ B. ticket
N
✔ C. label
N
✔ D. name
N

Select The Best Answer:
All labels on portable containers must contain the name of the material and the _____ number.

✔ A. EA
N
✔ B. MRC
N
✔ C. MSDS
N
✔ D. none of the above
N

3,

Select The Best Answer:
Hazardous waste containers must be a type _____ by EA.

✔ A. approved
N
✔ B. simulated
N
✔ C. substituted
N
✔ D. duplicated

N

You Scored 3 / 3 = 100%

Click here to review results

You need to score **100%** in order to pass. If you've scored **below** 100%, you need to retake the quiz.

If you've scored **below 80%** you are being advised to retake the total course and ask for coaching!

Table of Contents

Environmental Procedure - EP 5.1- Management of Byproducts and Waste

Environmental Procedure - EP 5.9- Management of Universal Wastes

Training Package

Objectives

Why Train on EP 5.1 and 5.9?

Where to Get More Information on EP 5.1 and 5.9?

General Policies

Disposal of Wastes to Trash Bins

Disposal of Soil and Construction Debris

Asbestos Wastes

Disposal of Wastes and Spent Solutions from Contractor Operations

Disposal of Laboratory Wastes

Paint, Coating Containers, Aerosol Cans and Empty Drums

Paper and Other Debris Contaminated with Oil or Organic Compounds

Handling of Universal Wastes

OBJECTIVES

At the end of this training you should:

- Know the general policies for waste management.
- Know how to handle common waste streams.
- Know who to contact for uncommon waste streams.
- Know how to manage universal wastes

WHY TRAIN ON E.P. 5.1 and 5.9?

- To prevent non-compliance with state and federal regulations.
- Required by 22 Calif. Code of Regulations 66264 to provide annual training to all employees.
- Any employee labeling or handling container of waste must understand both E.P. 5.1 and 5.3.
- Any employee inspecting waste containers must understand both E.P. 5.1 and 5.7.

- Any employee generating waste must understand both E.P. 5.1 and 5.9

WHERE TO GET MORE INFORMATION ON E.P. 5.1 and 5.9?

- Environmental Procedure Manual on SMR Intranet - Section EP5
- Department Environmental Focal Point
- Logistics Hazardous Waste Coordinator
- Environmental Affairs Department

GENERAL POLICIES

Any waste generated at SMR will be handled as hazardous waste unless determined to be non-hazardous by EA.

To determine classification of waste:

A. Talk to your Department Environmental Focal Point

B. Contact the Logistics Hazardous Waste Coordinator or EA

Do not dispose of hazardous waste in trash bins or on-site.

Hazardous wastes cannot be stored onsite for over 90 days. SMR is not permitted as a hazardous waste storage facility,

Departments generating a waste or byproduct must initiate the disposal process as quickly as possible.

Allow 4-8 weeks for the analysis and classification of waste and the obtaining of disposal approvals. To avoid unnecessary delays and costs, waste disposal needs should be reviewed and identified early in project review and turnaround planning.

DISPOSAL OF WASTES TO TRASH BINS

Trash bins located around the complex are to be used for non-hazardous wastes only (no hazardous wastes or designated wastes).

If you are not 100% sure that a waste can go in the trash, ask your supervisor, Environmental Focal Point or EA.

DISPOSAL OF SOIL AND CONSTRUCTION DEBRIS

Soil and rubble contaminated with hydrocarbons and chemicals may require disposal as hazardous waste depending on levels of contaminants.

Clean soil may be reused onsite.

Non-hazardous rubble may be reused onsite or disposed of off-site.

Environmental Procedure E.P. 5.6 and Field Requirements Manual D(F)-5, Disposal of Soil, Rubble, and Wood Scraps specify the requirements for management of soil and rubble.

ASBESTOS WASTES

EA must be notified at least two weeks before the demolition of any building, whether it contain asbestos or not. (See E.P. 1.2).

All asbestos waste, scrap, debris, vacuum cleaner bags and other materials contaminated with asbestos are classified as hazardous wastes.

Disposal in trash bins or anywhere on Shell property is prohibited.

All asbestos wastes must be segregated, placed in sealed impermeable bags specifically for asbestos wastes, and disposed according to procedures listed above.

Sealed asbestos bags may be placed in the asbestos bin at the Central Waste Handling Site. See your Dept. Environmental Focal Point.

For large jobs, the Logistics Hazardous Waste Coordinator can provide upon request a separate bin to contain asbestos in sealed bags.

DISPOSAL OF WASTES & SPENT SOLUTIONS FROM CONTRACTOR OPERATIONS

Shell must assume the lead role in arrangements for disposal of waste materials and spent solutions generated onsite by contractors while performing services for SMR.

The same procedures will be used for disposal of contractor's waste generated onsite as SMR waste.

DISPOSAL OF LABORATORY WASTES

If liquid wastes are generated from analytical tests, contact the Environmental Hazardous Waste Engineer to determine the proper disposal method.

Solid wastes (gloves, paper, cups, pipettes, bottles, etc.) contaminated with hydrocarbons and chemicals must be placed in the red hazardous waste cans located in the laboratory.

Wastes containing extremely hazardous components must be segregated from the other wastes and the Environmental Hazardous Waste Engineer should be notified to determine the proper disposal method (See EP 5.1 Attachment A for list of extremely hazardous components).

Old and/or off-specification chemicals and reagents should be returned to the supplier. If the supplier will not take the material back, contact the Environmental Hazardous Waste Engineer to arrange disposal.

PAINT, COATING CONTAINERS, AEROSOL CANS & EMPTY DRUMS

Aerosol cans that are completely emptied of pressure and contents can be disposed of in the trash bins. If there is material left in an aerosol can which cannot be emptied, the aerosol can be must be placed in containers labeled as “Aerosol Cans” or taken to the Liquid Handling Site. Aerosol cans shall not be punctured at any time.

Paint and coating containers (cans, pails, etc.) must contain no free liquids before they can be disposed.

Containers that contained water base paints and coatings without metals (lead, chromium, etc.) may be disposed of in trash bins.

Containers that contained oil base and/or metal containing paints or coatings must be crushed and disposed of as hazardous waste. Contact the Logistics Hazardous Waste Coordinator to arrange disposal of these containers.

Empty drums are either reused during turnarounds, returned to the supplier, sent out for reconditioning, or crushed and sold as scrap. Contact Environmental Hazardous Waste Engineer to determine how to handle the drums. See E.P. 5.3.

PAPER AND OTHER DEBRIS CONTAMINATED WITH OIL OR ORGANIC COMPOUNDS

Paper and other debris that have become contaminated with petroleum oil, organic compounds, or chemicals are considered oily debris and must be disposed as hazardous waste.

Oily debris must be temporarily stored in a closed container lined with a plastic bag pre-printed with the words “Hazardous Waste”. The container must be labeled with a magnetic temporary hazardous waste label for oily debris. The waste generator must write the Accumulation Start Date, the Local Code Number, Physical State (Solid) and Hazardous Properties (Toxic) on the label with a china marker.

HANDLING OF UNIVERSAL WASTES

E.P. 5.9 contains information on Management of Universal Wastes.

Universal wastes are hazardous upon disposal but State and Federal regulations have identified these wastes as posing a lower risk to people and the environment than other hazardous wastes. State and Federal regulations specifically identified which items are classified as universal wastes and have provided simplified rules for handling and recycling. If these wastes are not managed as universal wastes, they are considered and have to be managed as hazardous wastes.

Examples of Universal Wastes include: batteries (most alkaline batteries, rechargeable nickel-cadmium batteries, and carbon-zinc batteries), cathode ray tubes (CRTs), electronic wastes, fluorescent lamps, and specific mercury-containing items.

Mercury-containing items must be taken to the QA Laboratory where the containers for these universal wastes are located.

Fluorescent bulbs and electronic wastes (E-wastes) must be taken to the Recycle Center and placed in the appropriate containers on the loading platform. See EP 5.9 for proper handling of broken fluorescent tubes and bulbs.

Alkaline batteries must be placed in the battery recycle containers located throughout the refinery. Recycle Center personnel collect the batteries from these containers routinely. All non-alkaline batteries should be delivered to the Recycle Center and placed in the appropriate container on the loading platform. Spent automotive-type lead-acid storage batteries are *not* universal waste.

Updated:5/2/2011 MA

TEST

Select The Best Answer:
Electronic wastes, fluorescent tubes and lamps must be taken to the _____ and placed in the appropriate containers on the loading platform.

- ✔ A. ○ Bulk Warehouse N
- ✔ B. ○ Liquid Handling Site N
- ✔ C. ○ Old Main Office Building N
- ✔ D. ◉ Recycle Center N

Select All that Apply:
For waste management questions regarding uncommon waste streams, contact:

- ✔ A. ☐ Security N
- ✔ B. ☑ Logistics Hazardous Waste Coordinator N
- ✔ C. ☑ Environmental Focal Point N
- ✔ D. ☑ Environmenal Affairs Dept N

Select All that Apply:
Which of the following are examples of Universal Wastes?

- ✔ A. ☑ alkaline batteries N
- ✔ B. ☑ fluorescent tubes and bulbs N
- ✔ C. ☑ electronic wastes N
- ✔ D. ☐ automotive lead-acid batteries N

2,3,4,

Select The Best Answer:
Debris contaminated with hydrocarbons or chemicals is considered _____ wastes.

- ✔ A. hazardous
  N
- ✔ B. salvageable
  N
- ✔ C. unnecessary
  N
- ✔ D. secondary
  N

4,

Select The Best Answer:
Never keep hazardous waste on-site longer than _____ days.

- ✔ A. 30
  N
- ✔ B. 45
  N
- ✔ C. 60
  N
- ✔ D. 90
  N

4,

Select The Best Answer:
Never put hazardous waste in _____ cans or bins.

- ✔ A. garbage
  N
- ✔ B. trash
  N
- ✔ C. refuse
  N

✔ D. ◉ all of the above

N

4,

True or False:
Universal wastes are considered hazardous wastes if not managed properly as required by State and Federal regulations.

TRUE FALSE True

Select The Best Answer:
All waste generated at SMR is considered _____ until classified by EA.

✔ A. ○ immoral

N

✔ B. ○ wasteful

N

✔ C. ○ nonessential

N

✔ D. ◉ hazardous

N

4,

Select The Best Answer:
Never dispose of hazardous waste:

✔ A. ○ without permission of EA. N

✔ B. ○ on-site. N

✔ C. ○ in your backyard. N

✔ D. ◉ all of the above. N

You Scored 9 / 9 = 100%

You need to score **100%** in order to pass. If you've scored **below** 100%, you need to retake the quiz.

PROPER USE OF HAZARDOUS WASTE CONTAINERS

Objectives

The learning objectives of this section are:

- Know the characteristics of a proper hazardous waste container. 2. Understand why it is important to keep hazardous waste containers properly closed. 3. Know what constitutes a "closed" container.
- Understand why it is important to keep hazardous waste containers properly closed.
- Understand the Legal Impacts of Failures to properly-handled Containers.
- Understand what Closed Means.
- Understand which Waste belongs in which containers.
- Understand what to do if waste has leaked or spilled.

- **Waste Containers**
- A variety of waste containers exist throughout the refinery, each with a different purpose. Every employee must know how to use these containers properly and identify any deficiencies.

What is a "Proper" Hazardous Waste Container?

Any container used for the storage of hazardous waste must meet the following criteria:

1. The container must be in good condition (no severe corrosion, damage or leaks).
2. The container must be made of a material that is compatible with the waste (will not react).
3. The container must be labeled with the name of the waste and the accumulation start date.
4. The container must be closed, except when material is added or removed.
5. The container must be stored in a designated location where it is inspected weekly until transported for disposal.

Why is it Important to Keep the Hazardous Waste Container Closed?

1.The refinery must be operated in accordance with all environmental, health and safety regulations and in a manner that does not create a hazard for employees, contractors, the community or the environment. Some hazardous wastes are ignitable, corrosive, reactive and toxic, so it's pretty obvious they should be stored in firmly closed containers to prevent accidental contact with people and the environment. Other waste streams may appear relatively harmless, but are still defined by the State of

California as “hazardous” and must be handled and contained in the same manner. At home, most of us would toss a pair of greasy gloves into the trash, but at the refinery, used gloves and other PPE must be handled as “Oily Debris,” one of the State hazardous wastes. Other refinery hazardous wastes such as spent catalyst and refractory are solids that may not appear to present an immediate hazard, but could cause long-term harm to the environment if not properly managed due to high concentrations of trace metals such as nickel, vanadium, mercury and chromium. Regardless of the actual and perceived hazard, all hazardous wastes must be handled in accordance with environmental laws and regulations.

2. Aside from the regulatory requirements, there are several practical reasons why hazardous waste containers must be properly closed. Open or partially open containers could:

1. Generate an immediate hazard such as flammable or potentially toxic vapors.
2. Allow oily rags, debris and any waste with reactive iron sulfides to spontaneously ignite and cause a fire.
3. Provide a source of odors that could lead to community complaints.
4. Spill their contents if accidentally tipped or knocked over.
5. Create excess air emissions that could contribute to pollution.
6. Provide an open invitation to use a hazardous waste container as a trash container.
7. Raise questions about the overall effectiveness of the hazardous waste management program. Visitors and inspectors and others may wonder if we can’t keep a hazardous waste container closed, what else are we not doing right?

Recent Inspection and Audit Results

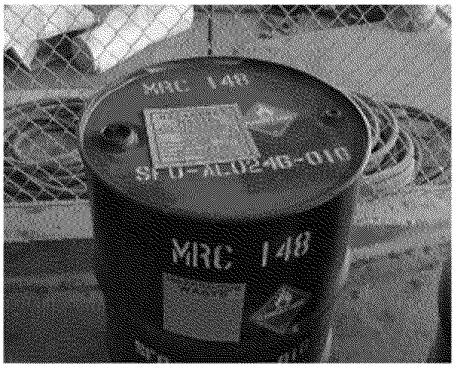
One of the most common violations of the hazardous waste regulations observed by inspectors is an “open” storage container or satellite accumulation container. The following examples have been observed during inspections and audits of the Martinez Refinery over the last year:

1. An open top drum containing hazardous waste without a lid.
2. An open top drum with a partially open lid not in contact with the entire rim of the drum.
3. An open top drum that is overfilled, preventing the closure of the lid.
4. A bung top drum with liquid without the bung or other closure device in place.
5. An oily debris container with a spring-activated lid that will not close completely.

Hazardous Waste Container Requirements - What Does “Closed” Mean?

The following examples describe and illustrate the definition of a “closed” container for several common types of hazardous waste.

Containers Storing Liquids or Solids with Volatile Organic Compounds



Right!
Closed Drum with Bungs

Right!
Closed drum with Ring Band

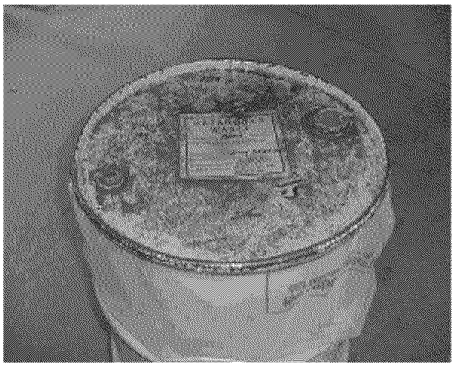
Containers of any liquid hazardous waste and solid waste with Volatile Organic Compounds (VOC’s) must be closed to prevent the escape of vapors and/or spillage if the container is tipped or knocked over. This guideline is commonly known as the “Tipping Test.” For open top drums, clamp or tightly bolt the ring band that seals the lid to the container. For closed top drums, tighten the bungs securely.
The container must be securely closed except when adding or removing waste. For liquids, even viscous liquids, it is best to only used closed top drums with the bungs securely fastened. If an open or closed top drum will be used for the transport of a hazardous waste within the refinery or off-site, the lid must be secured with a ring band or the bungs must be tightly secured.

Some operations such as auto shops or equipment maintenance shops require frequent additions of wastes to the container. An example is a container that receives waste oil from engines, machinery and other equipment. A number of commercially available devices may be acceptable for closing the container if properly used and maintained. Funnels can be secured into the large bung hole on a closed top drum. In order for a container with a funnel to be considered closed, a lid, flap or valve should be attached to the funnel. The lid or flap must fit tightly against the rim of the funnel to prevent the escape of vapors. For used oil filters for example, once the filters have stopped draining oil, the filter should be placed in a separate container and the funnel lid or valve should be closed.

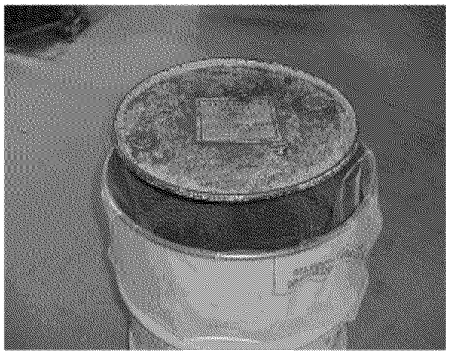
Open Top Containers Storing Solid Hazardous Waste

Solid hazardous wastes that emit no vapors or odors may be stored in an open top container such as a 55-gallon drum without the ring band in place as long as there is complete contact between the lid and entire rim of the container. A removable lid can be used if care is taken to ensure it is centered and is not bent. A spring-activated or hinged lid meets this requirement and eliminates the risk of forgetting to replace the lid.

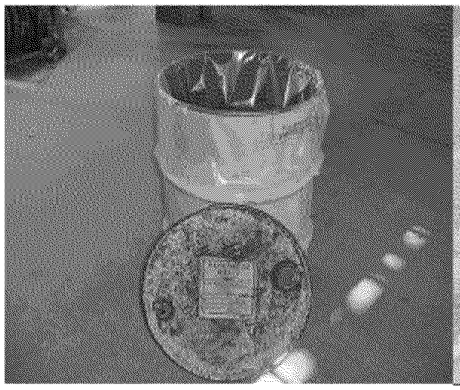
If a spring-activated or hinged lid does not close completely, it must be immediately repaired or replaced. If the waste emits vapors or odors, the lid must be secured with a ring band with bolts, snap levers or similar closure devices when not adding or removing waste. If any open top container with hazardous waste, regardless of type, must be moved within the facility or off-site, then the lid must be secured with a ring band with bolts or snap levers before movement or transportation. Containers with spring-activated or hinged lids do not meet the containment or Department of Transportation (DOT) requirements for the transportation of hazardous waste.



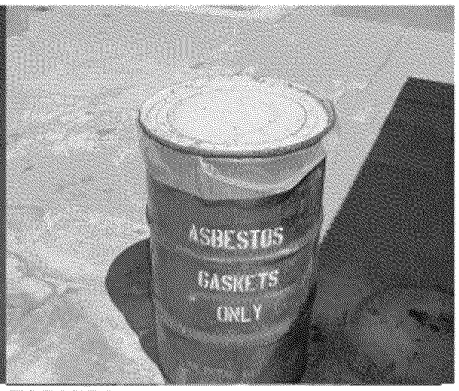
RIGHT !
Properly closed container



WRONG !
Partially open container



Wrong! Fully Open Container!



RIGHT !
Properly closed container

RIGHT !
Properly closed container

WRONG !
Partially open, overfilled container

Bins and Roll-off Containers

Bins and roll-off containers are primarily used for the temporary storage and transportation of solids and sludges. Some roll-off containers are manufactured with lids that open and close. When these lids are closed tightly and latched with a good seal around the entire rim, the container is considered closed. Roll-off containers with

securely closed lids must be used for any wastes that contain volatile organic compounds or present odors. Roll-off containers with heavy tarps that may be secured to the container may be used for non-VOC and non-odorous wastes. The lids or tarps must be fully secured on all sides of the bin or roll-off container.

Right! Lid is properly closed.

Wrong!
This lid is partially open!

Right! This container is properly closed.

Wrong! This container is partially open.

Other Containers

Other types of containers such as bags, super sacks, fiberboard boxes, etc., may be used according to waste type and some may even be used for transportation as long as they meet DOT requirements for the specific waste type.

Right!
Properly closed Super Sacks

Right!
Properly closed catalyst flow bins

These containers are considered closed when they are sealed to the extent necessary to keep the hazardous waste within the container and prevent any emissions of dust, VOC's or odors. For bags and super sacks for example, the container will be considered closed if the neck of the bag is tightly bound. For any wastes containing VOC's, the bags or super sacks must be able to be closed in a way that prevents the emission of vapors or odors.

Segregating Hazardous Waste and General Trash

Another common observation at the Martinez Refinery is waste in the wrong container. Examples include used gloves and gaskets in general trash and food wrappers in Oily Debris drums. Failure to properly segregate hazardous waste and general trash can create regulatory compliance and waste management issues or additional expenses:

1. If hazwaste is placed in the wrong hazwaste container, this can create potential hazardous waste management and DOT violations and problems for the disposal company. The disposal company may reject the load and send it back to the refinery or charge additional special handling expenses.

2. If hazwaste is placed in a general trash container and shipped as a non-hazardous waste, this can create a serious environmental and DOT compliance issues.

3. If hazwaste is placed in a general trash container, the entire container becomes a hazardous waste container and must be labeled, handled and disposed accordingly. This creates unnecessary work and expenses.

4. If general trash is placed in a hazwaste container, the trash becomes a hazwaste and unnecessarily increases the hazwaste volume, weight and expense for shipping and disposal.

5. Just like open hazwaste containers, waste in the wrong container raises questions about the overall effectiveness of the waste management program.

Do not use a container labeled for hazardous waste or non-hazardous general trash for any other purpose.

How do I Select the Proper Container for my Waste?

The following chart includes some of the most common waste containers that you may see around the refinery. The lists provide examples of what you should put in a container with that label. Refer to Environmental Procedures EP 5.1 and 5.3 for more details.

Examples of Common Types of Waste*

Waste Container label	Non-Hazardous Trash	Recycle (Labeled by Type)	Oily Debris	Asbestos Gaskets	Man-Made Mineral Fibers
Examples	Office trash Kitchen trash & food wrappers Non-recyclable paper Barricade tape	Recyclable paper Cardboard Batteries Scrap metal Aluminum Cans	Used rags Used gloves Absorbents Used non-asbestos gaskets Used Tyvek	Asbestos gaskets Gaskets of unknown composition	All insulation other than asbestos

* See Environmental Procedure EP 5.1 for a more comprehensive information

Additional Information

If you discover any hazardous waste container that has leaked or spilled, follow the Initial Reporting of Environmental Incident requirements of Environmental Procedure EP 1.1. For more information of if you have any questions about these regulations, guidelines and requirements of Environmental Procedure EP 5.3, contact:

1. Your Environmental Focal Point;
2. The Logistics Hazardous Waste Coordinator at x3329;
3. The Environmental Affairs Waste Engineer at x5516; or
4. The Environmental Hotline at x3777.

TEST

True or False:
A plastic bag pre-printed with "Hazardous Waste" containing Oily Debris can be closed by tightly wrapping the neck with duct tape.

TRUE FALSE True

Select The Best Answer:
Bins and roll-off containers containing any type of hazardous waste are considered closed when:

✔ A. The lid on a hard top bin or roll-off container is ON and latched to form a tight seal around the entire perimeter of the bin or roll-off container. N

✔ B. The tarp on an open-top bin or roll-off container is ON, covers the entire bin, and is strapped down around the entire perimeter of the bin or roll-off container. N

✔ C. Both the above are correct.

True or False:
A pre-labeled Oily Debris plastic bag can be used to store new materials if it is obvious that it is not a waste material.

TRUE FALSE False

Select The Best Answer:
Oily gloves may be placed into a non-hazardous trash container:

✔ A. If there is no Oily Debris container in the area. N

✔ B. If they only have a little bit of oil on them. N

✔ C. If they are covered with non-hazardous trash. N

✔ D. Never - Hazardous waste cannot be placed in a non-hazardous waste container. N

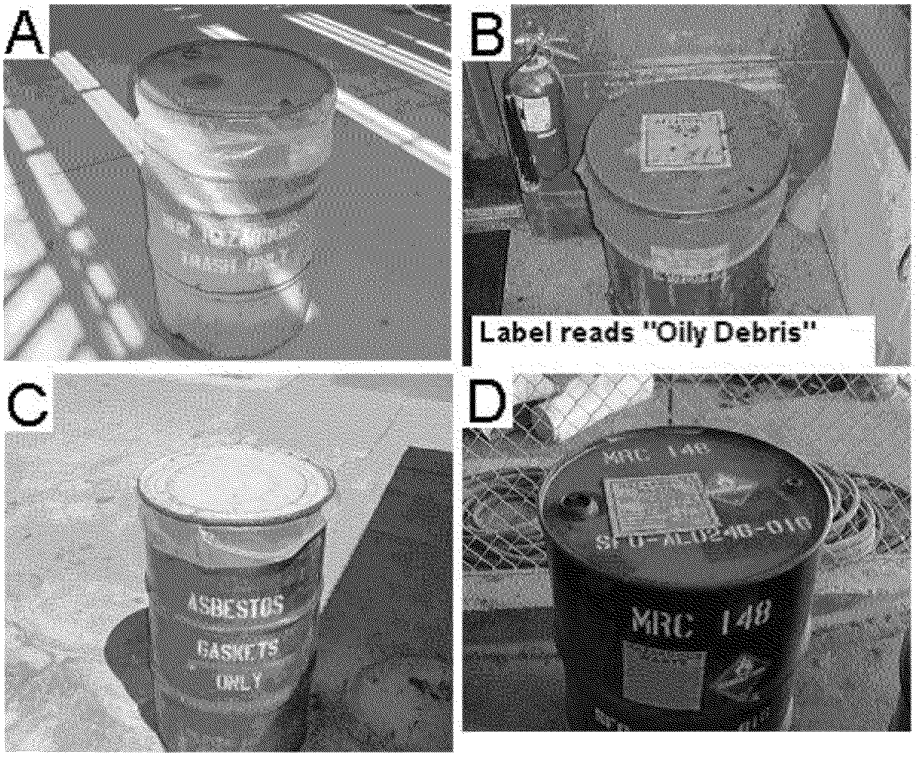
3,

True or False:
If the top of a solid hazardous waste containment drum is bent and the lid

is not in complete contact with the entire rim of the drum, the container is not closed.

TRUE FALSE

Select The Best Answer:



Pick the proper letter (container type) for the waste stream "a gasket of unknown composition".

✔ A. ○ A
N

✔ B. ○ B
N

✔ C. ◉ C
N

✔ D. ○ D

Select The Best Answer:
Pick the proper letter (container type) for the waste stream "40 gallons of a flammable liquid chemical".

✔ A. ○ A
N

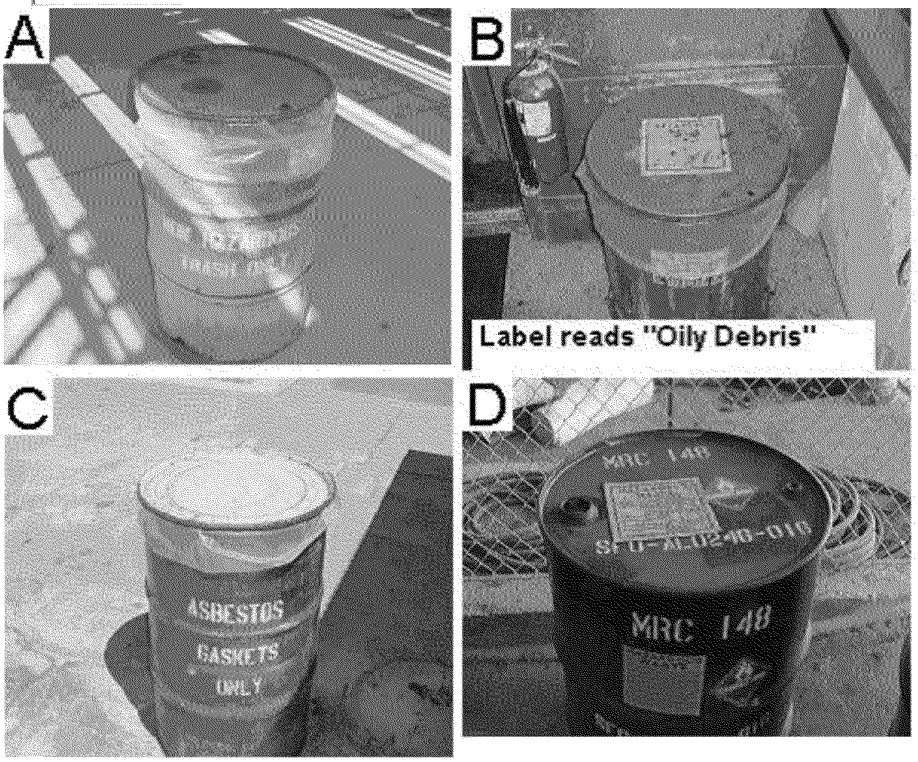
✔ B. ○ B
N

✔ C. ○ C
N

✔ D. ◉ D
N

4,

1,2,3,4



Select All that Apply:
An open hazardous waste container could:

✔ A. ☑ Provide a source of odors that could cause a community complaint. N

✔ B. ☑ Allow reactive iron sulfides to spontaneously ignite and cause a

fire. N

✔ C. ☑ Generate potentially flammable or toxic vapors. N

✔ D. ☑ Create excess air emissions that could contribute to air pollution. N

Select All that Apply:
Containers storing liquid hazardous wastes or solid wastes with volatile organic compounds are considered closed when:

✔ A. ☑ For closed-top drums, all bungs are in place and securely fastened. N

✔ B. ☑ For closed-top drums, all funnels are either closed, removed or covered. N

✔ C. ☑ The contents will not spill if the container is tipped over. N

✔ D. ☐ For open top drums, the lid is on, with no ring band in place. N

Select All that Apply:
Hazardous waste containers must be:

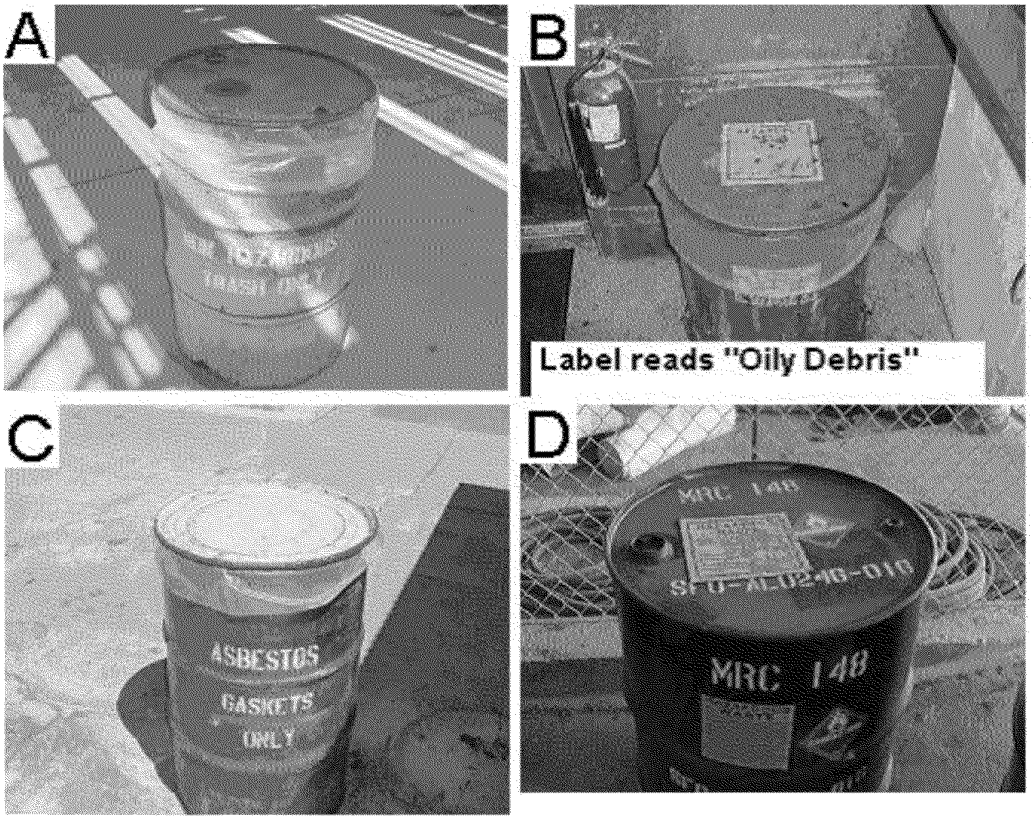
✔ A. ☑ In good condition (no severe corrosion, damage or leaks). N

✔ B. ☑ Closed, except when adding or removing waste. N

✔ C. ☑ Made of a material that is compatible with the waste. N

✔ D. ☑ Labeled with the name of the waste and the accumulation start date.

Select The Best Answer:



Pick the proper letter (container type) for the waste stream "Used absorbents or gloves".

✔ A. ○ A
N

✔ B. ◉ B
N

✔ C. ○ C
N

✔ D. ○ D
N

2,

True or False:
Hazardous waste with VOC's may be left in an open container only if the container is at least 300 feet from a fenceline.

TRUE FALSE False

True or False:
Any spill or release of a hazardous waste from a hazardous waste drum, bin, roll-off container, supersack, portable tank or catalyst flow bin must be immediately reported in accordance with Environmental Procedure EP 1.1 - Initial Reporting of Environmental Incidents.

TRUE FALSE

True or False:
A hazardous waste containment drum may have a hole near the bottom as long as the hazardous waste is a solid and will not spill out from the drum.

TRUE FALSE False

Select The Best Answer:
Pick the proper letter (container type) for the waste stream "non-recyclable paper or cans".

✔ A. A
N

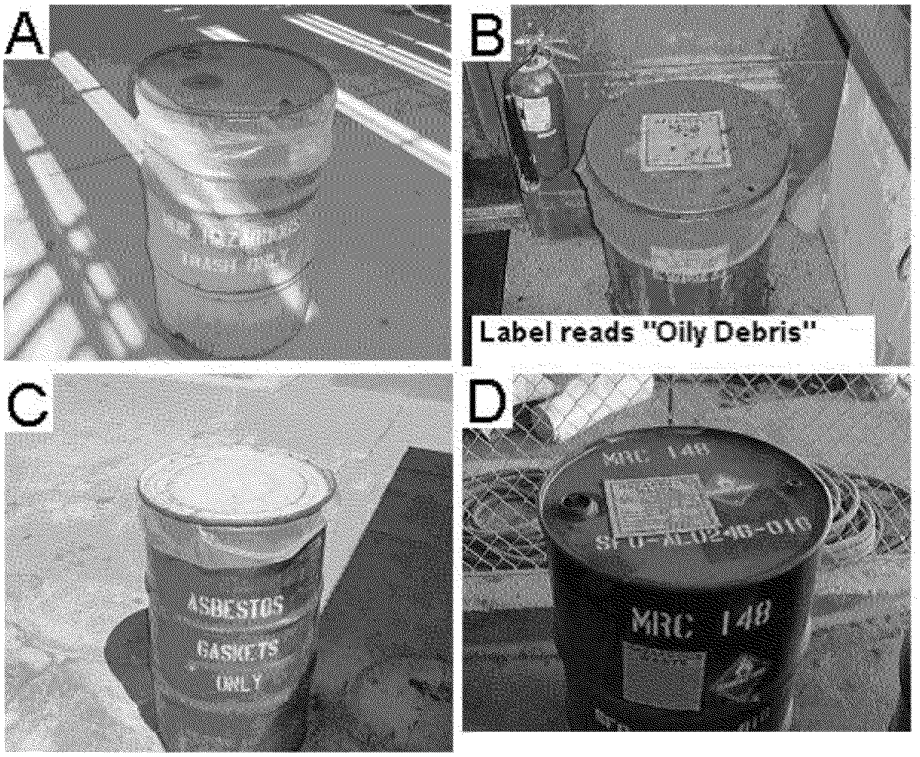
✔ B. B
N

✔ C. C
N

✔ D. D
N

1,

1,2,3,4



True or False:
Hazardous waste containers may only be opened when adding or removing waste.

TRUE FALSE True

True or False:
It is OK to leave an open funnel in the bung on a waste oil drum all the time, provided you remove when the drum is full.

TRUE FALSE False

You Scored 20 / 20 = 100%

You need to score 100% in order to pass. If you've scored **below** 100% you need to retake the quiz.

To: Lin, Sharon[Lin.Sharon@epa.gov]
From: Arora, Asha@DTSC
Sent: Thur 8/6/2015 11:04:06 PM
Subject: FW: AT-2 Tank Integrity Assessment
AT-2 Tank Integrity Assessment - 2013.pdf

Here is another email... Thanks
Asha

From: michael.monson@shell.com [michael.monson@shell.com]
Sent: Thursday, August 06, 2015 11:36 AM
To: Arora, Asha@DTSC
Cc: lin.sharon@epa.gov; michael.monson@shell.com
Subject: AT-2 Tank Integrity Assessment

Asha,

See attached Tank Integrity Assessment for ETP-3 (AT-2).

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

Hazardous Waste Tank Integrity Assessment

ETP-3 Biotreater Tank System

Shell Oil Products US, Martinez Refinery
Martinez, California

Prepared for:
Shell Oil Products US, Martinez Refinery

11 September 2013

www.erm.com

Delivering sustainable solutions in a more competitive world

ERM

Hazardous Waste Tank Integrity Assessment
ETP-3 Biotreater Tank System

Shell Oil Products US, Martinez Refinery
Martinez, California

September 2013

Project No. 0212000

Kevin M. Mucha, P.E.
Senior Engineer

Lynn McGuire, P.E.
Partner

Environmental Resources Management
1277 Treat Boulevard, Suite 500
Walnut Creek, California 94597
T: 925-946-0455
F: 925-946-9968

TABLE OF CONTENTS

1.0	*ENGINEER'S CERTIFICATION*	*1*
2.0	*INTRODUCTION*	*2*
	2.1 ASSESSMENT OVERVIEW	*2*
3.0	*ETP-3 BIOTREATER*	*4*
	3.1 ASSESSMENT INFORMATION	*4*
	3.2 MATERIAL COMPATIBILITY	*7*
	3.3 CONCLUSIONS	*7*

APPENDIX A — SECONDARY CONTAINMENT CALCULATIONS

APPENDIX B — ETP-3 HYDRO-STATIC TEST RESULTS

LIST OF FIGURES

(Figures immediately follow the text)

1	*Site Vicinity Map*
2	*Biotreater Plot Plan*
3	*DWG-03A – Design Data Tank*

ED_001593_00015664

1.0 ENGINEER'S CERTIFICATION

In accordance with 22 CCR §66270.11(d), the following statement is included:

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 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 known violations.

11 September 2013

Kevin M. Mucha, P.E. Date

CA No. C 70110

ED_001593_00015664

2.0 *INTRODUCTION*

On behalf of the Shell Oil Products US Martinez Refinery (Shell), ERM-West, Inc. (ERM) has prepared this Hazardous Waste Tank Assessment Report for the newly constructed Effluent Treatment Tank #3 Aeration Tank (ETP-3 Biotreater) located within the ETP facility at the Shell Oil Products US, Refinery in Martinez, California .

Shell has permitted the use of ETP-3 under the Permit-By Rule regulations in accordance with Title 22 of the California Code of Regulations (CCR), Division 4.5, Chapter 45 Requirements for Units and Facilities Deemed to Have a Permit-By-Rule. Section 67450.3(c)(9)(F) indicates the owner or operator of a fixed treatment unit shall maintain compliance with Chapter 15, Article 10 Tank Systems (22 CCR §66265.190 through 202).

This report focuses on the requirements set forth in 22 CCR §66265.192, Design and Installation of New Tank Systems or Components. The regulation requires Shell to have a hazardous waste containment system integrity assessment performed by a qualified professional engineer (PE), registered in California. ERM conducted an integrity assessment and construction document review of the new ETP-3 Biotreater tank system. The assessment attests that:

- The tank system has sufficient structural integrity and is acceptable for the transfer, storage, and treatment of wastewater; and
- The tank system and associated containment system is suitably designed to meet 22 CCR §66265.192 requirements.

An independent, qualified P.E., registered in California, certified the tank system integrity examination in accordance with 22 CCR §66270.11(d).

2.1 *ASSESSMENT OVERVIEW*

ERM conducted an integrity assessment on the following tank system:

- ETP-3 Biotreater.

The ETP-3 integrity assessment consisted of the following:

- A visual examination of the tank, piping, valves, and connections of the systems, checking specifically for signs of cracks, leaks, corrosion and erosion;

ED_001593_00015664

- Assessment of the containment and detection of release measures as regulated by 22 CCR §66265.193;
- Review of available tank system design drawings and construction records including the following:
  - *Basis of Design Report, ETP-3 Biotreater Project* (January 2011)
  - Foundation designs;
  - Structural design calculations;
  - Tank construction drawings;
  - Piping and Instrumentation Diagrams (P&ID);
  - Secondary containment HDPE liner construction and attachment specifications;
  - Secondary containment calculations;
  - ETP-3 hydro-testing records; and
  - Inspection records from onsite Jacobs Engineering QA/QC inspectors.
- A compatibility assessment of system building materials and the hazardous materials stored; and
- Interviews with Shell and contractor personnel responsible for overseeing the construction of the tank system.

ED_001593_00015664

3.0 *ETP-3 BIOTREATER*

The installation and operation of ETP-3 will provide the refinery with the needed biological treatment capacity during the shutdown of the ETP-2 system for its mandatory 25 year internal inspection currently planned for 2020. During normal operations, ETP-3 will also provide additional biological treatment capacity by supplementing the existing ETP-2 treatment system.

3.1 *ASSESSMENT INFORMATION*

According to Shell personnel, the waste stream is a Resource Conservation and Recovery Act (RCRA) hazardous waste exhibiting characteristics of toxicity via benzene only. The tank system is subject to the tank design and operational requirements described in Article 10 of 22 CCR §66265.190 to 200, except §66265.197, which applies only to closure. In accordance with 22 CCR §66265.192(k), the assessment includes the following information:

- **Tank configuration and gross capacity:**
  - ETP-3 is a vertically constructed cylindrical tank with a nominal capacity of 50,000 barrels (2.1 million gallons). Tank dimensions measure 120 feet in diameter x 28 feet wall height. Operational water level is 25 feet.
- **Design standard(s) according to which the tank and ancillary equipment were constructed:**
  - **Material of construction** – The ETP-3 tank design is based on the existing ETP-2 biotreater construction and consists of a field built carbon steel tank with a concrete bottom. These materials are industry standard for use in this capacity. This tank is designed per American Petroleum Institute (API) 650 industry code.
  - **Material thickness and the method used to determine the thickness** – As determined from the specifications from *DWG-03A-Design Data Tank* (Figure 3) provided by the tank manufacturer Matrix, the biotreater tank is constructed of three rings. The first ring is 1.00-inch thick, ring two is 0.334-inch thick, and ring three is 0.3125-inch thick.

ED_001593_00015664

- **Description of tank system piping (material, diameter)** – Plumbing for wastewater diversion throughout the ETP-3 system is consistent with that of the ETP-2 system and consists generally of 10-inch and 12-inch carbon steel and/or fiberglass piping. Most connections are welded with bolted flange fittings at replaceable sections.
- **Description of pumps** – As noted in the Basis of Design report, multiple pumps are used throughout the ETP-3 biotreater system to transfer waste materials, treatment chemicals, and provide air to the diffuser equipment. The following table describes the major equipment associated with the system:

Equipment	Materials of Construction
Sludge Booster Pump	Polypropylene
Effluent Transfer Pump	Ductile Cast Iron
Sulfuric Acid Pump	PVDF/PTFE Liquid End
Caustic Pump	PVC/PTFE Liquid End
Antifoam Pump	316SS Liquid End
Antifoam Pumps	Polypropylene
Coarse Bubble Diffuser	316 SS
Aeration Blower	Iron, ASTM A48

- **Sketch of tank including dimensions** – Attached DWG-03A shows the tank design data. Other drawings are available from Jacobs Engineering upon request.

- **Documented age of the tank system** – The ETP-3 biotreater system installation was completed and ready for operation in September 2013.
- **Description and evaluation of leak-detection equipment** – The ETP-3 biotreater sits within a shared secondary containment basin. Leak detection is via visual observation during daily walk-around inspections by ETP operators. Low-point sumps are inspected to observe any releases.
- **Description and evaluation of corrosion protection equipment, devices, or material** – The interior walls of the ETP-3 biotreater tank are coated with a 35 Mil thick layer of Caborline® Plasite® 4550, a high performance epoxy coating to prevent corrosion. The concrete floor of the tank is coated with a 50 Mil thick layer of Plastite 4550. Using

ED_001593_00015664

compatible materials in the construction of the tanks provides corrosion protection.

- **Description and evaluation of spill prevention or overfill equipment** – The ETP-3 biotreater tank operates via gravity flow-through, so there is little likelihood of an overfill of the biotreater tank. In the event of a deluge event, wastewater influent can be diverted to the diversion tanks for storage until flow-through capacity is restored.
- **Description and evaluation of secondary containment for the tank system including applicable secondary containment for ancillary equipment as required by subsection 66265.193(f)** – The ETP-2 and ETP-3 biotreaters are located within a shared secondary containment basin. The basin consists of an HDPE liner installed over a sub-base. Approximately 4 inches of asphalt concrete is then installed over the HDPE liner. Secondary containment calculations performed by Jacobs Engineering are included in Appendix A. The calculations indicate that a minimum containment elevation of 10.53 feet is necessary to meet the required secondary containment volume. Notes in the calculations indicate that 110% volume rule was used since the 10% of largest spill volume was greater than the 4.2-inches accumulated in a 24-hour, 25-year storm event. The secondary containment berm was raised in several locations during construction such that the lowest containment elevation is at 11.0 feet. The secondary containment for the tank systems was determined to meet the necessary requirements as described in 22 CCR §66265.193.
- **Hazardous characteristics of the waste(s) that have been or will be handled** – The wastewater processed in the ETP-3 biotreater is classified as hazardous waste due to high benzene concentrations.
- **Description of any structural damage or inadequate construction or installation** – Based on the assessment conducted by ERM and subsequent review of the QA/QC reports by Jacobs Engineering inspectors the ETP-3 biotreater system appears to be free of structural and installation defects and material corrosion or erosion.
- **Results of a leak test, internal inspection, or other tank system integrity examination including the type of integrity examination performed** – ERM conducted a visual inspection of the exterior of the ETP-3 biotreater. The inspections did not indicate any damage to the tank exterior. No visible cracks, scratches, cuts, or other damage was observed. Tank contractor Matrix conducted a hydro-static test of the ETP-3 biotreater on 3 April 2013. After 24 hours there were no observations of leaks in the tank. The hydro-static test results are included in Appendix B.

ED_001593_00015664

- **Estimated remaining service life of the tank system based on above findings –** Based on the above assessment of the ETP-3 biotreater and observed condition of ETP-2, the remaining service life of the system is estimated to be at least 10 years.

3.2 *MATERIAL COMPATIBILITY*

Materials used in the construction of the waste tanks are consistent with industry standards for the type of materials handled within the waste tanks.

3.3 *CONCLUSIONS*

The ETP-3 biotreater system and appurtenances are found to be compliant in accordance with all the regulations set forth in 22 CCR §66265.192. There were no visual defects or damage that would jeopardize the functionality of the tank system. The estimated remaining service life of the tanks is at least 10 years.

This assessment is valid for a maximum period of five (5) years in accordance with 22 §66265.192(h).

ED_001593_00015664

Figures

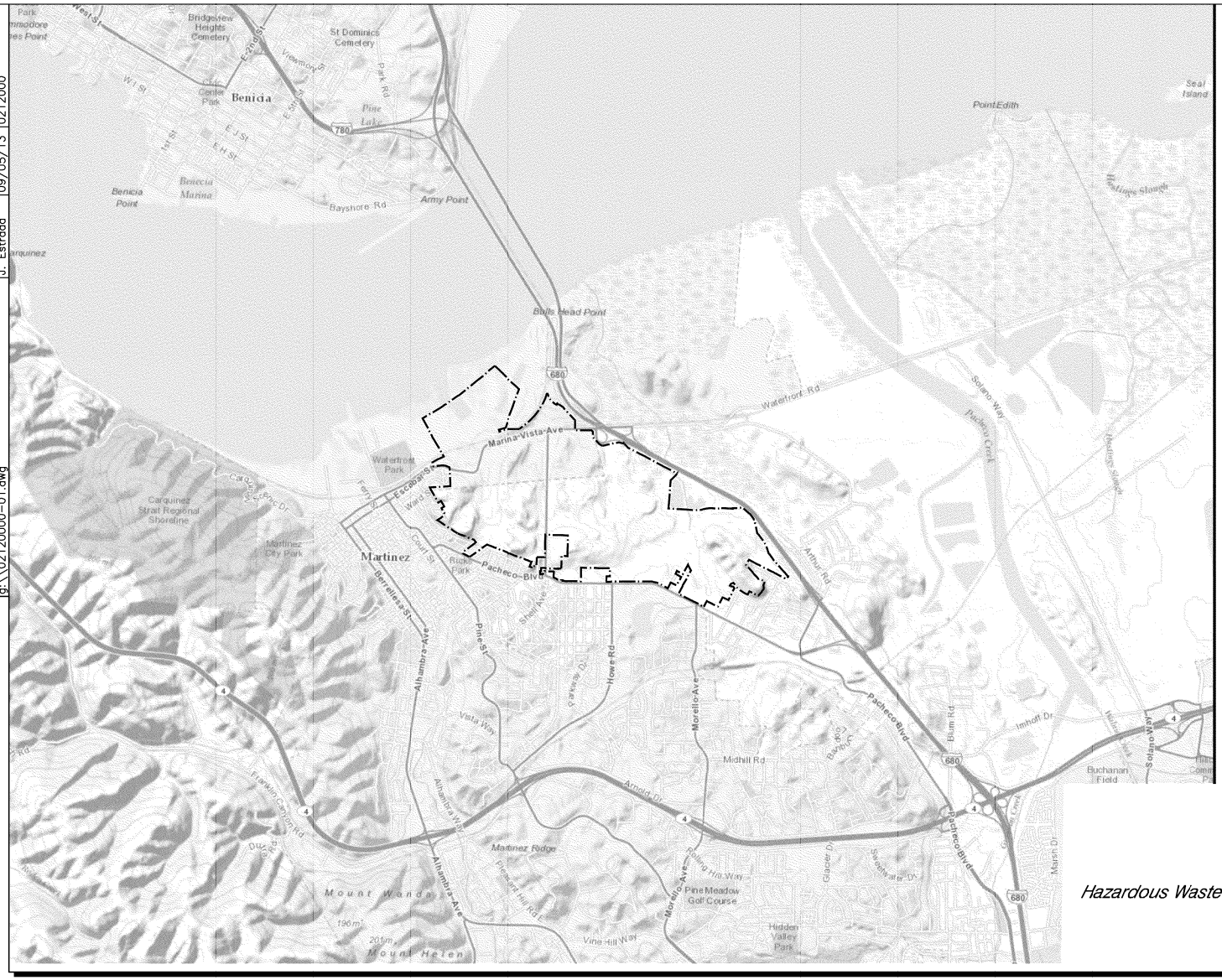


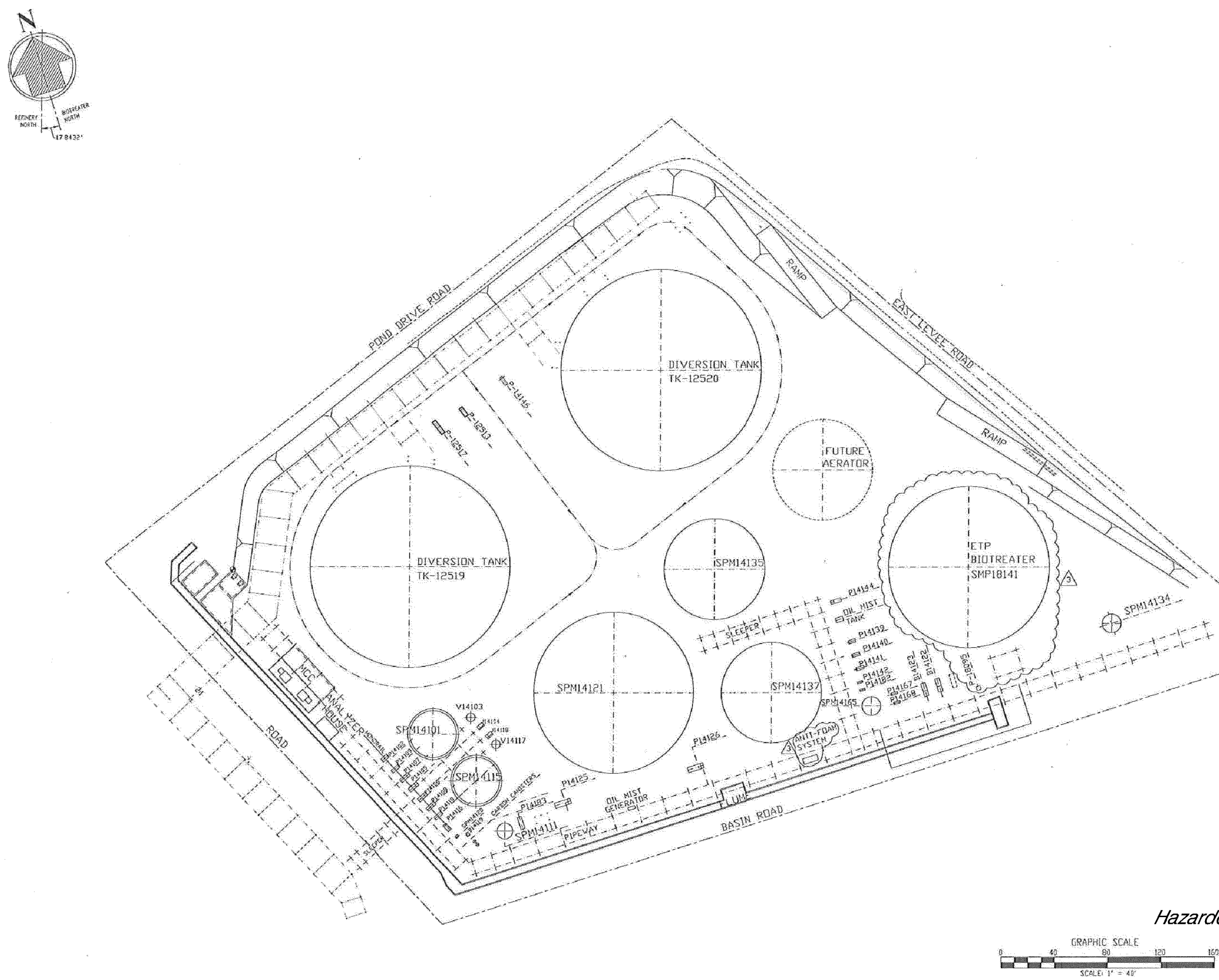
Figure 1
Site Location Map
ETP-3 Biotreater
Hazardous Waste Tank System Integrity Assessment
Shell Martinez Refinery
Martinez, California

ERM *09/13*

CAD File: g:\\02120000-01.dwg
Drawn By: J. Estrada
Date: 09/05/13
Project No. 02120000

ED_001593_00015664

CAD File:	Drawn By:	Date:	Project No.
g:\\02120000-01.dwg	J. Estrada	09/05/13	0212000



EQUIPMENT LIST

DNF EQUIPMENT

NO.	DESCRIPTION
J14104	NITROGEN GAS COMPRESSOR
J14118	NITROGEN GAS COMPRESSOR
P14102	EFFLUENT RECYCLE PUMP
P14116	EFFLUENT RECYCLE PUMP
SPM14101	DNF UNIT
SPM14115	DNF UNIT
V14103	N2 PRESSURIZED VESSEL
V14117	N2 PRESSURIZED VESSEL
DNF AUXILIARIES	
B14119	VOC & NITROGEN GAS BLOWER
P14105	SLUDGE PUMP
P14106	SLUDGE PUMP
P14107	FLOAT TRANSFER PUMP
P14108	FLOAT TRANSFER PUMP
P14183	SLUDGE LOADING PUMP
SPM14111	SLUDGE STORAGE
SPM14120	REFRIGERATED AIR DRYER
AERATION SYSTEM EQUIPMENT	
B14122	AERATION BLOWER
B14123	AERATION BLOWER
P14109	AERATOR FEED PUMP
P14110	AERATOR FEED PUMP
P14125	JET AERATOR RECYCLE PUMP
P14126	JET AERATOR RECYCLE PUMP
SPM14121	AERATOR
SPM14134	PAC FEED SYSTEM
BIOCLARIFIER EQUIPMENT	
P18095	SLUDGE BOOSTER PUMP
P14139	RETURN ACTIVATED SLUDGE PUMP
P14140	RETURN ACTIVATED SLUDGE PUMP
P14141	RETURN ACTIVATED SLUDGE PUMP
P14144	SCUM PUMP
P14142	CLARIFIED WATER RECYCLE PUMP
SPM14135	BIOCLARIFIER
SPM14137	BIOCLARIFIER
SPM18141	ETP-3 BIOTREATER
	ANTI-FOAM SYSTEM
DIVERSION TANK TRANSFER PUMPS	
P14146	TRANSFER PUMP
EFFLUENT EQUIPMENT	
P14167	EFFLUENT TRANSFER PUMP
P14168	EFFLUENT TRANSFER PUMP
P14182	FLUSH WATER PUMP
SPM14165	EFFLUENT STORAGE

Figure 2
Biotreater Plot Plan
ETP-3 Biotreater
Hazardous Waste Tank System Integrity Assessment
Shell Martinez Refinery
Martinez, California
ERM *09/13*

ED_001593_00015664

CAD File: g:\\02120000-01.dwg
Drawn By: J. Estrada
Date: 09/05/13
Project No. 0212000

TANK DESIGN DATA

CODE: API 650, 11TH EDITION, ADDENDUM 2
INSIDE DIAMETER: 120'-0"
HEIGHT: 28'-0" (NOTE 14)
NOMINAL CAPACITY: 56,402 BBL
MAXIMUM CAPACITY: 50,143 BBL
NET WORK CAPACITY: 47,421 BBL
PRODUCT: WASTE WATER
PRODUCT SPECIFIC GRAVITY: 1.01
DESIGN SPECIFIC GRAVITY: 1.01
DESIGN LIQUID LEVEL: 26'-0" (NOTE 12)
INTERNAL PRESSURE: ATMOSPHERIC
EXTERNAL PRESSURE: ATMOSPHERIC
MAXIMUM DESIGN TEMPERATURE: 105°F
MAXIMUM OPERATING TEMPERATURE: 105°F
DESIGN METAL TEMPERATURE: 45°F
WIND CODE: API 650, 11TH EDITION, ADDENDUM 2
WIND SPEED: 85 MPH
WIND CHECK: AS-BUILT
WIND IMPORTANCE FACTOR: 1.0
EARTHQUAKE CODE: API 650, 11TH EDITION, ADD. 2
RESPONSE ACCELERATION (Ss): 152.7%g
RESPONSE ACCELERATION (S1): 60.0%g
SITE CLASS: E
EARTHQUAKE IMPORTANCE FACTOR: 1.0
TANK FILL RATE: 3,600 GPM
TANK SUCTION RATE: 3,600 GPM
SHELL INSULATION THICKNESS: NONE

BOTTOM DESIGN DATA

BOTTOM PL MAT'L. SPEC.: CONCRETE (BY OTHERS)
SKETCH PL MAT'L. SPEC.: N/A
WELDING: N/A
CORROSION ALLOWANCE: N/A
TYPE: FLAT
SLOPE: FLAT

ANNULAR PLATE DATA

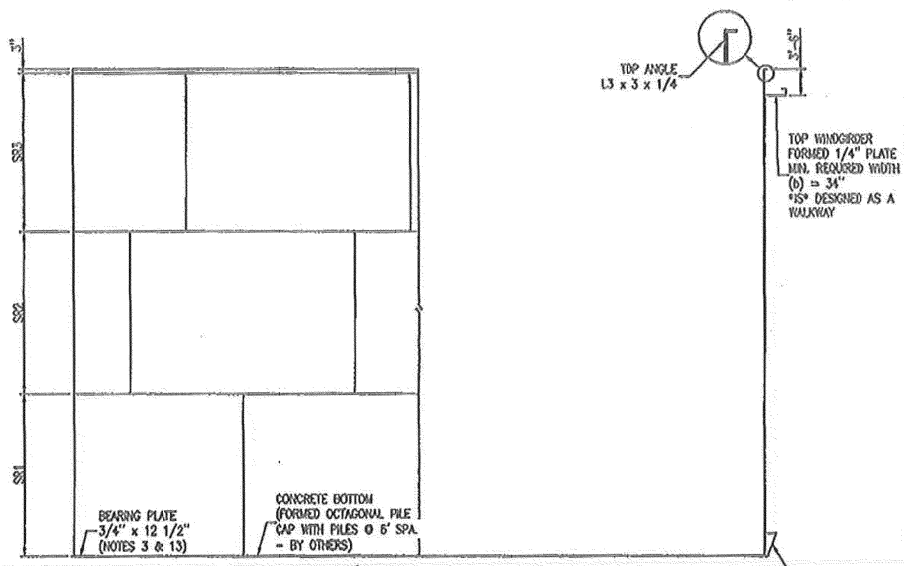
MATERIAL SPECIFICATION: N/A
WELDING: N/A
CORROSION ALLOWANCE: N/A

FLOATING ROOF DATA

TYPE: NONE
OUTER RIM CORROSION ALLOWANCE: N/A
DECK CORROSION ALLOWANCE: N/A

FIXED ROOF DATA

TYPE: OPEN TOP
SLOPE: N/A
PL MAT'L. SPEC.: N/A
WELDING: N/A
RAFTER MAT'L. SPEC.: N/A
GIRDER MAT'L. SPEC.: N/A
COLUMN MAT'L. SPEC.: N/A
UNIFORM LIVE LOAD: N/A
UNBAL. SNOW LOAD: N/A
ADDITIONAL DEAD LOAD: N/A
PL CORROSION ALLOWANCE: N/A
STRUCT CORROSION ALLOWANCE: N/A
ROOF INSULATION THICKNESS: N/A



ELEVATION/SECTION

SHELL DESIGN

JOINT EFFICIENCY = 1.0

RING NO.	API 650 MAT'L. GROUP	MAT'L. SPEC.	THK. USED (IN.)	WIDTH USED (FT.-IN.)	DESIGN FOR PRODUCT SPECIFIC GRAVITY: ALLOWABLE STRESS (PSI)	DESIGN FOR PRODUCT SPECIFIC GRAVITY: CALCULATED THK. (IN.)	DESIGN FOR HYDROSTATIC TESTING: ALLOWABLE STRESS (PSI)	DESIGN FOR HYDROSTATIC TESTING: CALCULATED THK. (IN.)	CORR. ALLOW. (IN.)	STRESS RELIEVE NOTES	IMPACT TESTING REQ'MENTS: TEST TEMP.	IMPACT TESTING REQ'MENTS: LONG. (FT-LBS)	IMPACT TESTING REQ'MENTS: TRANS. (FT-LBS)	RADIOGRAPHY ON VERTICAL SEAMS
SR1	I	A36 G2	1.000	8'-8"	23200	0.430	24900	0.339	0.0625	N/A	N/A	N/A	N/A	SPOT
SR2	I	A36	0.334	9'-11"	23200	0.322	24900	0.240	0.0625	N/A	N/A	N/A	N/A	SPOT
SR3	I	A36	0.3125	9'-11"	23200	0.188	24900	0.115	0.0625	N/A	N/A	N/A	N/A	SPOT

NO.	REVISION DESCRIPTION	BY	DATE
3			
2			
0	ISSUED FOR APPROVAL		

DESIGN BY: CP | DATE: 12/08/2011 | DESIGN CHK. BY: MT

MATRIX SERVICE
INDUSTRIAL SERVICE CONTRACTOR

TITLE: DESIGN DATA TANK
CUSTOMER: SHELL OIL COMPANY
CITY: MARTINEZ STATE/PROVINCE: CA
TANK NO.: SPM-18141 DIAMETER: 120'-0 HEIGHT: 28'-0

EI:160161	BY	DATE	STD. NO.: M023069	SCALE: NONE
DRAWN:	TRW	01/09/2012	DWG: 03A	
CHECKED:	TDG	01/11/2012		
APPROVED:			JOB NO.: 2661-3022	REV. NO.:0

ISSUED FOR CONSTRUCTION

Figure 3
DWG-03A - Design Data Tank
ETP-3 Biotreater
Hazardous Waste Tank System Integrity Assessment
Shell Martinez Refinery
Martinez, California

ERM 09/13

Appendix A
Secondary Containment
Calculations

JACOBS

1500 Hughes Way, Suite B-400
Long Beach, CA 90810
310-507-6450

Containment calculations

For

Shell Refinery Martinez

Biotreater ETP-3 Containment

Evaluation of containment for bermed area

Prepared by: Peter Innerhofer _____

Checked by: Robert McDougall _____

Client:
Shell Martinez
Martinez, CA

Jacobs Project No: 02KK1845

Date: 3-Dec-12

REGISTERED PROFESSIONAL ENGINEER
PETER INNERHOFER
No.27965
EXP. 3-31-14
CIVIL
STATE OF CALIFORNIA

JACOBS

Subject **Containment at Biotreater** Project: **02KK1845**

Authored by **PI** Date: **30-Nov** Checked by RCM Date

Discussion

The ETP Biotreater tank was added to an existing bermed area that contained 2 large diameter tanks, 1 medium sized tanks, 4 smaller tanks, various pumps and piping at a lower level.
A surveyor was hired to take elevation readings, we used the ACAD Civil Land program to calculate the volume of the basin up to the lowest crest line, which is EL 9.6'.

Comparisons between rainfall and 10% of of the maximum storage capacity was made and determined that the 10% rule of thumb is larger and therefore used.

In addition deductions were made for numerous pipes thorughout the facility, especially some of the larger 36" and 24" lines. A rough estimate was made for pumps and typical 12" diameter lines to estimate a realistic and acceptable volume deduction.

In one of the areas, rainwater is dumped onto the road which dumps into the basin. As a result checkvalves were added at that location to allow rainwater into the basin.

The volumes of all tanks except TK-12520 were deducted from the total volume of the basin.
Several calculations are then made at the existing crest elevation of 9.6' to determine if containment was sufficient. Then the elevation for equilibrium was calculated to be at 10.53'.

The final determination was made at a crest elevation of 11.0' which provides a sufficient margin of 9%.

JACOBS

Subject: **Containment at Biotreater** Project: **02KK1845**

Authored by: **PI** Date: **3-Dec** Checked by: Date:

Jacobs calculation of volume and area from ACAD file

Vol of containment up to current El of 9.6' = 41642 yd3
Area at 9.6 elevation = 228,650 ft2
Containment elevation = 9.60 ft

→ **NG-Raise Containment Elevation**

25 yr storm volume of rain in 24 hours is 4.2 " in 24 hours.
Rainfall intensity = 4.20 in / 24 hours
24 hour storm Vol rain = 4.2 * 228650 / (12 * 27)
24 hour storm Vol rain = **2964** yd3

Calculate deduction of all tanks to Containment elev except TK-12520

Tk #	Dia	Bot TK EL	AREA	Vol to EL 9.6	Design Level	VOL yd3	110% Max Spill - yd3	
12519	150	3.6	17671	3927				
12519 fdn	161.2	3.25	20409	265				
12520	150	3.7	17672	**0**	50	32726	35999	**No Deduction**
12520 fdn	161.2	3.5	20409	151				
14101	35.17	4.5	971	184	10% of spill volume =		3273	yd3
14115	35.2	5	973	166				
14121	120.2	4.5	11347	2143				
14135	75	5.2	4418	720				
14137	75	4.5	4418	834				
14165	14	4.75	154	28				
14134	14	4.75	154	28				
ETP-3 Equiv round fdn	129.4	4.5	13151	1315				
ETP-3	120	7.2	11310	1005				
		→		10,766 yd3				

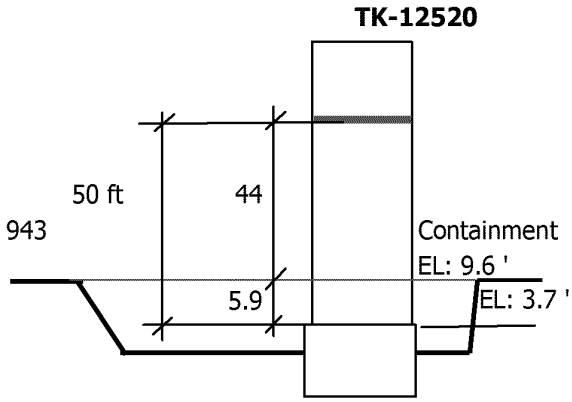
Note: Since 10% of spill volume is larger than 25 Yr storm, use 110% rule for calculations

Additional deductions from piping and equipment

3' diameter pipe x 300' long = 314 yd3
2' diameter pipe x 500' long = 233 yd3
10 pumps - 5 x 5 x 5 = 47 yd3
30 pipes x 12" x 100' = 349 yd3
→ **943** yd3

Net Containment = 41642 - 10766 - 943
Net Containment = 29933 yd3

110% spill volume from TK-12520 = 35,999 yd3



NG - < 110% Vol = 35998.6 yd3

Min containment elev = 10.53 ft

121203 Containment calcs

JACOBS

Subject: **Containment at Biotreater** Project: **02KK1845**

Authored by: **PI** Date: **3-Dec** Checked by: Date:

Jacobs calculation of volume and area from ACAD file

Vol of containment up to current El of 9.6' = 41642 yd3
Area at 9.6 elevation = 228,650 ft2
Containment elevation = 10.53 ft
→ Volume to EL 10.53 = 49,518 yd3
25 yr storm volume of rain in 24 hours is 4.2 " in 24 hours.
Rainfall intensity = 4.20 in / 24 hours
24 hour storm Vol rain = 4.2 * 228650 / (12 * 27)
24 hour storm Vol rain = **2964** yd3

Calculate deduction of all tanks to Containment elev except TK-12520

Tk #	Dia	Bot TK EL	AREA	Vol to EL 10.53	Design Level	VOL yd3	110% Max Spill - yd3	
12519	150	3.6	17671	4536				
12519 fdn	161.2	3.25	20409	265				
12520	150	3.7	17672	**0**	50	32726	35999	**No Deduction**
12520 fdn	161.2	3.5	20409	151				
14101	35.17	4.5	971	217	10% of spill volume =		3273	yd3
14115	35.2	5	973	199				
14121	120.2	4.5	11347	2534				
14135	75	5.2	4418	872				
14137	75	4.5	4418	987				
14165	14	4.75	154	33				
14134	14	4.75	154	33				
ETP-3 Equiv round fdn	129.4	4.5	13151	1315				
ETP-3	120	7.2	11310	1395				
		→		12,537 yd3				

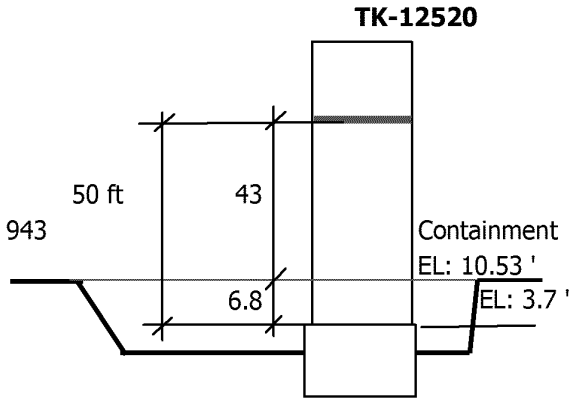
Note: Since 10% of spill volume is larger than 25 Yr storm, use 110% rule for calculations

Additional deductions from piping and equipment

3' diameter pipe x 300' long = 314 yd3
2' diameter pipe x 500' long = 233 yd3
10 pumps - 5 x 5 x 5 = 47 yd3
30 pipes x 12" x 100' = 349 yd3
→ **943** yd3

Net Containment = 49518 - 12537 - 943
Net Containment = 36038 yd3

110% spill volume from TK-12520 = 35,999 yd3



Containment Elev of 10.53 ft is OK
Margin = 0.2 %
Min containment elev = 10.53 ft

121203 Containment calcs

JACOBS

Subject: **Containment at Biotreater** Project: **02KK1845**

Authored by: **PI** Date: **3-Dec** Checked by: Date:

Jacobs calculation of volume and area from ACAD file

Vol of containment up to current El of 9.6' = 41642 yd3
Area at 9.6 elevation = 228,650 ft2
Containment elevation = 11.00 ft
→ Volume to EL 11 = 53,498 yd3
25 yr storm volume of rain in 24 hours is 4.2 " in 24 hours.
Rainfall intensity = 4.20 in / 24 hours
24 hour storm Vol rain = 4.2 * 228650 / (12 * 27)
24 hour storm Vol rain = **2964** yd3

Calculate deduction of all tanks to Containment elev except TK-12520

Tk #	Dia	Bot TK EL	AREA	Vol to EL 11	Design Level	VOL yd3	110% Max Spill - yd3	
12519	150	3.6	17671	4843				
12519 fdn	161.2	3.25	20409	265				
12520	150	3.7	17672	**0**	50	32726	35999	**No Deduction**
12520 fdn	161.2	3.5	20409	151				
14101	35.17	4.5	971	234	10% of spill volume =		3273	yd3
14115	35.2	5	973	216				
14121	120.2	4.5	11347	2732				
14135	75	5.2	4418	949				
14137	75	4.5	4418	1064				
14165	14	4.75	154	36				
14134	14	4.75	154	36				
ETP-3 Equiv round fdn	129.4	4.5	13151	1315				
ETP-3	120	7.2	11310	1592				
		→		13,432 yd3				

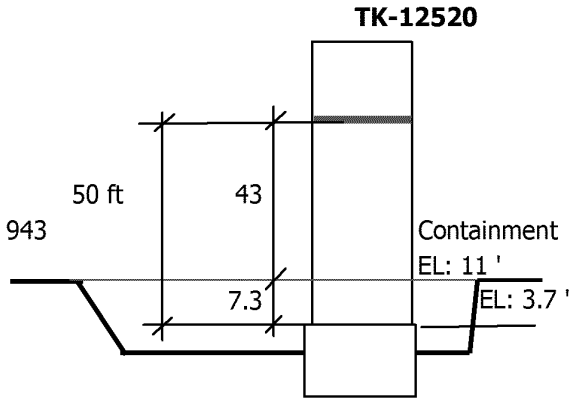
Note: Since 10% of spill volume is larger than 25 Yr storm, use 110% rule for calculations

Additional deductions from piping and equipment

3' diameter pipe x 300' long = 314 yd3
2' diameter pipe x 500' long = 233 yd3
10 pumps - 5 x 5 x 5 = 47 yd3
30 pipes x 12" x 100' = 349 yd3
→ **943** yd3

Net Containment = 53498 - 13432 - 943
Net Containment = 39123 yd3

110% spill volume from TK-12520 = 35,999 yd3



Containment Elev of 11 ft is OK
Margin = 8.7 %
Min containment elev = 10.53 ft

121203 Containment calcs

Appendix B
ETP-3 Hydro-Static Test Results

MATRIX PDM
ENGINEERING

HYDRO-STATIC TEST CERTIFICATION

COMPANY: SHELL **JOB #:** 2861-3022

LOCATION: MARTINEZ CALIF

TANK #: SPM 18141

TANK SIZE: DIA-120' HT-28'

DATE: 4-3-2013

This certifies the satisfactory completion of a Hydro-Static Test on the above referenced tank.

The following personnel conducted and/or witnessed this test:

MATRIX FOREMAN: Antonio J Acosta

OWNER REPRESENTATIVE: JACOBS Mark Pacheco 4-3-2013

TEST OPERATOR: Antonio J Acosta

COMMENTS: TANK FILLED with Hytro at Level 27' 4½" at 0900 ON 4-2-13 HELD for 24 hrs 0900 4-3-13. found NO indications.

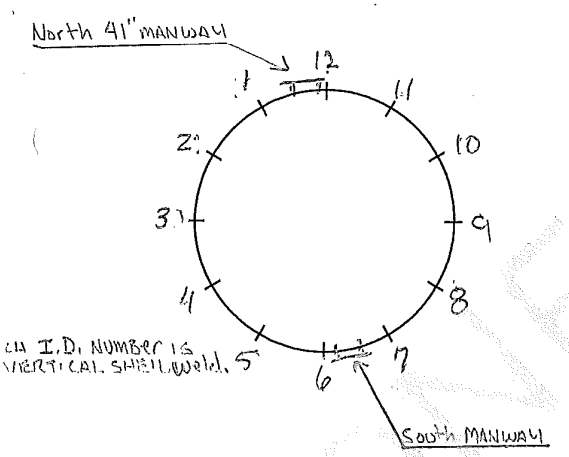
MATRIX PDM ENGINEERING	NDE Category HT Hydro Testing	NDE # / Rev. HT1A / 1	Page No. 1 of 1
NDE PROCEDURES	**SUBJECT :TANK HYDROTEST REPORT**		

Note: This form only to be used when customer requires elevation shots during hydrotest.

Customer : SHELL
City, State : MARTINEZ CALIF
Tank # : ETP-3
Diameter X Height : HT-28' DIA-120'

Testing Fluid : HYTRO
Temperature : ABIENT
Max Oper. Height :
Max Test Height :

Date and Time Test Filling Started : 0900 3-18-13
Date and Time Max Test Level Reached : 0900 4-2-13 (27'4½")
Date and Time Tank Started To Be Emptied :
Date and Time Tank Empty :
Floating Roof Pontoons Checked :
Floating Roof Travel and Rim Space Checked :
Floating Roof Seal Tolerance Checked :



Note: Identify location of shell fitting to orient benchmark locations.

BOTTOM ELEVATIONS

	START EMPTY	1/4 FULL	HALF FULL	3/4 FULL	FULL	FINISH EMPTY
1	26 7/8"	26 7/8"	27"	27 1/8"	27 1/8"	
2	26 3/16"	26 3/16	26 7/16	26 9/16	26 5/8	
3	26 1/4"	26 1/4"	26 3/8"	26 3/8"	26 9/16"	
4	26 1/16"	26 1/8"	26 3/16	26 3/16	26 5/16	
5	26 1/8	26 1/4	26 5/8	26 5/8	26 5/8	
6	26 3/16	26 5/16	26 11/16	27"	27"	
7	26 3/16	26 9/16	26 11/16	26 11/16	26 11/16	
8	26 1/2"	26 9/16	27'	27 1/8"	27 1/8"	
9	27 1/16	27 1/8	27 1/2	27 5/8	27 5/8	
10	26 11/16"	26 13/16	26 15/16	26 15/16	26 15/16	
11	26 3/4"	26 5/8"	26 15/16	26 15/16	27"	
12	26 7/8	26 7/8	27 1/16	27 1/16	27 1/8	

Maximum Total Settlement :
Maximum Differential Settlement :
Maximum Out of Plumb :

Comments :

Foreman Sign : [signature]
Print Name : Antonio J Acosta
Date : 4-2-13

Customer Sign : Martin Pacheco
Print Name : MARTIN PACHECO
Title : QA MNGR JACOBS
Date : 4-3-13

This document and all text, calculations, drawings, details and data shown herein is confidential. It is the sole property of Matrix PDM Engineering and shall be used only for the purpose intended. The information provided may not be divulged or copied, in whole or part, and may not be used for any purpose whatsoever including the fabrication of equipment or parts without the express written permission of Matrix PDM Engineering.

To: michael.monson@shell.com[michael.monson@shell.com]
Cc: Lin, Sharon[Lin.Sharon@epa.gov]
From: Arora, Asha@DTSC
Sent: Thur 8/6/2015 7:21:03 PM
Subject: RE: 2011 SB-14 Files

Hi Michael,

I want to thank you so much for your time and assistance during our inspection. Thank you so much for sending SB14 documents to me. Here is a list of the additional documents that I had requested you and Brock Nethery during our inspection:

-Tank integrity assessment for ETP-3 (tank At2) - already received in 2nd email
-ERM justification, including attachments for the selenium sludge going to Cement Kiln in Nevada via Kleen Industrial Services)
-ERM justification for the sand blast grit
-A written Closure plan for the tiered permitting units
-A written training plan for the hazardous waste employees

Brock-
-Contract between Shell and Clean Harbor (retracted as we do not need the financial information) for the operations of tiered permitting units
-Inspection log (5 or 6 pages that I had flagged for the weekly emergency equipment inspections, i.e fire extinguishers and SCBA)
-Permitting manual (marked as Sierra manual) for the treatment units
-SOP manual

Please send me these documents as time permits.

Thank you
Asha

Asha Arora

Senior Environmental Scientist (Specialist)

Department of Toxic Substances Control

Berkeley Office

700 Heinz Avenue, Berkeley, CA 94710

(510) 540-3874

Asha.Arora@dtsc.ca.gov

From: michael.monson@shell.com [michael.monson@shell.com]
Sent: Thursday, August 06, 2015 10:58 AM

To: Arora, Asha@DTSC
Cc: lin.sharon@epa.gov; michael.monson@shell.com
Subject: 2011 SB-14 Files

Asha,

See attached SB-14 report files. Included are the:

- Introduction (not required)
- Source Reduction Evaluation Review and Plan (Plan)
- Hazardous Waste Management Performance Report (Report)
- Summary Progress Report (SPR)

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

To: aarora@dtsc.ca.gov[aarora@dtsc.ca.gov]
Cc: Lin, Sharon[Lin.Sharon@epa.gov]; michael.monson@shell.com[michael.monson@shell.com]
From: michael.monson@shell.com
Sent: Thur 8/6/2015 6:36:13 PM
Subject: AT-2 Tank Integrity Assessment
AT-2 Tank Integrity Assessment - 2013.pdf

Asha,

See attached Tank Integrity Assessment for ETP-3 (AT-2).

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

Hazardous Waste Tank Integrity Assessment

ETP-3 Biotreater Tank System

Shell Oil Products US, Martinez Refinery
Martinez, California

Prepared for:
Shell Oil Products US, Martinez Refinery

11 September 2013

www.erm.com

Delivering sustainable solutions in a more competitive world

ERM

Hazardous Waste Tank Integrity Assessment
ETP-3 Biotreater Tank System

Shell Oil Products US, Martinez Refinery
Martinez, California

September 2013

Project No. 0212000

Kevin M. Mucha, P.E.
Senior Engineer

Lynn McGuire, P.E.
Partner

Environmental Resources Management
1277 Treat Boulevard, Suite 500
Walnut Creek, California 94597
T: 925-946-0455
F: 925-946-9968

TABLE OF CONTENTS

1.0	*ENGINEER'S CERTIFICATION*	*1*
2.0	*INTRODUCTION*	*2*
	2.1 ASSESSMENT OVERVIEW	*2*
3.0	*ETP-3 BIOTREATER*	*4*
	3.1 ASSESSMENT INFORMATION	*4*
	3.2 MATERIAL COMPATIBILITY	*7*
	3.3 CONCLUSIONS	*7*

APPENDIX A — SECONDARY CONTAINMENT CALCULATIONS

APPENDIX B — ETP-3 HYDRO-STATIC TEST RESULTS

LIST OF FIGURES

(Figures immediately follow the text)

1	*Site Vicinity Map*
2	*Biotreater Plot Plan*
3	*DWG-03A – Design Data Tank*

ED_001593_00015668

1.0 ENGINEER'S CERTIFICATION

In accordance with 22 CCR §66270.11(d), the following statement is included:

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 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 known violations.

11 September 2013

Kevin M. Mucha, P.E. Date

CA No. C 70110

ED_001593_00015668

2.0 *INTRODUCTION*

On behalf of the Shell Oil Products US Martinez Refinery (Shell), ERM-West, Inc. (ERM) has prepared this Hazardous Waste Tank Assessment Report for the newly constructed Effluent Treatment Tank #3 Aeration Tank (ETP-3 Biotreater) located within the ETP facility at the Shell Oil Products US, Refinery in Martinez, California .

Shell has permitted the use of ETP-3 under the Permit-By Rule regulations in accordance with Title 22 of the California Code of Regulations (CCR), Division 4.5, Chapter 45 Requirements for Units and Facilities Deemed to Have a Permit-By-Rule. Section 67450.3(c)(9)(F) indicates the owner or operator of a fixed treatment unit shall maintain compliance with Chapter 15, Article 10 Tank Systems (22 CCR §66265.190 through 202).

This report focuses on the requirements set forth in 22 CCR §66265.192, Design and Installation of New Tank Systems or Components. The regulation requires Shell to have a hazardous waste containment system integrity assessment performed by a qualified professional engineer (PE), registered in California. ERM conducted an integrity assessment and construction document review of the new ETP-3 Biotreater tank system. The assessment attests that:

- The tank system has sufficient structural integrity and is acceptable for the transfer, storage, and treatment of wastewater; and
- The tank system and associated containment system is suitably designed to meet 22 CCR §66265.192 requirements.

An independent, qualified P.E., registered in California, certified the tank system integrity examination in accordance with 22 CCR §66270.11(d).

2.1 *ASSESSMENT OVERVIEW*

ERM conducted an integrity assessment on the following tank system:

- ETP-3 Biotreater.

The ETP-3 integrity assessment consisted of the following:

- A visual examination of the tank, piping, valves, and connections of the systems, checking specifically for signs of cracks, leaks, corrosion and erosion;

ED_001593_00015668

- Assessment of the containment and detection of release measures as regulated by 22 CCR §66265.193;
- Review of available tank system design drawings and construction records including the following:
  - *Basis of Design Report, ETP-3 Biotreater Project* (January 2011)
  - Foundation designs;
  - Structural design calculations;
  - Tank construction drawings;
  - Piping and Instrumentation Diagrams (P&ID);
  - Secondary containment HDPE liner construction and attachment specifications;
  - Secondary containment calculations;
  - ETP-3 hydro-testing records; and
  - Inspection records from onsite Jacobs Engineering QA/QC inspectors.
- A compatibility assessment of system building materials and the hazardous materials stored; and
- Interviews with Shell and contractor personnel responsible for overseeing the construction of the tank system.

ED_001593_00015668

3.0 *ETP-3 BIOTREATER*

The installation and operation of ETP-3 will provide the refinery with the needed biological treatment capacity during the shutdown of the ETP-2 system for its mandatory 25 year internal inspection currently planned for 2020. During normal operations, ETP-3 will also provide additional biological treatment capacity by supplementing the existing ETP-2 treatment system.

3.1 *ASSESSMENT INFORMATION*

According to Shell personnel, the waste stream is a Resource Conservation and Recovery Act (RCRA) hazardous waste exhibiting characteristics of toxicity via benzene only. The tank system is subject to the tank design and operational requirements described in Article 10 of 22 CCR §66265.190 to 200, except §66265.197, which applies only to closure. In accordance with 22 CCR §66265.192(k), the assessment includes the following information:

- **Tank configuration and gross capacity:**
  - ETP-3 is a vertically constructed cylindrical tank with a nominal capacity of 50,000 barrels (2.1 million gallons). Tank dimensions measure 120 feet in diameter x 28 feet wall height. Operational water level is 25 feet.
- **Design standard(s) according to which the tank and ancillary equipment were constructed:**
  - **Material of construction** – The ETP-3 tank design is based on the existing ETP-2 biotreater construction and consists of a field built carbon steel tank with a concrete bottom. These materials are industry standard for use in this capacity. This tank is designed per American Petroleum Institute (API) 650 industry code.
  - **Material thickness and the method used to determine the thickness** – As determined from the specifications from *DWG-03A-Design Data Tank* (Figure 3) provided by the tank manufacturer Matrix, the biotreater tank is constructed of three rings. The first ring is 1.00-inch thick, ring two is 0.334-inch thick, and ring three is 0.3125-inch thick.

ED_001593_00015668

- **Description of tank system piping (material, diameter)** – Plumbing for wastewater diversion throughout the ETP-3 system is consistent with that of the ETP-2 system and consists generally of 10-inch and 12-inch carbon steel and/or fiberglass piping. Most connections are welded with bolted flange fittings at replaceable sections.
- **Description of pumps** – As noted in the Basis of Design report, multiple pumps are used throughout the ETP-3 biotreater system to transfer waste materials, treatment chemicals, and provide air to the diffuser equipment. The following table describes the major equipment associated with the system:

Equipment	Materials of Construction
Sludge Booster Pump	Polypropylene
Effluent Transfer Pump	Ductile Cast Iron
Sulfuric Acid Pump	PVDF/PTFE Liquid End
Caustic Pump	PVC/PTFE Liquid End
Antifoam Pump	316SS Liquid End
Antifoam Pumps	Polypropylene
Coarse Bubble Diffuser	316 SS
Aeration Blower	Iron, ASTM A48

- **Sketch of tank including dimensions** – Attached DWG-03A shows the tank design data. Other drawings are available from Jacobs Engineering upon request.

- **Documented age of the tank system** – The ETP-3 biotreater system installation was completed and ready for operation in September 2013.
- **Description and evaluation of leak-detection equipment** – The ETP-3 biotreater sits within a shared secondary containment basin. Leak detection is via visual observation during daily walk-around inspections by ETP operators. Low-point sumps are inspected to observe any releases.
- **Description and evaluation of corrosion protection equipment, devices, or material** – The interior walls of the ETP-3 biotreater tank are coated with a 35 Mil thick layer of Caborline® Plasite® 4550, a high performance epoxy coating to prevent corrosion. The concrete floor of the tank is coated with a 50 Mil thick layer of Plastite 4550. Using

ED_001593_00015668

compatible materials in the construction of the tanks provides corrosion protection.

- **Description and evaluation of spill prevention or overfill equipment** – The ETP-3 biotreater tank operates via gravity flow-through, so there is little likelihood of an overfill of the biotreater tank. In the event of a deluge event, wastewater influent can be diverted to the diversion tanks for storage until flow-through capacity is restored.
- **Description and evaluation of secondary containment for the tank system including applicable secondary containment for ancillary equipment as required by subsection 66265.193(f)** – The ETP-2 and ETP-3 biotreaters are located within a shared secondary containment basin. The basin consists of an HDPE liner installed over a sub-base. Approximately 4 inches of asphalt concrete is then installed over the HDPE liner. Secondary containment calculations performed by Jacobs Engineering are included in Appendix A. The calculations indicate that a minimum containment elevation of 10.53 feet is necessary to meet the required secondary containment volume. Notes in the calculations indicate that 110% volume rule was used since the 10% of largest spill volume was greater than the 4.2-inches accumulated in a 24-hour, 25-year storm event. The secondary containment berm was raised in several locations during construction such that the lowest containment elevation is at 11.0 feet. The secondary containment for the tank systems was determined to meet the necessary requirements as described in 22 CCR §66265.193.
- **Hazardous characteristics of the waste(s) that have been or will be handled** – The wastewater processed in the ETP-3 biotreater is classified as hazardous waste due to high benzene concentrations.
- **Description of any structural damage or inadequate construction or installation** – Based on the assessment conducted by ERM and subsequent review of the QA/QC reports by Jacobs Engineering inspectors the ETP-3 biotreater system appears to be free of structural and installation defects and material corrosion or erosion.
- **Results of a leak test, internal inspection, or other tank system integrity examination including the type of integrity examination performed** – ERM conducted a visual inspection of the exterior of the ETP-3 biotreater. The inspections did not indicate any damage to the tank exterior. No visible cracks, scratches, cuts, or other damage was observed. Tank contractor Matrix conducted a hydro-static test of the ETP-3 biotreater on 3 April 2013. After 24 hours there were no observations of leaks in the tank. The hydro-static test results are included in Appendix B.

ED_001593_00015668

- **Estimated remaining service life of the tank system based on above findings –** Based on the above assessment of the ETP-3 biotreater and observed condition of ETP-2, the remaining service life of the system is estimated to be at least 10 years.

3.2 *MATERIAL COMPATIBILITY*

Materials used in the construction of the waste tanks are consistent with industry standards for the type of materials handled within the waste tanks.

3.3 *CONCLUSIONS*

The ETP-3 biotreater system and appurtenances are found to be compliant in accordance with all the regulations set forth in 22 CCR §66265.192. There were no visual defects or damage that would jeopardize the functionality of the tank system. The estimated remaining service life of the tanks is at least 10 years.

This assessment is valid for a maximum period of five (5) years in accordance with 22 §66265.192(h).

ED_001593_00015668

Figures

ED_001593_00015668

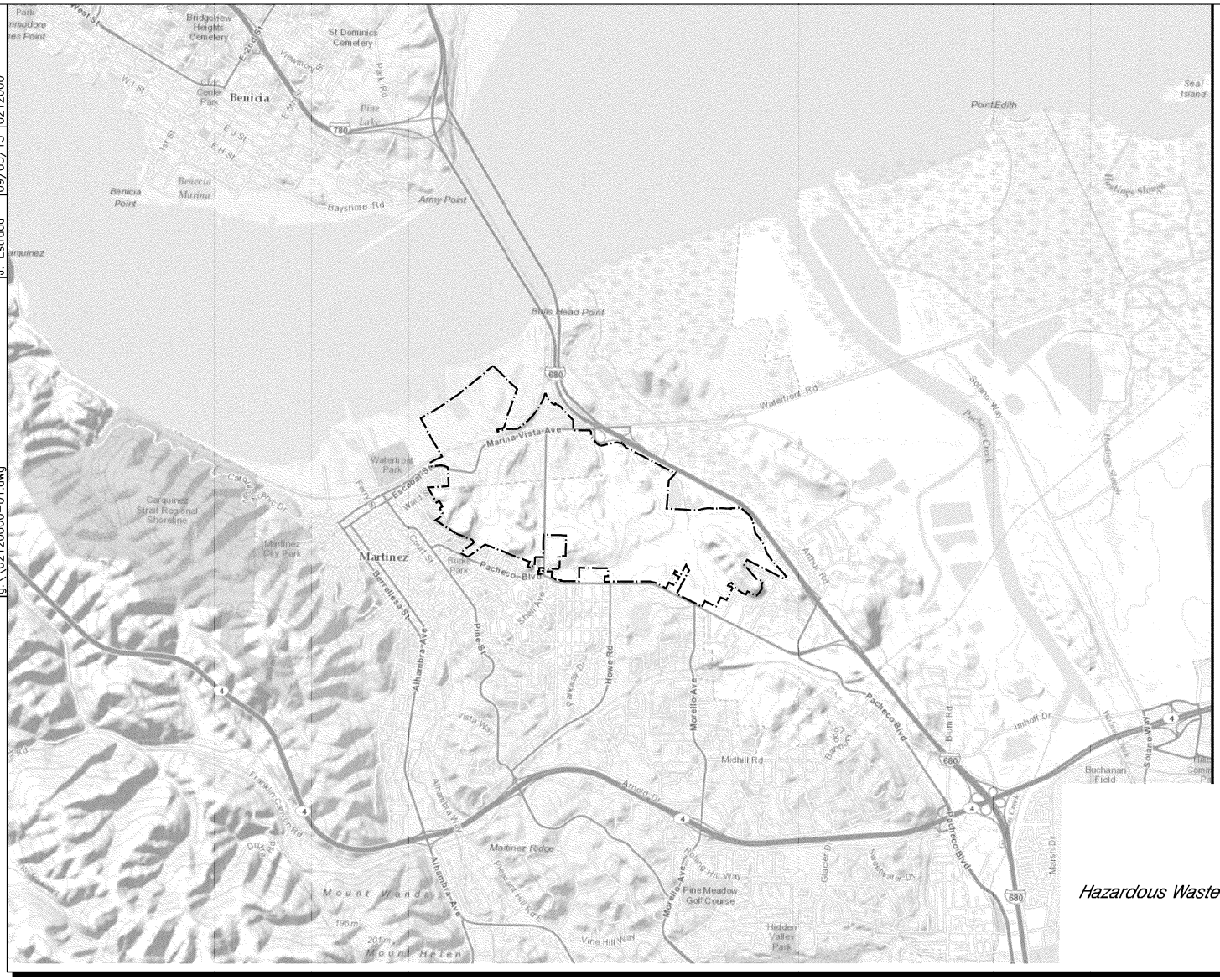


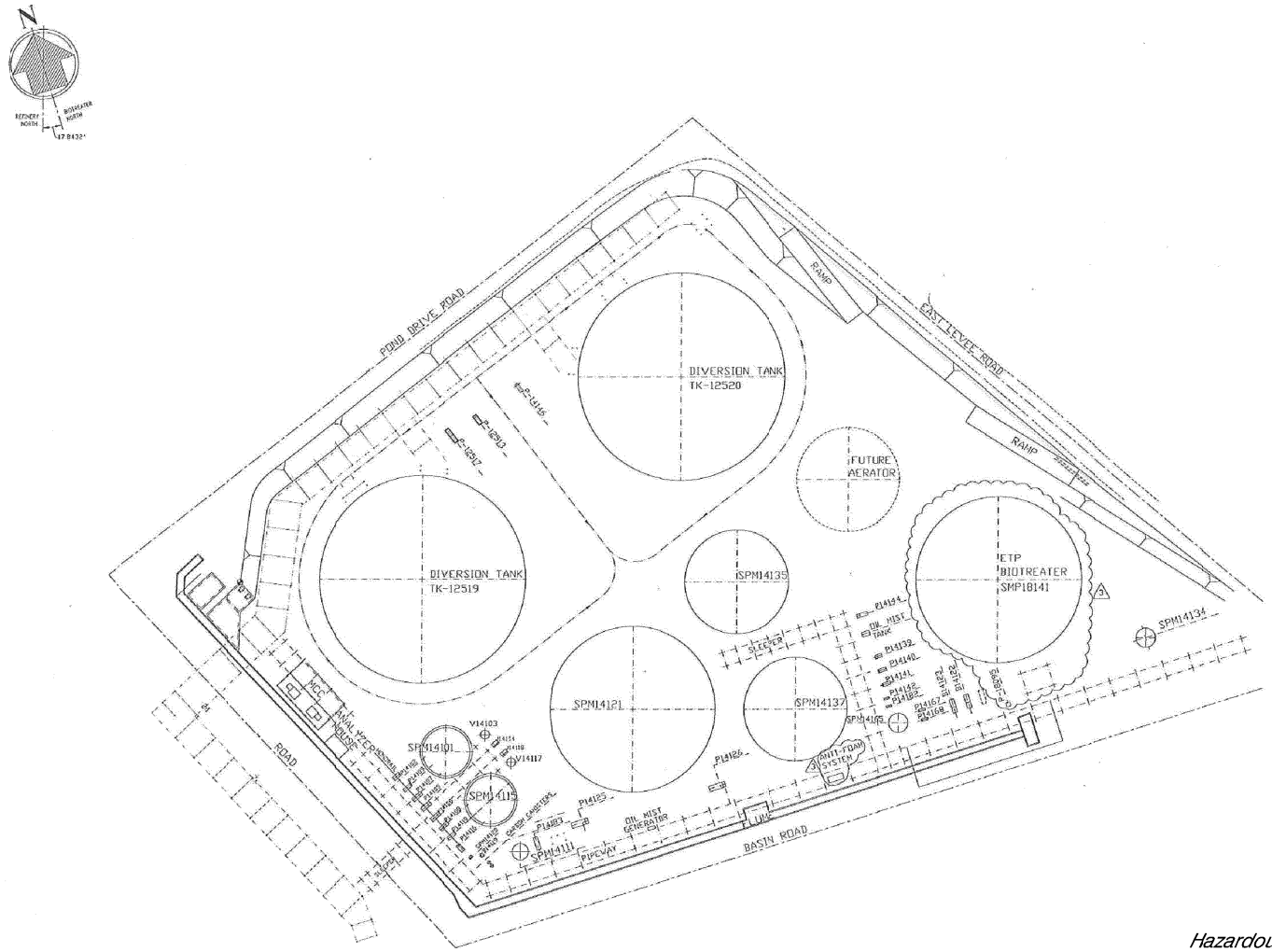
Figure 1
Site Location Map
ETP-3 Biotreater
Hazardous Waste Tank System Integrity Assessment
Shell Martinez Refinery
Martinez, California

ERM *09/13*

CAD File: g:\\02120000-01.dwg
Drawn By: J. Estrada
Date: 09/05/13
Project No. 02120000

ED_001593_00015668

CAD File: g:\\02120000-01.dwg | Drawn By: J. Estrada | Date: 09/05/13 | Project No. 0212000



EQUIPMENT LIST

DNF EQUIPMENT

NO.	DESCRIPTION
J14104	NITROGEN GAS COMPRESSOR
J14118	NITROGEN GAS COMPRESSOR
P14102	EFFLUENT RECYCLE PUMP
P14116	EFFLUENT RECYCLE PUMP
SPM14101	DNF UNIT
SPM14115	DNF UNIT
V14103	N2 PRESSURIZED VESSEL
V14117	N2 PRESSURIZED VESSEL

DNF AUXILIARIES

B14119	VOC & NITROGEN GAS BLOWER
P14105	SLUDGE PUMP
P14106	SLUDGE PUMP
P14107	FLOAT TRANSFER PUMP
P14108	FLOAT TRANSFER PUMP
P14183	SLUDGE LOADING PUMP
SPM14111	SLUDGE STORAGE
SPM14120	REFRIGERATED AIR DRYER

AERATION SYSTEM EQUIPMENT

B14122	AERATION BLOWER
B14123	AERATION BLOWER
P14109	AERATOR FEED PUMP
P14110	AERATOR FEED PUMP
P14125	JET AERATOR RECYCLE PUMP
P14126	JET AERATOR RECYCLE PUMP
SPM14121	AERATOR
SPM14134	PAC FEED SYSTEM

BIOCLARIFIER EQUIPMENT

3 P18095	SLUDGE BOOSTER PUMP
P14139	RETURN ACTIVATED SLUDGE PUMP
P14140	RETURN ACTIVATED SLUDGE PUMP
P14141	RETURN ACTIVATED SLUDGE PUMP
P14144	SCUM PUMP
P14142	CLARIFIED WATER RECYCLE PUMP
SPM14135	BIOCLARIFIER
SPM14137	BIOCLARIFIER
3 SPM18141	ETP-3 BIOTREATER
	ANTI-FOAM SYSTEM

DIVERSION TANK TRANSFER PUMPS

P14146	TRANSFER PUMP

EFFLUENT EQUIPMENT

P14167	EFFLUENT TRANSFER PUMP
P14168	EFFLUENT TRANSFER PUMP
P14182	FLUSH WATER PUMP
SPM14165	EFFLUENT STORAGE

GRAPHIC SCALE
0 40 80 120 160
SCALE: 1" = 40'

Figure 2
Biotreater Plot Plan
ETP-3 Biotreater
Hazardous Waste Tank System Integrity Assessment
Shell Martinez Refinery
Martinez, California

ERM 09/13

ED_001593_00015668

TANK DESIGN DATA

CODE: API 650, 11TH EDITION, ADDENDUM 2
INSIDE DIAMETER: 120'-0"
HEIGHT: 28'-0" (NOTE 14)
NOMINAL CAPACITY: 56,402 BBL
MAXIMUM CAPACITY: 50,143 BBL
NET WORK CAPACITY: 47,421 BBL
PRODUCT: WASTE WATER
PRODUCT SPECIFIC GRAVITY: 1.01
DESIGN SPECIFIC GRAVITY: 1.01
DESIGN LIQUID LEVEL: 28'-0" (NOTE 12)
INTERNAL PRESSURE: ATMOSPHERIC
EXTERNAL PRESSURE: ATMOSPHERIC
MAXIMUM DESIGN TEMPERATURE: 105°F
MAXIMUM OPERATING TEMPERATURE: 105°F
DESIGN METAL TEMPERATURE: 45°F
WIND CODE: API 650, 11TH EDITION, ADDENDUM 2
WIND SPEED: 85 MPH
WIND CHECK: AS-BUILT
WIND IMPORTANCE FACTOR: 1.0
EARTHQUAKE CODE: API 650, 11TH EDITION, ADD. 2
RESPONSE ACCELERATION (Ss): 152.7%g
RESPONSE ACCELERATION (S1): 60.0%g
SITE CLASS: E
EARTHQUAKE IMPORTANCE FACTOR: 1.0
TANK FILL RATE: 3,600 GPM
TANK SUCTION RATE: 3,600 GPM
SHELL INSULATION THICKNESS: NONE

BOTTOM DESIGN DATA

BOTTOM PL MAT'L. SPEC.: CONCRETE (BY OTHERS)
SKETCH PL MAT'L. SPEC.: N/A
WELDING: N/A
CORROSION ALLOWANCE: N/A
TYPE: FLAT
SLOPE: FLAT

ANNULAR PLATE DATA

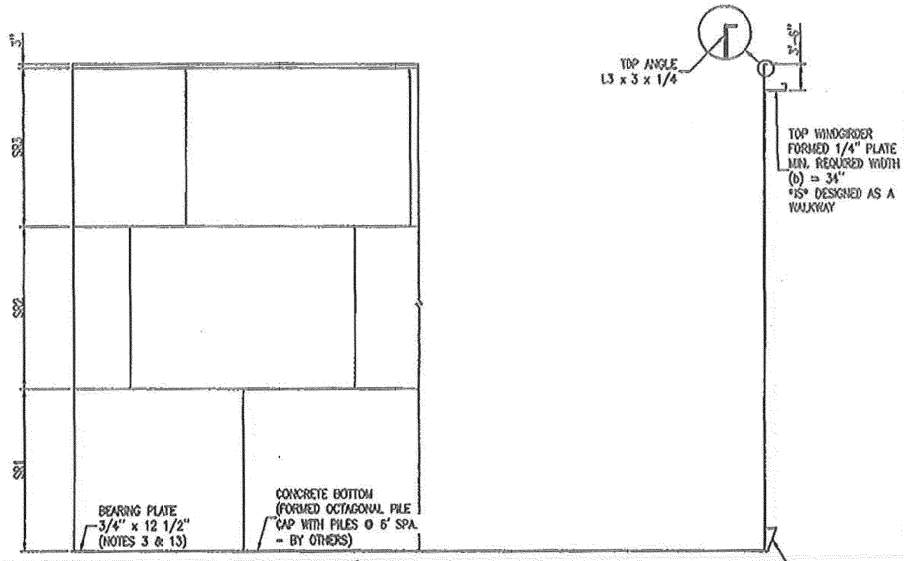
MATERIAL SPECIFICATION: N/A
WELDING: N/A
CORROSION ALLOWANCE: N/A

FLOATING ROOF DATA

TYPE: NONE
OUTER RIM CORROSION ALLOWANCE: N/A
DECK CORROSION ALLOWANCE: N/A

FIXED ROOF DATA

TYPE: OPEN TOP
SLOPE: N/A
PL MAT'L. SPEC.: N/A
WELDING: N/A
RAFTER MAT'L. SPEC.: N/A
GIRDER MAT'L. SPEC.: N/A
COLUMN MAT'L. SPEC.: N/A
UNIFORM LIVE LOAD: N/A
UNBAL. SNOW LOAD: N/A
ADDITIONAL DEAD LOAD: N/A
PL CORROSION ALLOWANCE: N/A
STRUCT CORROSION ALLOWANCE: N/A
ROOF INSULATION THICKNESS: N/A



ELEVATION/SECTION

SHELL DESIGN

JOINT EFFICIENCY = 1.0

RING NO.	API 650 MAT'L. GROUP	MAT'L. SPEC.	THK. USED (IN.)	WIDTH USED (FT.-IN.)	DESIGN FOR PRODUCT SPECIFIC GRAVITY: ALLOWABLE STRESS (PSI)	DESIGN FOR PRODUCT SPECIFIC GRAVITY: CALCULATED THK. (IN.)	DESIGN FOR HYDROSTATIC TESTING: ALLOWABLE STRESS (PSI)	DESIGN FOR HYDROSTATIC TESTING: CALCULATED THK. (IN.)	CORR. ALLOW. (IN.)	STRESS RELIEVE NOTES	IMPACT TESTING REQ'MENTS: TEST TEMP.	IMPACT TESTING REQ'MENTS: LONG. (FT-LBS)	IMPACT TESTING REQ'MENTS: TRANS. (FT-LBS)	RADIOGRAPHY ON VERTICAL SEAMS
SR1	I	A36 G2	1.000	8'-8"	23200	0.430	24900	0.339	0.0625	N/A	N/A	N/A	N/A	SPOT
SR2	I	A36	0.334	9'-11"	23200	0.322	24900	0.240	0.0625	N/A	N/A	N/A	N/A	SPOT
SR3	I	A36	0.3125	9'-11"	23200	0.188	24900	0.115	0.0625	N/A	N/A	N/A	N/A	SPOT

NO.	REVISION DESCRIPTION	BY	DATE
3			
2			
0	ISSUED FOR APPROVAL		

DESIGN BY: CP | DATE: 12/08/2011 | DESIGN CHK. BY: MT

MATRIX SERVICE
INDUSTRIAL SERVICE CONTRACTOR

TITLE: DESIGN DATA TANK
CUSTOMER: SHELL OIL COMPANY
CITY: MARTINEZ STATE/PROVINCE: CA
TANK NO.: SPM-18141 DIAMETER: 120'-0 HEIGHT: 28'-0

EI:160161	BY	DATE	STD. NO.: M023069	SCALE: NONE
DRAWN:	TRW	01/09/2012	DWG: 03A	
CHECKED:	TDG	01/11/2012		
APPROVED:			JOB NO.: 2661-3022	REV. NO.: 0

ISSUED FOR CONSTRUCTION

CAD File: g:\\02120000-01.dwg | Drawn By: J. Estrada | Date: 09/05/13 | Project No. 0212000

Figure 3
DWG-03A - Design Data Tank
ETP-3 Biotreater
Hazardous Waste Tank System Integrity Assessment
Shell Martinez Refinery
Martinez, California

ERM 09/13

Appendix A
Secondary Containment
Calculations

JACOBS

1500 Hughes Way, Suite B-400
Long Beach, CA 90810
310-507-6450

Containment calculations

For

Shell Refinery Martinez

Biotreater ETP-3 Containment

Evaluation of containment for bermed area

Prepared by: Peter Innerhofer _____

Checked by: Robert McDougall _____

Client:
Shell Martinez
Martinez, CA

Jacobs Project No: 02KK1845

Date: 3-Dec-12

REGISTERED PROFESSIONAL ENGINEER
PETER INNERHOFER
No.27965
EXP. 3-31-14
CIVIL
STATE OF CALIFORNIA

JACOBS

Subject **Containment at Biotreater** Project: **02KK1845**

Authored by **PI** Date: **30-Nov** Checked by RCM Date

Discussion

The ETP Biotreater tank was added to an existing bermed area that contained 2 large diameter tanks, 1 medium sized tanks, 4 smaller tanks, various pumps and piping at a lower level.
A surveyor was hired to take elevation readings, we used the ACAD Civil Land program to calculate the volume of the basin up to the lowest crest line, which is EL 9.6'.

Comparisons between rainfall and 10% of of the maximum storage capacity was made and determined that the 10% rule of thumb is larger and therefore used.

In addition deductions were made for numerous pipes thorughout the facility, especially some of the larger 36" and 24" lines. A rough estimate was made for pumps and typical 12" diameter lines to estimate a realistic and acceptable volume deduction.

In one of the areas, rainwater is dumped onto the road which dumps into the basin. As a result checkvalves were added at that location to allow rainwater into the basin.

The volumes of all tanks except TK-12520 were deducted from the total volume of the basin.
Several calculations are then made at the existing crest elevation of 9.6' to determine if containment was sufficient. Then the elevation for equilibrium was calculated to be at 10.53'.

The final determination was made at a crest elevation of 11.0' which provides a sufficient margin of 9%.

JACOBS

Subject: **Containment at Biotreater** Project: **02KK1845**

Authored by: **PI** Date: **3-Dec** Checked by: Date:

Jacobs calculation of volume and area from ACAD file

Vol of containment up to current El of 9.6' = 41642 yd3
Area at 9.6 elevation = 228,650 ft2
Containment elevation = 9.60 ft

→ **NG-Raise Containment Elevation**

25 yr storm volume of rain in 24 hours is 4.2 " in 24 hours.
Rainfall intensity = 4.20 in / 24 hours
24 hour storm Vol rain = 4.2 * 228650 / (12 * 27)
24 hour storm Vol rain = **2964** yd3

Calculate deduction of all tanks to Containment elev except TK-12520

Tk #	Dia	Bot TK EL	AREA	Vol to EL 9.6	Design Level	VOL yd3	110% Max Spill - yd3	
12519	150	3.6	17671	3927				
12519 fdn	161.2	3.25	20409	265				
12520	150	3.7	17672	**0**	50	32726	35999	**No Deduction**
12520 fdn	161.2	3.5	20409	151				
14101	35.17	4.5	971	184	10% of spill volume =		3273	yd3
14115	35.2	5	973	166				
14121	120.2	4.5	11347	2143				
14135	75	5.2	4418	720				
14137	75	4.5	4418	834				
14165	14	4.75	154	28				
14134	14	4.75	154	28				
ETP-3 Equiv round fdn	129.4	4.5	13151	1315				
ETP-3	120	7.2	11310	1005				
		→		10,766 yd3				

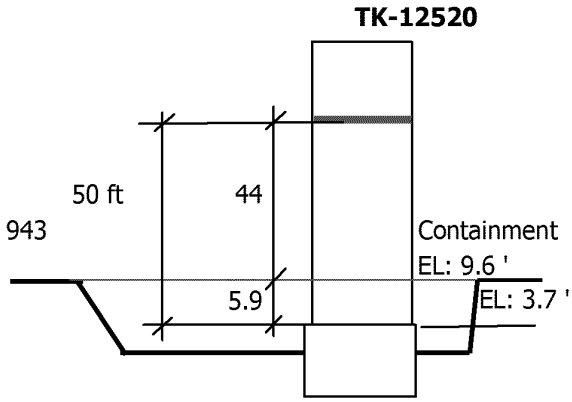
Note: Since 10% of spill volume is larger than 25 Yr storm, use 110% rule for calculations

Additional deductions from piping and equipment

3' diameter pipe x 300' long = 314 yd3
2' diameter pipe x 500' long = 233 yd3
10 pumps - 5 x 5 x 5 = 47 yd3
30 pipes x 12" x 100' = 349 yd3
→ **943** yd3

Net Containment = 41642 - 10766 - 943
Net Containment = 29933 yd3

110% spill volume from TK-12520 = 35,999 yd3



NG - < 110% Vol = 35998.6 yd3

Min containment elev = 10.53 ft

121203 Containment calcs

JACOBS

Subject: **Containment at Biotreater** Project: **02KK1845**

Authored by: **PI** Date: **3-Dec** Checked by: Date:

Jacobs calculation of volume and area from ACAD file

Vol of containment up to current El of 9.6' = 41642 yd3
Area at 9.6 elevation = 228,650 ft2
Containment elevation = 10.53 ft
→ Volume to EL 10.53 = 49,518 yd3
25 yr storm volume of rain in 24 hours is 4.2 " in 24 hours.
Rainfall intensity = 4.20 in / 24 hours
24 hour storm Vol rain = 4.2 * 228650 / (12 * 27)
24 hour storm Vol rain = **2964** yd3

Calculate deduction of all tanks to Containment elev except TK-12520

Tk #	Dia	Bot TK EL	AREA	Vol to EL 10.53	Design Level	VOL yd3	110% Max Spill - yd3	
12519	150	3.6	17671	4536				
12519 fdn	161.2	3.25	20409	265				
12520	150	3.7	17672	**0**	50	32726	35999	**No Deduction**
12520 fdn	161.2	3.5	20409	151				
14101	35.17	4.5	971	217	10% of spill volume =		3273	yd3
14115	35.2	5	973	199				
14121	120.2	4.5	11347	2534				
14135	75	5.2	4418	872				
14137	75	4.5	4418	987				
14165	14	4.75	154	33				
14134	14	4.75	154	33				
ETP-3 Equiv round fdn	129.4	4.5	13151	1315				
ETP-3	120	7.2	11310	1395				
		→		12,537 yd3				

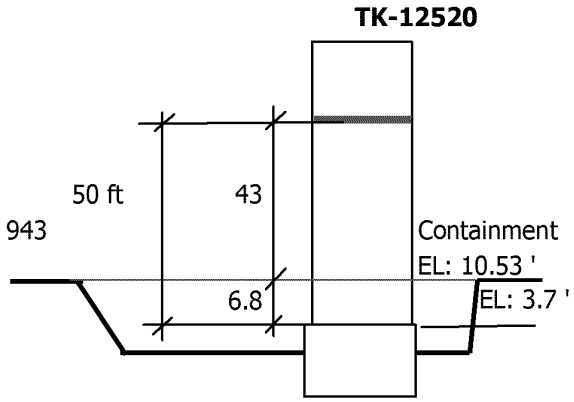
Note: Since 10% of spill volume is larger than 25 Yr storm, use 110% rule for calculations

Additional deductions from piping and equipment

3' diameter pipe x 300' long = 314 yd3
2' diameter pipe x 500' long = 233 yd3
10 pumps - 5 x 5 x 5 = 47 yd3
30 pipes x 12" x 100' = 349 yd3
→ **943** yd3

Net Containment = 49518 - 12537 - 943
Net Containment = 36038 yd3

110% spill volume from TK-12520 = 35,999 yd3



Containment Elev of 10.53 ft is OK
Margin = 0.2 %
Min containment elev = 10.53 ft

121203 Containment calcs

JACOBS

Subject: **Containment at Biotreater** Project: **02KK1845**

Authored by: **PI** Date: **3-Dec** Checked by: Date:

Jacobs calculation of volume and area from ACAD file

Vol of containment up to current El of 9.6' = 41642 yd3
Area at 9.6 elevation = 228,650 ft2
Containment elevation = 11.00 ft
→ Volume to EL 11 = 53,498 yd3
25 yr storm volume of rain in 24 hours is 4.2 " in 24 hours.
Rainfall intensity = 4.20 in / 24 hours
24 hour storm Vol rain = 4.2 * 228650 / (12 * 27)
24 hour storm Vol rain = **2964** yd3

Calculate deduction of all tanks to Containment elev except TK-12520

Tk #	Dia	Bot TK EL	AREA	Vol to EL 11	Design Level	VOL yd3	110% Max Spill - yd3	
12519	150	3.6	17671	4843				
12519 fdn	161.2	3.25	20409	265				
12520	150	3.7	17672	**0**	50	32726	35999	**No Deduction**
12520 fdn	161.2	3.5	20409	151				
14101	35.17	4.5	971	234	10% of spill volume =		3273	yd3
14115	35.2	5	973	216				
14121	120.2	4.5	11347	2732				
14135	75	5.2	4418	949				
14137	75	4.5	4418	1064				
14165	14	4.75	154	36				
14134	14	4.75	154	36				
ETP-3 Equiv round fdn	129.4	4.5	13151	1315				
ETP-3	120	7.2	11310	1592				
		→		13,432 yd3				

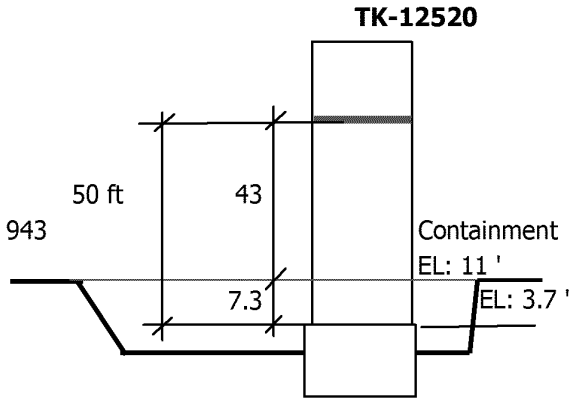
Note: Since 10% of spill volume is larger than 25 Yr storm, use 110% rule for calculations

Additional deductions from piping and equipment

3' diameter pipe x 300' long = 314 yd3
2' diameter pipe x 500' long = 233 yd3
10 pumps - 5 x 5 x 5 = 47 yd3
30 pipes x 12" x 100' = 349 yd3
→ **943** yd3

Net Containment = 53498 - 13432 - 943
Net Containment = 39123 yd3

110% spill volume from TK-12520 = 35,999 yd3



Containment Elev of 11 ft is OK
Margin = 8.7 %
Min containment elev = 10.53 ft

121203 Containment calcs

Appendix B
ETP-3 Hydro-Static Test Results

MATRIX PDM
ENGINEERING

HYDRO-STATIC TEST CERTIFICATION

COMPANY: SHELL **JOB #:** 2861-3022

LOCATION: MARTINEZ CALIF

TANK #: SPM 18141

TANK SIZE: DIA-120' HT-28'

DATE: 4-3-2013

This certifies the satisfactory completion of a Hydro-Static Test on the above referenced tank.

The following personnel conducted and/or witnessed this test:

MATRIX FOREMAN: Antonio J Acosta

OWNER REPRESENTATIVE: JACOBS Mark Pacheco 4-3-2013

TEST OPERATOR: Antonio J Acosta

COMMENTS: TANK FILLED with Hytro at Level 27' 4½" at 0900 ON 4-2-13 HELD for 24 hrs 0900 4-3-13. found NO indications.

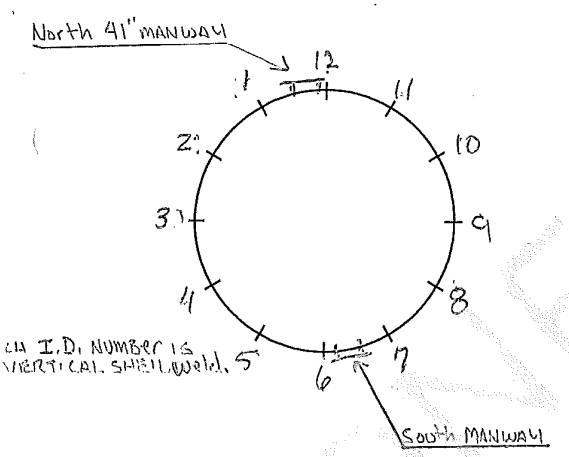
MATRIX PDM ENGINEERING	NDE Category HT Hydro Testing	NDE # / Rev. HT1A / 1	Page No. 1 of 1
NDE PROCEDURES	**SUBJECT :TANK HYDROTEST REPORT**		

Note: This form only to be used when customer requires elevation shots during hydrotest.

Customer : SHELL
City, State : MARTINEZ CALIF
Tank # : ETP-3
Diameter X Height : HT-28' DIA-120'

Testing Fluid : HYDRO
Temperature : AMBIENT
Max Oper. Height :
Max Test Height :

Date and Time Test Filling Started : 0900 3-18-13
Date and Time Max Test Level Reached : 0900 4-2-13 (27'4½")
Date and Time Tank Started To Be Emptied :
Date and Time Tank Empty :
Floating Roof Pontoons Checked :
Floating Roof Travel and Rim Space Checked :
Floating Roof Seal Tolerance Checked :



Note: Identify location of shell fitting to orient benchmark locations.

BOTTOM ELEVATIONS

	START EMPTY	1/4 FULL	HALF FULL	3/4 FULL	FULL	FINISH EMPTY
1	26 7/8"	26 7/8"	27'	27 1/8"	27 1/8"	
2	26 3/16"	26 3/16	26 3/16	26 3/16	26 5/8	
3	26 1/4"	26 1/4"	26 3/8"	26 3/8"	26 9/16"	
4	26 1/16"	26 1/8"	26 5/16	26 3/16	26 5/16	
5	26 1/8	26 1/4	26 3/8	26 5/8	26 5/8	
6	26 3/16	26 5/16	26 7/16	27"	27"	
7	26 3/16	26 9/16	26 11/16	26 11/16	26 11/16	
8	26 1/2"	26 9/16	27'	27 1/8"	27 1/8"	
9	27 1/16	27 1/8	27 1/2	27 5/8	27 5/8	
10	26 11/16	26 13/16	26 13/16	26 13/16	26 13/16	
11	26 3/4"	26 5/8"	26 15/16	26 15/16	27"	
12	26 7/8	26 7/8	27 1/16	27 1/16	27 1/8	

Maximum Total Settlement :
Maximum Differential Settlement :
Maximum Out of Plumb :

Comments :

Foreman Sign : [signature]
Print Name : Antonio J Acosta
Date : 4-2-13

Customer Sign : [signature]
Print Name : MARTIN PACHECO
Title : QA MNGR JACOBS
Date : 4-2-13

This document and all text, calculations, drawings, details and data shown herein is confidential. It is the sole property of Matrix PDM Engineering and shall be used only for the purpose intended. The information provided may not be divulged or copied, in whole or part, and may not be used for any purpose whatsoever including the fabrication of equipment or parts without the express written permission of Matrix PDM Engineering.

To: Lin, Sharon[Lin.Sharon@epa.gov]
Cc: Schofield, John[Schofield.John@epa.gov]; Vega, Jackie[Vega.Jackie@epa.gov]; Rollins, Christopher[Rollins.Christopher@epa.gov]
From: Soria, Maria@DTSC
Sent: Thur 11/20/2014 12:56:00 AM
Subject: RE: DTSC Valero Inspection (March 16-18, 2010) Heat Exchanger Bundle Cleaning Pad Status

I'll have the inspector look into this. Is this urgent or can we get back to you the week after Thanksgiving?

From: Lin, Sharon [mailto:Lin.Sharon@epa.gov]
Sent: Wednesday, November 19, 2014 4:51 PM
To: Soria, Maria@DTSC
Cc: Schofield, John; Vega, Jackie; Rollins, Christopher
Subject: DTSC Valero Inspection (March 16-18, 2010) Heat Exchanger Bundle Cleaning Pad Status

Hi, Maria,

We are figuring out the status of the heat exchanger bundle cleaning pad at the Valero Refinery in Benicia. It appears that the DTSC inspectors cited Valero for a Class I violation for storing K050 RCRA hazardous waste in the Heat Exchanger Bundle cleaning pad trough and sump without a permit during the inspection. Valero's environmental manager, John Lazorik, in an email to DTSC representatives (dated March 31, 2011), stated that the alleged violation at the heat exchanger bundle cleaning pad had been withdrawn. EPA would like to see the formal responses from DTSC on this issue.

Please feel free to give me a call if you have any questions. Thanks.

Sharon Lin, P.E.

U.S. Environmental Protection Agency Region 9

Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2
75 Hawthorne Street

San Francisco, CA 94105

Tel: (415) 972-3446

Email: Lin.Sharon@epa.gov

To: Lin, Sharon[Lin.Sharon@epa.gov]
From: Pacheco-Mendez, Marisol
Sent: Mon 4/24/2017 3:10:43 PM
Subject: RE: Valero Benicia-EOL-10 Data From April

Lin, thank you for the response!

From: Lin, Sharon [mailto:Lin.Sharon@epa.gov]
Sent: Sunday, April 23, 2017 7:02 PM
To: Pacheco-Mendez, Marisol <Marisol.Pacheco-Mendez@valero.com>
Subject: RE: Valero Benicia-EOL-10 Data From April

Receipt confirmed.

sharon

From: Pacheco-Mendez, Marisol [mailto:Marisol.Pacheco-Mendez@valero.com]
Sent: Saturday, April 22, 2017 1:12 PM
To: Lin, Sharon <Lin.Sharon@epa.gov>
Cc: Ronan, Kimberly A <Kim.Ronan@valero.com>; Cuffel, Donald <Don.Cuffel@valero.com>; Bourbon, Elizabeth <Elizabeth.Bourbon@valero.com>; Bluntzer, Megan <Megan.Bluntzer@valero.com>; Suhami, Iren <Iren.Suhami@valero.com>
Subject: Valero Benicia-EOL-10 Data From April

Hello Sharon,

Pursuant to item 63 of the Consent Agreement and Final Order negotiated between EPA and Valero (RCRA EPA ID No. CAD063001770, TRI ID No. 94510XXNCS3400E), please see attached for end of line (EOL) sampling point EOL-10 data collected on April 6, 7 and 8, 2017. This data was received from the contractor laboratory on April 21, 2017.

The self-diversion was a result of the storm event at the time of these results.

Please confirm receipt of this email.

Please contact me if you have any questions.

Regards,

Marisol Pacheco-Mendez

Valero Benicia Refinery

Staff Environmental Engineer

707-745-7573

To: Lin, Sharon[Lin.Sharon@epa.gov]
From: Pacheco-Mendez, Marisol
Sent: Fri 1/6/2017 8:34:11 PM
Subject: Valero Benicia Refinery- EOL10 data from December 23,2016
R1612106.pdf

Hi Sharon,

Happy New Year!

Pursuant to item 63 of the Consent Agreement and Final Order negotiated between EPA and Valero (RCRA EPA ID No. CAD063001770, TRI ID No. 94510XXNCS3400E), please see attached for end of line (EOL) sampling point EOL-10 data collected on December 23, 2016. This data was received from the contractor laboratory on December 28, 2016.

I do apologize for the tardiness as I was on vacation during the holidays.

Please contact me if you have any questions.

Regards,

Marisol Pacheco-Mendez

Valero Benicia Refinery

Staff Environmental Engineer

707-745-7573

From: Hossein Khoshkhoo [mailto:deltahk1@sbcglobal.net]
Sent: Wednesday, December 28, 2016 2:31 PM

To: Ronan, Kimberly A <Kim.Ronan@valero.com>; Pacheco-Mendez, Marisol <Marisol.Pacheco-Mendez@valero.com>; Johnston, David <David.Johnston@valero.com>
Subject: Work Order no 1612106

Hello Everyone,

Please see the attached report and EDD for **Work Order No 1612106**. Let me know if you have any concerns.

Thank you

Chelsea

Delta Environmental Laboratories, LLC

685 Stone Road, Suite #11 & 12

Benicia, CA 94510

tel: (707) 747-6081

fax: (707) 747-6082

deltahk1@sbcglobal.net

December 28, 2016

Analytical Report

Client:	**Valero** 3400 East Second St Benicia, CA 94510
Attn:	**Kimberly Ronan**

Work Order #:	1612106
Project:	Valero NESHAP
Project#:	[none]
P.O. Number:	4503499083
Project Received:	December 23, 2016 11:00
Project Reported:	December 28, 2016 10:21

Sincerely,

Hossein Khoshkhoo

H. Khoshkhoo, Ph.D.
Laboratory Director / President

WORK ORDER: 1612106

COC Number:

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Samples in this Report

Lab ID	Sample	Matrix	Date Sampled	Date Received
1612106-01	Self Divert to RP	Aqueous	December 15, 2016 3:20	December 23, 2016 11:00
1612106-02	Self Divert to RP	Aqueous	December 15, 2016 3:20	December 23, 2016 11:00
1612106-03	Self Divert to RP	Aqueous	December 16, 2016 12:01	December 23, 2016 11:00
1612106-04	Self Divert to RP	Aqueous	December 23, 2016 7:30	December 23, 2016 11:00
1612106-05	Self Divert to RP	Aqueous	December 23, 2016 7:30	December 23, 2016 11:00

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106

COC Number:

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Sample Results

Sample: **Self Divert to RP**
1612106-01 (Aqueous)

Sample Type: Grab

Sample Date: December 15, 2016

Prep Date: December 27, 2016 9:42

Analyte	MDL	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
Semi-Volatile Organic Compounds by EPA 8270									
Dimethyl Phthalate	3.0	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Acenaphthene	5.5	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Acenaphthylene	1.2	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Anthracene	2.5	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Benzidine	16.5	100	ND	100	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Benzoic Acid	16.0	100	ND	100	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Benzo (a) anthracene	1.2	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Benzo (b) fluoranthene	2.6	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Benzo (k) fluoranthene	4.0	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Benzo (g,h,i) perylene	6.5	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Benzo (a) pyrene	2.8	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Benzyl Alcohol	10.5	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Bis (2-chloroethoxy) methane	3.6	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Bis (2-chloroethyl) Ether	2.8	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Bis (2-chloroisopropyl) Ether	13.0	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Bis (2-ethylhexy) Phthalate	3.5	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
4-Bromophenyl Phenyl Ether	3.7	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Butylbenzyl Phthalate	4.0	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
4-Chloroaniline	3.6	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
2-Chloronaphthalene	0.02	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
4-Chlorophenyl Phenyl Ether	1.8	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Chrysene	1.5	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Dibenzo (a,h) anthracene	5.5	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Dibenzofuran	1.5	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Di-n-butyl Phthalate	3.5	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
1,2-Dichlorobenzene	3.5	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
1,3-Dichlorobenzene	3.2	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
1,4-Dichlorobenzene	1.6	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
3,3'-Dichlorobenzidine	2.8	50.0	ND	50.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Sample Results
(Continued)

Sample: **Self Divert to RP (Continued)**
1612106-01 (Aqueous)

Sample Type: Grab

Sample Date: December 15, 2016

Prep Date: December 27, 2016 9:42

Analyte	MDL	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
Semi-Volatile Organic Compounds by EPA 8270 (Continued)									
Diethyl Phthalate	4.5	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
2,4-Dinitrotoluene	6.2	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
2,6-Dinitrotoluene	2.6	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Di-n-octyl Phthalate	3.5	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Fluoranthene	6.5	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Fluorene	3.5	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Hexachlorobenzene	6.0	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Hexachlorobutadiene	4.0	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Hexachlorocyclopentadiene	7.0	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Hexachloroethane	0.05	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Indeno (1,2,3-cd) pyrene	5.5	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Isophorone	4.0	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
2-Methylnaphthalene	0.05	25.0		**97.5**	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Naphthalene	2.0	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
2-Nitroaniline	5.4	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
3-Nitroaniline	6.6	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
4-Nitroaniline	4.2	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Nitrobenzene	1.9	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
N-Nitrosodiphenylamine	4.0	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
N-Nitrosodi-n-propylamine	8.5	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Phenanthrene	1.5	25.0		**41.8**	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Pyrene	6.0	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
1,2,4-Trichlorobenzene	2.5	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
4-Chloro-3-methylphenol	5.3	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
2-Chlorophenol	4.5	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
2,4-Dichlorophenol	1.8	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
2,4-Dimethylphenol	1.8	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
4,6-Dinitro-2-methylphenol	3.7	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
2,4-Dinitrophenol	12.8	50.0	ND	50.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106

COC Number:

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Sample Results
(Continued)

Sample: **Self Divert to RP (Continued)**
1612106-01 (Aqueous)

Sample Type: Grab

Sample Date: December 15, 2016

Prep Date: December 27, 2016 9:42

Analyte	MDL	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
Semi-Volatile Organic Compounds by EPA 8270 (Continued)									
2-Methylphenol	9.8	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
4-Methylphenol	6.0	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
2-Nitrophenol	2.8	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
4-Nitrophenol	4.4	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Pentachlorophenol	20.5	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Phenol	2.5	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
2,4,5-Trichlorophenol	2.7	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
2,4,6-Trichlorophenol	1.7	25.0	ND	25.0	ug/L	5	12/27/16	EPA 8270C	16L0148/HK
Surrogate: 2-Fluorobiphenyl		32-144		175%			12/27/16	EPA 8270C	16L0148/HK
Surrogate: Phenol-d6		5-93		40.2%			12/27/16	EPA 8270C	16L0148/HK
Surrogate: Nitrobenzene-d5		34-141		162%			12/27/16	EPA 8270C	16L0148/HK
Surrogate: 2-Fluorophenol		23-92		51.0%			12/27/16	EPA 8270C	16L0148/HK
Surrogate: 2,4,6-Tribromophenol		22-154		116%			12/27/16	EPA 8270C	16L0148/HK
Surrogate: p-Terphenyl-d14		28-157		178%			12/27/16	EPA 8270C	16L0148/HK

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Sample Results
(Continued)

Sample: **Self Divert to RP**
1612106-02 (Aqueous)

Sample Type: Grab

Sample Date: December 15, 2016

Prep Date: December 27, 2016 9:27

Analyte	MDL	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
Volatile Organic Compounds									
Benzene	0.600	5.00		**12.7**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Bromobenzene	1.90	5.00	ND	1.90	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Methylene Chloride	3.10	20.0	ND	3.10	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Bromochloromethane	0.900	5.00	ND	0.900	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Bromodichloromethane	1.20	5.00	ND	1.20	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Bromoform	1.20	5.00	ND	1.20	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Bromomethane	2.80	5.00	ND	2.80	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
n-Butylbenzene	3.00	5.00	ND	3.00	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
sec-Butylbenzene	1.40	5.00	ND	1.40	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
tert-Butylbenzene	1.40	5.00	ND	1.40	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Carbon Tetrachloride	1.00	5.00	ND	1.00	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Chlorobenzene	1.30	5.00	ND	1.30	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Chloroethane	2.10	5.00	ND	2.10	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Chloroform	1.20	5.00		**10.4**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Chloromethane	3.20	5.00	ND	3.20	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
2-Chlorotoluene	2.20	5.00	ND	2.20	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
4-Chlorotoluene	1.10	5.00	ND	1.10	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Dibromochloromethane	0.800	5.00	ND	0.800	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2-Dibromo-3-chloropropane	2.70	5.00	ND	2.70	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2-Dibromoethane	1.50	5.00	ND	1.50	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Dibromomethane	1.50	5.00	ND	1.50	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2-Dichlorobenzene	1.10	5.00	ND	1.10	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,3-Dichlorobenzene	1.00	5.00	ND	1.00	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,4-Dichlorobenzene	1.00	5.00	ND	1.00	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Dichlorodifluoromethane	2.00	5.00	ND	2.00	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,1-Dichloroethane	1.60	5.00	ND	1.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2-Dichloroethane	2.10	5.00	ND	2.10	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,1-Dichloroethene	2.00	5.00	ND	2.00	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
cis-1,2-Dichloroethene	1.40	5.00	ND	1.40	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Sample Results
(Continued)

Sample: **Self Divert to RP (Continued)**
1612106-02 (Aqueous)

Sample Type: Grab

Sample Date: December 15, 2016

Prep Date: December 27, 2016 9:27

Analyte	MDL	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
Volatile Organic Compounds (Continued)									
trans-1,2-Dichloroethene	1.60	5.00	ND	1.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2-Dichloropropane	1.30	5.00	ND	1.30	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,3-Dichloropropane	0.900	5.00	ND	0.900	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
2,2-Dichloropropane	1.60	5.00	ND	1.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,1-Dichloropropene	1.30	5.00	ND	1.30	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Ethylbenzene	0.800	5.00		**4.60**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Hexachlorobutadiene	4.30	5.00	ND	4.30	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Isopropylbenzene	0.800	5.00	ND	0.800	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
p-Isopropyltoluene	1.60	5.00	ND	1.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Naphthalene	4.60	5.00	ND	4.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
n-Propylbenzene	1.30	5.00		**2.80**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Styrene	1.40	5.00	ND	1.40	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,1,1,2-Tetrachloroethane	1.00	5.00	ND	1.00	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,1,2,2-Tetrachloroethane	2.30	5.00	ND	2.30	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Tetrachloroethene	1.60	5.00	ND	1.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Toluene	1.20	5.00		**76.0**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2,3-Trichlorobenzene	2.80	5.00	ND	2.80	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2,4-Trichlorobenzene	2.90	5.00	ND	2.90	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,1,1-Trichloroethane	1.60	5.00	ND	1.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,1,2-Trichloroethane	1.20	5.00	ND	1.20	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Trichloroethene	1.60	5.00	ND	1.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Trichlorofluoromethane	2.30	5.00	ND	2.30	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2,3-Trichloropropane, TCP	2.50	5.00	ND	2.50	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2,4-Trimethylbenzene	3.00	5.00		**20.0**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,3,5-Trimethylbenzene	2.00	5.00		**5.50**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Vinyl Chloride	2.70	5.00	ND	2.70	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
o-Xylene	1.60	5.00		**8.70**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
m,p-Xylenes	3.00	10.0		**14.7**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
cis-1,3-Dichloropropene	1.20	5.00	ND	1.20	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
trans-1,3-Dichloropropene	0.900	5.00	ND	0.900	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106

COC Number:

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Sample Results
(Continued)

Sample: **Self Divert to RP (Continued)**
1612106-02 (Aqueous)

Sample Type: Grab

Sample Date: December 15, 2016

Prep Date: December 27, 2016 9:27

Analyte	MDL	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
Volatile Organic Compounds (Continued)									
Methyl-tert-butyl ether (MTBE)	1.40	5.00	ND	1.40	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Surrogate: Dibromofluoromethane		70-130		99.5%			12/27/16	EPA 8260 B	16L0147/HK
Surrogate: Toluene-d8		70-130		94.5%			12/27/16	EPA 8260 B	16L0147/HK
Surrogate: 4-Bromofluorobenzene		70-130		93.0%			12/27/16	EPA 8260 B	16L0147/HK

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Sample Results
(Continued)

Sample: **Self Divert to RP**
1612106-03 (Aqueous)

Sample Type: Grab

Sample Date: December 16, 2016 1

Prep Date: December 27, 2016 9:27

Analyte	MDL	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
Volatile Organic Compounds									
Benzene	0.600	5.00		**6.40**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Bromobenzene	1.90	5.00	ND	1.90	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Methylene Chloride	3.10	20.0	ND	3.10	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Bromochloromethane	0.900	5.00	ND	0.900	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Bromodichloromethane	1.20	5.00	ND	1.20	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Bromoform	1.20	5.00	ND	1.20	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Bromomethane	2.80	5.00	ND	2.80	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
n-Butylbenzene	3.00	5.00	ND	3.00	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
sec-Butylbenzene	1.40	5.00		**2.40**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
tert-Butylbenzene	1.40	5.00	ND	1.40	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Carbon Tetrachloride	1.00	5.00	ND	1.00	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Chlorobenzene	1.30	5.00	ND	1.30	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Chloroethane	2.10	5.00	ND	2.10	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Chloroform	1.20	5.00		**7.60**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Chloromethane	3.20	5.00	ND	3.20	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
2-Chlorotoluene	2.20	5.00	ND	2.20	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
4-Chlorotoluene	1.10	5.00	ND	1.10	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Dibromochloromethane	0.800	5.00	ND	0.800	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2-Dibromo-3-chloropropane	2.70	5.00	ND	2.70	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2-Dibromoethane	1.50	5.00	ND	1.50	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Dibromomethane	1.50	5.00	ND	1.50	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2-Dichlorobenzene	1.10	5.00	ND	1.10	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,3-Dichlorobenzene	1.00	5.00	ND	1.00	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,4-Dichlorobenzene	1.00	5.00	ND	1.00	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Dichlorodifluoromethane	2.00	5.00	ND	2.00	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,1-Dichloroethane	1.60	5.00	ND	1.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2-Dichloroethane	2.10	5.00	ND	2.10	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,1-Dichloroethene	2.00	5.00	ND	2.00	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
cis-1,2-Dichloroethene	1.40	5.00	ND	1.40	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Sample Results
(Continued)

Sample: **Self Divert to RP (Continued)**
1612106-03 (Aqueous)

Sample Type: Grab

Sample Date: December 16, 2016 1

Prep Date: December 27, 2016 9:27

Analyte	MDL	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
Volatile Organic Compounds (Continued)									
trans-1,2-Dichloroethene	1.60	5.00	ND	1.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2-Dichloropropane	1.30	5.00	ND	1.30	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,3-Dichloropropane	0.900	5.00	ND	0.900	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
2,2-Dichloropropane	1.60	5.00	ND	1.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,1-Dichloropropene	1.30	5.00	ND	1.30	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Ethylbenzene	0.800	5.00		**15.0**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Hexachlorobutadiene	4.30	5.00	ND	4.30	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Isopropylbenzene	0.800	5.00		**3.00**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
p-Isopropyltoluene	1.60	5.00		**3.90**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Naphthalene	4.60	5.00	ND	4.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
n-Propylbenzene	1.30	5.00		**7.30**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Styrene	1.40	5.00	ND	1.40	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,1,1,2-Tetrachloroethane	1.00	5.00	ND	1.00	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,1,2,2-Tetrachloroethane	2.30	5.00	ND	2.30	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Tetrachloroethene	1.60	5.00	ND	1.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Toluene	1.20	5.00		**47.5**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2,3-Trichlorobenzene	2.80	5.00	ND	2.80	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2,4-Trichlorobenzene	2.90	5.00	ND	2.90	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,1,1-Trichloroethane	1.60	5.00	ND	1.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,1,2-Trichloroethane	1.20	5.00	ND	1.20	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Trichloroethene	1.60	5.00	ND	1.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Trichlorofluoromethane	2.30	5.00	ND	2.30	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2,3-Trichloropropane, TCP	2.50	5.00	ND	2.50	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2,4-Trimethylbenzene	3.00	5.00		**77.3**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,3,5-Trimethylbenzene	2.00	5.00		**16.3**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Vinyl Chloride	2.70	5.00	ND	2.70	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
o-Xylene	1.60	5.00		**31.2**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
m,p-Xylenes	3.00	10.0		**60.7**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
cis-1,3-Dichloropropene	1.20	5.00	ND	1.20	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
trans-1,3-Dichloropropene	0.900	5.00	ND	0.900	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106

COC Number:

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Sample Results
(Continued)

Sample: **Self Divert to RP (Continued)**
1612106-03 (Aqueous)

Sample Type: Grab

Sample Date: December 16, 2016 1

Prep Date: December 27, 2016 9:27

Analyte	MDL	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
Volatile Organic Compounds (Continued)									
Methyl-tert-butyl ether (MTBE)	1.40	5.00	ND	1.40	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Surrogate: Dibromofluoromethane		70-130		97.5%			12/27/16	EPA 8260 B	16L0147/HK
Surrogate: Toluene-d8		70-130		94.0%			12/27/16	EPA 8260 B	16L0147/HK
Surrogate: 4-Bromofluorobenzene		70-130		89.0%			12/27/16	EPA 8260 B	16L0147/HK

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Sample Results
(Continued)

Sample: **Self Divert to RP**
1612106-04 (Aqueous)

Sample Type: Grab

Sample Date: December 23, 2016

Prep Date: December 27, 2016 9:42

Analyte	MDL	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
Semi-Volatile Organic Compounds by EPA 8270									
Dimethyl Phthalate	0.6	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Acenaphthene	1.1	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Acenaphthylene	0.2	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Anthracene	0.5	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Benzidine	3.3	20.0	ND	20.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Benzoic Acid	3.2	20.0	ND	20.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Benzo (a) anthracene	0.2	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Benzo (b) fluoranthene	0.5	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Benzo (k) fluoranthene	0.8	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Benzo (g,h,i) perylene	1.3	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Benzo (a) pyrene	0.6	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Benzyl Alcohol	2.1	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Bis (2-chloroethoxy) methane	0.7	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Bis (2-chloroethyl) Ether	0.6	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Bis (2-chloroisopropyl) Ether	2.6	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Bis (2-ethylhexy) Phthalate	0.7	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
4-Bromophenyl Phenyl Ether	0.7	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Butylbenzyl Phthalate	0.8	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
4-Chloroaniline	0.7	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
2-Chloronaphthalene	0.005	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
4-Chlorophenyl Phenyl Ether	0.4	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Chrysene	0.3	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Dibenzo (a,h) anthracene	1.1	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Dibenzofuran	0.3	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Di-n-butyl Phthalate	0.7	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
1,2-Dichlorobenzene	0.7	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
1,3-Dichlorobenzene	0.6	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
1,4-Dichlorobenzene	0.3	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
3,3'-Dichlorobenzidine	0.6	10.0	ND	10.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Sample Results
(Continued)

Sample: **Self Divert to RP (Continued)**
1612106-04 (Aqueous)

Sample Type: Grab

Sample Date: December 23, 2016

Prep Date: December 27, 2016 9:42

Analyte	MDL	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
Semi-Volatile Organic Compounds by EPA 8270 (Continued)									
Diethyl Phthalate	0.9	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
2,4-Dinitrotoluene	1.2	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
2,6-Dinitrotoluene	0.5	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Di-n-octyl Phthalate	0.7	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Fluoranthene	1.3	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Fluorene	0.7	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Hexachlorobenzene	1.2	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Hexachlorobutadiene	0.8	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Hexachlorocyclopentadiene	1.4	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Hexachloroethane	0.01	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Indeno (1,2,3-cd) pyrene	1.1	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Isophorone	0.8	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
2-Methylnaphthalene	0.01	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Naphthalene	0.4	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
2-Nitroaniline	1.1	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
3-Nitroaniline	1.3	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
4-Nitroaniline	0.8	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Nitrobenzene	0.4	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
N-Nitrosodiphenylamine	0.8	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
N-Nitrosodi-n-propylamine	1.7	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Phenanthrene	0.3	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Pyrene	1.2	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
1,2,4-Trichlorobenzene	0.5	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
4-Chloro-3-methylphenol	1.1	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
2-Chlorophenol	0.9	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
2,4-Dichlorophenol	0.4	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
2,4-Dimethylphenol	0.4	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
4,6-Dinitro-2-methylphenol	0.7	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
2,4-Dinitrophenol	2.6	10.0	ND	10.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106

COC Number:

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Sample Results
(Continued)

Sample: **Self Divert to RP (Continued)**
1612106-04 (Aqueous)

Sample Type: Grab

Sample Date: December 23, 2016

Prep Date: December 27, 2016 9:42

Analyte	MDL	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
Semi-Volatile Organic Compounds by EPA 8270 (Continued)									
2-Methylphenol	2.0	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
4-Methylphenol	1.2	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
2-Nitrophenol	0.6	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
4-Nitrophenol	0.9	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Pentachlorophenol	4.1	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Phenol	0.5	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
2,4,5-Trichlorophenol	0.5	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
2,4,6-Trichlorophenol	0.3	5.0	ND	5.0	ug/L	1	12/27/16	EPA 8270C	16L0148/HK
Surrogate: 2-Fluorobiphenyl		32-144		82.5%			12/27/16	EPA 8270C	16L0148/HK
Surrogate: Phenol-d6		5-93		46.7%			12/27/16	EPA 8270C	16L0148/HK
Surrogate: Nitrobenzene-d5		34-141		71.0%			12/27/16	EPA 8270C	16L0148/HK
Surrogate: 2-Fluorophenol		23-92		75.0%			12/27/16	EPA 8270C	16L0148/HK
Surrogate: 2,4,6-Tribromophenol		22-154		96.5%			12/27/16	EPA 8270C	16L0148/HK
Surrogate: p-Terphenyl-d14		28-157		81.3%			12/27/16	EPA 8270C	16L0148/HK

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Sample Results
(Continued)

Sample: **Self Divert to RP**
1612106-05 (Aqueous)

Sample Type: Grab

Sample Date: December 23, 2016

Prep Date: December 27, 2016 9:27

Analyte	MDL	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
Volatile Organic Compounds									
Benzene	0.600	5.00		**8.40**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Bromobenzene	1.90	5.00	ND	1.90	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Methylene Chloride	3.10	20.0	ND	3.10	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Bromochloromethane	0.900	5.00	ND	0.900	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Bromodichloromethane	1.20	5.00	ND	1.20	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Bromoform	1.20	5.00	ND	1.20	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Bromomethane	2.80	5.00	ND	2.80	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
n-Butylbenzene	3.00	5.00	ND	3.00	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
sec-Butylbenzene	1.40	5.00	ND	1.40	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
tert-Butylbenzene	1.40	5.00	ND	1.40	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Carbon Tetrachloride	1.00	5.00	ND	1.00	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Chlorobenzene	1.30	5.00	ND	1.30	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Chloroethane	2.10	5.00	ND	2.10	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Chloroform	1.20	5.00		**7.80**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Chloromethane	3.20	5.00	ND	3.20	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
2-Chlorotoluene	2.20	5.00	ND	2.20	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
4-Chlorotoluene	1.10	5.00	ND	1.10	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Dibromochloromethane	0.800	5.00	ND	0.800	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2-Dibromo-3-chloropropane	2.70	5.00	ND	2.70	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2-Dibromoethane	1.50	5.00	ND	1.50	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Dibromomethane	1.50	5.00	ND	1.50	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2-Dichlorobenzene	1.10	5.00	ND	1.10	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,3-Dichlorobenzene	1.00	5.00	ND	1.00	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,4-Dichlorobenzene	1.00	5.00	ND	1.00	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Dichlorodifluoromethane	2.00	5.00	ND	2.00	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,1-Dichloroethane	1.60	5.00	ND	1.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2-Dichloroethane	2.10	5.00	ND	2.10	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,1-Dichloroethene	2.00	5.00	ND	2.00	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
cis-1,2-Dichloroethene	1.40	5.00	ND	1.40	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Sample Results
(Continued)

Sample: **Self Divert to RP (Continued)**
1612106-05 (Aqueous)

Sample Type: Grab

Sample Date: December 23, 2016

Prep Date: December 27, 2016 9:27

Analyte	MDL	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
Volatile Organic Compounds (Continued)									
trans-1,2-Dichloroethene	1.60	5.00	ND	1.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2-Dichloropropane	1.30	5.00	ND	1.30	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,3-Dichloropropane	0.900	5.00	ND	0.900	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
2,2-Dichloropropane	1.60	5.00	ND	1.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,1-Dichloropropene	1.30	5.00	ND	1.30	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Ethylbenzene	0.800	5.00		**8.70**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Hexachlorobutadiene	4.30	5.00	ND	4.30	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Isopropylbenzene	0.800	5.00		**2.50**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
p-Isopropyltoluene	1.60	5.00	ND	1.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Naphthalene	4.60	5.00	ND	4.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
n-Propylbenzene	1.30	5.00		**5.80**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Styrene	1.40	5.00	ND	1.40	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,1,1,2-Tetrachloroethane	1.00	5.00	ND	1.00	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,1,2,2-Tetrachloroethane	2.30	5.00	ND	2.30	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Tetrachloroethene	1.60	5.00	ND	1.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Toluene	1.20	5.00		**40.6**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2,3-Trichlorobenzene	2.80	5.00	ND	2.80	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2,4-Trichlorobenzene	2.90	5.00	ND	2.90	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,1,1-Trichloroethane	1.60	5.00	ND	1.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,1,2-Trichloroethane	1.20	5.00	ND	1.20	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Trichloroethene	1.60	5.00	ND	1.60	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Trichlorofluoromethane	2.30	5.00	ND	2.30	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2,3-Trichloropropane, TCP	2.50	5.00	ND	2.50	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,2,4-Trimethylbenzene	3.00	5.00		**54.4**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
1,3,5-Trimethylbenzene	2.00	5.00		**13.7**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Vinyl Chloride	2.70	5.00	ND	2.70	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
o-Xylene	1.60	5.00		**15.2**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
m,p-Xylenes	3.00	10.0		**31.4**	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
cis-1,3-Dichloropropene	1.20	5.00	ND	1.20	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
trans-1,3-Dichloropropene	0.900	5.00	ND	0.900	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106

COC Number:

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Sample Results
(Continued)

Sample: **Self Divert to RP (Continued)**
1612106-05 (Aqueous)

Sample Type: Grab

Sample Date: December 23, 2016

Prep Date: December 27, 2016 9:27

Analyte	MDL	Reporting Limit	Qual	Result	Unit	Dilution Factor	Date Analyzed	Method	Batch/ Analyst
Volatile Organic Compounds (Continued)									
Methyl-tert-butyl ether (MTBE)	1.40	5.00	ND	1.40	ug/L	10	12/27/16	EPA 8260 B	16L0147/HK
Surrogate: Dibromofluoromethane		70-130		99.0%			12/27/16	EPA 8260 B	16L0147/HK
Surrogate: Toluene-d8		70-130		93.0%			12/27/16	EPA 8260 B	16L0147/HK
Surrogate: 4-Bromofluorobenzene		70-130		83.5%			12/27/16	EPA 8260 B	16L0147/HK

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106

COC Number:

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Quality Control

Volatile Organic Compounds

Prepared & Analyzed: Dec-27-16

Analyte	Source Result	Result	Qual	Reporting Limit	Unit	Spike Level	% REC	%REC Limits	RPD	RPD Limit
Batch: 16L0147										**Analyst:** HK
Blank (16L0147-BLK1)										
Benzene		**ND**		0.500	ug/L					
Methylene Chloride		**ND**		2.00	ug/L					
Bromobenzene		**ND**		0.500	ug/L					
Bromochloromethane		**ND**		0.500	ug/L					
Bromodichloromethane		**ND**		0.500	ug/L					
Bromoform		**ND**		0.500	ug/L					
Bromomethane		**ND**		0.500	ug/L					
n-Butylbenzene		**ND**		0.500	ug/L					
sec-Butylbenzene		**ND**		0.500	ug/L					
tert-Butylbenzene		**ND**		0.500	ug/L					
Carbon Tetrachloride		**ND**		0.500	ug/L					
Chlorobenzene		**ND**		0.500	ug/L					
Chloroethane		**ND**		0.500	ug/L					
Chloroform		**ND**		0.500	ug/L					
Chloromethane		**ND**		0.500	ug/L					
2-Chlorotoluene		**ND**		0.500	ug/L					
4-Chlorotoluene		**ND**		0.500	ug/L					
Dibromochloromethane		**ND**		0.500	ug/L					
1,2-Dibromo-3-chloropropane		**ND**		0.500	ug/L					
1,2-Dibromoethane		**ND**		0.500	ug/L					
Dibromomethane		**ND**		0.500	ug/L					
1,2-Dichlorobenzene		**ND**		0.500	ug/L					
1,3-Dichlorobenzene		**ND**		0.500	ug/L					
1,4-Dichlorobenzene		**ND**		0.500	ug/L					
Dichlorodifluoromethane		**ND**		0.500	ug/L					
1,1-Dichloroethane		**ND**		0.500	ug/L					
1,2-Dichloroethane		**ND**		0.500	ug/L					
1,1-Dichloroethene		**ND**		0.500	ug/L					
cis-1,2-Dichloroethene		**ND**		0.500	ug/L					
trans-1,2-Dichloroethene		**ND**		0.500	ug/L					
1,2-Dichloropropane		**ND**		0.500	ug/L					
1,3-Dichloropropane		**ND**		0.500	ug/L					
2,2-Dichloropropane		**ND**		0.500	ug/L					
1,1-Dichloropropene		**ND**		0.500	ug/L					
Ethylbenzene		**ND**		0.500	ug/L					
Hexachlorobutadiene		**ND**		0.500	ug/L					

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Quality Control
(Continued)

Volatile Organic Compounds (Continued)

Prepared & Analyzed: Dec-27-16

Analyte	Source Result	Result	Qual	Reporting Limit	Unit	Spike Level	% REC	%REC Limits	RPD	RPD Limit
Batch: 16L0147 (Continued)										**Analyst:** HK
Blank (16L0147-BLK1)										
Isopropylbenzene		**ND**		0.500	ug/L					
p-Isopropyltoluene		**ND**		0.500	ug/L					
Naphthalene		**ND**		0.500	ug/L					
n-Propylbenzene		**ND**		0.500	ug/L					
Styrene		**ND**		0.500	ug/L					
1,1,1,2-Tetrachloroethane		**ND**		0.500	ug/L					
1,1,2,2-Tetrachloroethane		**ND**		0.500	ug/L					
Tetrachloroethene		**ND**		0.500	ug/L					
Toluene		**ND**		0.500	ug/L					
1,2,3-Trichlorobenzene		**ND**		0.500	ug/L					
1,2,4-Trichlorobenzene		**ND**		0.500	ug/L					
1,1,1-Trichloroethane		**ND**		0.500	ug/L					
1,1,2-Trichloroethane		**ND**		0.500	ug/L					
Trichloroethene		**ND**		0.500	ug/L					
Trichlorofluoromethane		**ND**		0.500	ug/L					
1,2,3-Trichloropropane, TCP		**ND**		0.500	ug/L					
1,2,4-Trimethylbenzene		**ND**		0.500	ug/L					
1,3,5-Trimethylbenzene		**ND**		0.500	ug/L					
Vinyl Chloride		**ND**		0.500	ug/L					
o-Xylene		**ND**		0.500	ug/L					
m,p-Xylenes		**ND**		1.00	ug/L					
cis-1,3-Dichloropropene		**ND**		0.500	ug/L					
trans-1,3-Dichloropropene		**ND**		0.500	ug/L					
Methyl-tert-butyl ether (MTBE)		**ND**		0.500	ug/L					
Surrogate: Dibromofluoromethane		20.3			ug/L	20.0	102	70-130		
Surrogate: Toluene-d8		21.6			ug/L	20.0	108	70-130		
Surrogate: 4-Bromofluorobenzene		19.1			ug/L	20.0	95.5	70-130		

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106

COC Number:

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Quality Control
(Continued)

Volatile Organic Compounds (Continued)

Prepared & Analyzed: Dec-27-16

Analyte	Source Result	Result	Qual	Reporting Limit	Unit	Spike Level	% REC	%REC Limits	RPD	RPD Limit
Batch: 16L0147 (Continued)										**Analyst:** HK
LCS (16L0147-BS1)										
Benzene		**18.1**		0.500	ug/L	20.0	90.5	80-120		
Chlorobenzene		**18.1**		0.500	ug/L	20.0	90.5	80-120		
1,1-Dichloroethene		**16.7**		0.500	ug/L	20.0	83.5	80-120		
Toluene		**17.6**		0.500	ug/L	20.0	88.0	80-120		
Trichloroethene		**18.3**		0.500	ug/L	20.0	91.5	80-120		
Surrogate: Dibromofluoromethane		19.8			ug/L	20.0	99.0	70-130		
Surrogate: Toluene-d8		21.3			ug/L	20.0	106	70-130		
Surrogate: 4-Bromofluorobenzene		21.1			ug/L	20.0	106	70-130		

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106

COC Number:

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Quality Control
(Continued)

Semi-Volatile Organic Compounds by EPA 8270

Prepared & Analyzed: Dec-27-16

Analyte	Source Result	Result	Qual	Reporting Limit	Unit	Spike Level	% REC	%REC Limits	RPD	RPD Limit
Batch: 16L0148										**Analyst:** HK
Blank (16L0148-BLK1)										
Dimethyl Phthalate		ND		5.0	ug/L					
Acenaphthene		ND		5.0	ug/L					
Acenaphthylene		ND		5.0	ug/L					
Anthracene		ND		5.0	ug/L					
Benzidine		ND		20.0	ug/L					
Benzoic Acid		ND		20.0	ug/L					
Benzo (a) anthracene		ND		5.0	ug/L					
Benzo (b) fluoranthene		ND		5.0	ug/L					
Benzo (k) fluoranthene		ND		5.0	ug/L					
Benzo (g,h,i) perylene		ND		5.0	ug/L					
Benzo (a) pyrene		ND		5.0	ug/L					
Benzyl Alcohol		ND		5.0	ug/L					
Bis (2-chloroethoxy) methane		ND		5.0	ug/L					
Bis (2-chloroethyl) Ether		ND		5.0	ug/L					
Bis (2-chloroisopropyl) Ether		ND		5.0	ug/L					
Bis (2-ethylhexy) Phthalate		ND		5.0	ug/L					
4-Bromophenyl Phenyl Ether		ND		5.0	ug/L					
Butylbenzyl Phthalate		ND		5.0	ug/L					
4-Chloroaniline		ND		5.0	ug/L					
2-Chloronaphthalene		ND		5.0	ug/L					
4-Chlorophenyl Phenyl Ether		ND		5.0	ug/L					
Chrysene		ND		5.0	ug/L					
Dibenzo (a,h) anthracene		ND		5.0	ug/L					
Dibenzofuran		ND		5.0	ug/L					
Di-n-butyl Phthalate		ND		5.0	ug/L					
1,2-Dichlorobenzene		ND		5.0	ug/L					
1,3-Dichlorobenzene		ND		5.0	ug/L					
1,4-Dichlorobenzene		ND		5.0	ug/L					
3,3'-Dichlorobenzidine		ND		10.0	ug/L					
Diethyl Phthalate		ND		5.0	ug/L					
2,4-Dinitrotoluene		ND		5.0	ug/L					
2,6-Dinitrotoluene		ND		5.0	ug/L					
Di-n-octyl Phthalate		ND		5.0	ug/L					
Fluoranthene		ND		5.0	ug/L					
Fluorene		ND		5.0	ug/L					
Hexachlorobenzene		ND		5.0	ug/L					

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Quality Control
(Continued)

Semi-Volatile Organic Compounds by EPA 8270 (Continued **Prepared & Analyzed: Dec-27-16**

Analyte	Source Result	Result	Qual	Reporting Limit	Unit	Spike Level	% REC	%REC Limits	RPD	RPD Limit
Batch: 16L0148 (Continued)										**Analyst:** HK
Blank (16L0148-BLK1)										
Hexachlorobutadiene		**ND**		5.0	ug/L					
Hexachlorocyclopentadiene		**ND**		5.0	ug/L					
Hexachloroethane		**ND**		5.0	ug/L					
Indeno (1,2,3-cd) pyrene		**ND**		5.0	ug/L					
Isophorone		**ND**		5.0	ug/L					
2-Methylnaphthalene		**ND**		5.0	ug/L					
Naphthalene		**ND**		5.0	ug/L					
2-Nitroaniline		**ND**		5.0	ug/L					
3-Nitroaniline		**ND**		5.0	ug/L					
4-Nitroaniline		**ND**		5.0	ug/L					
Nitrobenzene		**ND**		5.0	ug/L					
N-Nitrosodiphenylamine		**ND**		5.0	ug/L					
N-Nitrosodi-n-propylamine		**ND**		5.0	ug/L					
Phenanthrene		**ND**		5.0	ug/L					
Pyrene		**ND**		5.0	ug/L					
1,2,4-Trichlorobenzene		**ND**		5.0	ug/L					
4-Chloro-3-methylphenol		**ND**		5.0	ug/L					
2-Chlorophenol		**ND**		5.0	ug/L					
2,4-Dichlorophenol		**ND**		5.0	ug/L					
2,4-Dimethylphenol		**ND**		5.0	ug/L					
4,6-Dinitro-2-methylphenol		**ND**		5.0	ug/L					
2,4-Dinitrophenol		**ND**		10.0	ug/L					
2-Methylphenol		**ND**		5.0	ug/L					
4-Methylphenol		**ND**		5.0	ug/L					
2-Nitrophenol		**ND**		5.0	ug/L					
4-Nitrophenol		**ND**		5.0	ug/L					
Pentachlorophenol		**ND**		5.0	ug/L					
Phenol		**ND**		5.0	ug/L					
2,4,5-Trichlorophenol		**ND**		5.0	ug/L					
2,4,6-Trichlorophenol		**ND**		5.0	ug/L					
Surrogate: 2-Fluorobiphenyl		105			ug/L	100	105	32-144		
Surrogate: Phenol-d6		116			ug/L	200	58.0	5-93		
Surrogate: Nitrobenzene-d5		93.7			ug/L	100	93.7	34-141		
Surrogate: 2-Fluorophenol		116			ug/L	200	58.0	23-92		
Surrogate: 2,4,6-Tribromophenol		115			ug/L	200	57.5	22-154		
Surrogate: p-Terphenyl-d14		95.4			ug/L	100	95.4	28-157		

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106 **COC Number:**

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Quality Control
(Continued)

Semi-Volatile Organic Compounds by EPA 8270 (Continued

Prepared & Analyzed: Dec-27-16

Analyte	Source Result	Result	Qual	Reporting Limit	Unit	Spike Level	% REC	%REC Limits	RPD	RPD Limit
Batch: 16L0148 (Continued)										**Analyst:** HK
LCS (16L0148-BS1)										
Acenaphthene		**49.5**		5.0	ug/L	50.0	99.0	31-123		
1,4-Dichlorobenzene		**38.7**		5.0	ug/L	50.0	77.4	26-113		
2,4-Dinitrotoluene		**36.9**		5.0	ug/L	50.0	73.8	34-128		
N-Nitrosodi-n-propylamine		**31.8**		5.0	ug/L	50.0	63.6	30-139		
Pyrene		**28.5**		5.0	ug/L	50.0	57.0	27-136		
1,2,4-Trichlorobenzene		**36.3**		5.0	ug/L	50.0	72.6	29-105		
4-Chloro-3-methylphenol		**45.5**		5.0	ug/L	50.0	91.0	28-125		
2-Chlorophenol		**35.6**		5.0	ug/L	50.0	71.2	29-104		
4-Nitrophenol		**37.7**		5.0	ug/L	50.0	75.4	0.4-90		
Pentachlorophenol		**34.1**		5.0	ug/L	50.0	68.2	1-165		
Phenol		**17.1**		5.0	ug/L	50.0	34.2	1-90		
Surrogate: 2-Fluorobiphenyl		98.6			ug/L	100	98.6	32-144		
Surrogate: Phenol-d6		136			ug/L	200	68.0	5-93		
Surrogate: Nitrobenzene-d5		83.0			ug/L	100	83.0	33-141		
Surrogate: 2-Fluorophenol		136			ug/L	200	68.0	23-92		
Surrogate: 2,4,6-Tribromophenol		180			ug/L	200	90.0	22-154		
Surrogate: p-Terphenyl-d14		101			ug/L	100	101	28-157		

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

WORK ORDER: 1612106

COC Number:

Valero
3400 East Second St
Benicia, CA 94510

Project: Valero NESHAP
PO Number: 4503499083
Project Manager: Kimberly Ronan
Project #: [none]

Notes and Definitions

Item	Definition
Dry	Sample results reported on a dry weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.
%REC	Percent Recovery
DF	Dilution Factor
LCS	Lab Control Sample
LCSD	Lab Control Sample Duplicate
MDL	Minimum Detection Limit
MRL	Minimum Reporting Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

685 Stone Road #11 & 12 • Benicia, CA 94510 • (707) 747-6081 • (800) 747-6082 • Fax (707) 747-6082

Valero Benicia Refinery
Bioassay Laboratory Chain of Custody

1612206

Sample Destination: Delta

LabCode: D 16-350

Date: 23-Dec-16

Report Results To: Kimberly.Ronan@valero.com
Marisol.Pacheco-Mendez@Valero.com

Phone:

Fax 1:

e-mail : David.Johnston@Valero.com

Fax 2:

PO# Delta (non-NPDES) 4503523772-10

Cost Center 7319 417190

Sample Notes or Special Instructions

#	Sample ID	Turn Around	Sample Size	# of Samples	Date	Time	GRAB	COMP	Preserve	Temp.	Total Se 200.7	Oil & Grease EPA 1664	NH3 as N SM 4500 -NH3	CA 17 Metals EPA 200.7	Chronic *Mysidopsis bahia*	Benzene 8020	EOL Benzene (EPA 8260)	TOC - SM5310		EPA 8260	EPA 8270					
											Testing Requested															
1	Self Divert to RP	48 hrs	1L	2	15-Dec	3:20 PM	☑	☐	None	4.0											X					
2	Self Divert to RP	48 hrs	VOA	3	15-Dec	3:20 PM	☑	☐	HCl	4.0										X						
3	Self Divert to RP	48 hrs	VOA	3	16-Dec	12:01 AM	☑	☐	HCl	4.0										X						
4	Self Divert to RP	48 hrs	1L	2	23-Dec	7:30 AM	☐	☐	HCl	4.0											X					
5	Self Divert to RP	48 hrs	VOA	3	23-Dec	7:30 AM	☐	☐	HCl	4.0										X						
6							☐	☐																		
7							☐	☐																		
8							☐	☐																		
9							☐	☐																		

Samples Prepared By: [signature] 12/23/16 0530 Date/Time — D Johnston Print Name

Relinquished By: [signature] 12/23/16 1045 Date/Time — Received By: Chelsea Feeney 12/23/16 11:00 Date / Time

Delta Self Diversion 12-23-16

ED_001593_00015731

To: Lin, Sharon[Lin.Sharon@epa.gov]; Schofield, John[Schofield.John@epa.gov]
Cc: gordon.johnson@shell.com[gordon.johnson@shell.com]; michael.monson@shell.com[michael.monson@shell.com]
From: michael.monson@shell.com
Sent: Fri 12/30/2016 11:18:16 PM
Subject: Shell Martinez Notice of Violation

Sharon & John,

Unfortunately, I don't have an e-mail address for Douglas McDaniel, so please forward as necessary. Due to the date of the arrival of the report, with key personnel being on vacation the last 2 weeks of December as well as the first week of January, we would like to request an extension to the 30 day limit mentioned in the report.

I will be out of the office next week, so if there is a more formalized process to request and receive an extension, please reply to Gordon Johnson.

Thanks,

Michael Monson

Staff Engineer – Environmental (Waste)

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

To: aarora@dtsc.ca.gov[aarora@dtsc.ca.gov]
Cc: Lin, Sharon[Lin.Sharon@epa.gov]; michael.monson@shell.com[michael.monson@shell.com]
From: michael.monson@shell.com
Sent: Thur 8/6/2015 5:58:45 PM
Subject: 2011 SB-14 Files
Hazardous Waste Management Performance Report.pdf
SB-14 Waste Minimization Plan Introduction.pdf
Source Reduction, Evaluation & Plan.pdf
Summary Progress Report.pdf

Asha,

See attached SB-14 report files. Included are the:

- Introduction (not required)
- Source Reduction Evaluation Review and Plan (Plan)
- Hazardous Waste Management Performance Report (Report)
- Summary Progress Report (SPR)

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

2011 SB-14 HAZARDOUS WASTE SOURCE REDUCTION & MANAGEMENT REVIEW

SHELL OIL PRODUCTS US
MARTINEZ REFINERY

HAZARDOUS WASTE MANAGEMENT PERFORMANCE REPORT

TABLE OF CONTENTS

SECTION

1.0 General Facility Information

2.0 Hazardous Waste Generation Data

3.0 Current Waste Management Approaches and Effects

4.0 Factors Affecting Major Waste Streams

5.0 Technical and Financial Certification

HAZARDOUS WASTE MANAGEMENT PERFORMANCE REPORT

SHELL OIL PRODUCTS US
MARTINEZ REFINERY

Section 1.0 – General Facility Information

SB-14 General Facility Information Requirements specified in 22 CCR Section 67100.5 (a) – (g)

67100 (a) Name and Location of the Site

Shell Oil Products US, Martinez Refinery
Contra Costa County
3485 Pacheco Boulevard
Martinez, CA 94553

EPA I.D. No. CAD 009 164 021
Facility Contact Phone Number: (925) 313-5516

67100 (b) Four digit SIC code Applicable to Site

2911 Petroleum Refining

Additional facility information is included in Section 1.0 of the Source Reduction Evaluation, Review and Plan that precedes this Report.

HAZARDOUS WASTE MANAGEMENT PERFORMANCE REPORT

SHELL OIL PRODUCTS US
MARTINEZ REFINERY

Section 2.0 – Hazardous Waste Generation Data

In this section, hazardous waste generation and management practices for the routinely generated major hazardous waste streams identified in 2006 (baseline year) are compared to those in 2010 (reporting year). Table 2-A provides a breakdown of major waste streams with a description of how these waste streams are managed. Information presented in the attached table complies with report requirements specified in 22 CCR 67100.8(a)(3)(A).

All three major waste streams applicable to the SB-14 program are generated at SMR's effluent treatment plant. A simplified flow diagram of SMR's effluent treatment plant is presented in Figure 3 of Section 3 in the Source Reduction Evaluation, Review and Plan. Locations of each major wastestream are highlighted in yellow on the flow diagram.

TABLE 2-A

2006 vs 2010 MAJOR HAZARDOUS WASTE STREAM GENERATION AND MANAGEMENT

MAJOR WASTE STREAM	MANAGEMENT PRACTICE	Baseline Year 2006 Weight, lbs	Reporting Year 2010 Weight, lbs
Process Wastewater to ETP-2 Biotreater (CWC 134)	On-Site Treatment	4.451×10^9	4.482×10^9 *
	On-Site Recycle	0	
	Off-Site Recycle	0	
	Off-Site Disposal	0	
	Total	4.451×10^9	4.482×10^9 *
Oil/Water Separator Sludge – DNF Float	On-Site Treatment	28,545,700	32,108,700
	On-Site Recycle	0	0
	Off-Site Recycle	0	0
	Off-Site Disposal	0	0
	Total	28,545,700	32,108,700
Selenium Precipitaion Unit (SPU) Filter Cake	On-Site Treatment	0	0
	On-Site Recycle	0	0
	Off-Site Recycle	0	0
	Off-Site Disposal	14,168,950	16,042,500
	Total	14,168,950	16,042,500

Note: This amount excludes the non-hazardous wastewater that was diverted to ETP-2 Biotreater in 2010 (see explanation below). The total non-hazardous and hazardous wastewater streams processed in ETP-2 Biotreater in 2010 was 6.223×10^9 lbs.

Section 2.1 - Category A: Comparison of Baseline and Reporting Year Data

Process Wastewater to ETP-2 Biotreater (CWC 134)

Process water that enters the SMR effluent treatment plant contains varying degrees of oil and solids as well as other organic and inorganic contaminants. Wastewater treatment units employed at SMR, including the American Petroleum Institute (API) oil/water separator and the Dissolved Nitrogen Flotation (DNF) units are designed to separate oil, water, and solids fractions resulting in significant oil recovery. Recovered oil is combined with normal refinery process streams to produce refined products. As such, wastewater and the units that are part of the system used for the recovery of oil from oil-bearing materials are

exempt from hazardous waste and SB-14 regulation. The specific wastestream addressed in this section is wastewater downstream of the DNF unit, i.e., following the recovery of oil, that is hazardous due to benzene concentrations exceeding 0.5 mg/l TCLP.

Under Permit-By-Rule, approximately 1.5 million gallons per day of process water that may at times contain greater than 0.5 mg/l (TCLP) benzene is biologically treated in the ETP-2 Biotreater and subsequently discharged under the facility's NPDES permit following further treatment.

The amount reported in Table 2-A on the previous page for hazardous process wastewater to ETP-2 Biotreater is calculated excluding the non-hazardous waste water stream that was diverted from ETP-1 biotreater to ETP-2 Biotreater during the first five months of 2010. The reason for the diversion of a portion of the ETP-1 feed is due to the plant upset in one of the major process units in the refinery, namely the Flexicoker Unit. *The process wastewater from the Flexicoker is non-hazardous and is normally lined up to go to ETP-1.* However, due to the unit upset, there was an elevated amount of solids from the Flexicoker entrained in the process wastewater. A heavy solid loading would have killed the "bugs" in ETP-1 Biotreater that would have resulted in an adverse effect on ETP-1 Biotreater's ability to treat the wastewater for organics. In order to prevent this from happening, the process wastewater from the Flexicoker was diverted to the ETP-2 treatment train until the conditions at the Flexicoker had stabilized and returned to normal. Corrective actions have been taken by the refinery to prevent the re-occurrence of such an upset.

SMR believes that the calculated ETP-2 biotreater feed minus the diverted stream from ETP-1 is a more accurate representation of hazardous wastewater streams for Category A. Below is a summary of the Process Wastewater to ETP-2 Biotreater for the period between the baseline year 2006 and reporting year 2010:

Calendar Year	**Process Wastewater to ETP-2 Biotreater Weight, lbs**
2007	4.517×10^9
2008	4.998×10^9
2009	4.331×10^9
3-Year Average	4.615×10^9

The above table shows that the Process Wastewater to ETP-2 Biotreater ranges from 4.3×10^9 to 5.0×10^9 lbs in the previous years with a decline in 2009. The calculated amount for the ETP-2 Bioteater of 4.482×10^9 lbs is consistent with historical volume for this waste stream.

Section 2.2 – Category B: Comparison of Baseline and Reporting Year Data

Oil/Water Separator Sludge-DNF Float (CWC 222)

DNF Float is a listed hazardous waste that carries the RCRA waste code K048. The waste is generated during the oil/water separation process. Fine nitrogen bubbles are dispersed in a column of wastewater to facilitate the separation of oil from the water by driving the oil (and associated particulates) to the surface where they can be skimmed off.

The amount of DNF generated in 2010 that was previously reported in SMR's Annual Facility Report to the Department of Toxic Substances Control was 24,081 tons. However, closer review of available data indicate that the meter for the DNF float was reading approximately 1.5 higher than actual flow. The corrected DNF float generated for 2010 is 32,108,700 lbs (16,054 tons). Based on this corrected amount, DNF Float increased by approximately 13% from baseline year 2006 to reporting year 2010. As explained in the previous pages for Process Wastewater to ETP-2 Biotreater, the upset in the Flexicoker caused elevated levels of Flexicoker solids carry-over in the process wastewater resulting in an increase in the DNF float generated in the reporting year. However, since this wastestream is treated on-site in SMR's CO Boilers, this increase in DNF Float has a smaller effect on total quantities of waste shipped offsite. Waste management strategies targeted at minimizing the generation of this waste stream is discussed in Section 3 of this report.

In contrast to the DNF float that rises to the surface and is skimmed off, oily solids (sludge) that settle out in the API treatment process and other oil-bearing materials are processed on-site in the delayed coker for oil recovery. This recycle activity has eliminated the need to ship these oily sludges off-site for disposal.

Selenium Precipitation Unit (SPU) Filter Cake (CWC 181)

Comparison of baseline year 2006 and reporting year 2010 values for the generation of SPU Filter Cake shows an increase of approximately 13%. This increase in waste generation between the baseline year and reporting year is consistent with the increase observed in the DNF float which is predominantly due to the elevated levels of Flexicoker solids carry-over in the process wastewater.

SPU filter cake comprised over 65% of all hazardous waste **shipped offsite** in 2010 making this the largest hazardous waste stream generated at SMR for offsite disposal. The filter cake is generated in the SMR Effluent Treatment Plant

in the Selenium Precipitation Unit (SPU). The SPU removes soluble selenium from SMR's wastewater using a ferric chloride co-precipitation process. This selenium removal process is required to comply with SMR's NPDES permit. The filter cake is a non-RCRA, California hazardous waste due to concentrations of selenium and vanadium exceeding the California hazardous waste criteria.

It has been a challenge to find offsite recycling or re-use applications of this waste stream. However, SMR continues our efforts to investigate potential beneficial use of this wastestream.

HAZARDOUS WASTE MANAGEMENT PERFORMANCE REPORT

SHELL OIL PRODUCTS US
MARTINEZ REFINERY

Section 3.0 – Current Management Approaches

This section describes SMR's waste minimization program and current hazardous waste management approaches. A copy of Shell's Corporate Position of Waste Management is included as Attachment 3. This statement emphasizes the importance of responsible decision–making and requires pursuing waste management options that includes waste minimization.

Other administrative waste management approaches include the designation of Environmental Focal Points for each of the refinery operating areas and incentive awards for environmental awareness. The environmental focal points serve as environmental ambassadors at the operating level. Each focal point person receives specialized hazardous waste management training and serves as a go-to person for operators as well as contractors to answer questions, resolve waste handling issues, and assure that hazardous and non-hazardous wastes and recyclables are managed properly.

Section 3.1 – Management Approaches for 2010 Major Wastestreams

PROCESS WATER TO ETP-2 BIOTREATER (CWC 134)

The following measures were selected to reduce the generation of Process Water to ETP-2 Biotreater:

1) Operational Changes

In 1995, SMR installed a second Effluent Treatment Plant (ETP-2) to facilitate treatment of additional water volumes generated from the newly constructed Clean Fuels Units. The new ETP-2 treatment systems runs parallel to the ETP-1 treatment train. Effluent from the two treatment systems are combined and undergo further treatment in the Selenium Precipitation Unit and Granular Activated Carbon columns prior to final discharge under the NPDES permit.

SMR has segregated benzene-containing streams into this ETP-2 treatment train in order to treat the benzene in the aeration tank, which is a permitted hazardous waste treatment unit. This segregation has effectively reduced the volume of this waste stream from 1995 levels by nearly 50%. This reduction is a significant waste minimization accomplishment. SMR continues to identify wastestreams

that can potentially be diverted from the ETP-2 to the ETP-1 treatment train, thereby reducing the overall volume of this hazardous waste stream.

Other management approaches that effect the generation of hazardous process water are water reuse efforts in the refinery and reduction of oil discharges to the sewer.

Minimizing unnecessary discharges of any material to process sewers is a significant aspect of source reduction relating to process wastewater. Two management strategies targeting water reuse have been implemented that result in significant wastewater volume reductions.

(1) SMR has implemented a source reduction effort for hydrotesting tanks and other pieces of equipment by returning the hydrotest water back to the sourcewater system instead of draining it into process sewers wherever practical.

(2) Historically, the source of water used for hydrotesting equipment and tanks came from the refinery's fresh raw water supply. In certain circumstance, fresh water can be substituted with treated refinery wastewater as a source of hydrotest water. The volume of water reuse by implementing this measure for one hydrotest event can be as much as 3,000,000 gallons. Not only does this approach reduce the amount of hazardous waste generated at the effluent treatment plant, but it is also a significant water conservation effort.

In addition to reducing the overall volume of wastestreams discharged to process sewers through water reuse activities, SMR has made considerable efforts to reduce the discharge of oil and other process streams to process sewers. This has had the effect of reducing hazardous sludge generation as well as decreasing wastewater toxicity (benzene, metals, etc.).

SMR aggressively implemented numerous capital projects to comply with the requirements established by the Bay Area Air Quality Management District (BAAQMD) for emissions from wastewater collection systems that contain organic compounds (Regulation 8 Rule 8). These projects aimed at eliminating hydrocarbon and hot water sources to the sewer were completed in 2006 through April 2007. The completion of these projects has a direct impact on the reduction of oil discharges to the refinery sewer. Examples of such projects are: equipment modifications, instrumentation improvements, re-piping and re-routing drains from equipment such as surge drums, scrubbers, pumps, compressors, knock-out pots to maintenance drop-out systems (MDOs), to blow-down system or to another vessel, and the retrofit of sample collection systems and analyzers to fast loops.

The installation of sample stations with sample fast loop is one method SMR has implemented to reduce oil discharges. Over 100 fast loop sample stations were installed to reduce the amount of oil and other hydrocarbons to the sewers. In cases where the sample stations were not converted to the fast loop system, the sample stations were retrofitted whereby the purge sample material is collected in containers, transferred to the sample collection system and then returned to the process.

It is estimated that each sample event requires one to five gallons of flush prior to pulling a representative sample. With over 100 fast-loop stations in the refinery and approximately 350 samples taken per day, it is estimated that implementation of this source reduction measure results in a 500-2500 tons reduction in oil and other hydrocarbon material to the sewer each year.

The photographs in next pages show examples of a fast-loop sample station conversion and sample collection systems. These photographs illustrate:

(1) the three-way valve used in returning the hydrocarbon sample back to the process,

(2) a sign located near sample stations describing the correct use of the sample station to assure that operators understand the reason for the fast-loop station and use it correctly. This is an example of an administrative source reduction step.

(3) a sample collection system for cases where the sample stations were not converted to the fast loop system, the sample stations were retrofitted whereby the purge sample material is collected in containers, transferred to the sample collection system and then returned to the process

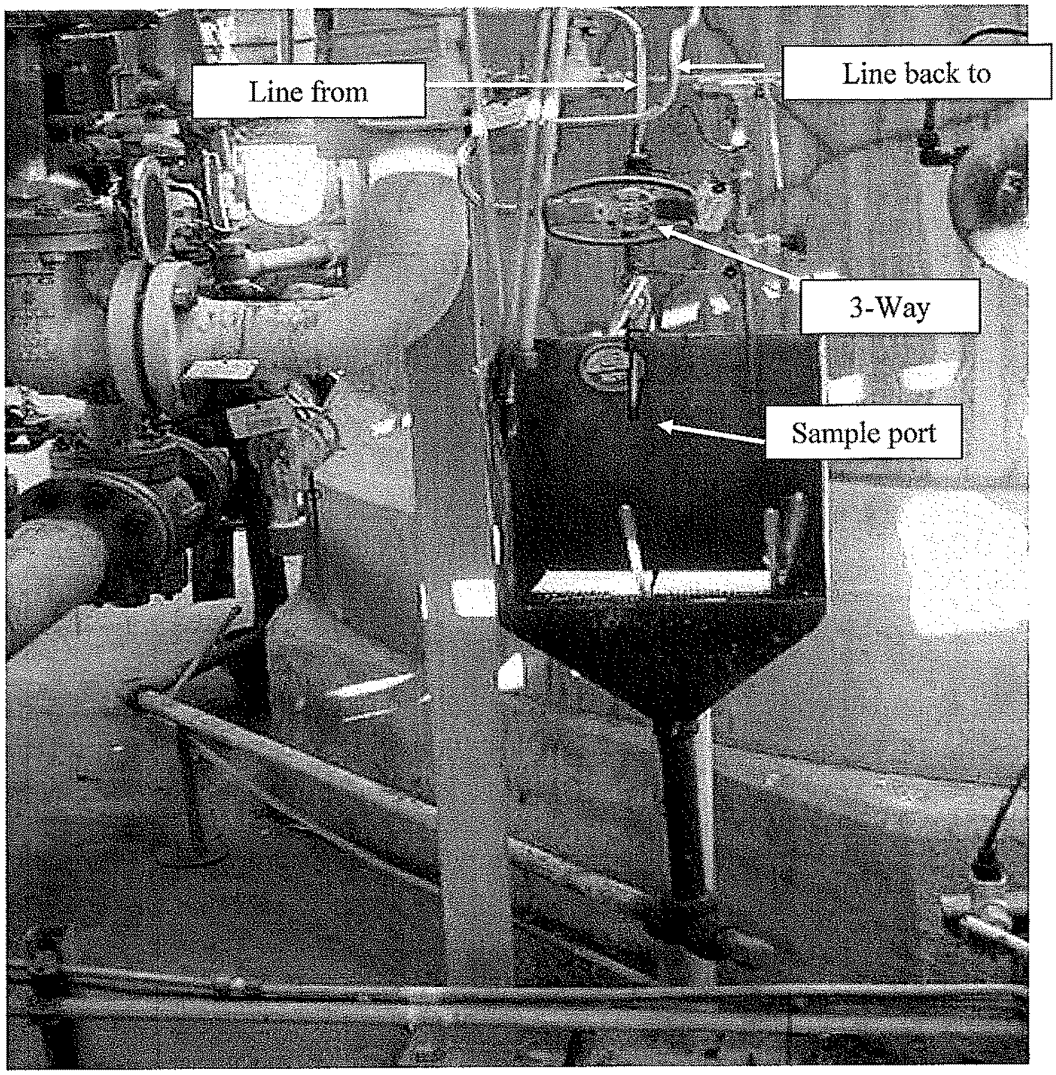


Figure 1: Fast-loop sample station - the three-way valve used in returning the hydrocarbon sample back to the process

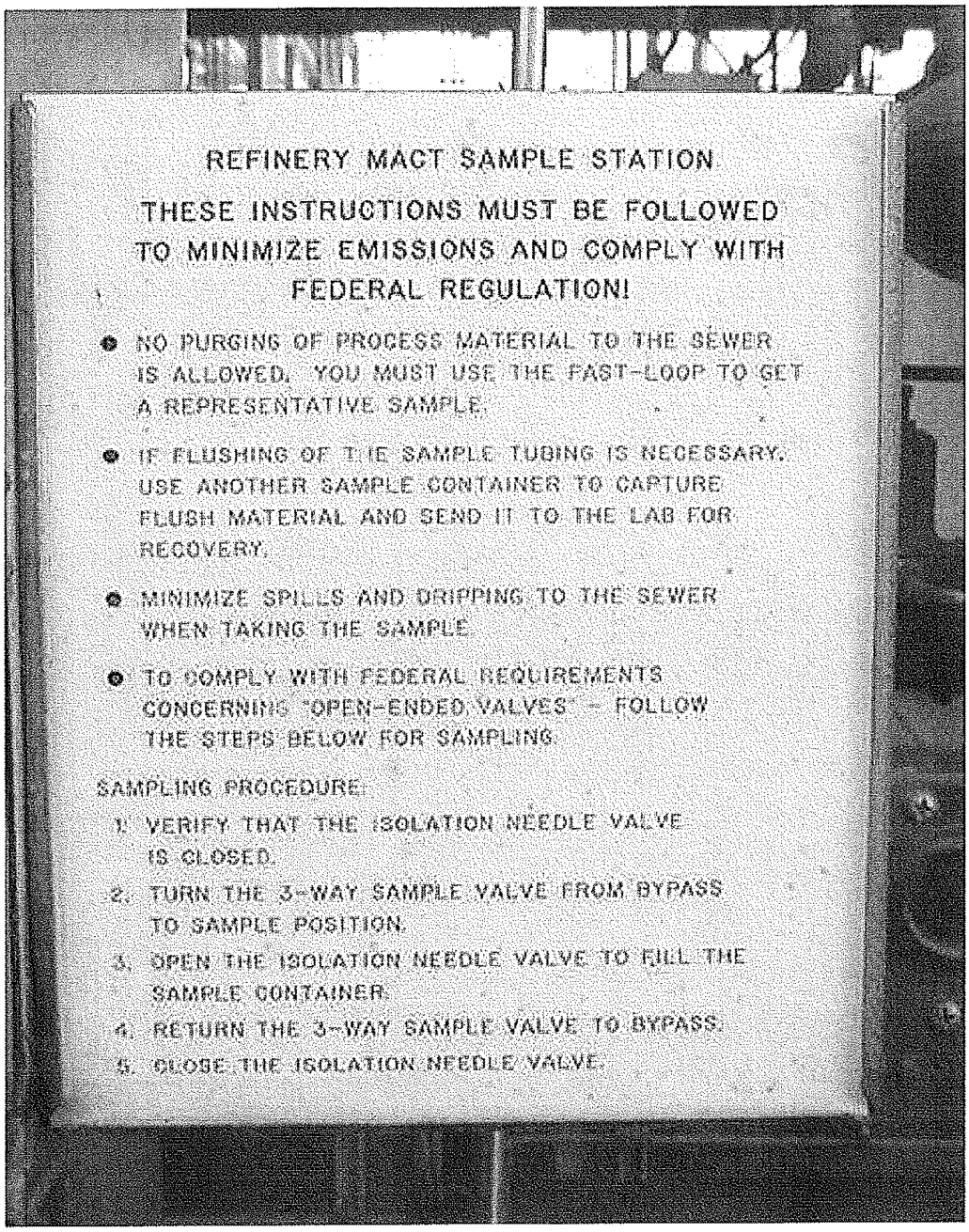
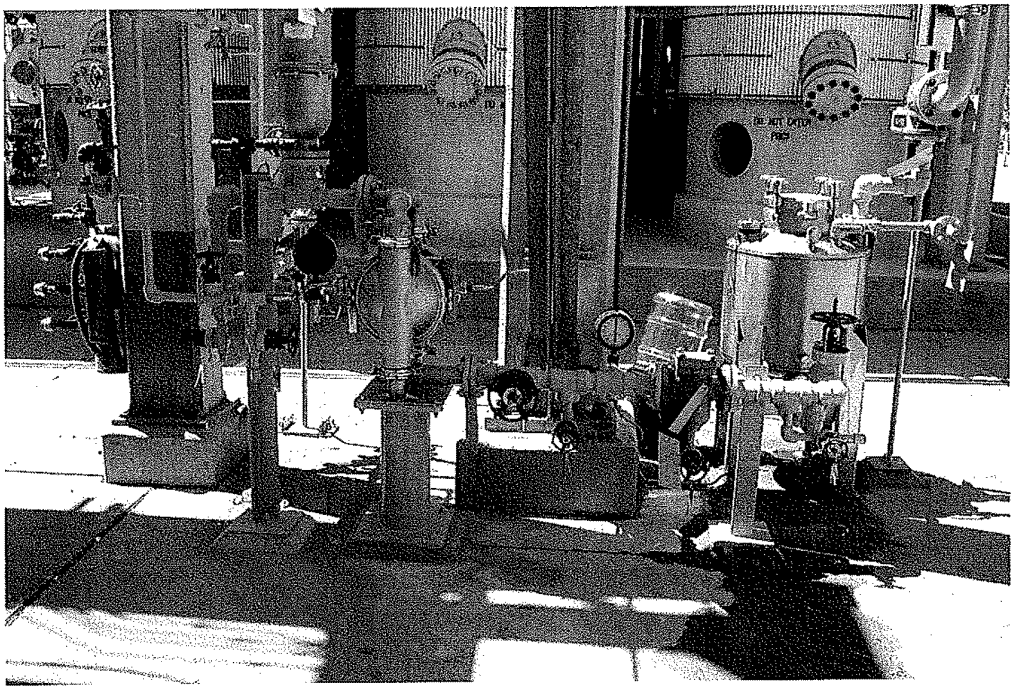
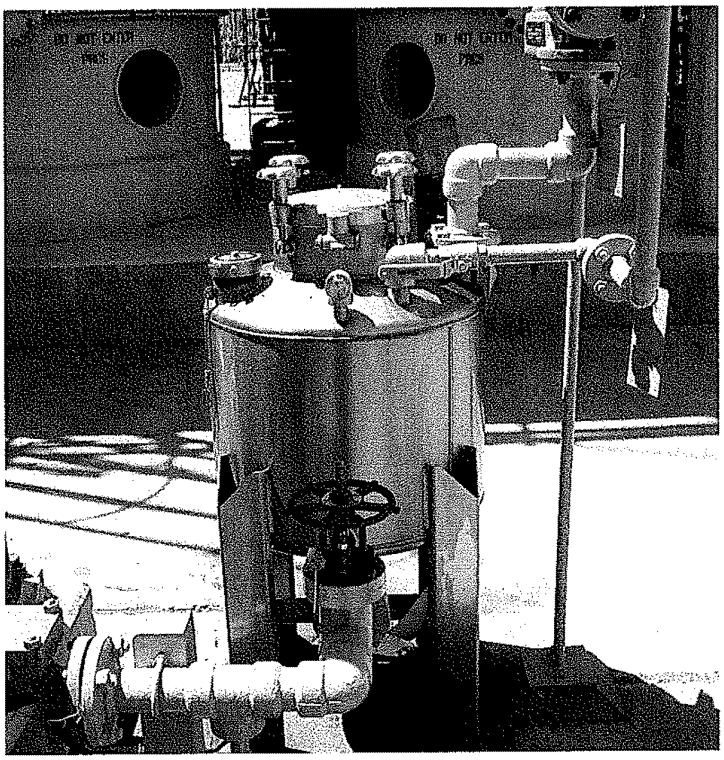


Figure 2: This sign is an example of an administrative source reduction measure. It effectively communicates to the operator the correct procedure for using the equipment as well as the regulatory and environmental basis for the sample station modification.





Figures 3 and 4: Sample Collection System

2) Administrative Steps

Administrative steps include internal procedures such as Environmental Procedures EP 2.14 "Wastewater Collection and Separation Systems" and EP 3.1 "Effluent Treatment Plant Source" that are required training modules for all employees whose activities could result in hydrocarbon to the process wastewater system. EP 3.1 clearly states effluent treatment plant source control parameters and instructs operators how to respond to spills or leaks that have the potential to enter the process or storm sewer system.

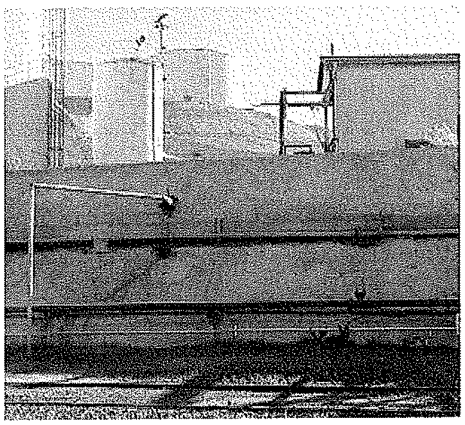
All operators receive environmental training that includes the limitations of the sewer systems and the need to notify appropriate personnel of unusual discharges. The notification and form completion includes information on the quantity and characteristics of the material that was spilled or otherwise discharged to the process sewers and serves two purposes. First, the notification provides effluent treatment plant operators an opportunity to evaluate the potential impact of the material to the effluent treatment plant and to make diversions if necessary. Second, the completion of the form tends to increase a sense of awareness and ownership that is likely to lead to improved housekeeping and an overall reduction in oil and other chemicals in the process sewers.

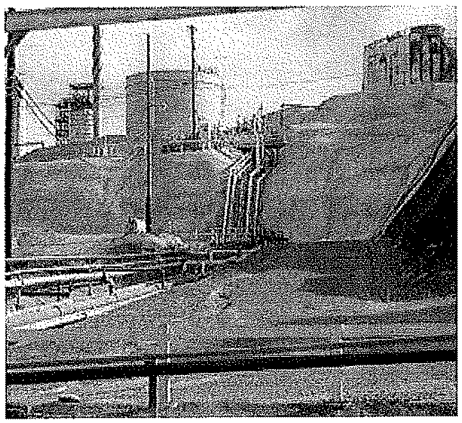
Signs are posted at fast-loop sample stations providing information to operators regarding sampling procedure as well as regulatory and environmental reason for the new sampling station design.

OIL/WATER SEPARATOR SLUDGE – DNF FLOAT (CWC 222)

The following measures were selected for reducing the generation of Oil/Water Separator Sludge:

1) Coating/Guniting/and Curbing
   SMR has spent approximately over $1,000,000 on coating, guniting and curbing areas in the refinery in the past years. Below are some photographs of gunited areas.





2) Street Sweeping Program
   This program has been successfully implemented at SMR and will be a continued program as part of SMR's waste minimization efforts.

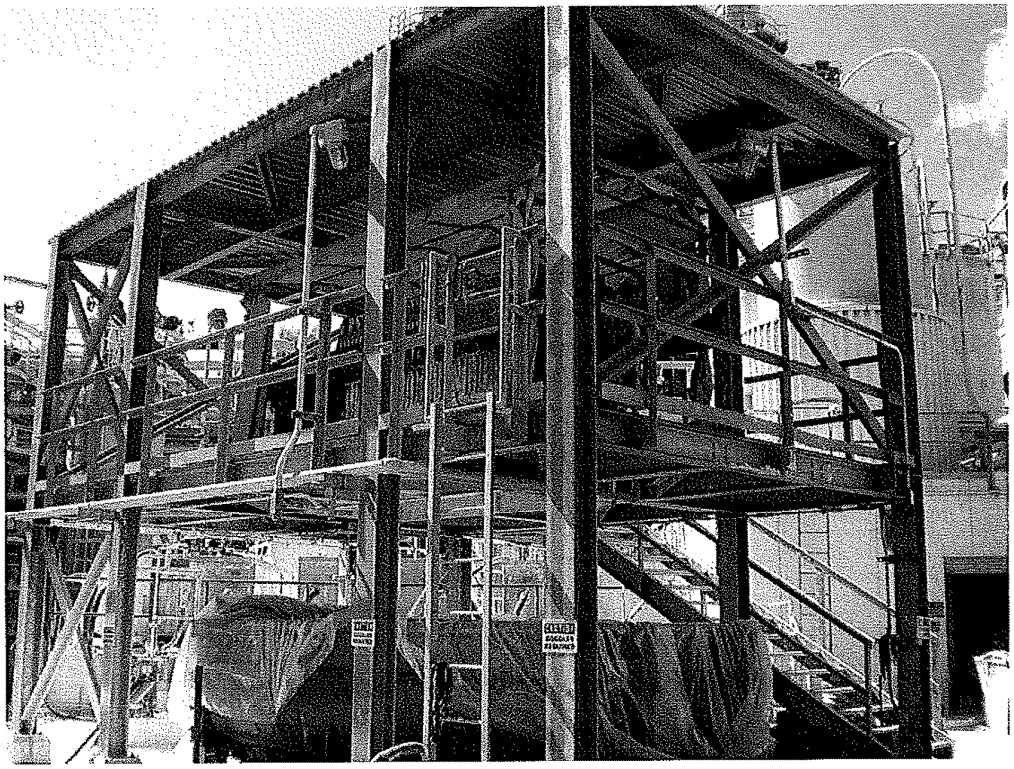
3) Reduce Oil Discharges
   As discussed in the section for the Process Wastewater to ETP-2 Biotreater, SMR aggressively implemented numerous capital projects to comply with the requirements established by the Bay Area Air Quality Management District (BAAQMD) for emissions from wastewater collection systems that contain organic compounds (Regulation 8 Rule 8). These projects aimed at eliminating hydrocarbon and hot water sources to the sewer were completed in 2006 through April 2007. The completion of these projects has a direct impact on the reduction of oil discharges to the refinery sewer. Examples of such projects are: equipment modifications, instrumentation improvements, re-piping and re-routing drains from equipment such as surge drums, scrubbers, pumps, compressors, knock-out pots to maintenance drop-out systems (MDOs), to blow-down system or to another vessel, the retrofit of sample collection systems and analyzers to fast loops.

4) Diverting High Hardness Low BOD Wastewater

SMR conducted studies indicating that precipitation of "hardness" solids, specifically calcium carbonate and magnesium hydroxide, occurs when cooling tower blowdown and other high hardness water is present in refinery wastewater and subject to high pH in the DNF unit. In the presence of oily wastewater, these solids contribute significantly to the formation of DNF Float.

In 2001, SMR implemented a project to divert approximately 600-1000 gpm of high hardness, low BOD wastewater around the DNF and biotreater units to Pond 5C in the effluent treatment plant.

5) Replacement of Filter Press at Utilities Department
The project to replace the filter press at the Hot Process Softener in the Utilities department with a newer filter press was completed in August 2009. This project helped reduce solids carry-over into the sewer system from the Hot Process Softener.



SPU FILTER CAKE (CWC 181)

The following measures were selected to reduce the generation of Selenium Precipitation Filter Cake:

1) Optimize Chemical Usage

The generation of SPU Filter Cake is a result of iron hydroxide precipitation that occurs during the selenium removal chemical process. The goal of this treatment process is to remove selenium from the wastewater to meet NPDES permit limits while minimizing sludge generation and chemical usage. To achieve these goals, SMR conducts weekly analytical testing on selenium concentrations in the feed and effluent of the SPU. Results from these analyses are used to fine-tune the chemical dosage to assure compliance with the facilities NPDES selenium permit limit without overtreating, resulting in unnecessary generation of hazardous waste.

In March 2010, the NPDES effluent permit limits for selenium became more stringent for both the concentration and total mass loading maximum limits. Necessary adjustments to the Selenium Precipitation Unit (SPU) have to be made in order to maintain compliance. SMR continues with our efforts for optimization of chemical usage and operational changes to minimize this waste stream while maintaining compliance with the Refinery's NPDES effluent permit limits.

2) Pursue Recycle Option

As previously mentioned, it has been a challenge to find offsite recycling or re-use applications of this waste stream. However, SMR continues our efforts to investigate potential beneficial use of this wastestream. If successful, recycling this wastestream will divert approximately up to 8,000 tons per year from California hazardous waste landfills.

Section 3.2 – Management Approaches for 2010 Non-Major Wastestreams

SPENT CATALYST

Clearly, one of the most practical and cost effective management approaches for catalyst is maximizing process unit run length. Increasing the length of time that catalyst remains active, i.e, extending the life of the catalyst is a high priority goal for every operating unit using catalyst in their process. Local engineers as well as engineers and chemists at Shell's Westhollow research facility in Houston continue to focus on ways to optimize catalyst performance. Such efforts include research on fresh catalyst reformulation with higher surface area and/or rare earth content to increase catalyst activity. As an example, a project that was completed replaced the catalytic oxidizer with thermal oxidizer. This project eliminated approximately 5,000 lbs of catalyst that needs to be managed routinely.

SMR continues to pursue alternate management methods for spent catalyst to minimize landfill disposal. Preferred management methods include catalyst recycling/regeneration and metals reclamation. Below is a summary of how spent catalyst was managed in 2010:

Recycling or Metals Reclamation:	1,068,521 lbs
Landfill Disposal	376,911 lbs
Incinerated:	24,930 lbs
Total	1,470,362 lbs

As indicated above, almost 73% of spent catalyst was sent for recycling or metals reclamation.

TANK CLEAN-OUT

Tank clean-out sludges in the refinery are currently sent out for off-site disposal. The project mentioned in the PLAN regarding the feasibility of relocating the injection point at the Delayed Coker Unit (DCU) for oil-bearing materials should provide an effective alternate management option for the tank clean-out sludges.

CAT CRACKER REGEN CATALYST

Spent non-hazardous aluminosilicate catalyst is generated continually during the catalytic cracking process. Historical management practices included landfill of this material. SMR recycles >90% of this material averaging

approximately 500 – 1,000 tons per year for use as a raw material in the production of cement.

SPENT ABRASIVES (SANDBLAST GRIT)

SMR began working with a sandblast grit recycling company in 1998. Historically, this waste stream was disposed off-site at a Class 1 hazardous waste landfill. Approximately 300 tons of sandblast grit was recycled in 2010 rather than disposed of in a landfill. In previous years, the amount of spent abrasives sent for recycling ranged from 175-300 tons per year.

RECYCLING PROGRAM

SMR continues our recycling efforts. In 2010, the refinery recycled the following:

Cardboards and other paper products	115,365 lbs
Metal cans	570 lbs

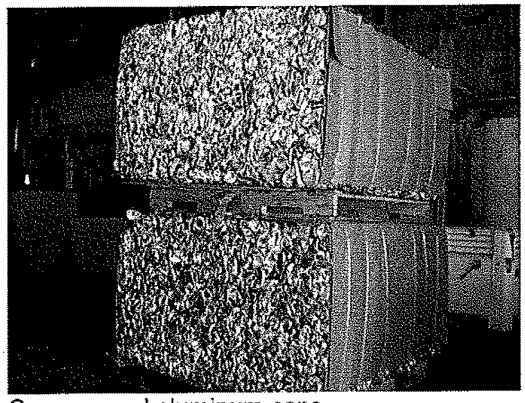
All proceeds from plastics, aluminum and cardboard are donated to local non-profit charitable organizations.

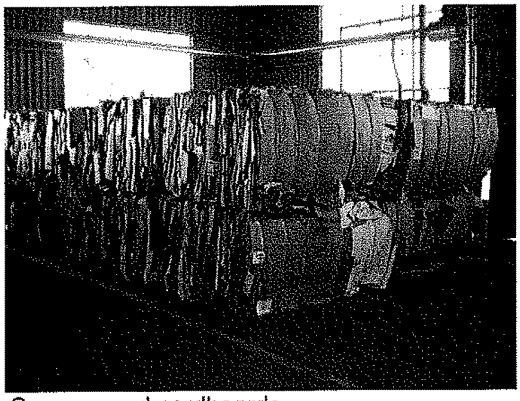
SMR also segregate universal wastes such as batteries, fluorescent bulbs, and electronic wastes. SMR has a staff devoted full-time to managing the recycle center that receives the recyclable materials and the universal wastes.

Furthermore, SMR sends scrap metal to a recycling facility. In 2010, approximately 3,200,000 lbs of scrap metal from the refinery was recycled.

The photographs in the following page highlight some of SMR's recycling activities.

SMR's Recycle Center has full-time staff


Compressed aluminum cans


Compressed cardboards

WASTE ELIMINATION

Through a variety of practices, SMR has accomplished the following in terms of waste elimination:

1. SMR has eliminated all usage of the ozone depleting chemical, freon, from its laboratory procedures.
2. SMR has been a PCB-free facility for many years
3. Nearly all asbestos containing facilities have been removed from SMR. In addition, a phased approach continues to eliminate ALL asbestos gaskets refinery-wide.
4. SMR completed conversion of hydrogen plants HP-1 and HP-2 during the first half of 2007 from use of Sulfinol Solution to MP solution. The use of the MP solution does not produce by-products that have to be disposed as in the case of the sulfinol solution. This conversion eliminates the generation and disposal of sulfinol reclaimer bottoms.

RECLASSIFICATION OF LISTED REFINERY WASTES

Environmental staff personnel at Shell's corporate office continue to work with the American Petroleum Institute (API) and US EPA regarding revisions to the regulatory definition of solid waste. In addition, SMR and Westhollow research facility personnel continue our efforts with vendors for potential re-use of currently listed refinery solids ("K" or "F" wastes) to make products such as asphalt mineral fillers or as valuable fuel, contingent on getting formal concurrence from DTSC and US EPA. The potential re-use of these refinery solids to make products instead of being managed and disposed as hazardous wastes will be a major opportunity for significant waste reductions.

Attachment 3

Sections from

Shell Manufacturing Site Requirements Manual

4. Each site handling barge and/or tanker traffic **shall** have a Marine Terminal Emergency Response Plan that specifies:
   a. The involvement of the site's response personnel and resources in fires or other emergencies aboard barges and/or tankers at the site's dock facilities with the objective of protecting Shell assets. Shell employees should not board a vessel that is involved in a fire.
   b. Training of the site's response personnel for fires and other emergencies aboard barges and/or tankers consistent with the objective of protecting Shell assets.
   c. Agreement with appropriate governmental and port authority agencies concerning the circumstances that would dictate the removal of a burning barge and/or tanker from the site's docks. A pre-planned location for removal should be agreed if possible.
5. For a supporting reference, see Group HSSE Control Framework Management System Manual – Planning and Procedures - Emergency Response, available in the Tier 2 MMS 5.6.1 Enabling and Supporting Process Areas - [25] Assure HSSE - Management System and HSSE/SD General.

6.1.12 Health

Note this section supports the following HSSE critical processes: personal protective equipment.

1. The Group Minimum Health Management Standards (MHMS) establish the fundamental requirements for the management of health in sites where Shell has operational control.
2. Compliance with national statutory requirements is mandatory for all aspects of health management. Currently accepted scientific knowledge should be applied in interpreting these standards. The seven MHMS standards that **shall** be followed include:
   a. Health Risk Assessment (see the Group HSSE Control Framework Manual Section Health Risk Assessment for detailed requirements)
   b. Monitoring of Health Performance and Incident Reporting and Investigation
   c. Health Impact Assessment (see the Group HSSE Control Framework Management System Impact Assessment Manual for detailed requirements)
   d. Human Factor Engineering in New Projects
   e. Product Stewardship
   f. Fitness to work (see the Group HSSE Control Framework Manual Section Fitness to Work for detailed requirements)
   g. Local Health Facilities and Medical Emergency Response
3. The requirements contained with the Group HSSE Control Framework Health Manual **shall** be followed.

4. It is a company policy to provide a substance abuse free workplace. Each site **shall**:
   a. Have a posted notice that references the policy that includes and prohibits the unauthorized use or possession of controlled substances on the Company's property.
   b. Require that the Substance Abuse Policy has been communicated to all employees, permanently posted on bulletin boards, and is strictly enforced.
   c. Communicate the Substance Abuse Policy relating to contractor employees to contractors working in our sites with the requirement that this policy be strictly enforced.
5. Each site **shall** have a fit-for-purpose overtime (OT) management policy in place that addresses the impact of OT on fitness to work.
6. For additional or more detailed requirements and references, see the Tier 2 MMS 5.6.1 Enabling and Supporting Process Areas - [25] Assure HSSE - Health.

   Note: See Section 6.1.10 "Contractor Safety Management" for more details related to the health for contractors.

6.1.13 Environmental Performance and Compliance

Note this section supports the following HSSE critical processes: HSSE compliance management.

1. All sites **shall** have their management systems certified under the ISO 14001 or American Chemistry Council (ACC) Responsible Care® 14001 standards.
2. Each site **shall** have an environmental performance monitoring program that requires:
   a. Identification of the quantity and sources of regulated emissions and discharges.
   b. Recording and timely reporting of environmental performance to regulatory agencies.
   c. Prompt corrective action to control identified episodic releases, emissions and discharges.
   d. Monthly performance reporting to Manufacturing.
3. Each site **shall** conduct periodic reviews of environmental performance, including evaluations of potential impacts and the identification and review of improvement opportunities. Priorities, goals and plans for improvement are to consider both community and employee concerns.
4. Each site **shall** monitor its air quality performance and have a process in place for identifying opportunities to reduce emissions. This process is to include the following:
   a. Maintaining emission inventories of air pollutants, including Greenhouse Gases (GHG), SO2, NOX and VOCs.

b. Evaluating current air toxics emissions including, as appropriate, modelling emissions and comparing results with reasonable screening values as a tool for prioritising reductions.

c. Reducing episodic releases to the atmosphere.

5. Each site **shall** monitor and minimise the impact of their effluent discharges on surface water quality by:

   a. Maintaining an inventory of all pollutant discharges.

   b. Assessing the quality of the site process water discharge by testing on an annual basis, or more frequently if toxicity is detected.

   c. Establishing a source control program.

   d. Operating existing facilities in a manner to minimise cross contamination of storm water and oily water sewers. The asset master plan for the site **shall** provide for segregation of these facilities unless storm water systems have facilities to remove oil from the water surface.

6. Each site **shall** ensure its drinking water meets all applicable standards.

7. The management of hazardous and non-hazardous wastes **shall** meet all regulatory requirements for identification, storage, treatment, transportation and disposal.

   a. Each site **shall** have management and control systems in place to minimise waste.

   b. All personnel handling hazardous waste and signing manifests **shall** be trained, and records of such training maintained.

   c. Where applicable, all waste **shall** be disposed of by using government-approved disposal sites, methods and contractors.

8. Each site **shall** identify inactive waste management units (e.g. disposal pits) and have appropriate mitigation plans in place.

9. Each site **shall** perform site assessments for soil and groundwater contamination. Where contamination is detected, risk-based measures **shall** be in place for any necessary control and/or remediation, including controls to minimise the risk of migration of contamination off-site. Sites **shall** emphasize the protection of soil and groundwater through prevention, elimination of leaks and prompt cleanup of spills.

10. Pollution control equipment **shall** be operated, inspected and maintained as required to comply with regulations and permits. Facilities operating with impaired pollution control equipment **shall** be shut down if continued operation will result in non-compliance with an environmental permit or regulation. The only exception would be relief granted by functional/site management following consultation with site and M environmental management, Legal, and/or regulatory agencies.

11. Each site **shall** require that employees, including on-site contractors, receive environmental training as follows:
    a. All employees and on-site contractors **shall** receive general environmental awareness training.
    b. In addition, each employee **shall** receive appropriate training related to their job assignment, to understand the potential impact of his/her actions on the environment and on the performance of emissions control, effluent treatment and waste management facilities.
    c. All required environmental training **shall** be documented.
12. Each site **shall** have programs and procedures emphasising at-source identification, monitoring, control and minimization of regulated air emissions, wastewater contaminants and liquid and solid wastes. Source control is to be interpreted in a very broad sense to include such items as corrective action for fugitive emissions, tank operations, loading operations, process drains, process vents, marine facilities, noise emitting equipment, and maintenance activities, including turnarounds.
13. For additional or more detailed requirements and references, see the Tier 2 MMS 5.6.1 Enabling and Supporting Process Areas - [25] Assure HSSE - Environment and Sustainable Development.

6.1.14 Tank Farm Drainage Control

Note this section supports the following HSSE critical processes: mechanical integrity.

1. Each site **shall** have procedure(s) that provide for the proper operation and surveillance of tank floating roof drain valves and dike valves.
2. In managing tank farm drainage systems, each site **shall** require:
    a. Specific responsibilities and accountabilities exist for the operation of tank dike and tank floating roof drains.
    b. Valves necessary for drainage are identified.
    c. A system exists to show when dike drain valves are open.
    d. Periodic training on tank farm draining procedures and systems is provided to operations personnel.
    e. Routine inspection, testing and maintenance is performed and documented on tank floating roof drain systems and dike drain valves, sumps and other spill prevention and control equipment.

6.1.15 HSSE Competency and Training

Note this section supports the following HSSE critical processes: competency management. Also, see Section 6.2 "Develop and Maintain People and Organisations" for additional requirements related to competence.

Line management **shall**:

1. Provide information, instruction, training and supervision so that people are competent to carry out their work safely in their area of responsibility.
2. Apply the formal and documented competence-assurance process (described in elements 3 to 7 below) to individuals in HSSE Critical Positions, leadership and HSSE professional positions.
3. Identify and record the positions that require competence assurance. These are:
   a. HSSE critical positions responsible for front line operational HSSE critical activities;
   b. HSSE critical positions responsible for planning/supervising HSSE critical activities;
   c. Leadership positions; and
   d. HSSE professional positions.
4. Identify and record the competences and proficiency levels required for the positions that require competence assurance.
   a. For a, b, c, and d of element 3 above, base these on HSSE-related competence requirements described in:
      - Local legislation; and
      - Business or industry standards for technical and operational competence, see sub eliminates 6a and 6b below.
   b. In addition, for b, c, and d of element 3 above, apply the Group HSSE competence framework, see sub element 6c below.
5. When there are changes in the Business or organisation, identify the positions affected and update the competence requirements for these positions (also see Section 6.1.6 "Management of Change").
6. Assess, verify and record the competence of individuals against the requirements defined for each individual's position.
   a. Verify that all required training and certification/licensing has been completed to meet legal requirements.
   b. Verify that individuals have the required HSSE-related technical and operational competences. Where external trade qualifications are required, verify that assessment by an accredited assessor has been carried out.
   c. Validate and endorse the individual's competence against the Group HSSE Competence Framework by confirming their self-assessment.
   d. Retain records of the assessment, including the date of the assessment and name of the assessor.

ED_001593_00015747

e. Review competence assessments as part of the Individual Performance Review process.

7. Manage any competence gaps through an agreed and documented plan.
   a. Manage gaps by taking into account the risk associated with the gap, the need to work without support and the competence of the whole team, then select an approach based on the following mitigation measures:
      - Reallocate the activity to someone who is competent.
      - Close the gap through training.
      - Provide supervision and support.
   b. Record the actions agreed, including any restrictions on the tasks that individuals are permitted to perform.
   c. Monitor progress in addressing competence gaps and update the competence assessment when progress is supported by suitable evidence.
8. In addition to general awareness training for employees, require that:
   a. Applicable legally required health and safety training, and testing when necessary, are conducted for each employee within the stipulated time period.
   b. Training on new or revised safe work procedures is provided to employees before implementation of the new or revised procedure.
   c. Periodic refresher training on all safe work procedures is provided.
9. Verify documentation of training, including employee name, date of training, means used to verify that the employee received and understood the training and the name of the trainer/instructor.
10. For additional requirements, see Section 6.2 "Develop and Maintain People and Organisations" and also see the Group HSSE Control Framework Management System Competence Manual in the Tier 2 MMS 5.6.1 Enabling and Supporting Process Areas - [25] Assure HSSE - HSSE Management System & HSSE/SD General.

6.1.16 Permit to Work (PtW)

Note this section supports the following HSSE critical processes: permit to work

Site management **shall** establish and maintain a Permit to Work (PtW) procedure for the site that meets the following requirements:

1. Identifies the types of work that need to be controlled through PtW.
2. Specifies that all Shell and contractor personnel at a location work under a single PtW system, unless specifically approved for work conducted by specialist contractors using their own PtW system.
3. Specifies the controls required for the work, based on a risk assessment, and the hierarchy of controls.
4. Defines when a job hazard analysis is required as part of the PtW procedure.

HAZARDOUS WASTE MANAGEMENT PERFORMANCE REPORT

SHELL OIL PRODUCTS US
MARTINEZ REFINERY

Section 4.0 – Changes Since Baseline Year

The waste stream in Category A (process wastewater to ETP-2 Biotreater) remain almost the same level in 2010 as it did in 2006 with slight increase of approximately 1%. Two of the three major waste streams showed an increase of approximately 13% from the baseline year 2006 to reporting year.

ADDITIONAL FACTORS AFFECTING PERFORMANCE

1) Operational ImprovementsTargeting Increased Capture of Oil and Solids

As discussed in the previous SB-14 Waste Minimization Report, increases in DNF Float were expected as a result of continued efforts to improve treatment performance aimed at increasing the amount of oil and solids (DNF Float) captured by the process. Effluent Treatment Plant personnel have operated the DNF units in a much more efficient manner in order to assure SMR's compliance with its NPDES discharge permit limits. The generation of DNF Float increased by approximately 12% from baseline year 2006 to reporting year 2010.

2) Increasing Challenges for Complying With NPDES Permit Limits

As the NPDES permit limits for the refinery's effluent get more stringent, necessary adjustment to treatment of the refinery's process wastewater streams have to be made. SMR continues with our efforts for optimization of chemical usage

3) Rainfall

Annual rainfall totals could significantly impact the volume of waste for all three major wastestreams addressed in this report due to the amount of water processed at the effluent treatment plant as well as erosional effects of heavy rain.

HAZARDOUS WASTE MANAGEMENT PERFORMANCE REPORT

SHELL OIL PRODUCTS US
MARTINEZ REFINERY

Section 4.0 – Changes From Baseline Year

Table 4-A

Waste Stream	Measure	Effect on Hazardous Waste Generation	Impact on Hazardous Properties	Effect on On-site Management	Effect on Off-Site Management
Oil/Water Separator Sludge	Coat, Gunite, Curb	160 tons/year reduction	None	None	None
	Street Sweeping	13 tons / year reduction	None	None	None
	Reduce Oil Discharges	To be determined	None	None	None
	Fast-Loop Sample Stations	500-2500 ton annual reduction in oil to sewer	None	None	None
	Divert High Hardness/Low BOD Wastewater	1800 tons/year	None	None	None
	Oil Recovery at the DCU	All API and GOS Solids are Processed for Oil Recovery	N/A	Requires on-site handling	None
	Replacement of Filter Press at Utilities	Difficult to quantify	None	None	None
SPU Filter Cake	Optimize Chemical Usage	800 tons/year	None	Requires increased monitoring	None
	Pursue Recycle Option	Material will no longer be classified as a waste	Process renders material nonhazardous	None	Material will be processed at off-site recycle facility
Process Wastewater to ETP-2 Biotreater	Implement Water Reuse Activities	Minor Reduction	None	Requires Job-By-Job Evaluation	None
	Segregate Non-Toxic from Toxic Streams	Approx. 10% reduction in waste volume	None	None	None

HAZARDOUS WASTE MANAGEMENT PERFORMANCE REPORT

SHELL OIL PRODUCTS US
MARTINEZ REFINERY

Section 5.0 – Technical and Financial Certification

Technical Certification

I certify this Hazardous Waste Management Performance Report meets the following requirement, as applicable:

The report identifies factors that affect the generation and on-site and off-site management of hazardous wastes and summarizes the effect of those factors on the generation and on-site and off-site management of hazardous wastes.

Raymond Fong	
Name	Signature
Senior Engineer	8/31/2011
Title	Date

HAZARDOUS WASTE MANAGEMENT PERFORMANCE REPORT

SHELL OIL PRODUCTS US
MARTINEZ REFINERY

Section 5.0 – Technical and Financial Certification

Financial Certification

I certify 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 the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for making false statements or representations to the Department, including the possibility of fines for criminal violations.

Paul D. Gabbard Name	[illegible] for Paul Gabbard Signature
Refinery General Manager Title	August 31, 2011 Date

Shell Oil Products US
Martinez Refinery
3485 Pacheco Blvd.
Martinez, CA 94553

2011 SB-14
WASTE MINIMIZATION REPORT

For the

Shell Oil Products US – Martinez Refinery
(EPA ID # CAD009164021)

This Report Includes the Following Documents
For Reporting Year 2006:

1) SOURCE REDUCTION EVALUATION REVIEW AND PLAN

2) HAZARDOUS WASTE MANAGEMENT PERFORMANCE REPORT

3) SUMMARY PROGRESS REPORT

September 1, 2011

HAZARDOUS WASTE SOURCE REDUCTION AND MANAGEMENT REVIEW

SHELL OIL PRODUCTS US
MARTINEZ REFINERY

Shell Oil Products US, Martinez Refinery (SMR) has prepared the following Source Reduction Evaluation Review and Plan, Hazardous Waste Management Performance Report, and Summary Progress Report to comply with the Hazardous Waste Source Reduction and Management Review Act of 1989 (Act), commonly known as SB-14.

The Act requires that generators of Hazardous Waste in excess of 12,000 kg in a reporting year prepare these documents by September 1, 1991 and every four years thereafter. SMR currently meets the specified hazardous waste generator requirements that trigger reporting under SB-14.

The purpose of the Source Reduction Evaluation Review and Plan (Plan) is to provide an overall facility description, identify the types, quantities, and processes generating hazardous wastes at SMR, and describe the facility's review, evaluation and selection of potential source reduction measures.

The purpose of the Hazardous Waste Management Performance Report (Report) is to discuss efforts that have been made to improve the management of hazardous waste at SMR, including source reduction, on-site and off-site recycling, treatment and disposal. Data from the 2010 reporting year is compared to that of the previous reporting year (2006), also referred to as the baseline year..

The final report is the Summary Progress Report (SPR). This report summarizes the result of implementing the source reduction measures identified in the generator's previous Plan and the amount of reduction that the generator anticipates will be achieved by the implementation of source reduction measures selected in the current Plan. Generators subject to SB-14 are required to prepare and submit a Summary Progress Report to DTSC by September 1, 2011.

The generator must retain the Plan, Performance Report, and SPR on-site, and have the documents readily available for on-site review by DTSC, a local agency or the public.

HAZARDOUS WASTE SOURCE REDUCTION AND MANAGEMENT REVIEW

SHELL OIL PRODUCTS US
MARTINEZ REFINERY

TABLE OF CONTENTS

SECTION	DESCRIPTION
COMPLETENESS CHECKLIST	Appendix G from Hazardous Waste Source Reduction Guidance Manual

SOURCE REDUCTION EVALUATION REVIEW AND PLAN

1.0.....	General Facility Information
2.0.....	Waste Stream Identification (Total and Major)
3.0.....	Waste Stream Characterization
4.0.....	Source Reduction Measures
5.0.....	Evaluation
6.0.....	Implementation and Exceptions and Numerical Goal
7.0.....	Technical and Financial Certification

HAZARDOUS WASTE MANAGEMENT PERFORMANCE REPORT

1.0.....	General Facility Information
2.0.....	Baseline and Reporting Year Hazardous Waste Quantities
3.0.....	Current Waste Management Approaches and Effects
4.0.....	Factors Affecting Major Waste Streams
5.0.....	Technical and Financial Certification

SUMMARY PROGRESS REPORT

Appendix G Completeness Lists For the Plan and Report

Source Reduction Evaluation Review and Plan List

The Office of Pollution Prevention and GreenTechnology suggests that you verify your Plan's completeness by checking each item and including the page number where the information can be found in your Plan. It may be helpful to include the completed list in front of your Plan.

		This requirement is in the Plan on page:
1. Is the generator's name, address, telephone number and EPAIdentification Number in the Plan? (CCR Section 67100.5(a))	☑ Yes ☐ No	
2. Is the address the same location where waste is generated? If no, is there a given address where waste is generated?	☑ Yes ☐ No	
3. Is the four-digit SIC code(s) for the site in the Plan? (CCR Section 67100.5(b))	☑ Yes ☐ No	
4. Is the Plan addressing a multi-site operation? If yes, are all the sites' addresses listed in the Plan? (If no, this Plan is incomplete.)	☐ Yes ☑ No	
5. Is there a description of the business or activity conducted at the site in the Plan? (CCR Section 67100.5(c))	☑ Yes ☐ No	
6. Is the length of time the company has been in operations at the present site provided in the Plan? (CCR Section 67100.5(d))	☑ Yes ☐ No	
7. Are the major manufactured products and services provided by the business described in the Plan? (CCR Section 67100.5(e))	☑ Yes ☐ No	

ED_001593_00015748

		This requirement is in the Plan on page:
8. Is the number of employees working at the site given in the Plan? (CCR Section 67100.5(f))	☑ Yes ☐ No	
9. Is there a general description of the operations of the site in the Plan with corresponding block diagrams focusing on quantity and type of hazardous wastes, raw materials, and final products produced at the site? (CCR Section 67100.5 (g))	☑ Yes ☐ No	
10. Does the Plan identify all routinely-generated hazardous waste streams which result from ongoing processes or operations having a yearly volume, or comparable weight, that exceeds five percent of the total yearly volume, or comparable weight, of hazardous waste at the site? (CCR Section 67100.5(h))	☑ Yes ☐ No	
For each hazardous waste stream identified in 10 above,		
11. Does the Plan provide an estimate of the weight, in pounds, of waste generated at the site? (CCR Section 67100.5(i)(1))	☑ Yes ☐ No	
12. Does the Plan provide the applicable California Waste Code(s) for each waste stream? (CCR Section 67100.5(i)(2))	☑ Yes ☐ No	
13. Are the waste-generating processes, operations and activities (along with corresponding diagrams) described in the Plan? (CCR Section 67100.5(i)(3))	☑ Yes ☐ No	
14. Do the processes, operations and activities described include a listing of all input materials contributing to the generation of waste (all input materials must be listed in diagrams identified in 13 above)? (CCR Section 67100.5(i)(3))	☑ Yes ☐ No	
15. Is there an evaluation of available source reduction measures? (CCR Section 67100.5(j))	☑ Yes ☐ No	

ED_001593_00015748

		This requirement is in the Plan on page:
16. Do the evaluations of source reduction measures consider the following approaches: (CCR Section 67100.5(j))		
Input changes	☑ Yes ☐ No ☐ N/A	
Operational improvements?	☑ Yes ☐ No ☐ N/A	
Production process changes?	☑ Yes ☐ No ☐ N/A	
Product reformulation?	☑ Yes ☐ No ☐ N/A	
Administrative steps?	☑ Yes ☐ No ☐ N/A	
17. Do the evaluations of source reduction measures consider thefollowing factors: (CCR Section 67100.5(k))		
Expected change in the amount of hazardous waste generated?	☑ Yes ☐ No ☐ N/A	
Technical feasibility?	☑ Yes ☐ No ☐ N/A	
Economic evaluation?	☑ Yes ☐ No ☐ N/A	
Effects on product quality?	☑ Yes ☐ No ☐ N/A	
Employee health and safety implications?	☑ Yes ☐ No ☐ N/A	
Permits, variances, compliance schedules of applicable State, local and federal agencies?	☑ Yes ☐ No ☐ N/A	
Releases and discharges?	☑ Yes ☐ No ☐ N/A	
18. Does the Plan provide information, such as waste stream constituents and concentrations, pertinent to the evaluation of the source reduction approaches? (CCR Section 67100.5(l))	☑ Yes ☐ No ☐ N/A	

ED_001593_00015748

		This requirement is in the Plan on page:
19. Is there a specification of, and a rationale for, each technically feasible and economically practicable source reduction measure(s) being proposed in the Plan for implementation? (CCR Section 67100.5(m))	☑ Yes ☐ No	
If yes, does the specification include at a minimum a narrative description of the factors in 67100.5(k) and address system capacity and efficiency?	☑ Yes ☐ No	
20. Is there an evaluation and, to the extent practicable, a quantificationof the effects of the chosen source reduction measure(s) on emissions and discharges to air, water, or land? (CCR Section 67100.5(n))	☑ Yes ☐ No ☐ N/A	
21. Is there a list of alternatives considered but not selected for a detailed evaluation as a potentially viable source reduction approach? (CCR Section 67100.5(o))	☐ Yes ☑ No	
22. For each alternative rejected, is there a rationale for rejection? (CCR Section 67100.5(o))	☐ Yes ☐ No	N/A
23. Is there a timetable for making reasonable and measurable progress towards implementing and completing the selected source reduction measures? (CCR Section 67100.5(p))	☑ Yes ☐ No	
24. Is there an implementation schedule for completing the evaluation of potentially viable source reduction measures and includes prioritization of processes and wastes for future research, development and source reduction analysis? (CCR Section 67100.5(p))	☑ Yes ☐ No ☐ N/A	
25. Does the Plan contain a four-year numerical goal for reducing the generation of hazardous waste streams through the selected source reduction measures? (CCR Section 67100.5(q))	☑ Yes ☐ No	

ED_001593_00015748

		This requirement is in the Plan on page:
26. Is the Plan properly certified? (CCR Section 67100.13)		
Technical Certification	☑ Yes ☐ No	
Financial Certification	☑ Yes ☐ No	

ED_001593_00015748

Hazardous Waste Management Performance Report List

The following list will be helpful in determining completeness of a Hazardous Waste Management Performance Report. The Department of Toxic Substances Control uses a similar approach to determine whether or not a Performance Report has met the minimum requirements necessary to comply with of the Hazardous Waste Source Reduction and Management Review Act of 1989.

The Office of Pollution Prevention and Green Technology suggests that you verify your Report's completeness by checking each item and including the page number where the information can be found in your Report. It may be helpful to include the completed list in front of your Report.

		This requirement is in the Plan on page:
1. Is the generator's name and address given in the Report? (CCR Section 67100.8(a)(1))	☑ Yes ☐ No	
2. Is the address the same location where the waste is generated? If no, is there a given address where waste is generated?	☑ Yes ☐ No	
3. Is the four-digit SIC code(s) for the site given? (CCR Section 67100.8(a)(2))	☑ Yes ☐ No	
4. Is the Report addressing a multi-site operation? If yes, are all the sites' addresses listed in the Report? (If no, the Report is incomplete.)	☐ Yes ☑ No	
5. Is the baseline year clearly stated in the Report?	☑ Yes ☐ No	
6. Is the reporting year clearly stated in the Report?	☑ Yes ☐ No	

ED_001593_00015748

		This requirement is in the Plan on page:
7. Is the reporting year the same as the baseline year and so stated in the Report? (If no years are given, the Report is incomplete.) Baseline Year is 2006.	☐ Yes ☑ No	
8. Does the Report identify all routinely-generated hazardous waste streams which result from ongoing processes or operations having a yearly volume, or comparable weight, that exceeds five percent of the total yearly volume, or comparable weight, of hazardous waste at the site? (CCR Section 67100.8(a)(3))	☑ Yes ☐ No	
For each hazardous waste stream identified in 8 above:		
9. Does the Report provide an estimate of the quantity, in pounds, of waste generated and managed, both on-site and off-site, during the current reporting year and the baseline year? (CCR Section 67100.8(a)(3)(A))	☑ Yes ☐ No	
10. Is there a listing and description of current hazardous waste management approaches and identification of all approaches implemented since the baseline year? (CCR Section 67100.8(a)(3)(B))	☑ Yes ☐ No	
11. Is there an assessment of the effect of each hazardous waste management approach implemented since the baseline year? (CCR Section 67100.8(a)(3)(C))	☑ Yes ☐ No	
12. Does the assessment of implemented waste management approaches consider the following: (CCR Section 67100.8 (a)(3)(C))		
Source Reduction?	☑ Yes ☐ No	
On-site or off-site recycling?	☑ Yes ☐ No	
On-site or off-site treatment?	☑ Yes ☐ No	

ED_001593_00015748

		This requirement is in the Plan on page:
13. If applicable, does the Report describe factors that, during the period between the baseline year and the current reporting year, have affected hazardous waste generation and on-site and off-site hazardous waste management practices? (CCR Section 67100.8(a)(3)(D))	☑ Yes ☐ No	
14. When describing factors affecting hazardous waste management practices at the site, did the generator consider:		
Changes in business activity?	☑ Yes ☐ No	
Changes in waste classification?	☑ Yes ☐ No	
Natural phenomena?	☑ Yes ☐ No	
15. Is the Report properly certified? (CCR Section 67100.13)		
Technical Certification	☑ Yes ☐ No	
Financial Certification	☑ Yes ✸ No	

ED_001593_00015748

2011 SB-14 HAZARDOUS WASTE SOURCE REDUCTION & MANAGEMENT REVIEW

SHELL OIL PRODUCTS US
MARTINEZ REFINERY

SOURCE REDUCTION EVALUATION, REVIEW AND PLAN

TABLE OF CONTENTS

SECTION

1.0 General Facility Information

2.0 Waste Stream Identification (Total and Major)

3.0 Waste Stream Characterization

4.0 Source Reduction Measures

5.0 Evaluation

6.0 Implementation and Exceptions and Numerical Goal

7.0 Technical and Financial Certification

SOURCE REDUCTION EVALUATION, REVIEW AND PLAN

SHELL OIL PRODUCTS US
MARTINEZ REFINERY

Section 1.0 – General Facility Information

This section provides SB-14 General Facility Information Requirements specified in 22 CCR Section 67100.5 (a) – (g)

67100.5 (a) Name and Location of the Site

Shell Oil Products US, Martinez Refinery
Contra Costa County
3485 Pacheco Boulevard
Martinez, CA 94553

EPA I.D. No. CAD009164021
Facility Contact Phone Number: (925) 313-5516

67100.5 (b) Four digit SIC code Applicable to Site

2911 Petroleum Refining

67100.5 (c) Type of business or activity conducted at site

The Shell Martinez Refinery (SMR) facility consists of a petroleum refinery complex. The refinery converts approximately 140,000 barrels of crude oil per day into many finished products, including liquefied petroleum gas, automotive gasoline, jet fuel, diesel, industrial fuel oils, asphalt, sulfur, and petroleum coke. The Lubricants Department that previously processed crude oil at approximately 15,000 barrels per day, into finished lubricating oils, sodium sulfonates, and asphalt ceased operation in September 2003.

A process flow diagram for the refinery is shown in Figure 1-A.

67100.5 (d) Length of time the company has been in business at the present site

The SMR facility has been in operation since 1915 with several major expansion projects taking place since then. The Light Oil Processing (LOP) units were added in the mid 1960's, and the Flexicoker and associated units were added in the mid 1980's. The "Clean Fuels" Units, including a Delayed Coking Unit began operation in 1996.

ED_001593_00015749

67100.5 (e) Major products manufactured or services provided

Finished products from the refinery include Liquefied Petroleum Gas (LPG), which is sold as propane and used for home heating, cooking, recreational vehicles, etc. Automotive gasoline and diesel are marketed throughout California and Nevada and used to power cars, trucks, buses, boats, and farm equipment. Heavier fuel oils are used for heating, in industrial steam boilers, and utilities. Asphalt is used as a road mix material.

67100.5 (f) Number of employees

As of January 1, 2011, there were 728 Shell employees at the SMR facility.

67100.5 (g) A general description of site operations with corresponding block diagrams focusing on the quantity and type of hazardous wastes, raw materials, and final products produced at the site.

Through a variety of chemical reactions and physical changes, the SMR manufactures finished petroleum products from crude oil. Oil refining includes four basic processes, described below:

SEPARATION Liquid hydrocarbons are separated into common boiling point fractions by distillation. The distillation process makes a "rough cut" of the crude oil, producing gases, light, medium, and heavy boiling range materials, and residuals. These cuts, or intermediate streams are then further processed.

CONVERSION Cracking – This process breaks or cracks large hydrocarbon molecules into smaller ones. This is done by thermal or catalytic cracking.

Reforming - This process uses high temperatures and catalysts to rearrange the chemical structure of a particular oil stream to improve its quality.

Alkylation – This process chemically combines two or more hydrocarbon streams to produce a higher grade product. Liquefied petroleum gas streams are combined in this manner to produce gasoline.

PURIFICATION This process converts contaminants into an easily removable or acceptable form.

BLENDING This process mixes combinations of hydrocarbon liquids to produce a final product.

67100.5 (g) A general description of site operations (cont'd)

Figure 1-B illustrates a block flow diagram of the SMR facility. Inputs, such as crude oil and various utilities are shown in the left column under "Raw Materials". Outputs in the form of Hazardous Waste are shown in the right column. Outputs in the form of finished products are shown at the top of the diagram. All of the refining processes previously described are included in the center block identified as "Shell Martinez Refinery".

ED_001593_00015749

Shell Martinez Refinery Process Schematic

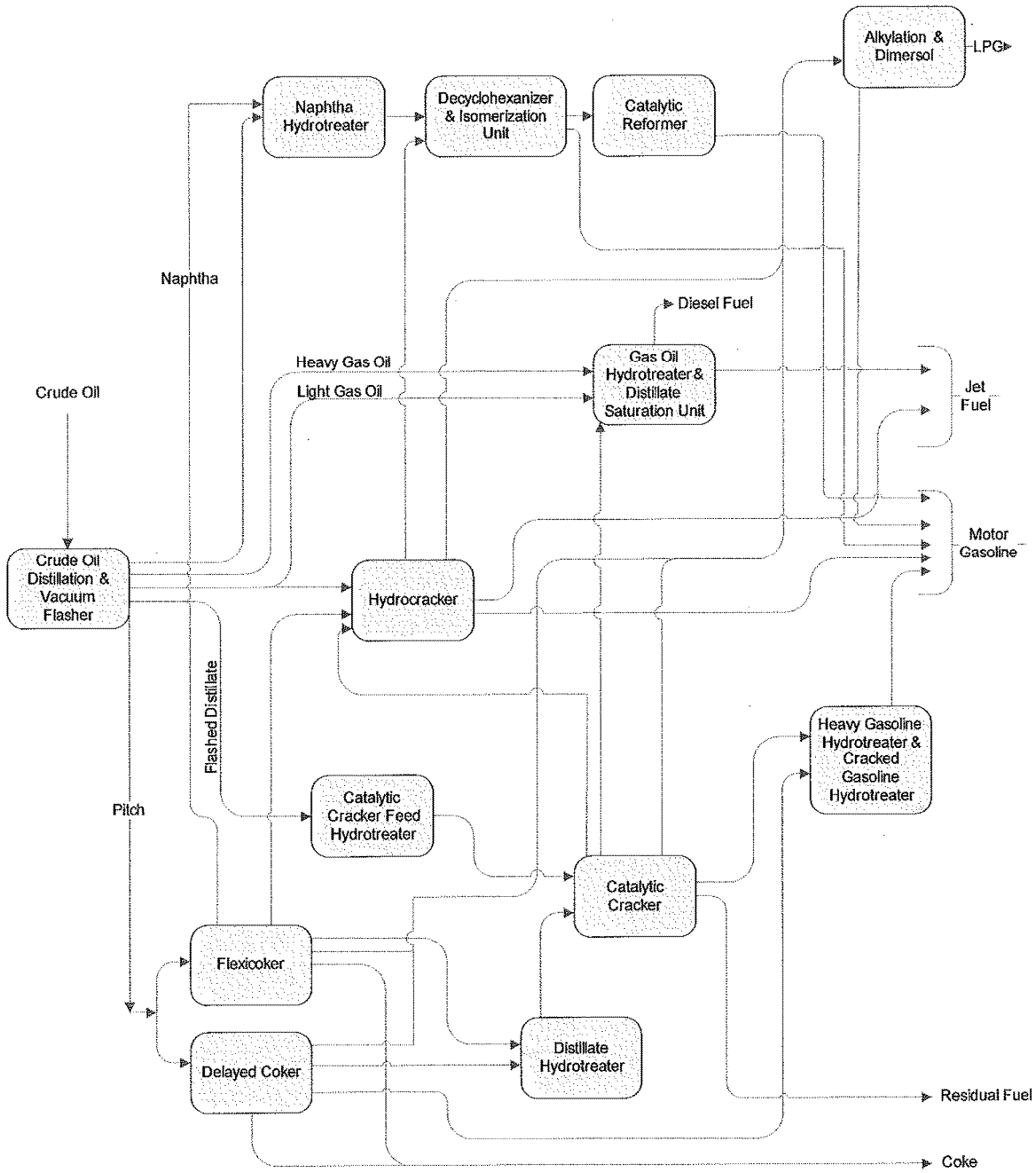
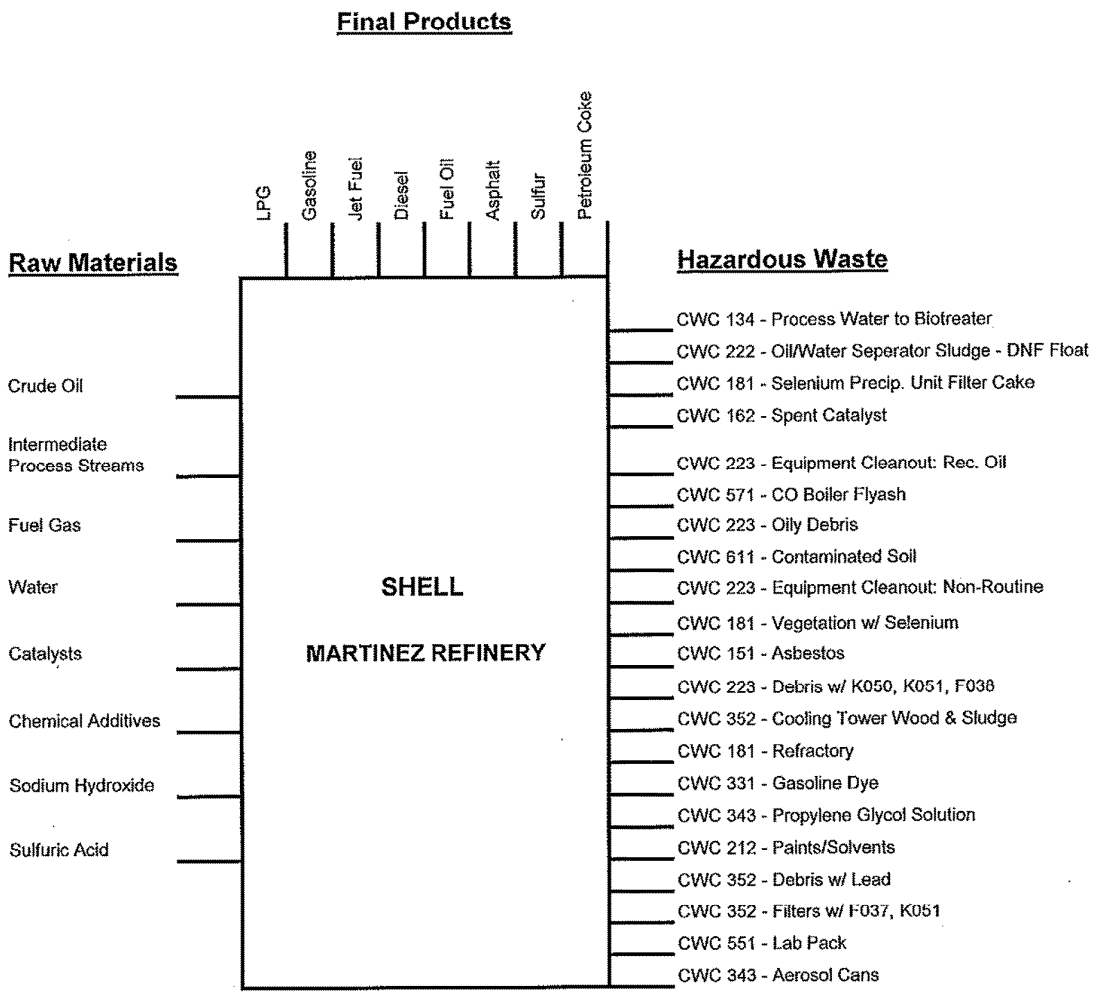


Figure 1-B Material Flow Diagram



Note: The Lubricants Department ceased operation in September 2003, hence products previously manufactured in this department such as lubricants and sodium sulfonates are no longer produced.

SOURCE REDUCTION EVALUATION, REVIEW AND PLAN

SHELL OIL PRODUCTS US
MARTINEZ REFINERY

Section 2.0 – Waste Stream Identification

This section provides information required for SB-14 Waste Stream Identification according to 22 CCR Section 67100.5 (h).

Table 2-A lists all of the hazardous waste streams generated at the SMR facility in the reporting year of 2010. This table was used to sort the streams by hazard class, frequency of generation and total volume. Wastestreams that are not generated routinely or are otherwise exempt are identified in this table and are not included when calculating the total weight of hazardous waste generated at the site to determine SB-14 applicability.

Table 2-B lists all the routinely generated hazardous waste streams listed in Table 2-A that are not otherwise exempt. Category A wastes are defined as those hazardous wastestreams that are processed onsite at the wastewater treatment unit referred to as Effluent Treatment Plant (ETP) and subsequently discharged to a receiving water under the refinery's NPDES permit.

Category B wastes are those hazardous wastestreams that are treated, recycled or disposed of on or off-site that are not processed in a wastewater treatment plant, in essence, all other hazardous wastes that are not Category A. Once all SB-14 applicable wastestreams were identified, calculations were made according to SB-14 guidelines to determine the "Major" wastestreams for each waste category, i.e., those that make up 5% or greater of the total volume of waste generated for Category A and Category B.

Based on the calculations, the major Category A waste stream generated in 2010 at SMR is the Process Wastewater to EPT-2 Biotreater (CWC 134). Process water upstream of the ETP-2 Biotreater unit that are hazardous because they contain benzene are exempt from the SB-14 program. These process water streams are excluded recyclable materials per California Health and Safety Code Sections 25143.2 and 25144 because the process water undergoes oil recovery in the process wastewater tanks, API Separator and DNF units.

The major Category B waste streams generated in 2010 at SMR are Oil/Water Separator Sludge – DNF Float (CWC 222) and Selenium Precipitation Unit Filter Cake (CWC 181).

ED_001593_00015749

All three major wastestreams applicable to the SB-14 program are generated at the SMR Effluent Treatment Plant (ETP). A simplified process flow diagram of SMR's effluent treatment plant is presented in Figure 3. The locations of each of the three major wastestreams are highlighted in yellow.

Description of SMR's Effluent Treatment Plant

The SMR wastewater treatment system treats process wastewater to produce a final effluent that is acceptable for discharge to the Carquinez Strait under SMR's NPDES permit.

The treatment system consists of oil-water separators, four dissolved nitrogen flotation units, a number of equalization and diversion tanks, two activated sludge biological treatment systems, a number of ponds, a chemical precipitation unit for the removal of selenium, and a Granular Activated Carbon (GAC) adsorption system for polishing treated wastewater. The hydraulic capacity of the entire effluent treatment plant is approximately 10 mgd. All wastewater is processed through the entire effluent treatment system with the following exceptions: Low Biochemical Oxygen Demand (BOD) streams such as cooling tower blowdown, boiler system blowdown, and noncontact stormwater can be first treated in an aerated pond, and then by GAC adsorption units. During large storm events, if the wastewater is not high in oil and/or solids, a portion of the wastewater may bypass the initial treatment units, namely the oil-water separators, and/or nitrogen flotation units. Additionally, a portion of the biologically treated wastewater may bypass the GAC adsorption units during high flow conditions caused by a significant storm event. High flow conditions are generally defined as an effluent discharge rate of 8.6 mgd (5972 gallons per minute) or higher. Wastewater is discharged from Discharge Point 001 to Carquinez Strait, a water of the United States.

The SMR wastewater treatment system consists of two effluent treatment plant (ETP) trains that operate in parallel, ETP-1 and ETP-2. In the ETP-1, a pair of API separator boxes provides removal of solids and oil from the oily wastewater generated in the refining process. The primary solids from the API boxes are fed to SMR's delayed coker for oil recovery. After the API boxes, the wastewater is combined with non-oily wastewater streams and processed through a pair of Dissolved Nitrogen Flotation (DNF) units. The DNF units remove the remaining solids and oil from the wastewater. From the DNFs, the wastewater is pumped to an activated sludge treatment unit (ETP-1 Biotreater). It should be noted that, due to new air regulations in 1991 limiting hydrocarbon emissions, dissolved air flotation (DAF) treatment units were required to be covered. Since explosive air mixtures would be created in the headspace of the units as a result of the covers, it became necessary to use a nitrogen blanket as a safety measure, hence the

ED_001593_00015749

change of name from DAF to DNF. The operation of the unit and characteristics of the wastes remain the same, only the name has changed although reference to DAF is still found in RCRA regulations.

ETP-1

The ETP-1 Biotreater was previously permitted by DTSC under SMR's RCRA facility permit to treat wastewater containing >0.5 ppm (TCLP) benzene (characteristic hazardous waste). As a result of wastestream segregations that took place in 1996, the benzene concentration in the wastewater stream to ETP-1 has been less than 0.5 ppm benzene. Following 1996, benzene-containing wastewater was routed to the ETP-2 treatment system where it is treated under Permit-By-Rule tiered permit. In 2003, DTSC approved a permit modification for the Delay of Closure for ETP-1 biotreater (i.e., closure of the treatment unit to be delayed until it ceases to operate). ETP-1 biotreater is no longer allowed to accept, store, treat or manage hazardous waste streams. ETP-1 can accept non-hazardous wastewater only.

Excess biosolids generated by the activated sludge treatment in ETP-1 and ETP-2 Biotreaters are removed and processed through a sludge thickener. DNF float from ETP-1 and ETP-2 (a listed KO48 hazardous waste) and the thickened biosolids are combined in permitted hazardous waste storage Tank 12038, then pumped to SMR's CO Boilers for thermal destruction. The CO Boiler unit is a RCRA permitted hazardous waste treatment facility.

The treated wastewater from ETP-1 flows to an equalization pond where it is combined with ETP-2 treated wastewater and subsequently pumped to the Selenium Precipitation Unit (SPU) as required to meet the current NPDES permit limit for selenium (see description of the Selenium Precipitation Unit in ETP-2 section). Following SPU treatment it is pumped to a final equalization pond, is filtered and polished through granular activated carbon (GAC) units, and then pumped to the Carquinez Strait under SMR's NPDES permit.

ETP-2

In ETP-2, oily wastewater streams containing benzene are initially pumped through equalization tanks and then a pair of DNF units for oil/water separation. The effluent from the DNF units is characterized as hazardous due to concentrations of benzene above the 0.5 mg/l (TCLP) RCRA waste characterization. Following DNF treatment, the wastewater is then fed to an activated sludge aeration tank followed by a pair of gravity clarifiers. The aeration tank, referred to as the ETP-2 Biotreater, is a permitted hazardous waste treatment unit under Permit-By-Rule tiered permit that utilizes biological

treatment to reduce organic contaminants and ammonia concentrations in the wastewater.

The DNF float and biosolids generated from ETP-2 are combined in hazardous waste storage Tank 12038 with the ETP-1 solids material, then pumped to SMR's CO Boilers for energy recovery under SMR's hazardous waste facility permit.

Following biological treatment in the ETP-2 Biotreater and subsequent clarification, the wastewater is then pumped, along with ETP-1 treated wastewater, to the Selenium Precipitation Unit (SPU), which removes soluble selenium from the wastewater using a ferric chloride precipitation process. Selenium removal is required by SMR's NPDES permit in order to meet the final effluent discharge concentration limits of 50 ug/L daily maximum, 42 ug/L monthly average maximum and a mass loading limit of 2.0 pounds per day based on 12-month rolling average. The SPU generates approximately 20 tons/day of filter cake from dewatering iron hydroxide sludge as part of the process. This filter cake is sent off-site for disposal to a Class 1 hazardous waste landfill in California.

MAJOR WASTESTREAM IDENTIFICATION

Process Wastewater to ETP-2 Biotreater (CWC 134)

SMR's only Category A wastestream is the refinery process wastewater in ETP-2 that has undergone oil recovery in the equalization tanks and DNF unit. This wastestream is characterized as hazardous due to its benzene content of greater than 0.5 mg/L. The point of generation of this hazardous waste is the DNF effluent, i.e., the point at which oil recovery ceases. From the DNF unit, the wastewater is pumped to the ETP-2 Biotreater where it undergoes aggressive biological treatment for the removal of ammonia and organic contaminants.

Oil/Water Separator Sludge-DNF Float (CWC 222)

More than half of the Category B hazardous waste generated at the SMR facility in 2010 was generated at the Effluent Treatment Plant in the form of Oil/Water Separator Sludge. The specific waste stream that accounts for this volume is DNF Float, which is generated in SMR's Dissolved Nitrogen Flotation Units. DNF Float is comprised of oily solids that are forced to the surface of the treatment unit by the action of fine nitrogen gas bubbles that facilitate oil/water separation. The DNF Float is removed from the surface water using a skimmer and is pumped to a RCRA permitted storage tank where it is mixed with biosolids from the ETP-1 and ETP-2 Biotreaters.

ED_001593_00015749

DNF Float is a listed K048 RCRA hazardous waste due to high concentrations of organic contaminants. The DNF Float, which is approximately 90% water, is burned on-site as fuel in three Carbon Monoxide (CO) Boilers. These CO Boilers are permitted under a RCRA hazardous waste facility permit.

Selenium Precipitation Unit (SPU) Filter Cake (CWC 181)

Approximately 29% of the Category B hazardous waste generated at the SMR facility in 2010 was filter cake from the Selenium Precipitation Unit. The feed to the SPU is comprised of secondary treated wastewater from ETP-1 and ETP-2. Both ETP-1 and ETP-2 wastewater at this point in the treatment system are non-hazardous. The SPU removes soluble selenium and other metals from SMR's wastewater using a ferric chloride co-precipitation process. This selenium removal process is required to comply with SMR's NPDES permit. Following the chemical addition, an iron-hydroxide precipitate is formed. The iron-hydroxide precipitate is concentrated in a pair of lamellas and subsequently gravity feeds to a pond where the solids are allowed to settle out. The solids are then dredged from the pond and dewatered using a belt press prior to being loaded onto a truck for shipment to a landfill. The filter cake is a non-RCRA, California hazardous waste due to concentrations of selenium and vanadium exceeding the California hazardous waste criteria.

ED_001593_00015749

Shell Oil Products US
Martinez Refinery

Table 2-A

Hazardous Waste Streams Generated 2010 Reporting Year				
RCRA and Non-RCRA Hazardous Waste Streams	**Total Weight, lbs**	**CWC**	**Routine?**	**Exempt?**
Process Wastewater to ETP-2 Biotreater (1*)	4,482,000,000	134	Yes	No
Oil/H2O Separator Sludge - DNF Float, K048 (2*)	32,108,700	222	Yes	No
Selenium Precipitation Unit Filter Cake	16,042,500	181	Yes	No
Tank Cleanout containing Oil/H2O Separation Sludge, F037	2,585,900	222	Yes	No
Equipment Cleanout: Recovered Oil Processing	1,512,130	223	Yes	No
Spent Catalysts	1,470,362	162	Yes	No
COB Fines/Flyash	661,380	571	Yes	No
Oily Debris	516,450	223	Yes	No
Refractory, Contaminated	413,480	181	Yes	No
Soil, Contaminated	134,980	611	Yes	No
Spent Molecular Sieve/Activated Alumina, Contaminated	101,727	181	Yes	No
Debris with K051/K050/F038	100,020	223	Yes	No
Sandblast, Contaminated	78,600	181	Yes	No
Equip Cleanout - Carbon, Self-Heating	76,860	352	Yes	No
Vegetation with Selenium	68,740	181	Yes	No
Waste Aerosol Cans	4,280	331	Yes	No
Expired Chemicals and Lab Packs (3*)	3,006	551	Yes	No
Paint / Solvents	2,650	212	Yes	No
Asbestos	90,660	151	Yes	Yes
Alkyl Polysulfides	29,960	331	No	No

Note: Shaded areas are not included in Major Waste Stream Calculation in Table 2-B
1* - Process Wastewater Flow to Permitted Activated Sludge Treatment Unit (ETP-2 Biotreater, Permit-by-Rule)
2* - Wet Weight as Generated - Incinerated in Permitted On-Site CO Boiler Units
3* - Other applicable CWC for the Expired Chemicals and Lab Packs are: 181, 211, 212, 214, 223, 331, 791

Shell Oil Products US
Martinez Refinery

Table 2-B

Major Waste Stream Calculation for Category A and B Wastes 2010 Reporting Year					
SB-14 Applicable Hazardous Waste Streams	**Total Weight, lbs**	**CWC**	**Processed in Wastewater Treatment Unit?**	**% by Weight**	**Major Waste Stream (>5%)**
Process Wastewater to ETP-2 Biotreater (1*)	4,482,000,000	134	Yes	98.77	Yes
Category A Subtotal	**4,482,000,000**				
Oil/H2O Separator Sludge - DNF Float, K048 (2*)	32,108,700	222	No	57.46	Yes
Selenium Precipitation Unit Filter Cake	16,042,500	181	No	28.71	Yes
Tank Cleanout containing Oil/H2O Separation Sludge, F037	2,585,900	222	No	4.63	No
Equipment Cleanout: Recovered Oil Processing	1,512,130	223	No	2.71	No
Spent Catalysts	1,470,362	162	No	2.63	No
COB Fines/Flyash	661,380	571	No	1.18	No
Oily Debris	516,450	223	No	0.92	No
Refractory, Contaminated	413,480	181	No	0.74	No
Soil, Contaminated	134,980	611	No	0.24	No
Spent Molecular Sieve/Activated Alumina, Contaminated	101,727	181	No	0.18	No
Debris with K051/K050/F038	100,020	223	No	0.18	No
Sandblast, Contaminated	78,600	181	No	0.14	No
Equip Cleanout - Carbon, Self-Heating	76,860	352	No	0.14	No
Vegetation with Selenium	68,740	181	No	0.12	No
Waste Aerosol Cans	4,280	331	No	0.01	No
Expired Chemicals and Lab Packs (3*)	3,006	551	No	0.01	No
Paint / Solvents	2,650	212	No	0.00	No
Category B Subtotal	**55,881,765**				
Total (Category A+B)	**4,537,881,765**				

Notes:

Category A percent weight was calculated by dividing the wastestream by Category A&B Total weight then multiplied by 100 to get a percentage

Category B percent weights were calculated by dividing each Category B waste stream by the Category B Subtotal then multiplied by 100 to get a percentage.

1* - Process Wastewater Flow to Permitted Activated Sludge Treatment Unit (ETP-2 Biotreater, Permit-by-Rule)

2* - Wet Weight as Generated - Incinerated in Permitted On-Site CO Boiler Units

3* - Other applicable CWC for the Expired Chemicals and Lab Packs are: 181, 211, 212, 214, 223, 331, 791

ED_001593_00015749

SOURCE REDUCTION EVALUATION, REVIEW AND PLAN

SHELL OIL PRODUCTS US
MARTINEZ REFINERY

Section 3.0 – Waste Stream Characterization

This section provides SB-14 waste stream characterization information specified in 22 CCR 67100.5 (i):

1) *An estimate of the weight, in pounds, of hazardous waste generated.*

2) *The applicable California Waste Code.*

3) *The processes, operations, and activities generating the waste(s), with corresponding block diagrams to illustrate the basis of generation including a listing of all input materials which contribute to the generation of hazardous or extremely hazardous waste.*

The attached Waste Stream characterization forms and corresponding process flow diagrams provide information on Oil/Water Separator Sludge-DNF Float, Selenium Precipitation Unit Filter Cake, and Process Wastewater to ETP-2 Biotreater. These are the major Category A and Category B waste streams generated at SMR in 2010.

ED_001593_00015749

WASTE STREAM IDENTIFICATION FORM

Waste Stream Identification: Oil/Water Separator Sludge (DNF Float)

CWC: 222

Reporting Year: 2010

Pounds Generated: 32,108,700 lbs

HAZARDOUS PROPERTIES:

Dissolved Nitrogen Flotation Unit (DNF) Float is a listed RCRA waste that carries the K048 waste code primarily due to organic contaminants derived from crude oil.

PROCESS UNIT: SMR Effluent Treatment Plant

PROCESS GENERATING WASTE:

Process wastewater consisting of stormwater and oily wastewater is treated on-site in SMR's Effluent Treatment Plant (ETP). The ETP plant consists of parallel wastewater treatment systems, ETP-1 and ETP-2. Each of these systems contains a pair of dissolved nitrogen flotation (DNF) units. The DNF units are designed to remove oil and solids from the process wastewater. The oily solids from this process are removed from the DNF units and ultimately pumped to the SMR Carbon Monoxide (CO) Boilers on-site for incineration. These solids, referred to as "DNF Float" are listed K048 RCRA hazardous waste. The DNF Float, which is approximately 90% water, is burned on-site in three Carbon Monoxide Boilers. These CO Boilers are permitted under the refinery's RCRA hazardous waste facility permit. Approximately 16,054 tons of DNF Float was generated at SMR in 2010. The amount of DNF float that was previously reported in SMR's 2010 Annual Facility Report to the Department of Toxic Substances Control was 24,081 tons. However, closer review of available data indicate that the meter for the DNF float was reading approximately 1.5 higher than actual flow. The corrected DNF float generated for 2010 is 32,108,700 lbs (16,054 tons).

ASSOCIATED BLOCK FLOW DIAGRAM: Figure 3

ED_001593_00015749

WASTE STREAM IDENTIFICATION FORM

Waste Stream Identification: Selenium Precipitation Unit (SPU) Filter Cake

CWC: 181

Reporting Year: 2010

Pounds Generated: 16,042,500 lbs

HAZARDOUS PROPERTIES: SPU Filter Cake is a non-RCRA waste hazardous due to elevated concentrations of selenium and vanadium

PROCESS UNIT: SMR Effluent Treatment Plant

PROCESS GENERATING WASTE:

Treated Wastewater from ETP-1 and ETP-2 is pumped to the Selenium Precipitation Unit (SPU), which removes soluble selenium from the wastewater using a ferric chloride precipitation process. The ferric chloride precipitate sludge generated from this process is de-watered using belt filter presses and is disposed off-site in a California landfill.

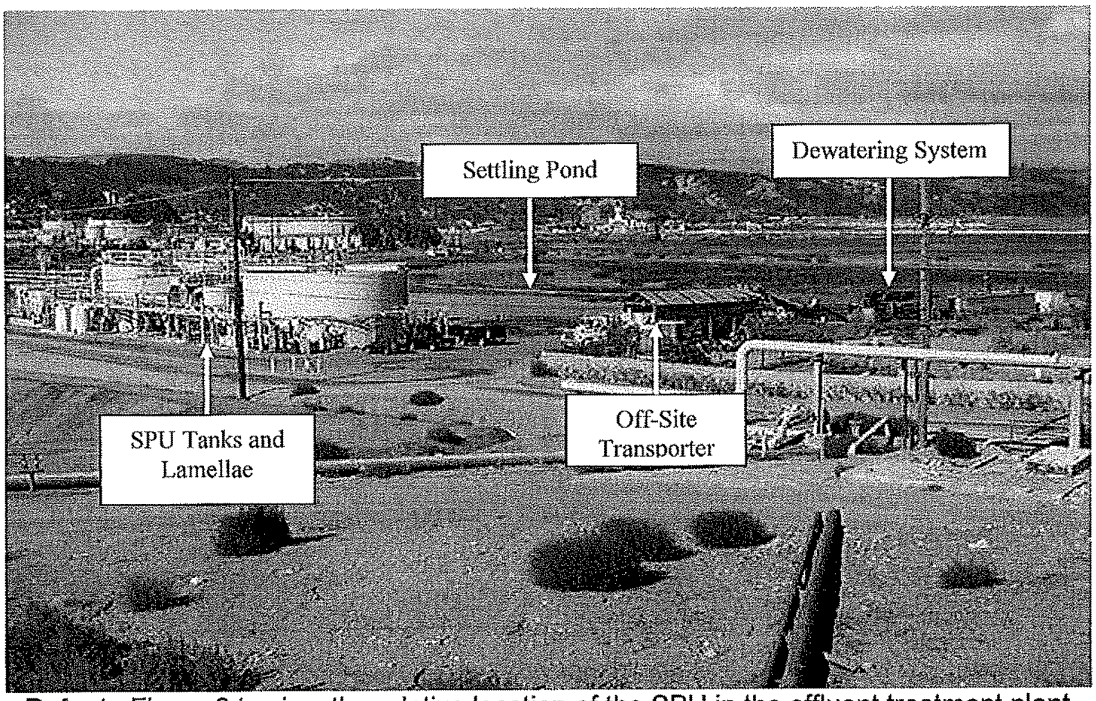
The removal of selenium from the treated wastewater is required by SMR's NPDES permit in order to meet the final effluent discharge concentration limits of 50 ug/L daily maximum, 42 ug/L monthly average maximum and a mass loading limit of 2.0 pounds per day based on 12-month rolling average. Approximately 2.5 tons of hazardous waste sludge is generated for each pound of selenium removed from the wastewater each day. Approximately 8,021 tons of SPU Filter Cake was generated and disposed of in a Class 1 hazardous waste landfill in 2010. Note that the filter press system for dewatering the sludge was recently replaced with a more efficient centrifuge system (discussed in more details in succeeding sections).

The photographs on the following page show the following elements of the SPU:

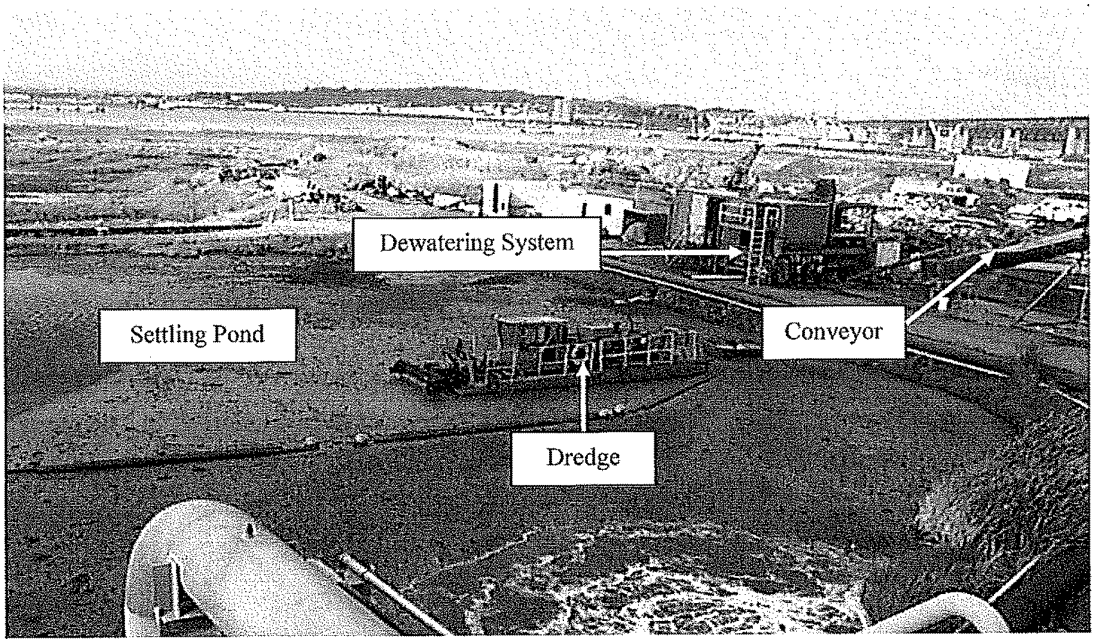
1) Tanks and piping used for chemical addition and mixing
2) Lamellas used for solids separation
3) Pond used for solids settling
4) Dredge used to remove solids from the pond that are transferred to the filter press system
5) Filter press system with conveyor to deliver the filter cake to the transport truck
6) Transporter vehicle with end dump.

ED_001593_00015749

SELENIUM PRECIPITATION UNIT



Refer to Figure 3 to view the relative location of the SPU in the effluent treatment plant.



ED_001593_00015749

WASTE STREAM IDENTIFICATION FORM

Waste Stream Identification: Process Wastewater to ETP-2 Biotreater

CWC: 134

Reporting Year: 2010

Pounds Generated: 4,482,000,000 lbs

HAZARDOUS PROPERTIES: Hazardous for Benzene (D018)

PROCESS UNIT: SMR Effluent Treatment Plant

PROCESS GENERATING WASTE:

Process Wastewater containing oil from SMR's Light Oil Processing (LOP) facility, Clean Fuels Units, Crude Desalter and Brine Deoiler is treated in SMR's Effluent Treatment Plant - 2 (ETP-2) treatment system. A pair of dissolved nitrogen flotation (DNF) units provides oil/water/solids separation. Following DNF treatment, the process wastewater is treated by the ETP-2 activated sludge unit (ETP-2 Biotreater also referred to as ETP-2 Aeration Tank). This aeration tank is permitted under the Permit-by-Rule program to treat this D018 wastewater stream. Following activated sludge treatment, the wastewater undergoes further treatment including clarification, selenium removal and carbon adsorption prior to final discharge to the Carquinez Strait, as permitted by SMR's NPDES discharge permit.

ED_001593_00015749

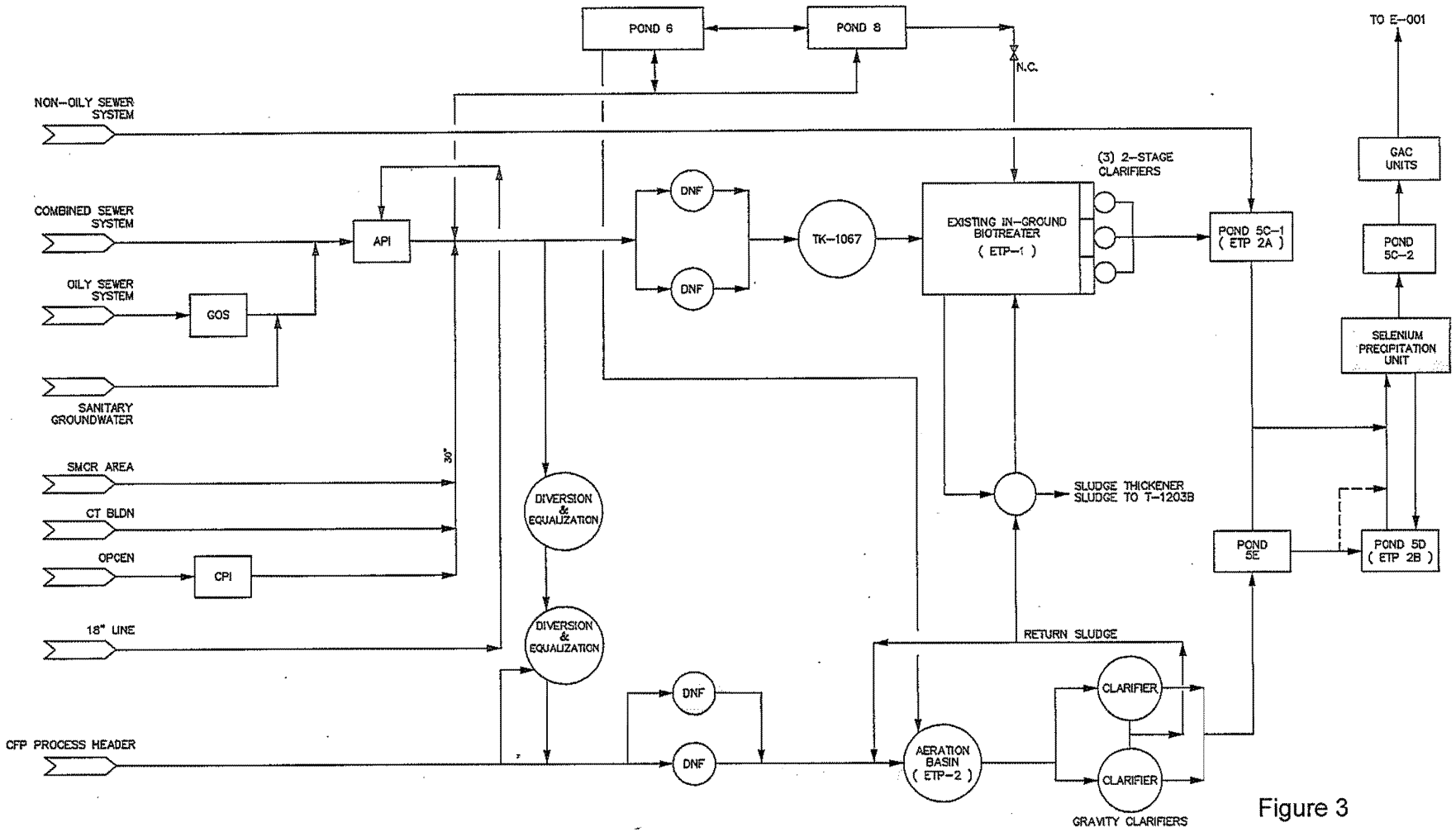


Figure 3

NO.	DATE	PROJ. NO.	DESCRIPTION	BY	APP.

REVISION

PROJ. NO.: 380033
DATE: 5/17/07
SCALE: NONE
DRAWN BY: FRG
PROJ. ENG.: S.OVERMAN
CHECKED:
APPROVED:
OUTPUT SIZE: A

SHELL OIL PRODUCTS U.S.
MARTINEZ, CALIFORNIA

PROCESS FLOW DIAGRAM
EFFLUENT TREATMENT PLANT

PLANT: 08-09 AREA:

CLASS	DOC. CTRL. NO.	REV.
2	688085	0

NOTICE: THIS DOCUMENT IS THE PROPERTY OF SHELL OIL PRODUCT US. NEITHER THIS DOCUMENT NOR ANY DATA OR INFORMATION HEREIN SHALL BE COPIED OR REPRODUCED IN ANY MANNER, LOANED OR OTHERWISE DISPOSED OF, OR USED FOR ANY PURPOSE WHATSOEVER, WITHOUT THE PRIOR WRITTEN PERMISSION OF SHELL OIL PRODUCT US. IF THIS DOCUMENT IS LOANED BY OR WITH THE AUTHORITY OF SHELL OIL PRODUCT US, THE BORROWER IN CONSIDERATION OF SUCH LOAN, AGREES TO THE FOREGOING CONDITIONS AND TO RETURN THIS DOCUMENT UPON REQUEST.

SHELL OIL PRODUCTS US – MARTINEZ REFINERY
EPA ID No. CAD009164021
HAZARDOUS WASTE FACILITY PERMIT

SOURCE REDUCTION EVALUATION, REVIEW AND PLAN

SHELL OIL PRODUCTS US
MARTINEZ REFINERY

Section 4.0 – Source Reduction Measures

The purpose of this section of the Plan is to develop a list of viable source reduction measures for each major hazardous wastestream. *This section fulfills the requirements of 22 CCR Section 67100.5 (j).* The following approaches were considered for each waste stream:

a) **Input Changes**, such as raw materials or feedstocks entering the system.

b) **Operational Improvements**, such as waste segregation, scheduling, maintenance, and site management.

c) **Production Process Changes**, such as equipment modifications and changes in operating conditions.

d) **Product Reformulations**, such as changes in composition or product specifications.

e) **Administrative Steps**, such as employee awareness, training, and procedures.

ED_001593_00015749

CWC 222: OIL / WATER SEPARATOR SLUDGE

Prior to the construction of the delayed coker unit in 1996, the Oil/Water Separator Sludge hazardous wastestream annual quantities consisted of several sludge streams including DAF Float (K048), API Box Solids (K051) and Gross Oil Separator (GOS) Solids. With the construction of the Delayed Coking Unit (DCU), the API Solids and GOS Solids are now fed to the DCU as secondary oil bearing materials for purposes of oil recovery. This practice effectively reduces hazardous waste generation by approximately 4,000 to 6,000 tons per year. Consequently, the DNF Float stream is the remaining stream that is considered for source reduction in this report.

INPUT CHANGES:

The primary raw material for the refinery is crude oil. Reducing crude rates to reduce the amount of oil/water separator sludge generated is not justifiable. Purchasing low-solids content crude oils is possible but not economically or logistically feasible. Crude tenders are purchased based on product yield which reasonably take precedence over the benefits of a relatively small reduction in solids formation. Eliminating, reducing, or changing the feedstock to reduce the generation of Oil/Water Separator Sludges is not deemed feasible.

OPERATIONAL IMPROVEMENTS

Solids such as dirt, silt and sand that enter the SMR process sewer system form oily solids in the presence of petroleum products, which are also present in the sewer system. Based on industry-specific studies, each pound of solids entering the process water collection system gives rise to eight to ten pounds of oily solids called "primary solids". The focus therefore, when looking for source reduction opportunities for this waste stream, is on the reduction of oil and the reduction of solids entering the sewer system.

The following operational improvements were considered and are described in detail below:

1. *POTENTIAL CONVERSION OF ETP-1 AND ETP-2 DNF UNITS TO EQUALIZATION TANKS*: A trial run period commenced in late August 2011 to determine feasibility of converting the ETP-1 and ETP-2 DNF units to equalization tanks without any impact on the over-all treated wastewater effluent quality. During this trial period, the ancillary equipment for DNF operation, including nitrogen injection system, are isolated from the main DNF tanks. Temporary operation of these tanks during the trial period will be identical to an equalization tank where the oil phase will be collected and managed as recovered oil for further processing and eventual re-injection to the Crude Unit. Future operation

ED_001593_00015749

of the DNF units will be determined based on the results of this feasibility run. If successful, this operational change can potentially eliminate the DNF float (K048) waste stream from ETP-1 and ETP-2.

2. *POTENTIAL RELOCATION OF INJECTION POINT FOR OIL-BEARING MATERIALS IN THE DELAYED COKER*: A project is currently in progress to review feasibility of moving the injection point of the oil-bearing materials in the Delayed Coker Unit (DCU). The oil-bearing materials are currently injected at the top of the drum during the quench cycle. The current location of the injection point limits the amount that can be injected to approximately 25,000 – 35,000 barrels per year. If the injection point can be relocated to the bottom part of the drum, the amount of the oil-bearing materials that can be injected and converted to petroleum coke can be increased to approximately 5 times the current injection rate. Final injection point will be determined based on the project. The oil-bearing materials are excluded recyclable materials per California Health and Safety Code Sections 25143.2 and 25144.

3. *COAT, GUNITE, and CURB*: Asphalt coating and paving, guniting and landscaping bare areas throughout the Complex reduces the amount of sediment that enters the sewer system due to stormwater runoff. In addition, the gunite surfaces improve the ability of facility personnel to detect oil pipeline leaks in piperows. Constructing asphalt curbs in high water run-off areas also serves to divert and contain solids. These approaches have been successfully implemented in several areas of the refinery. SMR continues to evaluate and implement opportunities as part of this program.

4. *MINIMIZE OIL DISCHARGES TO THE SEWER:* The reduction of oil discharges to the sewer is another approach that SMR has taken in prior years and is committed to continue.

   SMR aggressively implemented numerous capital projects to comply with the requirements established by the Bay Area Air Quality Management District (BAAQMD) for emissions from wastewater collection systems that contain organic compounds (Regulation 8 Rule 8). These projects aimed at eliminating hydrocarbon and hot water sources to the sewer were completed in 2006 through April 2007. The completion of these projects has a direct impact on the reduction of oil discharges to the refinery sewer. Examples of such projects are: equipment modifications, instrumentation improvements, re-piping and re-routing drains from equipment such as surge drums, scrubbers, pumps, compressors, knock-out pots to maintenance drop-out systems (MDOs), to blow-down system or to another vessel, and the retrofit of sample collection stations and analyzers to fast loops. The installation of sample stations with sample fast loop is

ED_001593_00015749

one method SMR has implemented to reduce oil discharges. Over 100 fast loop sample stations were either installed or converted to reduce the amount of oil and other hydrocarbons to the sewers. In cases where the sample stations were not converted to the fast loop system, the sample stations were retrofitted whereby the purge sample material is collected in containers, transferred to the sample collection system and then returned to the process.

Another area that SMR continues to focus on is improved oil recovery operations. Improvements in the SMR oil recovery operations have decreased both solids and oil to the sewer with the introduction of a three-phase centrifuge. Continued efforts to optimize this oil recovery system are ongoing for both economic and environmental benefits.

5. *STREET-SWEEPING PROGRAM*: Much of the sediment entering the sewer system accumulates in parking lots and on paved roadways throughout the refinery. Sediment removal by street sweeping significantly reduces the introduction of solids into the sewer. SMR continues to pursue this practice as part of its waste minimization efforts. SMR also continues to raise awareness of employees and contractors to minimize debris in the sewer by proper waste handling.

PRODUCTION PROCESS CHANGES

No production process changes could be identified that would result in significant reduction in the formation of oil/water separator sludge.

PRODUCT REFORMULATION

Changes in intermediate or finished product composition or specifications would not impact the formation of this waste stream.

ADMINISTRATIVE STEPS

SMR employee awareness is considered extremely high in this area. This awareness is exhibited by continued commitment to maintain the good operating practices that minimize oil discharges to the sewer. Some of these good practices include:

a) Managing tank drainings to minimize oil to the sewer
b) Using half drums and vacuum trucks to drain equipment for maintenance
c) Quickly detecting and repairing oil leaks.

ED_001593_00015749

d) Sweeping and disposing of dirt in trash bins instead of pad washings
e) Flushing equipment/units to tanks during shutdowns
f) Capping and plugging all drain lines not in use
g) Installation of temporary piping to a recovery or maintenance dropout system when feasible.

SMR Environmental Procedures EP 2.14 "Wastewater Collection and Separation Systems" and EP 3.1 "Effluent Treatment Plant Source Management for NPDES Permit Compliance" are required training modules for all employees whose activities could result in hydrocarbon to the process wastewater system. EP 3.1 clearly states effluent treatment plant source control parameters and instructs operators how to respond to spills or leaks that have the potential to enter the process or storm sewer system.

ED_001593_00015749

CWC 181: SELENIUM PRECIPITATION UNIT (SPU) FILTER CAKE

Selenium Precipitation Unit Filter Cake is a result of a change in SMR's NPDES effluent permit limit for selenium that began in July 1998. Based on an evaluation of several available technologies to reduce selenium concentrations in SMR's effluent, ferric chloride precipitation chemistry proved to be the reliable treatment technology to consistently meet the new permit limits. The selenium precipitation unit filter cake is a characteristic California (non-RCRA) hazardous waste due to its selenium and vanadium concentrations.

INPUT CHANGES:

The source of selenium in the refinery process water at SMR is derived primarily from the crude oil feedstock. Selenium concentrations in crude oil vary depending on the origin of the crude. As such, a change in crude oil type could have a small impact in the amount of selenium in the process water, in turn affecting the amount of treatment necessary to meet NPDES selenium permit limits. Reduced selenium concentrations in process wastewater would impact the amount of hazardous waste generated from the SPU.

However, as mentioned in the prior section, crude tenders are purchased based on product yield which reasonably take precedence over the benefits of a small reduction in solids formation. A change in crude type or reduction in crude rates for the purpose of reducing the amount of this waste stream is therefore not feasible.

OPERATIONAL IMPROVEMENTS:

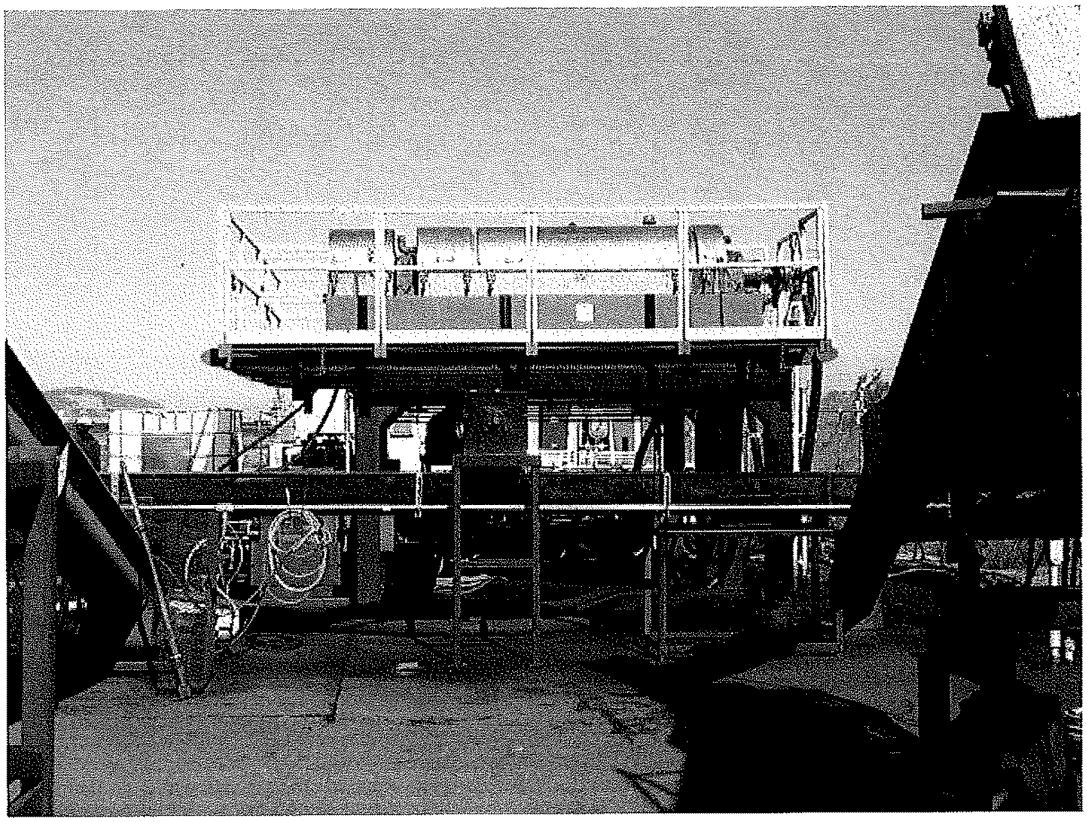
As discussed, SMR wastewater contains soluble selenium that must be reduced to comply with NPDES discharge limits (50 ug/L daily maximum, 42 ug/L monthly average maximum and a mass loading limit of 2.0 pounds per day based on 12-month rolling average) prior to discharge to the Carquinez Strait. The Selenium Precipitation Unit (SPU) reduces SMR's treated wastewater selenium levels using a ferric chloride co-precipitation process. Essentially, ferric chloride is injected into the wastewater under controlled pH conditions, and a ferric hydroxide sludge containing selenium precipitates out of solution. The sludge generated from this process is dewatered generating a filter cake that is a non-RCRA hazardous waste. The SPU-treated wastewater is then discharged to the Carquinez Strait following carbon adsorption treatment. Operational improvements in the areas of chemical treatment optimization were considered for waste reduction.

1. *REPLACEMENT OF FILTER PRESS WITH CENTRIFUGE*: SMR conducted a series of sampling to determine dewatering efficiency between the existing filter press and a temporarily-installed centrifuge.

ED_001593_00015749

The sampling results indicate that the % solid in the SPU cake is approximately 20% using the filter press and approximately 28% using the centrifuge. Based on these results, SMR replaced the filter press system with the centrifuge system for dewatering the sludge in May 2011. The increased dewatering efficiency from this operational change will reduce the total amount of SPU cake generated for offsite disposal.

The newly installed centrifuge for dewatering the Selenium Precipitation Unit solids



2. *CONSTRUCTION OF ETP-3*: ETP-2 Biotreater (ETP-2 Aeration Tank) will be required to undergo an API mandated internal tank inspection. During this required outage, SMR must have an alternate equipment that can process the wastewater streams containing benzene at concentrations greater than 0.5 ppm. As previously mentioned, ETP-1 biotreater is only allowed to accept and process non-hazardous waste water streams. In order to prepare for the anticipated outage of ETP-2,

SMR started construction activities of ETP-3 biotreater in July 2011. ETP-3 biotreater is identical in size and design as ETP-2 biotreater. When ETP-2 biotreater returns in service, ETP-3 will continue to operate in parallel with ETP-2, providing redundant capacity. The parallel system of ETP-2 and ETP-3 is expected to reduce biosolids carry-over to the Selenium Precipitation Unit with a resultant reduction in the generation of SPU cake.

3. *OPTIMIZE CHEMICAL TREATMENT:* The removal of selenium using the co-precipitation process is dependent upon several chemical additive injections. The optimization of ferric chloride dosage, the control of pH using sodium hydroxide and sulfuric acid are monitored and evaluated to improve selenium removal while reducing sludge formation.

PRODUCTION PROCESS CHANGES

No production process changes could be identified which would significantly reduce the formation of this waste stream.

PRODUCT REFORMULATION

Changes in intermediate or finished product composition or specifications would not impact the formation of this waste stream.

ADMINISTRATIVE STEPS

1. *PURSUE RECYCLE/RE-USE OPTION:* SMR continues with its efforts to find recycle option for this wastestream. The most probable user of this waste stream as a suitable raw material for their processes is the cement industry.

ED_001593_00015749

CWC 134: PROCESS WASTEWATER TO ETP-2 BIOTREATER

SMR uses approximately ten million gallons per day of raw water in the process of refining crude oil into the various final products. Of the total volume of water used in the refining process, approximately 60%, or 6 mgd is discharged as final effluent under the NPDES permit. The balance is lost primarily through the evaporative cooling process that takes place in cooling water towers.

The wastewater processed at ETP-2 comprises approximately 1.5 mgd of the process water that is treated in SMR's effluent treatment plant. This major SB14 wastestream is the result of a combination of process wastewater streams that contain, or have the potential to contain benzene concentrations at levels above the RCRA criteria of 0.5 mg/l (TCLP).

INPUT CHANGES:

Benzene is a component of all crude oils. A change in crude oil type or reduction in crude rates to reduce the amount of this waste stream is not an economically or technologically feasible source control measure for this wastestream.

OPERATIONAL CHANGES:

As part of the Clean Fuels Units upgrade of the SMR facility, a new effluent treatment plant (ETP-2) was constructed to handle the additional wastewater flows from the new units. The ETP-2 plant consists of equalization/diversion tanks, DNF treatment units, an activated sludge aeration tank (ETP-2 Biotreater), and gravity clarifiers. The process wastewater fed to the aeration tank is characterized hazardous for benzene and is the waste stream under evaluation in this section of this *Source Reduction Evaluation Review and Plan*. SMR has segregated benzene-containing streams into this ETP-2 treatment train in order to treat the benzene and other contaminants in the aeration tank, which is a permitted hazardous waste treatment unit under the Permit-by-Rule tiered program. This segregation effort has effectively reduced the volume of this waste stream from 1995 levels by nearly 50%. This reduction has been a significant waste minimization accomplishment.

The benzene content in the wastewater is due to oil and other hydrocarbon discharges to the sewer that contain benzene. Therefore, by working towards reducing oil discharges to the sewer, SMR can realize reductions in this waste stream if it can reduce the benzene concentration of the waste stream below hazardous waste levels. Similar to source reduction measures described in the Oil/Water Separator Sludge source reduction section, oil discharges to the sewer can be reduced by the following measures:

ED_001593_00015749

1. *REDUCE OIL DISCHARGES*: The reduction of oil and other hydrocarbon discharges to the sewer is an approach that SMR has pursued during the recent years and continues to implement. As previously discussed under the major wastestream CWC 222: Oil/Water Separator Sludge, SMR aggressively implemented numerous capital projects to comply with the requirements established by the Bay Area Air Quality Management District (BAAQMD) for emissions from wastewater collection systems that contain organic compounds. These projects aimed at eliminating hydrocarbon and hot water sources to the sewer were completed in April 2007. The completion of these projects has a direct impact on reduction of oil discharges to the refinery sewer. Improved oil recovery operations as described in prior sections of this report have been realized and will continue to be pursued.

   The use of vacuum trucks to transport oil to oil recovery facilities rather than using the sewers, and improved employee awareness are all methods that SMR has employed and plans to continue to use to reduce oil discharges to the sewer.

2. *REDUCE OVERALL WATER VOLUME TO SEWER*: As mentioned, SMR has segregated benzene-containing streams into this ETP-2 treatment train in order to treat the benzene in the aeration tank. This segregation has effectively reduced the volume of this waste stream from 1995 levels by nearly 50%. In addition to this segregation, SMR plans to continue to evaluate the potential for reducing the overall water volume to this unit. Opportunities such as using recycled process water for sprays at SMR equalization ponds and continuing to segregate wastewater streams between ETP-1 and ETP-2.

   Other water reuse measures are being continuously implemented including the return of hydrotest water to the raw water system instead of to the process sewer, and the use of treated wastewater as a source of hydrotest water where practical in place of using fresh water.

PRODUCTION PROCESS CHANGES

No production process changes could be identified which would significantly reduce the formation of this waste stream.

PRODUCT REFORMULATION

Changes in intermediate or finished product composition or specifications would not impact the formation of this waste stream.

ED_001593_00015749

ADMINISTRATIVE STEPS

As mentioned in the section earlier, SMR Environmental Procedures EP 2.14 "Wastewater Collection and Separation Systems" and EP 3.1 "Effluent Treatment Plant Source" are required training modules for all employees whose activities could result in hydrocarbon to the process wastewater system. EP 3.1 clearly states effluent treatment plant source control parameters and instructs operators how to respond to spills or leaks that have the potential to enter the process or storm sewer system.

ED_001593_00015749

SOURCE REDUCTION EVALUATION, REVIEW AND PLAN

SHELL OIL PRODUCTS US
MARTINEZ REFINERY

Section 5.0 – Source Reduction Measure Evaluation

This section provides an evaluation of Source Reduction measures identified in Section 4.0 of the plan, per the following instructions in 22 CCR:

67100.5 (k) Consideration of the following factors for each measure evaluated:

(1) Expected change in the amount of hazardous waste generated
(2) Technical feasibility
(3) Economic evaluation
(4) Effect on product quality
(5) Employee health and safety implications
(6) Permits, variances, compliance schedules of applicable state, local, and federal agencies
(7) Releases and discharges

Evaluations and feasibility analyses of the source reduction measures identified for the following major wastestreams are presented in Tables 5-A, 5-B, and 5-C, respectively.

CWC 222: Oil/Water Separator Sludge – DNF Float,
CWC 181: Selenium Precipitation Unit (SPU) Filter Cake, and
CWC 134: Process Wastewater to ETP-2 Biotreater

From these analyses, source reduction measures will be selected for implementation. A discussion of these measures with an implementation timetable and projected numerical source reduction goal is presented in Section 6.0 of this plan.

ED_001593_00015749

CWC 222: OIL/WATER SEPARATOR SLUDGE – DNF FLOAT

Five general source reduction measures were identified to reduce oil/water separator sludge. Three of the measures (Coat, Gunite, Curb; Street Sweeping; and reduce oil discharges to the sewers) have already proven to reduce waste generation at SMR and SMR intends to continue these measures. SMR will continue to evaluate and identify additional opportunities.

1. *POTENTIAL CONVERSION OF ETP-2 DNF UNITS TO EQUALIZATION TANKS*:

   As mentioned in Section 4.0, the trial run period for potential conversion of the ETP-1 and ETP-2 DNF units to equalization tanks commenced in late August 2011. During this trial period, the ancillary equipment for DNF operation, including nitrogen injection system, will be physically isolated (with block valves) or de-energized (electrically isolated) from the main DNF tanks. Temporary operation of these tanks during the trial period will be identical to an equalization tank where the oil phase will be collected and managed as recovered oil for further processing and eventual re-injection to the Crude Unit. Future operation of the DNF units will be determined based on the results of this feasibility run.

   Expected Reduction in Hazardous Waste Generation

   If successful, this operational change can potentially eliminate the DNF float (K048) waste stream from ETP-2.

   Technical Feasibility

   The conversion of the ETP-1 and ETP-2 DNF units to equalization is technically feasible. However, monitoring of the over-all performance of the effluent treatment plant to ensure that treated wastewater effluent quality is not impacted with the change will determine if this measure will be implanted permanently.

   Economic Evaluation

   Conversion of the ETP-1 and ETP-2 DNF Units to equalization is not expected to have significant economic impact. This operational change will have reduction in nitrogen cost and maintenance of associated equipment.

   Effect on Product Quality

   This measure is expected to have no effect on the quality of the products manufactured in the refinery.

ED_001593_00015749

Employee Health and Safety Implications

No change from existing health and safety precautions and procedures currently in place.

Compliance with State, Local, and Federal laws

Compliance with SMR's NPDES permit limits as well as hazardous waste laws is always a high priority. This hazardous waste reduction measure is geared towards maintaining compliance.

Releases and Discharges

No hazardous materials will be released to the environment as a result of implementing this procedure.

2. *POTENTIAL RELOCATION OF INJECTION POINT FOR OIL-BEARING MATERIALS IN THE DELAYED COKER*:

A project is currently in progress to review feasibility of moving the injection point of the oil-bearing materials in the Delayed Coker Unit (DCU). The oil-bearing materials are currently injected at the top of the drum during the quench cycle. The current location of the injection point limits the amount that can be injected to approximately 25,000 – 35,000 barrels per year. If the injection point can be relocated to the bottom part of the drum, the amount of the oil-bearing materials that can be injected and converted to petroleum coke can be increased to approximately 3-4 times the current injection rate. Final injection point will be determined based on the project. The oil-bearing materials are excluded recyclable materials per California Health and Safety Code Sections 25143.2 and 25144.

Expected Reduction in Hazardous Waste Generation

If successfully implemented, any DNF float generated will no longer be incinerated in the CO Boilers but will be managed as an oil-bearing material.

Technical Feasibility

The technical feasibility is still being reviewed.

Economic Evaluation

Economic evaluation is in progress.

ED_001593_00015749

Effect on Product Quality

This measure is expected to have no effect on the quality of the products manufactured in the refinery.

Employee Health and Safety Implications

No change from existing health and safety precautions and procedures for personnel handling the DNF Float at ETP and the oil-bearing materials at the Delayed Coker.

Compliance with State, Local, and Federal laws
The oil-bearing materials are excluded recyclable materials per California Health and Safety Code Sections 25143.2 and 25144.

Releases and Discharges
No hazardous materials will be released to the environment as a result of implementing this procedure.

3. COAT, GUNITE, AND CURB

This measure has been shown to consistently reduce waste generation at the SMR facility by reducing suspended solids that enter the sewer as a result of erosion of exposed hillsides, ditches, and piperows.

Expected Reduction in Hazardous Waste Generation

Historically, approximately 50-100 tons of erosion solids enter the sewer system each year. A combination of gunite construction of asphalt curbs in high runoff areas reduces this erosion by an estimated 10%. This reduction in solids in the sewer corresponds to an annual reduction in oil/water separator sludge of approximately 150 tons.

Technical Feasibility

This method has been implemented successfully not only at SMR, but throughout the Bay Area industrial facilities to reduce erosion. It has been demonstrated to be technically feasible. One area of concern is that as more surface area of the refinery is covered with an impervious surface like gunite, the stormwater runoff coefficient becomes much greater. This has the effect of greater storm sewer surges resulting in higher water volume to the effluent treatment plant.

ED_001593_00015749

Economic Evaluation

The Coat, Gunite, and Curb program at SMR has been in operation for over a decade. Approximately four million dollars has been spent to date on this program. Since 1999, over 425,000 square feet (~9 acres) of sloped area has received gunite treatment at a cost of over $1,000,000.

Effect on Product Quality

This measure is expected to have no effect on the quality of the products manufactured in the refinery.

Employee Health and Safety Implications

Required personal protective equipment will be worn during application of coating materials and gunite. The work will also require the issuance of a Health and Safety Departmental permit.

Compliance with State, Local, and Federal laws

Not applicable

Releases and Discharges

No hazardous materials will be released to the environment as a result of implementing this procedure.

4 REDUCE OIL DISCHARGES TO SEWER

The numerous projects put in place to reduce or eliminate sources of hydrocarbon into the sewer system were completed through April 2007. These projects included equipment modifications, instrumentation improvements, re-piping and re-routing drains from equipment such as surge drums, scrubbers, pumps, compressors, knock-out pots to maintenance drop-out systems (MDOs), to blow-down system or to another vessel, and the retrofit of sample collection systems and analyzers to fast loops.

Expected Reduction in Hazardous Waste Generation

Although it is difficult to provide accurate estimates of potential hazardous waste reduction from all the projects mentioned above, DNF generation is expected to show reduction compared to previous years.

Since 1993 to present, over 100 fast loop sample stations have been installed to reduce the amount of light hydrocarbon range material to the

ED_001593_00015749

sewers. It is estimated that each sample event previously required one to five gallons of flush prior to pulling a representative sample. With approximately 350 samples taken per day, it is estimated that implementation of this source reduction measure results in a 500-2500 tons reduction in oil and other hydrocarbon material to the sewer each year.

Technical Feasibility

Fast-loop sampling stations are becoming an industry standard and is widely recognized as being technically feasible. All the other projects mentioned were completed in April 2007.

Economic Evaluation

The total cost for all of the projects associated with compliance with BAAQMD Regulation 8 Rule 8 is approximately $30M. A significant portion of this amount was spent on the projects that eliminate or reduce the amount of hydrocarbons sent to the sewer system.

Effect on Product Quality

This measure is expected to have no effect on the quality of the products manufactured in the refinery.

Employee Health and Safety Implications

Required personal protective equipment does not change as a result of the conversions.

Compliance with State, Local, and Federal laws

The projects implemented including conversion of sample stations to fast-loop sample stations complies with BAAQMD Regulation 8 Rule 8 that regulates emissions of volatile organic compounds from wastewater collection systems.

Releases and Discharges

No hazardous materials will be released to the environment as a result of implementing this procedure.

Changes in Hazardous Characteristics

This measure would not change the hazardous characteristics of the waste stream.

ED_001593_00015749

Previous Success

Previous success at minimizing solids and oil in the sewers has been realized in the past.

5. STREET SWEEPING

Dirt, sand and other particulate matter accumulates on paved roadways and in parking lots thought the complex. During rain events, this sediment is washed into the sewer system where it generates up to ten times its weight in hazardous waste. SMR has an effective street sweeping program and has realized waste reduction success from this program.

Expected Reduction in Hazardous Waste Generation

From historical studies, it is estimated that approximately 2500 pounds of dirt, sand and silt can enter the sewers from roadways and parking lots on the west side of the refinery alone each year. This equates to 25,000 pounds or 12.5 tons of oil/water separator sludge each year.

Technical Feasibility

This process has been implemented by other refineries as a means of solids control, and has been demonstrated to be technically feasible.

Economic Evaluation

Beyond the initial investment of the street sweeping equipment, this program is estimated to cost approximately $5000 per year. This amount is well below the potential savings from preventing the waste from being generated.

Effect on Product Quality

This measure is expected to have no effect on the quality of the products manufactured in the refinery.

Employee Health and Safety Implications

As most of the street sweeping occurs in or near process units, required personal protective equipment will be worn during this activity

Compliance with State, Local, and Federal laws

Not applicable

ED_001593_00015749

Releases and Discharges

No hazardous materials will be released to the environment as a result of implementing this procedure.

Changes in Hazardous Characteristics

This measure would not change the hazardous characteristics of the waste stream.

ED_001593_00015749

CWC 181: SELENIUM PRECIPITATION UNIT (SPU) FILTER CAKE

Two measures have been identified regarding the Filter Cake with Selenium/Vanadium volume generated at SMR. An analysis of each approach follows:

1. *REPLACEMENT OF FILTER PRESS WITH CENTRIFUGE*

   SMR conducted a series of sampling to determine dewatering efficiency between the existing filter press and centrifuge. The sampling results indicate that the % solid in the SPU cake is approximately 20% using the filter press and approximately 28% using the centrifuge. Based on these results, SMR replaced the filter press with the centrifuge for dewatering the sludge in May 2011. The increased dewatering efficiency from this operational change will reduce the total amount of SPU cake generated for offsite disposal.

   Expected Reduction in Hazardous Waste Generation

   Based on %solids increase from 20% to approximately 28% in the SPU cake, the corresponding calculated decrease in SPU cake is approximately 25% – 30%.

   Technical Feasibility

   This project has been implemented.

   Economic Evaluation

   Cost of replacement of the filter press system with the centrifuge system was approximately $500,000.

   Offsite disposal of the SPU cake costs approximately $150 per ton, including transportation costs. Savings will be realized for every ton of waste reduction.

   Effect on Product Quality

   This measure is expected to have no effect on the quality of the products manufactured in the refinery.

   Employee Health and Safety Implications

   Required personal protective equipment does not change as a result of the replacement of filter press with the centrifuge.

ED_001593_00015749

Compliance with State, Local, and Federal laws

Compliance with SMR's NPDES permit limits as well as hazardous waste laws is always a high priority. This hazardous waste reduction measure is geared towards maintaining compliance.

Releases and Discharges

No hazardous materials will be released to the environment as a result of implementing this procedure.

Changes in Hazardous Characteristics

This measure would not change the hazardous characteristics of the waste stream.

2. *CONSTRUCTION OF ETP-3*: ETP-2 Biotreater (ETP-2 Aeration Tank) will be required to undergo an API mandated internal tank inspection. During this required outage, SMR must have an alternate equipment that can process the wastewater streams containing benzene at concentrations greater than 0.5 ppm. As previously mentioned, ETP-1 biotreater is only allowed to accept and process non-hazardous waste water streams. In order to prepare for the anticipated outage of ETP-2, SMR started construction activities of ETP-3 biotreater in July 2011. ETP-3 biotreater is identical in size and design as ETP-2 biotreater. When ETP-2 biotreater returns in service, ETP-3 will continue to operate in parallel with ETP-2, providing redundant capacity. The parallel system of ETP-2 and ETP-3 is expected to reduce biosolids carry-over to the Selenium Precipitation Unit with a resultant reduction in the generation of SPU cake.

Expected Reduction in Hazardous Waste Generation

Actual reduction in SPU solids generation due to the parallel operation of ETP-2 and ETP-3 is difficult to quantify at this point.

Technical Feasibility

The construction activities of ETP-3 has already commenced.

Economic Evaluation

The total cost for the construction of ETP-3 is under development.

Effect on Product Quality

This measure is expected to have no effect on the quality of the products manufactured in the refinery.

Employee Health and Safety Implications

Required personal protective equipment and procedures for operation of ETP-3 will be identical to current requirements for operation of ETP-2.

Compliance with State, Local, and Federal laws

Compliance with SMR's NPDES permit limits as well as hazardous waste laws is always a high priority. This hazardous waste reduction measure is geared towards maintaining compliance. ETP-3 is permitted under Permit-by-Rule regulations.

Releases and Discharges

No hazardous materials will be released to the environment as a result of implementing this procedure.

Changes in Hazardous Characteristics

This measure would not change the hazardous characteristics of the waste stream.

3. OPTIMIZE CHEMICAL USAGE

The generation of the selenium/vanadium sludge occurs through the use of several process chemicals. The goal of chemical addition is to remove selenium from the wastewater while minimizing sludge generation and chemical usage. SMR has implemented a monitoring program in order to optimize this process.

Expected Reduction in Hazardous Waste Generation

The ultimate goal of the SPU is to achieve compliance with SMR's NPDES selenium limit. In order to meet that goal, specific dosage of ferric chloride is necessary to remove selenium from the wastewater. As selenium is removed, iron hydroxide sludge is generated that, when dewatered, becomes a non-RCRA hazardous waste. Two options exist for maintaining compliance with the NPDES permit limit:

1) Closely monitor selenium concentrations in and out of the SPU and adjust ferric chloride dosage accordingly, or
2) Attach a fudge factor to the typical ferric chloride dose and overtreat by a given amount to maximize the likelihood of maintaining permit compliance on a consistent basis.

ED_001593_00015749

Clearly, the first option appears to be the more prudent choice as ferric chloride dosage would be based on actual data and overtreatment would be kept to a minimum.

With regard to the expected reduction of hazardous waste by implementing this measure, assuming that 20% overtreatment would be necessary to provide a reasonable safety margin, then the overall reduction of hazardous waste generation due to this measure would be approximately 1600 tons annually.

Technical Feasibility

The chemical process of removing selenium from SMR's wastewater is well understood at this point. SMR has been extremely successful in maintaining compliance with the NPDES selenium permit limit. Success has been achieved by implementing a monitoring program that measures selenium concentrations in SPU influent and effluent and adjusting chemical dosing accordingly. Therefore, this waste reduction measure is found to be technically feasible.

In March 2010, the NPDES effluent permit limits for selenium became more stringent for both the concentration and total mass loading maximum limits. Necessary adjustments to the Selenium Precipitation Unit (SPU) have to be made in order to maintain compliance. SMR continues with our efforts for optimization of chemical usage and operational changes to minimize generation of the SPU filter cake while maintaining compliance with the Refinery's NPDES effluent permit limits.

Economic Evaluation

The cost for SMR to perform in-house analytical monitoring of the SPU influent and effluent on a weekly basis is minimal. Currently disposal costs, including transportation and hazardous waste fees total approximately $150 per ton.

Effect on Product Quality

This measure is expected to have no effect on the quality of the products manufactured in the refinery.

Employee Health and Safety Implications

There are no health and safety implications to this measure.

ED_001593_00015749

Compliance with State, Local, and Federal Laws

Compliance with SMR's NPDES permit limits as well as hazardous waste laws is always a high priority. This hazardous waste reduction measure is geared towards maintaining compliance.

Releases and Discharges
No hazardous materials will be released to the environment as a result of implementing this procedure.

Changes in Hazardous Characteristics
This measure would not change the hazardous characteristics of the waste stream.

Previous Success
This measure has shown to be very effective based on SMR's compliance history.

1) PURSUE RECYCLE OPTION

Expected Reduction in Hazardous Waste Generation

This measure has no impact on the generation of the SPU Filter Cake. Rather, implementation of the proposed recycle option can prevent the landfill disposal of this wastestream by using it as a raw material substitute in an industrial process to make a product.

The net environmental benefit of implementing this measure is the diversion of up to 8000 tons per year of this material from landfill disposal to beneficial use.

Technical Feasibility

Due to its iron content, SPU Filter Cake is a likely suitable material for use in the cement manufacturing process. However, due to the high moisture content, finding users for this waste stream has been a challenge.

Economic Evaluation

The cement manufacturing company has facilities in California and Texas. Depending which facility the SPU Filter Cake is accepted, transportation costs will vary. Increased cost for transportation to Texas can possibly be off-set by savings in the areas of hazardous waste taxes and fees and disposal costs.

ED_001593_00015749

Effect on Product Quality

This measure is expected to have no effect on the quality of the products manufactured in the refinery.

Employee Health and Safety Implications

All required personal protective equipment will be worn when handling this material. There are no health and safety implications to this measure.

Compliance with State, Local, and Federal Laws

Compliance with all hazardous waste laws and regulations is always a high priority. Discussions with the Department of Toxic Substances Control are an integral part of evaluating the viability of this measure.

Releases and Discharges

No hazardous materials will be released to the environment as a result of implementing this procedure. Contaminants present in the SPU Filter Cake are stabilized during the manufacturing process and are rendered inert.

Changes in Hazardous Characteristics

When used as raw material for the cement industry, the contaminants present in the SPU Cake will be stabilized during the manufacturing process making the material statutorily inert. The material is rendered non-hazardous following processing.

ED_001593_00015749

CWC 134: PROCESS WASTEWATER TO ETP-2 BIOTREATER

Two source reduction measures are evaluated for this waste stream, namely: Reducing Oil to Sewers and Reducing Water Volume to Sewers.

1. REDUCE OIL DISCHARGES TO SEWER

Reduce Oil to Sewers, is the same measure for the other waste stream described earlier in this section, Oil/Water Separator Sludge - DNF.

Expected Reduction in Hazardous Waste Generation

It is difficult to provide accurate estimates of potential hazardous waste reduction from the projects mentioned above.

Technical Feasibility

Fast-loop sampling stations are becoming an industry standard and is widely recognized as being technically feasible. All the other projects mentioned were completed in April 2007.

It is likely that as other source reduction measures relating to improved oil recovery operations are evaluated, some will be deemed technically feasible. Those which are will be candidates for implementation

Economic Evaluation

The total cost for all of the projects associated with compliance with BAAQMD Regulation 8 Rule 8 is approximately $30M. A significant portion of this amount was spent on the projects that eliminate or reduce the amount of hydrocarbons sent to the sewer system.

Effect on Product Quality

This measure is expected to have no effect on the quality of the products manufactured in the refinery.

Employee Health and Safety Implications

Required personal protective equipment does not change as a result of the conversions.

Compliance with State, Local, and Federal laws

The projects implemented including conversion of sample stations to fast-loop sample stations complies with BAAQMD Regulation 8 Rule 8 that

ED_001593_00015749

regulates emissions of volatile organic compounds from wastewater collection systems.

Releases and Discharges

No hazardous materials will be released to the environment as a result of implementing this procedure.

Changes in Hazardous Characteristics

This measure may change the hazardous characteristics of the waste stream if the concentration of benzene in this waste stream can be reduced below hazardous levels (<0.5 ppm).

Previous Success

Previous success at minimizing solids and oil in the sewers has been realized in the past.

2. REDUCE OVERALL WATER VOLUME TO SEWER:

As mentioned, SMR has segregated benzene-containing streams into this ETP-2 treatment train in order to treat the benzene in the aeration tank. This segregation has effectively reduced the volume of this waste stream from 1995 levels by nearly 50%. This reduction is a significant waste minimization accomplishment. In addition to this segregation, SMR plans to continue to evaluate the potential for reducing the overall water volume to this unit. Opportunities such as using recycled process water for sprays at SMR equalization ponds, hydrotesting, and continuing to segregate wastewater streams between ETP-1 and ETP-2 will be evaluated.

Other water reuse measures are being evaluated including the return of hydrotest water to the raw water system instead of to the process sewer, and the use of treated wastewater as a source of hydrotest water where practical in place of using fresh water.

Expected Reduction in Hazardous Waste Generation

Prior to performing the analysis, it is difficult to provide accurate estimates of potential hazardous waste reduction in this area of generation.

Technical Feasibility

It is estimated that operational changes exist that may be selected that will be technically feasible.

Economic Evaluation

Prior to identifying water volume reduction opportunities, it is difficult to assess economic impacts of this approach. Costs to install required piping to minimize water volume through segregation may be incurred.

Effect on Product Quality

This measure is expected to have no effect on the quality of the products manufactured in the refinery.

Employee Health and Safety Implications

Required personal protective equipment will be worn during this evaluation.

Compliance with State, Local, and Federal laws

Not applicable

Releases and Discharges

No hazardous materials will be released to the environment as a result of implementing this procedure.

Changes in Hazardous Characteristics

This measure may change the hazardous characteristics of the waste stream if the concentration of benzene in this waste stream can be reduced below hazardous levels (<0.5 ppm).

Previous Success

This measure has already been implemented to some extent at SMR and has been shown to be successful.

ED_001593_00015749

SOURCE REDUCTION EVALUATION, REVIEW AND PLAN

SHELL OIL PRODUCTS US
MARTINEZ REFINERY

Section 6.0 – Implementation & Exceptions and Numerical Goals

All of the source reduction measures identified and evaluated in Sections 4.0 and 5.0 of this Plan are considered to be technically feasible. None of the measures are expected to create emissions or discharges to the air, water, or land. There are no rejected measures at the point of the development of this PLAN.

All measures have been selected for implementation or for further evaluation. If, after further analysis, any measure is determined to be not technically feasible, or attempts to implement a measure reveal that it will result in:

a) an increase in hazardous waste generation
b) additional environmental releases
c) adverse effects on product quality
d) increased risk to human health or the environment,

then that measure will not be implemented as stated in 22 CCR Section 67100.4 (c).

In the event that a selected measure is not implemented, this Plan and the Plan Summary will be amended to reflect the decision and rationale for rejection within 90 days.

CWC 222: OIL/WATER SEPARATOR SLUDGE – DNF FLOAT

Implementation timetables for each source reduction measure selected for CWC 222, Oil/Water Separator Sludge, are found in Tables 6-A through 6-E. These include:

1. Potential Conversion of ETP-2 DNF units to equalization tanks
2. Potential relocation of injection point for oil-bearing materials in the Delayed Coker Unit (DCU)
3. Coat, Gunite, and Curb
4. Street Sweeping
5. Reduce Oil Discharge to Sewer

The numerical four-year reduction goal for this waste stream could be greater than 50%, depending on the results of the trial/feasibility of measure #1 (potential conversion of ETP-1 and ETP-2 DNF units to equalization tanks). It should be

ED_001593_00015749

noted this measure will be implemented permanently only if the feasibility study show that the conversion of the DNF units will have no impact on over-all quality of the treated wastewater effluent.

CWC 181: SELENIUM PRECIPITATION UNIT (SPU) FILTER CAKE

Implementation timetables for each source reduction measure selected for CWC 223, Selenium Precipitation Unit (SPU) Filter Cake, are provided in Tables 6-F and 6-G. These include:

1. Replacement of SPU filter press with more efficient centrifuge
2. Construction of ETP-3
3. Optimize Chemical Treatment Process
4. Pursue recycle option

The numerical four-year reduction goal for this waste stream is 25%. The possible re-use of this residual material as raw material for the cement manufacturing industry no impact on the generation of the SPU Cake. Rather, implementation of the proposed recycle option can prevent the landfill disposal of this wastestream by using it as a raw material substitute in an industrial process to make a product. The classification of this waste stream could then change from non-RCRA waste to excluded recyclable material for re-use as raw material.

CWC 134: PROCESS WASTEWATER TO ETP-2 BIOTREATER

Implementation timetables for each source reduction measure selected for CWC 134, Process Water to Biotreater, are provided in Tables 6-H and 6-I. These include:

1) Reduce Oil Discharges to Sewer, and
2) Reduce Discharge Volume to Sewer (Water Conservation and Reuse)

The numerical four-year reduction goal for this waste stream is 5%.

ED_001593_00015749

TIMETABLES

CWC 222: OIL/WATER SEPARATOR SLUDGE – DNF FLOAT

Table 6-A: Potential Conversion of ETP-1 and ETP-2 DNF Tanks to Equalization Tanks

TASK	TIMEFRAME	DESCRIPTION
1	By late 08/2011	Start trial period to determine feasibility of converting the ETP1 and ETP-2 DNF units to equalization tanks without any impact on the over-all treated wastewater effluent quality
2	By 6/2012	Review collected data and make determination if tank conversion can be implemented permanently.
3	By 12/2012	If determined feasible with no impact to over-all treated wastewater effluent quality, implement conversion.

Table 6-B: Potential Relocation of Injection Point for Oil-Bearing Materials in the Delayed Coker Unit (DCU)

TASK	TIMEFRAME	DESCRIPTION
1	08/2011	Start project to review feasibility of relocating the injection point for the oil bearing materials into the Delayed Coker Unit
2	03/2012	Make selection of appropriate injection point
3	07/2012	Detail project proposal (if determined feasible)
4	To be determined	The start of injection point relocation will depend on the outcome of the feasibility project.

ED_001593_00015749

Table 6-C: Coat, Gunite, and Curb

TASK	TIMEFRAME	DESCRIPTION
1	Ongoing	Identify areas where significant erosion exists: hillsides, pipe rows, and tank levees to gunite, landscape, or curb
2	Ongoing	Work with maintenance to develop timeline, costs and budget
3	Ongoing	Implement identified erosion control options

Table 6-D: Street Sweeping

TASK	TIMEFRAME	DESCRIPTION
1	By 12/2011	Review areas currently addressed by street sweeping program with Maintenance Department.
2	By 04/2012	Meet with Maintenance Department and Street Sweeping Contractor to review program and evaluate improvement opportunities.
3	By 08/2012	Schedule and budget necessary funds to implement improvements.
4	By 08/2012	Continue Street Sweeping Program with Improvements.

Table 6-E: Reduce Oil Discharges

TASK	TIMEFRAME	DESCRIPTION
1	Ongoing	Identify potential process operating changes that can impact oil/solids discharges to sewer, eliminating specific hydrocarbon sources to the sewer system (BAAQMD Reg 8 Rule 8)
2	Ongoing	Implement operating changes

ED_001593_00015749

CWC 181: SELENIUM PRECIPITATION UNIT (SPU) CAKE

Table 6-F: Replacement of Filter Press with Centrifuge

TASK	TIMEFRAME	DESCRIPTION
1	May 2011	Replacement of filter press for dewatering with centrifuge has been completed
2	Ongoing	Monitor reduction in generated SPU cake

Table 6-G: Construction of ETP-3 Biotreater

TASK	TIMEFRAME	DESCRIPTION
1	July 2011	Obtain all require permit for construction of ETP-3 Biotreater, including Authority to Construct from BAAQMD and Permit-by-Rule from Contra Costa County Health Services
2	August 2011	Start construction activities
3	Early 2013	Start-up of ETP-3 Biotreater

Table 6-H: Optimize Chemical Usage

TASK	TIMEFRAME	DESCRIPTION
1	Ongoing	Monitor selenium concentrations in SPU influent and effluent on a weekly basis
2	Ongoing	Adjust chemical dose based on analytical data to achieve compliance with NPDES permit limits

Table 6-I: Pursue Recycle Option

TASK	TIMEFRAME	DESCRIPTION
1	07/2011 Completed	Send samples to contract laboratory for analytical testing
2	Ongoing	Work with Shell Global Solutions adviser to identify potential use of SPU cake as substitute for raw material

ED_001593_00015749

CWC 134: PROCESS WASTEWATER TO ETP-2 BIOTREATER

Table 6-J: Reduce Oil Discharges

TASK	TIMEFRAME	DESCRIPTION
1	Ongoing	Identify potential process operating changes that can impact oil/solids discharges to sewer, eliminating specific hydrocarbon sources to the sewer system (BAAQMD Reg 8 Rule 8)
2	Ongoing	Implement operating changes

Table 6-K: Reduce Water Volumes

TASK	TIMEFRAME	DESCRIPTION
1	On a job-by-job basis	Evaluate potential for using treated wastewater for hydrotesting tanks and other equipment
2	Ongoing	Identify opportunities to segregate/quantify low-benzene streams
3	Ongoing	Where feasible, return hydrotest water back to raw water system (reuse) rather than drain to sewer

ED_001593_00015749

SOURCE REDUCTION EVALUATION, REVIEW AND PLAN

SHELL OIL PRODUCTS US
MARTINEZ REFINERY

Section 7.0 – Technical and Financial Certification

Technical Certification

I certify that this Source Reduction Evaluation, Review and Plan meets all of the following requirements:

1) The review and plan addresses each hazardous waste stream identified pursuant to section 67100.5(h), Title 22 of the California Code of Regulations.
2) The review and plan addresses the source reduction approaches specified in section 67100.5(j), Title 22 of the California Code of Regulations.
3) The review and plan clearly sets forth the measures to be taken with respect to each hazardous waste stream for which source reduction has been found to be technically feasible and economically practicable, with timetables for making reasonable and measurable progress, and documents the rationale for rejecting available source reduction measures.
4) The review and plan does not merely shift hazardous waste from one environmental medium to another environmental medium by increasing emissions or discharges to air, water, or land.

Raymond Fong	
Name	Signature
Senior Engineer	8/31/2011
Title	Date

ED_001593_00015749

SOURCE REDUCTION EVALUATION, REVIEW AND PLAN

SHELL OIL PRODUCTS US
MARTINEZ REFINERY

Section 7.0 – Technical and Financial Certification

Financial Certification

I certify 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 the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for making false statements or representations to the Department, including the possibility of fines for criminal violations.

Paul D. Gabbard	Shirley for Paul Gabbard
Name	Signature
Refinery General Manager	August 31, 2011
Title	Date

Shell Oil Products US

Martinez Refinery
PO Box 711
Martinez, CA 94553-0071
Tel (925) 313-3000
Fax (925) 313-3065

CERTIFIED MAIL

August 31, 2011

Department of Toxic Substances Control
Office of Pollution Prevention and Technology Development
Source Reduction Unit
P.O. Box 806, 12th Floor
Sacramento, CA 95812-0806

SUBJECT: Hazardous Waste Source Reduction & Management Review Act (SB 14)
Summary Progress Report
Shell Oil Products US, Martinez Refinery
(EPA ID #CAD009164021)

The Shell Oil Products US, Martinez Refinery (SMR) has prepared the following Summary Progress Report to comply with the Hazardous Waste Source Reduction and Management Review Act of 1989, commonly known as SB-14. The act requires that generators of hazardous waste in excess of 12,000 kg in a reporting year prepare this report by September 1, 1991 and every four years thereafter. SMR meets this specified hazardous waste generator requirement that triggers reporting under SB-14.

Supplemental reports, the Source Reduction Evaluation Review and Plan and Hazardous Waste Management Performance Report have been prepared and are available upon request.

If you have any questions regarding this letter or the contents of the Summary Progress Report, please contact Merliza Z. Alcala at (925) 313-5516.

Sincerely yours,

Lynley C. Harris, Manager
Environmental Affairs

Attachments: Summary Progress Report

Certification of SB-14 Hazardous Waste Summary Progress Report

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 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 Shirley G for Paul Gabbard

DATE August 31, 2011

NAME Paul D. Gabbard

TITLE Refinery General Manager

SUMMARY PROGRESS REPORT

TABLE 1: GENERAL INFORMATION

DATE: August 31, 2011

A hazardous waste generator subject to SB 14, is required to complete and submit Tables 1 and 2 to the Department of Toxic Substances Control by September 1, 2011. The generator is to submit only one Table 1. However, the generator may need to submit more than one Table 2, one for each reportable waste stream.

See Summary Progress Report publication or SB 14 Guidance Manual Chapter 7, for assistance.

(1) NAME OF GENERATOR, FACILITY, or BUSINESS: Shell Oil Products US, Martinez Refinery		☐ (1a) **MULTI-SITE?** (If this is a multi-site business, please check this box and list the primary EPA ID number under box #2 and add the remaining EPA ID numbers under "COMMENTS" below. Combine data for similar wastes from the multiple sites for the remainder of the Summary Progress Report).	
(2) EPA ID NO.	(3) SIC CODE	(4) NAICS CODE	
CAD009164021	2911	324110	
(5) STREET ADDRESS		(6) CITY	(7) COUNTY
3485 Pacheco Boulevard		Martinez	Contra Costa
(8) MAILING ADDRESS		(9) CITY	(10) ZIP CODE
P.O. Box 711		Martinez	94553
(11) CONTACT NAME			(12) CONTACT PHONE
Merliza Z. Alcala, Environmental Affairs Department			(925) 313-5516
(13) TYPE OF BUSINESS, OPERATION, or ACTIVITY:			
Petroleum Refining Facility			

(14) SB 14 reportable total quantities of Hazardous Waste Generated at Site, for 2006 and 2010 Reporting Years. Reportable Total Quantities include all hazardous wastes subject to SB 14. Do not include nonroutinely generated, exempted, or secondary wastes. Exempted and nonroutinely generated wastes are listed in Section 67100.2(c), Title 22, California Code of Regulations. Secondary waste is hazardous waste generated as a result of onsite treatment of HAZARDOUS waste.

Obtain information requested below from your 2006 and 2010 Plans or compliance Checklists.		2006	2010
(15) SB 14 hazardous waste processed onsite in a wastewater pretreatment unit for discharge to POTW or NPDES permit (Category A*)	Total:	4,451,000,000 lbs	4,482,000,000 lbs
(16) All other SB 14 hazardous waste (Category B*)	Total:	50,977,894 lbs	55,881,765 lbs
(17) All extremely hazardous waste	Total:	0 lbs	0 lbs

* Category A was previously referred to as aqueous waste. Category B was previously referred to as nonaqueous waste.

(18) COMMENTS regarding hazardous waste source reduction and recycling activities (add page if needed).

The three major hazardous waste streams subject to SB 14 reporting requirements are generated at SMR's Effluent Treatment Plant. Comparison of Category A wastestream amount (Line 15) indicates that this wastestream remains almost the same from baseline year 2006 with a slight increase of 1%. The values entered in Line 16 above for 2006 and 2010 represent the total for all SB 14 Category B hazardous wastes (major and minor). Total of all Category B waste streams shows an increase of approximately 10 %. Additional comments are provided in the attachment.

Please continue by clicking on the "Table 2" tab below.

SUMMARY PROGRESS REPORT

TABLE 2: SPECIFIC WASTE STREAM INFORMATION **DATE:** August 31, 2011

Complete and submit a separate Table 2 for each major hazardous waste stream.

Complete and submit a separate Table 2 for each minor hazardous waste stream for which a source reduction measure was selected.

IDENTIFICATION

(19) NAME OF GENERATOR, FACILITY, or BUSINESS	(20) EPA ID NO.
Shell Oil Products US, Martinez Refinery	CAD009164021
(21) HAZARDOUS WASTE STREAM DESCRIPTION	(22) CALIFORNIA WASTE CODE
Process Wastewater to ETP-2 Biotreater	CWC: 134

(23) THIS HAZARDOUS WASTE IS (please check one):

X Processed onsite in a wastewater pretreatment unit for discharge to POTW or NPDES permit (Category A)

____ Other SB 14 hazardous waste (Category B)

____ Extremely hazardous waste

ACCOMPLISHMENTS

Your 2006 SB 14 Plan, Performance Report, or Compliance Checklist, has this information.

(24) Provide the following information for this waste stream:

How much waste was generated in the 2006 Reporting Year? 4,451,000,000 pounds

Describe the source reduction measure(s) implemented since 2006 (add page if needed):

(1)Reduction of oil discharges to sewer through (a) projects put in place to eliminate hydrocarbon discharges to sewer (b) use of sample fast loops and sample collection systems; (2) Continue water re-use within the refinery.

Estimate when this source reduction measure was implemented: Ongoing Month 2007 Year

For this measure, what source reduction quantity was projected in the 2006 Plan: 223,000,000 pounds per year

Estimate the quantity of waste reduced annually by this measure since implementation: See Note Below ** pounds per year

*** The measures were succesful in reducing the total oil and hydrocarbons in the process sewer. Based on 2010 reported amount, there is no noticeable reduction in the total aqueous wastestream.*

(See Summary Progress Report publication or SB 14 Guidance Manual Chapter 6, to help estimate hazardous waste reduced.)

PROJECTIONS

Your 2010 SB 14 Plan or Compliance Checklist has this information.

(25) Provide the following information for this waste stream:

How much waste was generated in the 2010 Reporting Year? 4,482,000,000 pounds

Describe the source reduction measure selected to be implemented by 2014: (add page if needed):

Better segregation and quantification of non-hazardous wastewater streams from wastewater streams containing benzene levels of greater than 0.5 ppm.

Estimate when this source reduction measure will be implemented: Jan Month 2013 Year

What is the annual projected source reduction quantity identified in the 2010 Plan? (5%) 224,000,000 pounds per year

*** Since the information required for Table 2 is waste stream specific, a separate Table 2 must be completed for each Major waste stream. Add additional waste streams by clicking on the "Table 2-1" through "Table 2-10 " tabs at the bottom as necessary.**

SUMMARY PROGRESS REPORT

TABLE 2: SPECIFIC WASTE STREAM INFORMATION

DATE: August 31, 2011

Complete and submit a separate Table 2 for each major hazardous waste stream.

Complete and submit a separate Table 2 for each minor hazardous waste stream for which a source reduction measure was selected.

IDENTIFICATION

(19) NAME OF GENERATOR, FACILITY, or BUSINESS	(20) EPA ID NO.
Shell Oil Products US, Martinez Refinery	CAD009164021
(21) HAZARDOUS WASTE STREAM DESCRIPTION	(22) CALIFORNIA WASTE CODE
Oil/Water Separator Sludge - DNF Float	CWC: 222

(23) THIS HAZARDOUS WASTE IS (please check one):

	Processed onsite in a wastewater pretreatment unit for discharge to POTW or NPDES permit (Category A)
X	Other SB 14 hazardous waste (Category B)
	Extremely hazardous waste

ACCOMPLISHMENTS

Your 2006 SB 14 Plan, Performance Report, or Compliance Checklist, has this information.

(24) Provide the following information for this waste stream:
How much waste was generated in the 2006 Reporting Year? 28,545,700 pounds
Describe the source reduction measure(s) implemented since 2006 (add page if needed):

(1) Erosion control; (2) Street Sweeping; (3) Reduce oil discharges to sewer by (a) projects put in place to eliminate hydrocarbon discharges to sewer (b) use of sample fast loops and sample collection systems; (4) Reroute high hardness, low BOD wastewater around DNF; (5) Replacement of filter press in Utilities Dept.

Estimate when this source reduction measure was implemented: Jan Month 2007 Year
For this measure, what source reduction quantity was projected in the 2006 Plan: (5%) 1,427,000 pounds per year
Estimate the quantity of waste reduced annually by this measure since implementation: See Note Below ** pounds per year

*** Reduction from listed efforts were achieved. Increase in 2010 amount was from plant upset in 2010.*

(See Summary Progress Report publication or SB 14 Guidance Manual Chapter 6, to help estimate hazardous waste reduced.)

PROJECTIONS

Your 2010 SB 14 Plan or Compliance Checklist has this information.

(25) Provide the following information for this waste stream:
How much waste was generated in the 2010 Reporting Year? 32,108,700 pounds
Describe the source reduction measure selected to be implemented by 2014: (add page if needed):

Feasibility projects for (1) potential conversion of DNF tanks at the effluent treatment plant (ETP) to equalization tanks for oil recovery; (2) potential relocation of injection point for oil-bearing materials into the Delayed Coker Unit.

Estimate when this source reduction measure will be implemented: Dec Month 2012 Year
What is the annual projected source reduction quantity identified in the 2010 Plan? See Note Below *** pounds per year

*** The measure identified above, if determined feasible, is anticipated to have a reduction of over 50%.*

*** Since the information required for Table 2 is waste stream specific, a separate Table 2 must be completed for each Major waste stream. Add additional waste streams by clicking on the "Table 2-1" through "Table 2-10 " tabs at the bottom as necessary.**

SUMMARY PROGRESS REPORT

TABLE 2: SPECIFIC WASTE STREAM INFORMATION

DATE: August 31, 2011

Complete and submit a separate Table 2 for each major hazardous waste stream.

Complete and submit a separate Table 2 for each minor hazardous waste stream for which a source reduction measure was selected.

IDENTIFICATION

(19) NAME OF GENERATOR, FACILITY, or BUSINESS	(20) EPA ID NO.
Shell Oil Products US, Martinez Refinery	CAD009164021
(21) HAZARDOUS WASTE STREAM DESCRIPTION	(22) CALIFORNIA WASTE CODE
Selenium Precipitation Unit (SPU) Filter Cake	CWC: 181

(23) THIS HAZARDOUS WASTE IS (please check one):

- ____ Processed onsite in a wastewater pretreatment unit for discharge to POTW or NPDES permit (Category A)
- X Other SB 14 hazardous waste (Category B)
- ____ Extremely hazardous waste

ACCOMPLISHMENTS

Your 2006 SB 14 Plan, Performance Report, or Compliance Checklist, has this information.

(24) Provide the following information for this waste stream:

How much waste was generated in the 2006 Reporting Year? 14,169,000 pounds

Describe the source reduction measure(s) implemented since 2006 (add page if needed):

(1) Continue optimization of chemical tratment performance and (2) Pursue re-use option of SPU Filter Cake as raw material for other manufacturing industries.

Estimate when this source reduction measure was implemented: Ongoing Month 2007 Year

For this measure, what source reduction quantity was projected in the 2006 Plan: 10,600,000 ** pounds per year

Estimate the quantity of waste reduced annually by this measure since implementation: See Note Below ** pounds per year

*** There has been no reduction in the waste generated. The previous projection was based on re-use as raw material for the cement industry.*

(See Summary Progress Report publication or SB 14 Guidance Manual Chapter 6, to help estimate hazardous waste reduced.)

PROJECTIONS

Your 2010 SB 14 Plan or Compliance Checklist has this information.

(25) Provide the following information for this waste stream:

How much waste was generated in the 2010 Reporting Year? 16,042,500 pounds

Describe the source reduction measure selected to be implemented by 2014: (add page if needed):

(1) Replaced the filter press with more efficient centrifuge and (2) Construction of ETP-3 Biotreater that would reduce biosolids carry-over.

Estimate when this source reduction measure will be implemented: May Month 2011 Year

What is the annual projected source reduction quantity identified in the 2010 Plan? 4,000,000 pounds per year

The filter press was replaced with the more efficient centrifuge in May 2011. Contruction activities of ETP-3 commenced in August 2011 with anticipated completion in early 2013.

*** Since the information required for Table 2 is waste stream specific, a separate Table 2 must be completed for each Major waste stream. Add additional waste streams by clicking on the "Table 2-1" through "Table 2-10 " tabs at the bottom as necessary.**

HAZARDOUS WASTE SOURCE REDUCTION AND MANAGEMENT REVIEW ACT

SHELL OIL PRODUCTS US
MARTINEZ REFINERY

Shell Martinez Refinery (SMR) adheres to Shell's corporate policy that emphasizes the importance of responsible decision–making and requires compliance with regulatory requirements. The Shell Manufacturing Site Requirements Manual specifically requires that "each site shall have management and control systems in place to minimize waste."

The Refinery maintains the other administrative waste management measures mentioned in previous reports that include the designation of Environmental Focal Points for each of the refinery operating areas, incentive awards for environmental awareness, and implementation of internal procedures that are required training modules for all employees whose activities could result in generation and handling of wastes. The Environmental Focal Points serve as environmental ambassadors in the field and as go-to persons for operators as well as contractors to answer questions, resolve waste handling issues, and assure that hazardous and non-hazardous wastes and recyclables are managed properly.

RECYCLING/RECLAIM

Spent Catalysts

SMR continues to pursue alternate management methods for spent catalyst to minimize landfill disposal. Preferred management methods include catalyst recycling/regeneration and metals reclamation. Below is a summary of how spent catalyst was managed in 2010:

Recycling or Metals Reclamation:	1,068,521 lbs
Landfill Disposal	376,911 lbs
Incinerated:	24,930 lbs
Total	1,470,362 lbs

As indicated above, almost 73% of spent catalyst that are either listed or characteristic hazardous was sent for recycling or metals reclamation.

Cat Cracker Regen Catalyst

Spent non-hazardous aluminosilicate catalyst is generated continually during the catalytic cracking process. On average, SMR recycles >90% of this material for use as a raw material in the production of cement.

Other Recycling Activities

Just like in previous years, SMR recycled over 100,000 lbs of recyclable cardboards and other paper products, metal cans, and plastic bottles in 2010. All proceeds from plastics, aluminum and cardboard are donated to local non-profit charitable organizations.

Furthermore, SMR sends scrap metal to a recycling facility. In 2010, approximately 3,200,000 lbs of scrap metal from the refinery was recycled.

SMR also segregates universal wastes such as batteries, fluorescent bulbs, and electronic devices. SMR has a staff devoted full-time to managing the recycle center that receives the recyclable materials and the universal wastes.

OTHER FACTORS

In March 2010, the NPDES effluent permit limits for selenium became more stringent for both the concentration and total mass loading maximum limits. Necessary adjustments to the Selenium Precipitation Unit (SPU) have to be made in order to maintain compliance. The dewatered solids from the SPU comprise over 65% of all hazardous waste streams generated at the Refinery that are sent offsite for disposal. SMR continues with our efforts for optimization of chemical usage and operational changes to minimize this waste stream while maintaining compliance with the Refinery's NPDES effluent permit limits.

To: Lin, Sharon[Lin.Sharon@epa.gov]
Cc: Sugerman, Rebecca[Sugerman.Rebecca@epa.gov]; Frazer, Russell[Frazer.Russell@epa.gov]; Howe, Chris[Chris.Howe@valero.com]
From: Cuffel, Donald
Sent: Wed 8/5/2015 7:51:38 PM
Subject: RE: CD-R disc

Good afternoon Sharon,

We received EPA's flash drive today with accessible files and folders on it. Per our email exchange regarding the "date of receipt", Valero considers today, August 5, 2015, as the date of receipt.

Please contact me directly if you have any questions. Thank you,

Don

Donald W. Cuffel

Manager - Environmental Engineering

Valero Refining Company - CA, Benicia Refinery

707 745 7545

From: Lin, Sharon [mailto:Lin.Sharon@epa.gov]
Sent: Friday, July 31, 2015 1:10 PM
To: Cuffel, Donald
Cc: Sugerman, Rebecca; Frazer, Russell; Howe, Chris
Subject: RE: CD-R disc

Hi, Don,

I apologize for the missing content on the CD disc. I will check with our CBI document control officer since she did the mailing. I will get back to you next week. We will adjust the requested

response dates accordingly. Thanks.

Sharon

From: Cuffel, Donald [mailto:Don.Cuffel@valero.com]
Sent: Friday, July 31, 2015 12:59 PM
To: Lin, Sharon
Cc: Sugerman, Rebecca; Frazer, Russell; Howe, Chris
Subject: FW: CD-R disc
Importance: High

Good afternoon Sharon,

The CD-R disc in the manila envelope with EPA Region IX's return address is blank. It is also unlabeled. Perhaps the disc intended for Valero is still in your offices on Hawthorne Street?

We do not have the benefit of the data files supporting EPA's cover letter content; therefore, I believe that the countdown for our responses will be reset to the date on which we receive the full set of data files you intended to be included on the CD-R.

I have saved the disc and envelope in case EPA wants to review it. Please advise when we can expect the correct CD-R. Thank you,

Don

Donald W. Cuffel

Manager - Environmental Engineering

Valero Refining Company - CA, Benicia Refinery

707 745 7545

From: Lazorik, John
Sent: Friday, July 31, 2015 12:52 PM
To: Cuffel, Donald; Howe, Chris
Subject: FW: CD-R disc

I checked with Aaron Cruz how best to retrieve the information on the disc that EPA provided to assure there were no viruses or other threats. Aaron checked the disc on his computer and found that the disc was blank.

John Lazorik

Sr. Staff Environmental Engineer

Valero Benicia Refinery

3400 East Second Street Benicia, CA 94510

Office: 707-745-7660 Fax: 707-745-7339

john.lazorik@valero.com

From: Cruz, Aaron
Sent: Friday, July 31, 2015 12:49 PM
To: Lazorik, John
Subject: CD-R disc

John

Looking at the disc and how Windows behaves when inserted in the drive, I believe the disc is

blank.

Regards,

Aaron Cruz

IS Analyst

Valero Benicia Refinery

VHD

707 745-7932

To: Lin, Sharon[Lin.Sharon@epa.gov]
From: michael.monson@shell.com
Sent: Tue 12/13/2016 12:50:17 AM
Subject: RE: Request for Additional Information

Sharon,

Natalie has moved on, Gordon Johnson is the new EA Manager.

From: Lin, Sharon [mailto:Lin.Sharon@epa.gov]
Sent: Monday, December 12, 2016 3:16 PM
To: Monson, Michael J SOPUS-DMW/323
Subject: RE: Request for Additional Information

Hi, Mike,

I am getting ready to send the inspection report to you soon. Is Natalie still in the same position or should I send it to someone else? Please advise. Thanks.

Sharon

From: michael.monson@shell.com [mailto:michael.monson@shell.com]
Sent: Tuesday, November 15, 2016 3:39 PM
To: Lin, Sharon <Lin.Sharon@epa.gov>
Cc: michael.monson@shell.com
Subject: RE: Request for Additional Information

Sharon,

Per our earlier agreement, the ETP-1 Feed sample results for 2016 are attached. The benzene concentrations were 0.05 mg/L and 0.09 mg/L.

From: Lin, Sharon [mailto:Lin.Sharon@epa.gov]
Sent: Thursday, April 07, 2016 4:04 PM
To: Monson, Michael J SOPUS-DMW/323
Subject: RE: Request for Additional Information

Thanks!

From: michael.monson@shell.com [mailto:michael.monson@shell.com]
Sent: Thursday, April 07, 2016 3:40 PM
To: Lin, Sharon <Lin.Sharon@epa.gov>
Cc: michael.monson@shell.com
Subject: RE: Request for Additional Information

Sharon,

Hope you had a nice vacation.

See attached analytical data for 2003 as requested. Samples are semi-annual.

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

From: Lin, Sharon [mailto:Lin.Sharon@epa.gov]
Sent: Wednesday, March 23, 2016 1:54 PM
To: Monson, Michael J SOPUS-DMW/323
Subject: RE: Request for Additional Information

Ok. thanks. I saw the sampling location in Gordon's memo. Thanks!

Sharon

From: michael.monson@shell.com [mailto:michael.monson@shell.com]
Sent: Wednesday, March 23, 2016 1:20 PM
To: Lin, Sharon <Lin.Sharon@epa.gov>
Subject: RE: Request for Additional Information

Data from 2003 is stored off-site. I will need to request it.

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

From: Lin, Sharon [mailto:Lin.Sharon@epa.gov]
Sent: Wednesday, March 23, 2016 1:10 PM
To: Monson, Michael J SOPUS-DMW/323
Subject: RE: Request for Additional Information

Hi, Mike,

Could I get the 2003 ETP-1 data too? Also, please advise the frequency of the sampling for the ETP-1 feed and the location of the sampling point. Thanks.

Sharon

From: michael.monson@shell.com [mailto:michael.monson@shell.com]
Sent: Wednesday, March 23, 2016 11:26 AM
To: Lin, Sharon <Lin.Sharon@epa.gov>
Cc: michael.monson@shell.com

Subject: Request for Additional Information

Sharon,

The hard copy will be mailed later today, but I'm sending you electronic copies as well. Attached are the cover letter, analytical reports, and the BWON reports (without appendices A & B due to size constraints).

Please let me know if you have any further questions,

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

To: Lin, Sharon[Lin.Sharon@epa.gov]
Cc: michael.monson@shell.com[michael.monson@shell.com]
From: michael.monson@shell.com
Sent: Tue 11/15/2016 11:39:17 PM
Subject: RE: Request for Additional Information
J72969-1 ETP-1 Feed - 1H2016.pdf
J75238-1 ETP-1 Feed - 2H2016.pdf

Sharon,

Per our earlier agreement, the ETP-1 Feed sample results for 2016 are attached. The benzene concentrations were 0.05 mg/L and 0.09 mg/L.

From: Lin, Sharon [mailto:Lin.Sharon@epa.gov]
Sent: Thursday, April 07, 2016 4:04 PM
To: Monson, Michael J SOPUS-DMW/323
Subject: RE: Request for Additional Information

Thanks!

From: michael.monson@shell.com [mailto:michael.monson@shell.com]
Sent: Thursday, April 07, 2016 3:40 PM
To: Lin, Sharon <Lin.Sharon@epa.gov>
Cc: michael.monson@shell.com
Subject: RE: Request for Additional Information

Sharon,

Hope you had a nice vacation.

See attached analytical data for 2003 as requested. Samples are semi-annual.

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

From: Lin, Sharon [mailto:Lin.Sharon@epa.gov]
Sent: Wednesday, March 23, 2016 1:54 PM
To: Monson, Michael J SOPUS-DMW/323
Subject: RE: Request for Additional Information

Ok. thanks. I saw the sampling location in Gordon's memo. Thanks!

Sharon

From: michael.monson@shell.com [mailto:michael.monson@shell.com]
Sent: Wednesday, March 23, 2016 1:20 PM
To: Lin, Sharon <Lin.Sharon@epa.gov>
Subject: RE: Request for Additional Information

Data from 2003 is stored off-site. I will need to request it.

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

From: Lin, Sharon [mailto:Lin.Sharon@epa.gov]
Sent: Wednesday, March 23, 2016 1:10 PM
To: Monson, Michael J SOPUS-DMW/323
Subject: RE: Request for Additional Information

Hi, Mike,

Could I get the 2003 ETP-1 data too? Also, please advise the frequency of the sampling for the ETP-1 feed and the location of the sampling point. Thanks.

Sharon

From: michael.monson@shell.com [mailto:michael.monson@shell.com]
Sent: Wednesday, March 23, 2016 11:26 AM

To: Lin, Sharon <Lin.Sharon@epa.gov>
Cc: michael.monson@shell.com
Subject: Request for Additional Information

Sharon,

The hard copy will be mailed later today, but I'm sending you electronic copies as well. Attached are the cover letter, analytical reports, and the BWON reports (without appendices A & B due to size constraints).

Please let me know if you have any further questions,

Michael Monson

Staff Engineer - Environmental

Martinez Refinery, 3485 Pacheco Blvd, Martinez CA 94553

Phone: 925-313-5516

Email: michael.monson@shell.com

Internet: http://www.shelloilproductsus.com/

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Tel: (925)484-1919

TestAmerica Job ID: 720-72969-1
Client Project/Site: Benzene Waste NESHAP

For:
Shell Oil Products US
3485 Pacheco Blvd
Martinez, California 64553

Attn: Michael Monson

Authorized for release by:
6/23/2016 5:26:05 PM

Micah Smith, Project Manager II
(925)484-1919
micah.smith@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Cover Page 1
Table of Contents 2
Definitions/Glossary 3
Case Narrative 4
Detection Summary 5
Client Sample Results 6
QC Sample Results 7
QC Association Summary 8
Lab Chronicle 9
Certification Summary 10
Method Summary 11
Sample Summary 12
Chain of Custody 13
Receipt Checklists 14

ED_001593_00015778

Definitions/Glossary

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-72969-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Job ID: 720-72969-1

Laboratory: TestAmerica Pleasanton

Narrative

Job Narrative
720-72969-1

Comments
No additional comments.

Receipt
The samples were received on 6/17/2016 3:10 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.8º C.

GC/MS VOA
Method(s) 8260B: The following sample was diluted due to the abundance of non-target analytes: ETP1 FEED (720-72969-1). Elevated reporting limits (RLs) are provided.

Method(s) 8260B: An MS/MSD is not reported for batch 204809 due to lab error during sample preparation.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ED_001593_00015778

Detection Summary

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-72969-1

Client Sample ID: ETP1 FEED — Lab Sample ID: 720-72969-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	50		10		ug/L	20		8260B/CA_LUFT MS	Total/NA

Client Sample ID: CLARIFIER EFFLUENT — Lab Sample ID: 720-72969-2

No Detections.

Client Sample ID: FIELD BLANK — Lab Sample ID: 720-72969-3

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Pleasanton

Client Sample Results

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-72969-1

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Client Sample ID: ETP1 FEED — **Lab Sample ID: 720-72969-1**
Date Collected: 06/16/16 08:00 — **Matrix: Water**
Date Received: 06/17/16 15:10

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	50		10		ug/L			06/23/16 04:37	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*96*		*67 - 130*		*06/23/16 04:37*	*20*
1,2-Dichloroethane-d4 (Surr)	*103*		*72 - 130*		*06/23/16 04:37*	*20*
Toluene-d8 (Surr)	*99*		*70 - 130*		*06/23/16 04:37*	*20*

Client Sample ID: CLARIFIER EFFLUENT — **Lab Sample ID: 720-72969-2**
Date Collected: 06/16/16 08:00 — **Matrix: Water**
Date Received: 06/17/16 15:10

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.50		ug/L			06/23/16 05:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*94*		*67 - 130*		*06/23/16 05:03*	*1*
1,2-Dichloroethane-d4 (Surr)	*106*		*72 - 130*		*06/23/16 05:03*	*1*
Toluene-d8 (Surr)	*99*		*70 - 130*		*06/23/16 05:03*	*1*

Client Sample ID: FIELD BLANK — **Lab Sample ID: 720-72969-3**
Date Collected: 06/16/16 08:00 — **Matrix: Water**
Date Received: 06/17/16 15:10

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.50		ug/L			06/22/16 23:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*91*		*67 - 130*		*06/22/16 23:05*	*1*
1,2-Dichloroethane-d4 (Surr)	*103*		*72 - 130*		*06/22/16 23:05*	*1*
Toluene-d8 (Surr)	*96*		*70 - 130*		*06/22/16 23:05*	*1*

QC Sample Results

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-72969-1

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Lab Sample ID: MB 720-204809/4
Matrix: Water
Analysis Batch: 204809

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.50		ug/L			06/22/16 19:25	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*93*		*67 - 130*		*06/22/16 19:25*	*1*
1,2-Dichloroethane-d4 (Surr)	*99*		*72 - 130*		*06/22/16 19:25*	*1*
Toluene-d8 (Surr)	*96*		*70 - 130*		*06/22/16 19:25*	*1*

Lab Sample ID: LCS 720-204809/5
Matrix: Water
Analysis Batch: 204809

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene			25.0	23.8		ug/L		95	79 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*95*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*100*		*72 - 130*
Toluene-d8 (Surr)	*98*		*70 - 130*

Lab Sample ID: LCSD 720-204809/6
Matrix: Water
Analysis Batch: 204809

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene			25.0	23.7		ug/L		95	79 - 130	0	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*95*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*98*		*72 - 130*
Toluene-d8 (Surr)	*98*		*70 - 130*

QC Association Summary

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-72969-1

GC/MS VOA

Analysis Batch: 204809

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-72969-1	ETP1 FEED	Total/NA	Water	8260B/CA_LUFT MS	
720-72969-2	CLARIFIER EFFLUENT	Total/NA	Water	8260B/CA_LUFT MS	
720-72969-3	FIELD BLANK	Total/NA	Water	8260B/CA_LUFT MS	
LCS 720-204809/5	Lab Control Sample	Total/NA	Water	8260B/CA_LUFT MS	
LCSD 720-204809/6	Lab Control Sample Dup	Total/NA	Water	8260B/CA_LUFT MS	
MB 720-204809/4	Method Blank	Total/NA	Water	8260B/CA_LUFT MS	

Lab Chronicle

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-72969-1

Client Sample ID: ETP1 FEED

Lab Sample ID: 720-72969-1
Matrix: Water

Date Collected: 06/16/16 08:00
Date Received: 06/17/16 15:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/CA_LUFTMS		20	204809	06/23/16 04:37	JRM	TAL PLS

Client Sample ID: CLARIFIER EFFLUENT

Lab Sample ID: 720-72969-2
Matrix: Water

Date Collected: 06/16/16 08:00
Date Received: 06/17/16 15:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/CA_LUFTMS		1	204809	06/23/16 05:03	JRM	TAL PLS

Client Sample ID: FIELD BLANK

Lab Sample ID: 720-72969-3
Matrix: Water

Date Collected: 06/16/16 08:00
Date Received: 06/17/16 15:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/CA_LUFTMS		1	204809	06/22/16 23:05	JRM	TAL PLS

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Certification Summary

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-72969-1

Laboratory: TestAmerica Pleasanton

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	State Program	9	2496	01-31-18

Analysis Method	Prep Method	Matrix	Analyte

Method Summary

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-72969-1

Method	Method Description	Protocol	Laboratory
8260B/CA_LUFTMS	8260B / CA LUFT MS	SW846	TAL PLS

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Sample Summary

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-72969-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
720-72969-1	ETP1 FEED	Water	06/16/16 08:00	06/17/16 15:10
720-72969-2	CLARIFIER EFFLUENT	Water	06/16/16 08:00	06/17/16 15:10
720-72969-3	FIELD BLANK	Water	06/16/16 08:00	06/17/16 15:10

720-72969

16426

Test America

Shell OPUS Chain Of Custody Record

6/23/2016

CONSULTANT COMPANY: Shell Oil Products US - Martinez Refinery	Project Contact (Reported To;) Michael Monson 925-313-5516 michael.monson@shell.com
ADDRESS: 3485 Pacheco Blvd	Project Name SPECIAL - Monthly
CITY: Martinez, CA 94553	E-MAIL: Melisa.Guillen@Shell.com
TELEPHONE: 925-313-3401	FAX: 925-313-5174
TURNAROUND TIME standard	
SPECIAL INSTRUCTIONS OR NOTES: 28	

LAB Order #

TEMPERATURE ON RECEIPT C°

720-72969 Chain of Custody

LAB USE ONLY	Sample Identification and LIMS #	SAMPLING DATE mm/dd/yy	SAMPLING TIME 24-hr	Matrix AQ = Waste Water	Total number of bottles	8260B Benzene \ NESHAP	8260B EPA Volatiles \ Benzene \ NESHAP	Requested Analysis
					Number of Bottles	3	3	
					Bottle Type (1)	VOA	VOA	
					Preservative (2)	3	3	
	ETP1 Feed	6/16/2016	0800	AQ	3		X	
	Clarifier Effluent	6/16/2016	0800	AQ	3		X	
	Field Blank	6/16/2016	0800	AQ	3		X	

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Melisa Guillen	6			6/17/16	1152
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	6/17/16	1510		6/17/16	1510
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

(1) PT = Plastic pint, PL = Plastic liter, AL = Amber liter, AHL = Amber half-liter, UC = Ultra Clean half liter, GG = ground glass bottle, DB = Double Bag, VOA = 40 mL vial with septa cap

(2) 0 = none, 1 = H2SO4, 2 = HNO3, 3 = HCl, 4 = zinc acetate + NaOH, 5 = Na2S2O3, 6 = NaOH

01-26-06 Revision 0

ED_001593_00015778

Login Sample Receipt Checklist

Client: Shell Oil Products US

Job Number: 720-72969-1

Login Number: 72969

List Source: TestAmerica Pleasanton

List Number: 1

Creator: Arauz, Dennis

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Tel: (925)484-1919

TestAmerica Job ID: 720-75238-1
Client Project/Site: Benzene Waste NESHAP

For:
Shell Oil Products US
3485 Pacheco Blvd
Martinez, California 64553

Attn: Michael Monson

Authorized for release by:
10/26/2016 3:34:21 PM

Cherie Cuellar, Project Management Assistant I
(925)484-1919
cherie.cuellar@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Cover Page 1
Table of Contents 2
Definitions/Glossary 3
Detection Summary 4
Client Sample Results 5
QC Sample Results 10
QC Association Summary 17
Lab Chronicle 18
Certification Summary 19
Method Summary 20
Sample Summary 21
Chain of Custody 22
Receipt Checklists 23

ED_001593_00015779

Definitions/Glossary

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-75238-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Detection Summary

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-75238-1

Client Sample ID: ETP2 FEED — Lab Sample ID: 720-75238-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	3800		25		ug/L	50		8260B	Total/NA
Ethylbenzene	930		25		ug/L	50		8260B	Total/NA
Isopropylbenzene	29		25		ug/L	50		8260B	Total/NA
Naphthalene	250		50		ug/L	50		8260B	Total/NA
N-Propylbenzene	81		50		ug/L	50		8260B	Total/NA
Toluene	11000		250		ug/L	500		8260B	Total/NA
1,2,4-Trimethylbenzene	710		25		ug/L	50		8260B	Total/NA
1,3,5-Trimethylbenzene	180		25		ug/L	50		8260B	Total/NA
Xylenes, Total	5900		50		ug/L	50		8260B	Total/NA

Client Sample ID: FIELD BLANK — Lab Sample ID: 720-75238-2

No Detections.

Client Sample ID: ETP1 FEED — Lab Sample ID: 720-75238-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	90		10		ug/L	20		8260B/CA_LUFT MS	Total/NA

Client Sample ID: CLARIFIER EFFLUENT — Lab Sample ID: 720-75238-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	18		0.50		ug/L	1		8260B/CA_LUFT MS	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Pleasanton

Client Sample Results

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-75238-1

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Client Sample ID: ETP1 FEED — **Lab Sample ID: 720-75238-3**
Date Collected: 10/19/16 09:00 — **Matrix: Water**
Date Received: 10/19/16 13:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	90		10		ug/L			10/21/16 22:34	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*103*		*67 - 130*		*10/21/16 22:34*	*20*
1,2-Dichloroethane-d4 (Surr)	*101*		*72 - 130*		*10/21/16 22:34*	*20*
Toluene-d8 (Surr)	*95*		*70 - 130*		*10/21/16 22:34*	*20*

Client Sample ID: CLARIFIER EFFLUENT — **Lab Sample ID: 720-75238-4**
Date Collected: 10/19/16 09:10 — **Matrix: Water**
Date Received: 10/19/16 13:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	18		0.50		ug/L			10/21/16 22:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*100*		*67 - 130*		*10/21/16 22:05*	*1*
4-Bromofluorobenzene	*104*		*67 - 130*		*10/25/16 14:09*	*1*
1,2-Dichloroethane-d4 (Surr)	*98*		*72 - 130*		*10/21/16 22:05*	*1*
1,2-Dichloroethane-d4 (Surr)	*113*		*72 - 130*		*10/25/16 14:09*	*1*
Toluene-d8 (Surr)	*93*		*70 - 130*		*10/21/16 22:05*	*1*
Toluene-d8 (Surr)	*92*		*70 - 130*		*10/25/16 14:09*	*1*

Client Sample Results

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-75238-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Client Sample ID: ETP2 FEED
Date Collected: 10/19/16 09:05
Date Received: 10/19/16 13:15

Lab Sample ID: 720-75238-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tert-butyl ether	ND		25		ug/L			10/22/16 05:15	50
Acetone	ND		2500		ug/L			10/22/16 05:15	50
Benzene	**3800**		25		ug/L			10/22/16 05:15	50
Dichlorobromomethane	ND		25		ug/L			10/22/16 05:15	50
Bromobenzene	ND		50		ug/L			10/22/16 05:15	50
Chlorobromomethane	ND		50		ug/L			10/22/16 05:15	50
Bromoform	ND		50		ug/L			10/22/16 05:15	50
Bromomethane	ND		50		ug/L			10/22/16 05:15	50
2-Butanone (MEK)	ND		2500		ug/L			10/22/16 05:15	50
n-Butylbenzene	ND		50		ug/L			10/22/16 05:15	50
sec-Butylbenzene	ND		50		ug/L			10/22/16 05:15	50
tert-Butylbenzene	ND		50		ug/L			10/22/16 05:15	50
Carbon disulfide	ND		250		ug/L			10/22/16 05:15	50
Carbon tetrachloride	ND		25		ug/L			10/22/16 05:15	50
Chlorobenzene	ND		25		ug/L			10/22/16 05:15	50
Chloroethane	ND		50		ug/L			10/22/16 05:15	50
Chloroform	ND		50		ug/L			10/22/16 05:15	50
Chloromethane	ND		50		ug/L			10/22/16 05:15	50
2-Chlorotoluene	ND		25		ug/L			10/22/16 05:15	50
4-Chlorotoluene	ND		25		ug/L			10/22/16 05:15	50
Chlorodibromomethane	ND		25		ug/L			10/22/16 05:15	50
1,2-Dichlorobenzene	ND		25		ug/L			10/22/16 05:15	50
1,3-Dichlorobenzene	ND		25		ug/L			10/22/16 05:15	50
1,4-Dichlorobenzene	ND		25		ug/L			10/22/16 05:15	50
1,3-Dichloropropane	ND		50		ug/L			10/22/16 05:15	50
1,1-Dichloropropene	ND		25		ug/L			10/22/16 05:15	50
1,2-Dibromo-3-Chloropropane	ND		50		ug/L			10/22/16 05:15	50
Ethylene Dibromide	ND		25		ug/L			10/22/16 05:15	50
Dibromomethane	ND		25		ug/L			10/22/16 05:15	50
Dichlorodifluoromethane	ND		25		ug/L			10/22/16 05:15	50
1,1-Dichloroethane	ND		25		ug/L			10/22/16 05:15	50
1,2-Dichloroethane	ND		25		ug/L			10/22/16 05:15	50
1,1-Dichloroethene	ND		25		ug/L			10/22/16 05:15	50
cis-1,2-Dichloroethene	ND		25		ug/L			10/22/16 05:15	50
trans-1,2-Dichloroethene	ND		25		ug/L			10/22/16 05:15	50
1,2-Dichloropropane	ND		25		ug/L			10/22/16 05:15	50
cis-1,3-Dichloropropene	ND		25		ug/L			10/22/16 05:15	50
trans-1,3-Dichloropropene	ND		25		ug/L			10/22/16 05:15	50
Ethylbenzene	**930**		25		ug/L			10/22/16 05:15	50
Hexachlorobutadiene	ND		50		ug/L			10/22/16 05:15	50
2-Hexanone	ND		2500		ug/L			10/22/16 05:15	50
Isopropylbenzene	**29**		25		ug/L			10/22/16 05:15	50
4-Isopropyltoluene	ND		50		ug/L			10/22/16 05:15	50
Methylene Chloride	ND		250		ug/L			10/22/16 05:15	50
4-Methyl-2-pentanone (MIBK)	ND		2500		ug/L			10/22/16 05:15	50
Naphthalene	**250**		50		ug/L			10/22/16 05:15	50
N-Propylbenzene	**81**		50		ug/L			10/22/16 05:15	50
Styrene	ND		25		ug/L			10/22/16 05:15	50
1,1,1,2-Tetrachloroethane	ND		25		ug/L			10/22/16 05:15	50

Client Sample Results

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-75238-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Client Sample ID: ETP2 FEED
Date Collected: 10/19/16 09:05
Date Received: 10/19/16 13:15

Lab Sample ID: 720-75238-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2,2-Tetrachloroethane	ND		25		ug/L			10/22/16 05:15	50
Tetrachloroethene	ND		25		ug/L			10/22/16 05:15	50
Toluene	**11000**		250		ug/L			10/25/16 14:38	500
1,2,3-Trichlorobenzene	ND		50		ug/L			10/22/16 05:15	50
1,2,4-Trichlorobenzene	ND		50		ug/L			10/22/16 05:15	50
1,1,1-Trichloroethane	ND		25		ug/L			10/22/16 05:15	50
1,1,2-Trichloroethane	ND		25		ug/L			10/22/16 05:15	50
Trichloroethene	ND		25		ug/L			10/22/16 05:15	50
Trichlorofluoromethane	ND		50		ug/L			10/22/16 05:15	50
1,2,3-Trichloropropane	ND		25		ug/L			10/22/16 05:15	50
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		25		ug/L			10/22/16 05:15	50
1,2,4-Trimethylbenzene	**710**		25		ug/L			10/22/16 05:15	50
1,3,5-Trimethylbenzene	**180**		25		ug/L			10/22/16 05:15	50
Vinyl acetate	ND		500		ug/L			10/22/16 05:15	50
Vinyl chloride	ND		25		ug/L			10/22/16 05:15	50
Xylenes, Total	**5900**		50		ug/L			10/22/16 05:15	50
2,2-Dichloropropane	ND		25		ug/L			10/22/16 05:15	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*94*		*67 - 130*		*10/22/16 05:15*	*50*
4-Bromofluorobenzene	*101*		*67 - 130*		*10/25/16 14:38*	*500*
1,2-Dichloroethane-d4 (Surr)	*92*		*72 - 130*		*10/22/16 05:15*	*50*
1,2-Dichloroethane-d4 (Surr)	*112*		*72 - 130*		*10/25/16 14:38*	*500*
Toluene-d8 (Surr)	*96*		*70 - 130*		*10/22/16 05:15*	*50*
Toluene-d8 (Surr)	*97*		*70 - 130*		*10/25/16 14:38*	*500*

Client Sample ID: FIELD BLANK
Date Collected: 10/19/16 09:00
Date Received: 10/19/16 13:15

Lab Sample ID: 720-75238-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tert-butyl ether	ND		0.50		ug/L			10/22/16 00:53	1
Acetone	ND		50		ug/L			10/22/16 00:53	1
Benzene	ND		0.50		ug/L			10/22/16 00:53	1
Dichlorobromomethane	ND		0.50		ug/L			10/22/16 00:53	1
Bromobenzene	ND		1.0		ug/L			10/22/16 00:53	1
Chlorobromomethane	ND		1.0		ug/L			10/22/16 00:53	1
Bromoform	ND		1.0		ug/L			10/22/16 00:53	1
Bromomethane	ND		1.0		ug/L			10/22/16 00:53	1
2-Butanone (MEK)	ND		50		ug/L			10/22/16 00:53	1
n-Butylbenzene	ND		1.0		ug/L			10/22/16 00:53	1
sec-Butylbenzene	ND		1.0		ug/L			10/22/16 00:53	1
tert-Butylbenzene	ND		1.0		ug/L			10/22/16 00:53	1
Carbon disulfide	ND		5.0		ug/L			10/22/16 00:53	1
Carbon tetrachloride	ND		0.50		ug/L			10/22/16 00:53	1
Chlorobenzene	ND		0.50		ug/L			10/22/16 00:53	1
Chloroethane	ND		1.0		ug/L			10/22/16 00:53	1
Chloroform	ND		1.0		ug/L			10/22/16 00:53	1
Chloromethane	ND		1.0		ug/L			10/22/16 00:53	1
2-Chlorotoluene	ND		0.50		ug/L			10/22/16 00:53	1
4-Chlorotoluene	ND		0.50		ug/L			10/22/16 00:53	1

Client Sample Results

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-75238-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Client Sample ID: FIELD BLANK
Date Collected: 10/19/16 09:00
Date Received: 10/19/16 13:15

Lab Sample ID: 720-75238-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorodibromomethane	ND		0.50		ug/L			10/22/16 00:53	1
1,2-Dichlorobenzene	ND		0.50		ug/L			10/22/16 00:53	1
1,3-Dichlorobenzene	ND		0.50		ug/L			10/22/16 00:53	1
1,4-Dichlorobenzene	ND		0.50		ug/L			10/22/16 00:53	1
1,3-Dichloropropane	ND		1.0		ug/L			10/22/16 00:53	1
1,1-Dichloropropene	ND		0.50		ug/L			10/22/16 00:53	1
1,2-Dibromo-3-Chloropropane	ND		1.0		ug/L			10/22/16 00:53	1
Ethylene Dibromide	ND		0.50		ug/L			10/22/16 00:53	1
Dibromomethane	ND		0.50		ug/L			10/22/16 00:53	1
Dichlorodifluoromethane	ND		0.50		ug/L			10/22/16 00:53	1
1,1-Dichloroethane	ND		0.50		ug/L			10/22/16 00:53	1
1,2-Dichloroethane	ND		0.50		ug/L			10/22/16 00:53	1
1,1-Dichloroethene	ND		0.50		ug/L			10/22/16 00:53	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			10/22/16 00:53	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			10/22/16 00:53	1
1,2-Dichloropropane	ND		0.50		ug/L			10/22/16 00:53	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			10/22/16 00:53	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			10/22/16 00:53	1
Ethylbenzene	ND		0.50		ug/L			10/22/16 00:53	1
Hexachlorobutadiene	ND		1.0		ug/L			10/22/16 00:53	1
2-Hexanone	ND		50		ug/L			10/22/16 00:53	1
Isopropylbenzene	ND		0.50		ug/L			10/22/16 00:53	1
4-Isopropyltoluene	ND		1.0		ug/L			10/22/16 00:53	1
Methylene Chloride	ND		5.0		ug/L			10/22/16 00:53	1
4-Methyl-2-pentanone (MIBK)	ND		50		ug/L			10/22/16 00:53	1
Naphthalene	ND		1.0		ug/L			10/22/16 00:53	1
N-Propylbenzene	ND		1.0		ug/L			10/22/16 00:53	1
Styrene	ND		0.50		ug/L			10/22/16 00:53	1
1,1,1,2-Tetrachloroethane	ND		0.50		ug/L			10/22/16 00:53	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			10/22/16 00:53	1
Tetrachloroethene	ND		0.50		ug/L			10/22/16 00:53	1
Toluene	ND		0.50		ug/L			10/22/16 00:53	1
1,2,3-Trichlorobenzene	ND		1.0		ug/L			10/22/16 00:53	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			10/22/16 00:53	1
1,1,1-Trichloroethane	ND		0.50		ug/L			10/22/16 00:53	1
1,1,2-Trichloroethane	ND		0.50		ug/L			10/22/16 00:53	1
Trichloroethene	ND		0.50		ug/L			10/22/16 00:53	1
Trichlorofluoromethane	ND		1.0		ug/L			10/22/16 00:53	1
1,2,3-Trichloropropane	ND		0.50		ug/L			10/22/16 00:53	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			10/22/16 00:53	1
1,2,4-Trimethylbenzene	ND		0.50		ug/L			10/22/16 00:53	1
1,3,5-Trimethylbenzene	ND		0.50		ug/L			10/22/16 00:53	1
Vinyl acetate	ND		10		ug/L			10/22/16 00:53	1
Vinyl chloride	ND		0.50		ug/L			10/22/16 00:53	1
Xylenes, Total	ND		1.0		ug/L			10/22/16 00:53	1
2,2-Dichloropropane	ND		0.50		ug/L			10/22/16 00:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*89*		*67 - 130*		*10/22/16 00:53*	*1*
1,2-Dichloroethane-d4 (Surr)	*90*		*72 - 130*		*10/22/16 00:53*	*1*

Client Sample Results

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-75238-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Client Sample ID: FIELD BLANK
Date Collected: 10/19/16 09:00
Date Received: 10/19/16 13:15

Lab Sample ID: 720-75238-2
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	93		70 - 130		10/22/16 00:53	1

QC Sample Results

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-75238-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 720-211752/4
Matrix: Water
Analysis Batch: 211752

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tert-butyl ether	ND		0.50		ug/L			10/21/16 19:27	1
Acetone	ND		50		ug/L			10/21/16 19:27	1
Benzene	ND		0.50		ug/L			10/21/16 19:27	1
Dichlorobromomethane	ND		0.50		ug/L			10/21/16 19:27	1
Bromobenzene	ND		1.0		ug/L			10/21/16 19:27	1
Chlorobromomethane	ND		1.0		ug/L			10/21/16 19:27	1
Bromoform	ND		1.0		ug/L			10/21/16 19:27	1
Bromomethane	ND		1.0		ug/L			10/21/16 19:27	1
2-Butanone (MEK)	ND		50		ug/L			10/21/16 19:27	1
n-Butylbenzene	ND		1.0		ug/L			10/21/16 19:27	1
sec-Butylbenzene	ND		1.0		ug/L			10/21/16 19:27	1
tert-Butylbenzene	ND		1.0		ug/L			10/21/16 19:27	1
Carbon disulfide	ND		5.0		ug/L			10/21/16 19:27	1
Carbon tetrachloride	ND		0.50		ug/L			10/21/16 19:27	1
Chlorobenzene	ND		0.50		ug/L			10/21/16 19:27	1
Chloroethane	ND		1.0		ug/L			10/21/16 19:27	1
Chloroform	ND		1.0		ug/L			10/21/16 19:27	1
Chloromethane	ND		1.0		ug/L			10/21/16 19:27	1
2-Chlorotoluene	ND		0.50		ug/L			10/21/16 19:27	1
4-Chlorotoluene	ND		0.50		ug/L			10/21/16 19:27	1
Chlorodibromomethane	ND		0.50		ug/L			10/21/16 19:27	1
1,2-Dichlorobenzene	ND		0.50		ug/L			10/21/16 19:27	1
1,3-Dichlorobenzene	ND		0.50		ug/L			10/21/16 19:27	1
1,4-Dichlorobenzene	ND		0.50		ug/L			10/21/16 19:27	1
1,3-Dichloropropane	ND		1.0		ug/L			10/21/16 19:27	1
1,1-Dichloropropene	ND		0.50		ug/L			10/21/16 19:27	1
1,2-Dibromo-3-Chloropropane	ND		1.0		ug/L			10/21/16 19:27	1
Ethylene Dibromide	ND		0.50		ug/L			10/21/16 19:27	1
Dibromomethane	ND		0.50		ug/L			10/21/16 19:27	1
Dichlorodifluoromethane	ND		0.50		ug/L			10/21/16 19:27	1
1,1-Dichloroethane	ND		0.50		ug/L			10/21/16 19:27	1
1,2-Dichloroethane	ND		0.50		ug/L			10/21/16 19:27	1
1,1-Dichloroethene	ND		0.50		ug/L			10/21/16 19:27	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			10/21/16 19:27	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			10/21/16 19:27	1
1,2-Dichloropropane	ND		0.50		ug/L			10/21/16 19:27	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			10/21/16 19:27	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			10/21/16 19:27	1
Ethylbenzene	ND		0.50		ug/L			10/21/16 19:27	1
Hexachlorobutadiene	ND		1.0		ug/L			10/21/16 19:27	1
2-Hexanone	ND		50		ug/L			10/21/16 19:27	1
Isopropylbenzene	ND		0.50		ug/L			10/21/16 19:27	1
4-Isopropyltoluene	ND		1.0		ug/L			10/21/16 19:27	1
Methylene Chloride	ND		5.0		ug/L			10/21/16 19:27	1
4-Methyl-2-pentanone (MIBK)	ND		50		ug/L			10/21/16 19:27	1
Naphthalene	ND		1.0		ug/L			10/21/16 19:27	1
N-Propylbenzene	ND		1.0		ug/L			10/21/16 19:27	1
Styrene	ND		0.50		ug/L			10/21/16 19:27	1

QC Sample Results

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-75238-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 720-211752/4
Matrix: Water
Analysis Batch: 211752

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		0.50		ug/L			10/21/16 19:27	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			10/21/16 19:27	1
Tetrachloroethene	ND		0.50		ug/L			10/21/16 19:27	1
Toluene	ND		0.50		ug/L			10/21/16 19:27	1
1,2,3-Trichlorobenzene	ND		1.0		ug/L			10/21/16 19:27	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			10/21/16 19:27	1
1,1,1-Trichloroethane	ND		0.50		ug/L			10/21/16 19:27	1
1,1,2-Trichloroethane	ND		0.50		ug/L			10/21/16 19:27	1
Trichloroethene	ND		0.50		ug/L			10/21/16 19:27	1
Trichlorofluoromethane	ND		1.0		ug/L			10/21/16 19:27	1
1,2,3-Trichloropropane	ND		0.50		ug/L			10/21/16 19:27	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			10/21/16 19:27	1
1,2,4-Trimethylbenzene	ND		0.50		ug/L			10/21/16 19:27	1
1,3,5-Trimethylbenzene	ND		0.50		ug/L			10/21/16 19:27	1
Vinyl acetate	ND		10		ug/L			10/21/16 19:27	1
Vinyl chloride	ND		0.50		ug/L			10/21/16 19:27	1
Xylenes, Total	ND		1.0		ug/L			10/21/16 19:27	1
2,2-Dichloropropane	ND		0.50		ug/L			10/21/16 19:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*93*		*67 - 130*		*10/21/16 19:27*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*72 - 130*		*10/21/16 19:27*	*1*
Toluene-d8 (Surr)	*95*		*70 - 130*		*10/21/16 19:27*	*1*

Lab Sample ID: LCS 720-211752/5
Matrix: Water
Analysis Batch: 211752

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methyl tert-butyl ether	25.0	27.6		ug/L		110	62 - 130
Acetone	125	163		ug/L		130	26 - 180
Benzene	25.0	28.0		ug/L		112	79 - 130
Dichlorobromomethane	25.0	27.5		ug/L		110	70 - 130
Bromobenzene	25.0	26.7		ug/L		107	70 - 130
Chlorobromomethane	25.0	26.2		ug/L		105	70 - 130
Bromoform	25.0	28.7		ug/L		115	68 - 136
Bromomethane	25.0	27.2		ug/L		109	43 - 151
2-Butanone (MEK)	125	144		ug/L		116	54 - 153
n-Butylbenzene	25.0	27.5		ug/L		110	70 - 142
sec-Butylbenzene	25.0	27.8		ug/L		111	70 - 134
tert-Butylbenzene	25.0	27.4		ug/L		110	70 - 135
Carbon disulfide	25.0	30.6		ug/L		122	68 - 146
Carbon tetrachloride	25.0	27.0		ug/L		108	70 - 146
Chlorobenzene	25.0	26.2		ug/L		105	70 - 130
Chloroethane	25.0	28.3		ug/L		113	62 - 138
Chloroform	25.0	26.6		ug/L		106	70 - 130
Chloromethane	25.0	31.3		ug/L		125	52 - 175
2-Chlorotoluene	25.0	28.0		ug/L		112	70 - 130

QC Sample Results

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-75238-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 720-211752/5
Matrix: Water
Analysis Batch: 211752

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4-Chlorotoluene	25.0	28.7		ug/L		115	70 - 130
Chlorodibromomethane	25.0	26.3		ug/L		105	70 - 145
1,2-Dichlorobenzene	25.0	26.4		ug/L		105	70 - 130
1,3-Dichlorobenzene	25.0	26.4		ug/L		105	70 - 130
1,4-Dichlorobenzene	25.0	26.2		ug/L		105	70 - 130
1,3-Dichloropropane	25.0	28.0		ug/L		112	70 - 130
1,1-Dichloropropene	25.0	27.0		ug/L		108	70 - 130
1,2-Dibromo-3-Chloropropane	25.0	25.9		ug/L		104	70 - 136
Ethylene Dibromide	25.0	28.7		ug/L		115	70 - 130
Dibromomethane	25.0	27.4		ug/L		110	70 - 130
Dichlorodifluoromethane	25.0	34.0		ug/L		136	32 - 158
1,1-Dichloroethane	25.0	27.6		ug/L		110	70 - 130
1,2-Dichloroethane	25.0	25.8		ug/L		103	61 - 132
1,1-Dichloroethene	25.0	26.0		ug/L		104	64 - 128
cis-1,2-Dichloroethene	25.0	26.8		ug/L		107	70 - 130
trans-1,2-Dichloroethene	25.0	27.4		ug/L		110	68 - 130
1,2-Dichloropropane	25.0	29.6		ug/L		118	70 - 130
cis-1,3-Dichloropropene	25.0	27.3		ug/L		109	70 - 130
trans-1,3-Dichloropropene	25.0	26.3		ug/L		105	70 - 140
Ethylbenzene	25.0	27.6		ug/L		110	80 - 120
Hexachlorobutadiene	25.0	25.7		ug/L		103	70 - 130
2-Hexanone	125	147		ug/L		118	60 - 164
Isopropylbenzene	25.0	27.4		ug/L		110	70 - 130
4-Isopropyltoluene	25.0	27.1		ug/L		108	70 - 130
Methylene Chloride	25.0	26.9		ug/L		108	70 - 147
4-Methyl-2-pentanone (MIBK)	125	151		ug/L		121	50 - 155
Naphthalene	25.0	26.5		ug/L		106	50 - 130
N-Propylbenzene	25.0	28.5		ug/L		114	70 - 130
Styrene	25.0	24.9		ug/L		100	70 - 130
1,1,1,2-Tetrachloroethane	25.0	26.3		ug/L		105	70 - 130
1,1,2,2-Tetrachloroethane	25.0	29.2		ug/L		117	70 - 130
Tetrachloroethene	25.0	26.6		ug/L		106	70 - 130
Toluene	25.0	27.7		ug/L		111	78 - 120
1,2,3-Trichlorobenzene	25.0	25.9		ug/L		104	70 - 130
1,2,4-Trichlorobenzene	25.0	26.8		ug/L		107	70 - 130
1,1,1-Trichloroethane	25.0	27.0		ug/L		108	70 - 130
1,1,2-Trichloroethane	25.0	28.5		ug/L		114	70 - 130
Trichloroethene	25.0	26.3		ug/L		105	70 - 130
Trichlorofluoromethane	25.0	28.8		ug/L		115	66 - 132
1,2,3-Trichloropropane	25.0	29.4		ug/L		118	70 - 130
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	26.3		ug/L		105	42 - 162
1,2,4-Trimethylbenzene	25.0	27.8		ug/L		111	70 - 132
1,3,5-Trimethylbenzene	25.0	27.9		ug/L		112	70 - 130
Vinyl acetate	25.0	29.7		ug/L		119	43 - 163
Vinyl chloride	25.0	28.9		ug/L		116	54 - 135
m-Xylene & p-Xylene	25.0	27.1		ug/L		108	70 - 142
o-Xylene	25.0	27.2		ug/L		109	70 - 130

QC Sample Results

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-75238-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 720-211752/5
Matrix: Water
Analysis Batch: 211752

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,2-Dichloropropane	25.0	28.4		ug/L		113	70 - 140

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*95*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*90*		*72 - 130*
Toluene-d8 (Surr)	*97*		*70 - 130*

Lab Sample ID: LCSD 720-211752/6
Matrix: Water
Analysis Batch: 211752

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methyl tert-butyl ether	25.0	27.2		ug/L		109	62 - 130	2	20
Acetone	125	153		ug/L		122	26 - 180	7	30
Benzene	25.0	28.2		ug/L		113	79 - 130	1	20
Dichlorobromomethane	25.0	27.7		ug/L		111	70 - 130	1	20
Bromobenzene	25.0	26.9		ug/L		108	70 - 130	1	20
Chlorobromomethane	25.0	26.1		ug/L		104	70 - 130	0	20
Bromoform	25.0	28.7		ug/L		115	68 - 136	0	20
Bromomethane	25.0	28.0		ug/L		112	43 - 151	3	20
2-Butanone (MEK)	125	141		ug/L		113	54 - 153	2	20
n-Butylbenzene	25.0	27.8		ug/L		111	70 - 142	1	20
sec-Butylbenzene	25.0	28.0		ug/L		112	70 - 134	1	20
tert-Butylbenzene	25.0	27.8		ug/L		111	70 - 135	1	20
Carbon disulfide	25.0	31.1		ug/L		124	68 - 146	2	20
Carbon tetrachloride	25.0	27.3		ug/L		109	70 - 146	1	20
Chlorobenzene	25.0	26.4		ug/L		106	70 - 130	1	20
Chloroethane	25.0	29.2		ug/L		117	62 - 138	3	20
Chloroform	25.0	27.0		ug/L		108	70 - 130	1	20
Chloromethane	25.0	32.2		ug/L		129	52 - 175	3	20
2-Chlorotoluene	25.0	28.2		ug/L		113	70 - 130	1	20
4-Chlorotoluene	25.0	28.9		ug/L		115	70 - 130	1	20
Chlorodibromomethane	25.0	25.8		ug/L		103	70 - 145	2	20
1,2-Dichlorobenzene	25.0	26.4		ug/L		106	70 - 130	0	20
1,3-Dichlorobenzene	25.0	26.4		ug/L		105	70 - 130	0	20
1,4-Dichlorobenzene	25.0	26.3		ug/L		105	70 - 130	0	20
1,3-Dichloropropane	25.0	27.4		ug/L		110	70 - 130	2	20
1,1-Dichloropropene	25.0	27.5		ug/L		110	70 - 130	2	20
1,2-Dibromo-3-Chloropropane	25.0	25.4		ug/L		101	70 - 136	2	20
Ethylene Dibromide	25.0	28.0		ug/L		112	70 - 130	3	20
Dibromomethane	25.0	26.8		ug/L		107	70 - 130	2	20
Dichlorodifluoromethane	25.0	34.8		ug/L		139	32 - 158	2	20
1,1-Dichloroethane	25.0	27.7		ug/L		111	70 - 130	0	20
1,2-Dichloroethane	25.0	25.5		ug/L		102	61 - 132	1	20
1,1-Dichloroethene	25.0	26.7		ug/L		107	64 - 128	3	20
cis-1,2-Dichloroethene	25.0	27.0		ug/L		108	70 - 130	0	20
trans-1,2-Dichloroethene	25.0	27.7		ug/L		111	68 - 130	1	20
1,2-Dichloropropane	25.0	29.4		ug/L		117	70 - 130	1	20

QC Sample Results

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-75238-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 720-211752/6
Matrix: Water
Analysis Batch: 211752

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,3-Dichloropropene	25.0	27.1		ug/L		109	70 - 130	1	20
trans-1,3-Dichloropropene	25.0	25.7		ug/L		103	70 - 140	2	20
Ethylbenzene	25.0	27.9		ug/L		111	80 - 120	1	20
Hexachlorobutadiene	25.0	25.3		ug/L		101	70 - 130	1	20
2-Hexanone	125	140		ug/L		112	60 - 164	6	20
Isopropylbenzene	25.0	27.9		ug/L		112	70 - 130	2	20
4-Isopropyltoluene	25.0	27.3		ug/L		109	70 - 130	1	20
Methylene Chloride	25.0	27.0		ug/L		108	70 - 147	0	20
4-Methyl-2-pentanone (MIBK)	125	145		ug/L		116	50 - 155	4	20
Naphthalene	25.0	26.8		ug/L		107	50 - 130	1	20
N-Propylbenzene	25.0	28.9		ug/L		116	70 - 130	1	20
Styrene	25.0	25.2		ug/L		101	70 - 130	1	20
1,1,1,2-Tetrachloroethane	25.0	26.3		ug/L		105	70 - 130	0	20
1,1,2,2-Tetrachloroethane	25.0	28.8		ug/L		115	70 - 130	2	20
Tetrachloroethene	25.0	26.4		ug/L		106	70 - 130	1	20
Toluene	25.0	28.1		ug/L		112	78 - 120	1	20
1,2,3-Trichlorobenzene	25.0	25.9		ug/L		104	70 - 130	0	20
1,2,4-Trichlorobenzene	25.0	26.6		ug/L		106	70 - 130	1	20
1,1,1-Trichloroethane	25.0	27.2		ug/L		109	70 - 130	1	20
1,1,2-Trichloroethane	25.0	27.7		ug/L		111	70 - 130	3	20
Trichloroethene	25.0	26.3		ug/L		105	70 - 130	0	20
Trichlorofluoromethane	25.0	29.6		ug/L		118	66 - 132	3	20
1,2,3-Trichloropropane	25.0	29.2		ug/L		117	70 - 130	1	20
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	26.5		ug/L		106	42 - 162	1	20
1,2,4-Trimethylbenzene	25.0	27.9		ug/L		112	70 - 132	1	20
1,3,5-Trimethylbenzene	25.0	28.2		ug/L		113	70 - 130	1	20
Vinyl acetate	25.0	29.6		ug/L		119	43 - 163	0	20
Vinyl chloride	25.0	29.9		ug/L		119	54 - 135	3	20
m-Xylene & p-Xylene	25.0	27.2		ug/L		109	70 - 142	0	20
o-Xylene	25.0	27.5		ug/L		110	70 - 130	1	20
2,2-Dichloropropane	25.0	28.7		ug/L		115	70 - 140	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*95*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*89*		*72 - 130*
Toluene-d8 (Surr)	*97*		*70 - 130*

Lab Sample ID: MB 720-211882/4
Matrix: Water
Analysis Batch: 211882

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.50		ug/L			10/25/16 08:55	1
Toluene	ND		0.50		ug/L			10/25/16 08:55	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*100*		*67 - 130*		*10/25/16 08:55*	*1*

QC Sample Results

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-75238-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 720-211882/4 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 211882

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	111		72 - 130		10/25/16 08:55	1
Toluene-d8 (Surr)	91		70 - 130		10/25/16 08:55	1

Lab Sample ID: LCS 720-211882/5 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 211882

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	25.0	25.0		ug/L		100	79 - 130
Toluene	25.0	26.3		ug/L		105	78 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene	101		67 - 130
1,2-Dichloroethane-d4 (Surr)	110		72 - 130
Toluene-d8 (Surr)	92		70 - 130

Lab Sample ID: LCSD 720-211882/6 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 211882

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	25.0	25.1		ug/L		100	79 - 130	0	20
Toluene	25.0	26.0		ug/L		104	78 - 120	1	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene	101		67 - 130
1,2-Dichloroethane-d4 (Surr)	111		72 - 130
Toluene-d8 (Surr)	92		70 - 130

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Lab Sample ID: MB 720-211753/4 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 211753

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.50		ug/L			10/21/16 19:14	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	97		67 - 130		10/21/16 19:14	1
1,2-Dichloroethane-d4 (Surr)	115		72 - 130		10/21/16 19:14	1
Toluene-d8 (Surr)	91		70 - 130		10/21/16 19:14	1

QC Sample Results

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-75238-1

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS (Continued)

Lab Sample ID: LCS 720-211753/5
Matrix: Water
Analysis Batch: 211753

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene			25.0	26.1		ug/L		104	79 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*99*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*108*		*72 - 130*
Toluene-d8 (Surr)	*91*		*70 - 130*

Lab Sample ID: LCSD 720-211753/6
Matrix: Water
Analysis Batch: 211753

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene			25.0	26.4		ug/L		106	79 - 130	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*100*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*113*		*72 - 130*
Toluene-d8 (Surr)	*91*		*70 - 130*

QC Association Summary

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-75238-1

GC/MS VOA

Analysis Batch: 211752

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-75238-1	ETP2 FEED	Total/NA	Water	8260B	
720-75238-2	FIELD BLANK	Total/NA	Water	8260B	
MB 720-211752/4	Method Blank	Total/NA	Water	8260B	
LCS 720-211752/5	Lab Control Sample	Total/NA	Water	8260B	
LCSD 720-211752/6	Lab Control Sample Dup	Total/NA	Water	8260B	

Analysis Batch: 211753

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-75238-3	ETP1 FEED	Total/NA	Water	8260B/CA_LUFT MS	
720-75238-4	CLARIFIER EFFLUENT	Total/NA	Water	8260B/CA_LUFT MS	
MB 720-211753/4	Method Blank	Total/NA	Water	8260B/CA_LUFT MS	
LCS 720-211753/5	Lab Control Sample	Total/NA	Water	8260B/CA_LUFT MS	
LCSD 720-211753/6	Lab Control Sample Dup	Total/NA	Water	8260B/CA_LUFT MS	

Analysis Batch: 211882

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-75238-1	ETP2 FEED	Total/NA	Water	8260B	
720-75238-4	CLARIFIER EFFLUENT	Total/NA	Water	8260B/CA_LUFT MS	
MB 720-211882/4	Method Blank	Total/NA	Water	8260B	
LCS 720-211882/5	Lab Control Sample	Total/NA	Water	8260B	
LCSD 720-211882/6	Lab Control Sample Dup	Total/NA	Water	8260B	

Lab Chronicle

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-75238-1

Client Sample ID: ETP2 FEED — Lab Sample ID: 720-75238-1

Date Collected: 10/19/16 09:05
Date Received: 10/19/16 13:15
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		50	211752	10/22/16 05:15	JRM	TAL PLS
Total/NA	Analysis	8260B		500	211882	10/25/16 14:38	LPL	TAL PLS

Client Sample ID: FIELD BLANK — Lab Sample ID: 720-75238-2

Date Collected: 10/19/16 09:00
Date Received: 10/19/16 13:15
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	211752	10/22/16 00:53	JRM	TAL PLS

Client Sample ID: ETP1 FEED — Lab Sample ID: 720-75238-3

Date Collected: 10/19/16 09:00
Date Received: 10/19/16 13:15
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/CA_LUFTMS		20	211753	10/21/16 22:34	JRM	TAL PLS

Client Sample ID: CLARIFIER EFFLUENT — Lab Sample ID: 720-75238-4

Date Collected: 10/19/16 09:10
Date Received: 10/19/16 13:15
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/CA_LUFTMS		1	211753	10/21/16 22:05	JRM	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	211882	10/25/16 14:09	LPL	TAL PLS

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Certification Summary

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-75238-1

Laboratory: TestAmerica Pleasanton

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	State Program	9	2496	01-31-18

Analysis Method	Prep Method	Matrix	Analyte

Method Summary

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-75238-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL PLS
8260B/CA_LUFTMS	8260B / CA LUFT MS	SW846	TAL PLS

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Sample Summary

Client: Shell Oil Products US
Project/Site: Benzene Waste NESHAP

TestAmerica Job ID: 720-75238-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
720-75238-1	ETP2 FEED	Water	10/19/16 09:05	10/19/16 13:15
720-75238-2	FIELD BLANK	Water	10/19/16 09:00	10/19/16 13:15
720-75238-3	ETP1 FEED	Water	10/19/16 09:00	10/19/16 13:15
720-75238-4	CLARIFIER EFFLUENT	Water	10/19/16 09:10	10/19/16 13:15

720-75238

Test America

Shell OPUS Chain Of Custody Record

[7170]

10/26/2016

CONSULTANT COMPANY: Shell Oil Products US - Martinez Refinery		Project Contact (Reported To;) Michael Monson 925-313-5516 michael.monson@shell.com	LAB Order #
ADDRESS: 3485 Pacheco Blvd		Project Name SPECIAL - Monthly	TEMPERATURE ON RECEIPT C°
CITY: Martinez, CA 94553	E-MAIL: Melisa.Guillen@Shell.com		
TELEPHONE: 925-313-3401	FAX: 925-313-5174		
TURNAROUND TIME standard			
SPECIAL INSTRUCTIONS OR NOTES:			

LAB USE ONLY	Sample Identification and LIMS #	SAMPLING DATE mm/dd/yy	SAMPLING TIME 24-hr	Matrix AQ = Waste Water	Total number of bottles	8260B Benzene \ NESHAP	8260B EPA Volatiles \ Benzene \ NESHAP
					Number of Bottles	3	3
					Bottle Type (1)	VOA	VOA
					Preservative (2)	3	3
	ETP2 Feed	10/19/2016	0905	AQ	3		X
	Field Blank	10/19/2016	0900	AQ	3		X
	ETP1 Feed	10/19/2016	0900	AQ	3	X	
	Clarifier Effluent	10/19/2016	0910	AQ	3	X	

720-75238 Chain of Custody

2.8°C

Requested Analysis

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Melisa D Guillen	10/19/16	1000	[illegible]	10.19.16	12:24
[illegible]	10/19/16	1315	[illegible]	10/19/16	1315
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

(1) PT = Plastic pint, PL = Plastic liter, AL = Amber liter, AHL = Amber half-liter, UC = Ultra Clean half liter, GG = ground glass bottle, DB = Double Bag, VOA = 40 mL vial with septa cap

(2) 0 = none, 1 = H2SO4, 2 = HNO3, 3 = HCl, 4 = zinc acetate + NaOH, 5 = Na2S2O3, 6 = NaOH

01-26-06 Revision 0

ED_001593_00015779

Login Sample Receipt Checklist

Client: Shell Oil Products US

Job Number: 720-75238-1

Login Number: 75238
List Number: 1
Creator: Arauz, Dennis

List Source: TestAmerica Pleasanton

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

CONTRA COSTA HEALTH SERVICES

Contra Costa Health Services / Hazardous Materials Programs
4585 Pacheco Boulevard, Suite 100, Martinez, CA 94553
Telephone (925) 335-3200 FAX (925) 646-2073
WWW.CCHEALTH.ORG/GROUPS/HAZMAT
WILLIAM B. WALKER, M.D., HEALTH SERVICES DIRECTOR • RANDALL L. SAWYER, DIRECTOR

Hazardous Waste Inspection/Compliance Checklist (page 1 of 2)

FACILITY NAME	SITE ID	INSPECTION DATE
Martinez Refinery	729718	1-14-15

INSPECTION TYPE	VIOLATION CLASSIFICATIONS	EPA ID
Routine / Follow-Up / Other	M = Minor CI I = Major CI II = Medium / Repeat Minor	CAD009164021

California Code of Regulations (CCR), Title 22, Division 4.5, Chapter 10, §66001 et al
California Health and Safety Code (HSC), Division 20, Chapter 6.5, §25100 et al
Code of Federal Regulations (CFR) Title 40, Chapter 1, Part 260 et al

Disposal Documents Reviewed For Year:	HW Gen Rpt Form On File?	Total Annual Tonnage of All Hazardous Waste Generated:
2014	☒ Yes ☐ No	11835 T

CA State Waste Code if applicable, Federal Code(s)	Hazardous Waste Stream	Annual Quantity (Tons)
	See attached	
	Additional Wastes on Continuation Sheet? ☐ Yes ☒ No	

Generator Status:
☒ RCRA-LQG > 1,000 kg/month ☐ CA-LQG > 1,000 kg/month ☐ CA-SQG > 100 to < 1,000 kg/month ☐ CA-CESQG < 100 kg/month ☐ Episodic

Viol Code	Authority SQG Via CCR 22 66262.34	Authority LQG	GENERAL REQUIREMENTS	Viol Class.	Violation Due Date/ Violation Corrected
HW01	HSC 25189.5	HSC 25189.5	Disposal, treatment or storage at unauthorized location		
HW02	CCR 22 66262.11	CCR 22 66262.11	Hazardous Waste Determination		
HW03	CCR 22 66262.12	CCR 22 66262.12	Obtain & maintain a valid EPA ID Number (DTSC Form 1358) OK		
HW04	CFR 262.34(d)	—	Accumulation time may not exceed 180 days (Unless waste shipped 200 or more miles, no more than 270 days)		
HW05	—	CCR 22 66262.34(a)	Accumulation time may not exceed 90 days		
HW06	CCR 22 67450.1	CCR 22 67450.1	Notify CUPA for eligible onsite treatment.		
HW07	HSC 25163(a)	HSC 25163(a)	Lawful transportation of hazardous waste		
			RECORDKEEPING & REPORTING		
HW08	CCR 22 66262.20	CCR 22 66262.20	Properly Complete Manifest		
HW09	CCR 22 66262.23	CCR 22 66262.23	Send manifest copy to DTSC, P.O. Box 400, Sacramento, CA 95812 OK		
HW10	HSC 25160.2	HSC 25160.2	Properly complete consolidated manifest		
HW11	CCR 22 66262.40	CCR 22 66262.40	Keep waste manifests and/or consolidated manifests for 3 years		
HW12	—	CCR 22 66262.40-41	Biennial Report (RCRA LQG Only)		
HW13	HSC 25123.3	CCR 22 66262.42	File manifest Exception Report with DTSC		
HW14	HSC 25143.10	HSC 25143.10	Biennial Excluded Recyclable Materials Report		
HW15	HSC 25143.2(f) & CCR 22 66261.2(g)	HSC 25143.2(f) & CCR 22 66261.2(g)	Maintain adequate records demonstrating claim of exemption for Excluded Recyclable Material		
HW16	CCR 22 66262.40(c)	CCR 22 66262.40(c)	Keep copies of analytical results, waste analysis records, or waste determination results for 3 years		
HW17	CCR 22 66266.130(c)(5)	CCR 22 66266.130(c)(5)	Keep disposal receipts for 3 years for drained used oil filters and/or drained fuel filters		
HW18	—	CCR 22 67100.1	SB14 – Hazardous Waste Source Reduction Evaluation Review Plan		
			HAZARDOUS WASTE HANDLER TRAINING		
HW19	40 CFR 262.34(d)(5)(iii)	CCR 22 66265.16	Employee training program adequate.		
HW20	—	CCR 22 66265.16	Training Documentation		
HW21	—	CCR 22 66265.16	Training Conducted Annually		
HW22	40 CFR 262.34(d)(5)(ii)	—	Post Emergency Response Plan by telephone.		
HW23	40 CFR 262.34(d)(5)(i)	CCR 22 66265.55	Have an emergency coordinator on call or available during emergency.		
HW24	—	CCR 22 66265.51-55	Contingency Plan Completed		

Facility Rep Initials	CC Hazmat Rep Initials	Date
NAB	MDA	1-14-15

ENTERED

CONTRA COSTA HEALTH SERVICES

Contra Costa Health Services / Hazardous Materials Programs
4585 Pacheco Boulevard, Suite 100, Martinez, CA 94553
Telephone (925) 335-3200 FAX (925) 646-2073
WWW.CCHEALTH.ORG/GROUPS/HAZMAT
WILLIAM B. WALKER, M.D., HEALTH SERVICES DIRECTOR • RANDALL L. SAWYER, DIRECTOR

Hazardous Waste Inspection/Compliance Checklist (page 2 of 2)

FACILITY NAME	SITE ID	INSPECTION DATE
Martinez Refinery, Shell	729718	1-14-15

Viol Code	Authority SQG Via CCR 22 66262.34	Authority LQG	GENERAL REQUIREMENTS	Viol Class.	Violation Due Date/ Violation Corrected
HW25	40 CFR 262.34(d)(5)(iv)	CCR 22 66265.51	Properly carry out contingency plan during an emergency.		
			FACILITY OPERATION		
HW26	40 CFR 265.31, Via 262.34(d)(4)	CCR 22 66265.31	Maintain and/or operate facility to prevent release or fire ✓		
HW27	40 CFR 265.32(c) Via 262.34(d)(4)	CCR 22 66265.32	Spill/fire control equipment available. ✓		
HW28	40 CFR 265.32(a) & (b) Via 262.34(d)(4)	CCR 22 66265.32	Facility equipped with internal communication or alarm. ✓		
HW29	40 CFR 265.33 Via 262.34(d)(4)	CCR 22 66265.33	Equipment properly maintained and tested ✓		
HW30	40 CFR 265.35, Via 262.34(d)(4)	CCR 22 66265.35	Maintain adequate aisle space ✓		
HW31	40 CFR 265.37, Via 262.34(d)(4)	CCR 22 66265.37	Arrangements with response agencies		
			HAZARDOUS WASTE TANKS & CONTAINERS		
HW32	CCR 22 66262.34(f)	—	Properly label/date hazardous waste container and/or tank.		
HW33	CCR 22 66262.34	CCR 22 66262.34	Proper Markings including start date and composition		
HW34	HSC 25143.9(a)	HSC 25143.9(a)	Proper label on Excluded Recyclable Materials		
			HAZARDOUS WASTE CONTAINERS		
HW35	CFR 265.171, Via 262.34(d)(2)	CCR 22 66265.171	Container in good condition		
HW36	CFR 265.172, Via 262.34(d)(2)	CCR 22 66265.172	Container and/or liner compatible		
HW37	CFR 265.173, Via 262.34(d)(2)	CCR 22 66265.173	Containers are kept closed		
HW38	CFR 265.174, Via 262.34(d)(2)	CCR 22 66265.174	Conduct weekly inspections		
HW39	—	CCR 22 66265.176	Buffer zone for ignitable wastes		
HW40	CFR 265.177, Via 262.34(d)(2)	CCR 22 66265.177	Properly separate incompatible wastes		
HW41	CCR 22 66261.7(e)(f)(i)	CCR 22 66261.7(e)(f)(i)	Properly manage containers or inner liners removed from containers greater than 5 gallons (Accumulation time not to exceed one year)		
			HAZARDOUS WASTE TANK SYSTEMS		
HW42	CFR 262.201, Via 262.34(d)(2)	CCR 22 66265.190	Tank in good condition ✓		
HW43	—	CCR 22 66265.191(a) & (e)	Complete annual integrity assessment for HW tank system without secondary containment.		
HW44	—	CCR 22 66265.191(a) or 66265.192(a)	Failed to obtain a PE assessment for hazardous waste (HW) tank system. ✓		
HW45	Check local FD	CCR 22 66265.193(a)	Failed to provide proper secondary containment and/or leak detection for HW tank system.		
HW46	CFR 265.201, Via 262.34(d)(2)	CCR 22 66265.194(a)	Failed to use proper spill/overfill prevention controls and practices.		
HW47	CFR 265.201 Via 262.34(d)(2)	CCR 22 66265.194	Comply with tank standards which include: two feet of freeboard (where applicable), shut off for waste feed line, & daily inspections of waste levels		
HW48	—	CCR 22 66265.195(c)	Failed to inspect and/or document daily HW tank system inspections.		
HW49	—	CCR 22 6265.196(e)(1) or (3)	Notify DTSC when a release to environment occurred from HW tank system.		
HW50	CCR 22 67383.3	CCR 22 66265.197 CCR 22 67383.3	Properly complete and/or document closure for a hazardous waste tank.		
HW51	—	—	Other:		

Observations:
Spot check Q4, 2014 manifests.

Total Time for Review and Inspection (in 15 minute increments): 2 HR ☐ Notice to Comply ☐ Notice of Violation ☑ No Violations Observed

Facility Rep Initials NAB | CC Hazmat Rep Initials MDA | Date 1-14-15

Form HW / rev. 06/10

HW totals for 2014

SHELL OIL PRODUCTS US - MARTINEZ REFINERY
TOTAL HAZARDOUS WASTE GENERATED - 2013

STATE CODE	FED CODES	MATERIAL	TYPE	TRANS	DM	TSDF	LBS	TONS	GM Page	TSDF EPA ID #	MMC
571	D010; K048	COB Fines/Flyash	RCRA	PSC	Landfill	CH-BL	726,360	363.2	5	CAD980675276	H132
222	K048	Dissolved Nitrogen Float (DNF) From Onsite Wastewater Treatement Plant	RCRA	NA	Incinerate	Shell CO Boilers	369,494	184.7	6	CAD009164021	H050
223	D018	ECO: Rec Oil w/Benzene	RCRA	PSC	Incinerate	CH - Aragonite	529,000	264.5	7	UTD981552177	H040
181	D008	Debris Contaminated with Lead	RCRA	PSC	Landfill	CH-BL	45,800	22.9	8	CAD980675276	H132
181	D008	Waste Sandblast w/Lead	RCRA	PSC	Landfill	CH-BL	103,660	51.8	8	CAD980675276	H132
725	D009	Lab Pack - Mercury Waste	RCRA	Ingenium	Incinerate	Veolia	10	0.0	9	CAD008302903	H040
551	D002; D007; D008; D011; P022; P098	Lab pack DOT drums/containers	RCRA	Ingenium	Incinerate	CH - Aragonite	240	0.1	10	UTD981552177	H040
551	D001; D002; D003; D008; P105	Lab pack DOT drums/containers	RCRA	Ingenium	Incinerate	CH-El Dorado	115	0.1	10	ARD069748192	H040
551	D001; D005	Lab pack DOT drums/containers	RCRA	Ingenium	Incinerate	HERITAGE ENVIRONMENTAL SERVICES LLC	10	0.0	10	AZD081705402	H040
551	D002	Lab pack DOT drums/containers	RCRA	Ingenium	Incinerate	Veolia - CA	10	0.0	11	CAD008302903	H040
214	D001; D035; F003; F005	Lab Pack (Vials w/Organics)	RCRA	Ingenium	Fuel Blend	Rineco	750	0.4	12	ARD981057870	H061
212	D001; D035; F003; F005	Paint / Solvents	RCRA	Ingenium	Fuel Blend	Rineco	1,210	0.6	13	ARD981057870	H061
181	K048	Refractory w/K048	RCRA	PSC	Landfill	CH-BL	55,740	27.9	14	CAD980675276	H132
352	F037; F038; K050; K051	Shaker w/ F037/038, K050/051	RCRA	PSC	Incinerate	CH - Aragonite	186,160	93.1	15	UTD981552177	H040
162	D018	Chloride Absorb - CAT	RCRA	Pride	Incinerate	CH - Aragonite	40,480	20.2	16	UTD981552177	H040
162	D004; K170; K171	CFH Catalyst - K171/K172	RCRA	Western Hiways	Reclaim	DuraTherm	930,815	465.4	17	TXD981053770	H039
162	D004; K170; K171	HCU 1st. Stg - K171/K172	RCRA	Western Hiways	Reclaim	DuraTherm	381,908	191.0	17	TXD981053770	H039
162	D010	Cogen - SCR Catalyst	RCRA	PSC	Landfill	CH-BL	107,260	53.6	18	CAD980675276	H132
352	K169; K170	Tk ECO w/K169-170	RCRA	PSC	Incinerator	CH - Aragonite	207,460	103.7	19	UTD981552177	H040
331	D001; D035; F003; F005	Waste Aerosol Cans	RCRA	Ingenium	Recycle	Rineco	4,350	2.2	20	ARD981057870	H141
151		Asbestos	CH	PSC	Landfill	Forward	221,400	110.7	21	CAL000190080	H132
611		Contaminated Soil	CH	PSC	Landfill	CH-BL	614,340	307.2	22	CAD980675276	H132
261		PCB Ballast	CH/TSCA	Clean Harbors	Incinerator	CH - Aragonite	452	0.2	23	UTD981552177	H040
261		PCB Light Ballast	CH/TSCA	Clean Harbors	Incinerate	CH - Aragonite	974	0.5	23	UTD981552177	H040
181		Electical Waste (LCD Monitors)	CH	Clean Harbors		CH - San Jose	420	0.2	24	CAD059494310	H141
352		ECO - Self Heating Carbon	CH	PSC	Landfill	CH-BL	142,440	71.2	25	CAD980675276	H132
223		ECO: Rec Oil	CH	PSC	Landfill	CH-BL	1,224,320	612.2	26	CAD980675276	H132
181		Filter Cake w/Selenium	CH	PSC	Landfill	CH-BL	17,460,930	8,730.5	27	CAD980675276	H132
352		FXU Coke - Dry Fines	CH	PSC	Landfill	CH-BL	20,869	10.4	28	CAD980675276	H132
181		Nickel Metal Hydride Batteries	CH	Clean Harbors	Reclaim	CH - Aragonite	13	0.0	29	UTD981552177	H141
181		Nickel Metal Hydride Batteries	CH	Clean Harbors	Reclaim	CH - El Dorado	85	0.0	29	ARD069748192	H141
181		Non-PCB Light Ballast/Switches	CH	Clean Harbors	Landfill	CH-BL	696	0.3	30	CAD980675276	H132
352		Oily Coke	CH	PSC	Landfill	CH-BL	17,880	8.9	31	CAD980675276	H132
223		Oily Debris	CH	PSC	Landfill	CH-BL	386,220	193.1	32	CAD980675276	H132
162		LTS - Catalyst	CH	PSC	Landfill	CH-BL	120,260	60.1	33	CAD980675276	H132
181		Contam. Mole Sieve / Alumina	CH	PSC	Landfill	CH-BL	63,980	32.0	34	CAD980675276	H132
181		Gx/Refractory (FXU T/A)	CH	PSC	Landfill	CH-BL	74,120	37.1	35	CAD980675276	H132

Total Hazardous Waste Generated	24,040,231	12,020.1
Hazardous Waste Shipped Off-site	23,670,737	11,835.4

ED_001593_00015790

Shell Oil Projects US
Martinez Refinery

Subject: **Final Regulatory and Legal Review of Se Sludge Raw Material**

Date: **February 11, 2014**

By: **Gordon Johnson, MZR Environmental Affairs**

Summary
There are no regulatory and legal issues for re-designating this material as excludable recyclable material and to be sent to a cement kiln.

Background
MZR selenium sludge is generated at the MZR Effluent Treatment Plant (ETP) Selenium Treatment Unit (STU). Ferric chloride is added to treated wastewater to remove selenium in order for the effluent to meet the NPDES permit for discharge to Carquinez Strait. This ferric chloride process generates an iron hydroxide sludge containing selenium in ETP treated wastewater Pond 5D. The sludge is then dredged from Pond 5D and dewatered using a centrifuge. This dewatered sludge is then transported via truck to the Clean Harbors class 1 hazardous waste landfill located in Buttonwillow, CA, 250 miles from Martinez.

On average, 8,000 to 10,000 tons per year of sludge is generated, making up 50% -70% of MZR's hazardous waste volume. This corresponds to one to two truckloads of day of sludge shipped to the hazardous waste landfill.

Description of Change
This project will redirect this material to one or more cement kilns located in Nevada (Nevada Cement Company in Fernley – 30 miles east of Reno) or in California (i.e. CEMEX – Victorville). Cement consists of four primary components, calcium carbonate, silica, aluminum, and iron. The cement kiln will use this material as a feedstock to meet its iron requirements.

MZR is reducing its hazardous waste generation significantly with this change as well as realizing cost savings due to the difference in cost between sending the material to the kiln rather than to a landfill.

Regulatory & Legal
This material historically has been designated as a CA hazardous waste because its total selenium level exceeds the CA Total Threshold Limit Concentration (TTLC) limit and the vanadium level exceeds the CA Soluble Threshold Limit Concentration. However, this material is not a characteristic hazardous waste under Federal Toxicity Characteristic Leachate Procedure (TCLP) limits for any metals.

Federal and State regulations allow this material to be designated as a excludable recyclable material (ERM) if the material meets several criteria, including that the material must have a legitimate use as an alternate raw material (no 'sham' recycling) and that the material does not exceed TCLP thresholds (i.e. is not a Federal waste). As an ERM, the material must be tested routinely to verify the material does not

exceed any TCLP limits. Shipping will occur under a Bill of Lading. Shipping and analytical records must be kept and available for review during any agency or internal audit.

Replacing virgin feedstock in this case iron ore, is highly encouraged by the Department of Toxic Substances (DTSC) and there are multiple precedents for this action. The intent of the Hazardous Waste Source Reduction and Management Review Act of 1989, commonly referred to as SB-14, is to encourage facilities to minimize waste generation by eliminating wastes or recycling wastes. With the cement kiln using the material as an alternate raw material in lieu of virgin iron ore, greenhouse gases are also reduced by the elimination of incremental ore mining.

The practice of using materials that have beneficial use as ERM rather than waste is widely practiced in CA by industry, including a substantial number of CA refineries. MZR currently recycles its sandblast grit as well as using spent catalytic cracking catalyst as cement kiln feedstock (for silica supplement). This material upon the point of generation is deemed an ERM. The material will not be considered as a waste at any step of the process.

Shell Houston Offsite Residuals Management Team (ORMT) conducted an on-site audit at the Nevada Cement Kiln on October 8, 2013. The ORMT issued an approval to use the site for this purpose.

A legal summary by Cooper White Cooper is attached. No issues were raised.

Shell Houston Senior Residuals Project Advisor David Zabcik and Shell Houston MZR legal Pierre Espejo reviewed this change with MZR Environmental in November 2013. No issues were raised.

Lastly, by sending the material to a kiln as an alternative raw material rather than to a landfill, MZR's liability may be reduced if the landfill were to ever be designated a superfund site. The liability for each contributing company to the landfill is proportional to the amount of material sent by that company.

Attached Supporting Documents

1. Cooper, White, and Cooper, LLC legal analysis
2. Shell ORMT Nevada Cement Company Facility Audit.

COOPER
WHITE &
COOPER

Direct Line: (415) 765-6272
E-Mail: kcasto@cwclaw.com

November 20, 2013

Joseph Sells
President
Nevada Cement Company
I-80 at Exit 46
P. O. Box 840
Fernley, Nevada 89408-0840

Re: Recyclability of Kleen Industrial Services Filter Cake Material for Portland Cement Products Produced in Fernley, Nevada

Dear Mr. Sells:

This is a follow-up to our meeting on June 19th in ERM's Walnut Creek, California office. It was a pleasure to meet with you and Ben Bufmack. Per our discussion, this firm represents Kleen Industrial Services (KIS) with respect to the recyclability of certain alternative raw materials (ARM) as feedstock for incorporation into Portland cement products produced at your Fernley, Nevada facility. As we discussed, KIS converts certain industrial materials into ARM through beneficial reuse and recycling in accordance with California and federal environmental laws as described below.

KIS collects ARM from California generators (refineries, shipyards, and other from other sources) and processes (e.g., screening out garbage and debris) and supplies it to in-state or out-of-state Portland cement manufacturers such as Nevada Cement. This beneficial reuse program results in advancing the objectives of the State of California and the United States Environmental Protection Agency's (EPA) to promote resource recovery and reduce greenhouse gas emissions pursuant to the California Global Warming Solutions Act of 2006 (otherwise known as AB 32). The beneficial reuse program additionally reduces reliance on naturally occurring raw materials and fuels used in manufacturing while providing a safe, effective, and compliant use of ARM for beneficial reuse.

The ARM contains one or more of the following regulated components that can be beneficially reused as an ARM to manufacture Portland cement:

- Calcium (Ca)
- Silica (Si)
- Iron (Fe)

- Aluminum (Al)

Throughout the United States, this material has sometimes been discarded as a hazardous waste and at other times been beneficially recycled and incorporated into Portland cement products depending on the particular characteristics of the material involved.

The purpose of this letter is to address the question of whether the California ARM supplied by KIS can be legally recycled for use as feedstock for the Nevada Cement Portland cement facility in Fernley, Nevada under the federal Resource Conservation and Recovery Act (RCRA), 42 USC Section 6901, *et seq.*, and the more stringent California Hazardous Waste Control Act (HWCA), California Health & Safety Code Section 25100, *et seq*. We believe that the short answer to this question is, yes. Our legal basis for this conclusion follows.

As a starting point, it is our understanding that this material is neither a listed nor a characteristic hazardous waste under RCRA. Thus, the only hazardous characteristic which could conceivably apply is toxicity and this material does not exceed the applicable federal solubility test (i.e., the Toxicity Characteristic Leaching Procedure or TCLP). Therefore, this material is not regulated as a "hazardous waste" under RCRA and the regulatory restrictions for hazardous waste under RCRA consequently do not apply. However, since this material is generated in California, the more stringent requirements of the HWCA must be considered even if the material would be used as an ingredient for an industrial process outside the state of California. While this material is also not a listed hazardous waste under the HWCA, some batches may exceed the toxicity characteristic because it could exceed the more stringent California solubility test (i.e., the Soluble Threshold Limit Concentration or STLC) and is thus potentially a "non-RCRA" or "California-only" hazardous waste. However, under the HWCA (specifically, California Health & Safety Code Section 25143.2 (b) and (d)), recyclable material which is used as an ingredient in an industrial process to make a product and is managed in accordance with certain regulatory requirements (California Health & Safety Code Section 25143.9 and 25143.10) is specifically excluded from classification as a regulated California "waste." Because the ARM is a recyclable material intended for use as an ingredient in an industrial process to make a product, this material is neither a "waste" under California law nor regulated as a "hazardous waste" under RCRA.

In order to qualify for this particular exclusion, several relevant conditions must be met. First, it must not be a RCRA hazardous waste. Second, it must not be treated except by filtering, screening, sorting, sieving, grinding, physical or gravity separation under specified conditions, pH adjustment, or viscosity adjustments. Third, any air emissions from the treatment of the material (through filtering, screening, sorting, sieving, grinding, physical or gravity separation under specified conditions, pH adjustment, or viscosity adjustments using only these treatment methodologies) must not contain constituents that are regulated

hazardous wastes and are in compliance with applicable air pollution regulatory requirements. It is our understanding that the KIS ARM meets these conditions.

The HWCA also requires the generator to comply with certain handling requirements for this excluded recyclable material. Under these requirements, containers and tanks holding recyclable hazardous materials must be marked as follows:

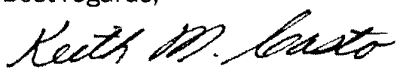
- The words "EXCLUDED RECYCLABLE MATERIAL";
- The accumulation start date for the material in the container;
- Composition (e.g., oil, acetone 40%, toluene 60%, etc.) and physical state (i.e., solid, liquid, etc.) of the material;
- Hazardous properties (e.g., flammable, corrosive, reactive, toxic, etc.) of the material;
- Name and address of the facility generating the material; and
- Aboveground tanks must also be marked in accordance with CFC Standard 79-3 (HSC 25143.9 and HSC 25143.10.)

While California law would also impose certain additional regulatory requirements on a receiving facility in California, these requirements do not apply to a receiving facility in Nevada such as yours. Instead, your facility would be governed by applicable Nevada regulatory requirements. It is our understanding that Nevada follows federal RCRA requirements. Therefore, since the ARM is not a "hazardous waste" under RCRA, Nevada Cement need not manage the ARM as a permitted "hazardous waste treatment, storage, or disposal facility." However, Nevada Cement would otherwise need to comply with other applicable Nevada environmental, health, and safety requirements.

In summary, based on available data, the KIS material appears to be excluded recyclable material under the California HWCA and therefore can be legally incorporated as an ingredient into your Portland cement product manufactured in your Fernley, Nevada facility. In addition, on the receiving side, the California HWCA does not apply to your Fernley, Nevada facility. Therefore, your Fernley facility would be governed by the applicable federal and state regulatory requirements of Nevada.

I hope this is responsive to your inquiry. If you or your colleagues have any questions, please free to contact me directly on my direct line (415/765-6272) or mobile (408/221-1304).

Best regards,



Keith M. Casto

KMC:mcb
cc: Tim Spurgeon
Fionn O'Neill
Gary Lucks
Gordon Johnson
741389.1 / 17041.7000

Facility Information	
Facility Address	Interstate 80 @ Exit 46; Fernley, NV 89408
Facility Contact Name	Michael Hicks
Facility Phone Number	(775) 575-2281 / mhicks@nevadacement.com
Requested By	Martinez Refinery

Review Information		
New/Update	Review Type (CHWMEG, Third Party, or Internal)	Reviewed by (Consultant Name/Shell Business)
New	Internal	PTE/AUHT
Last Review Date	Current Review Date	Facility Type
N/A	October 8, 2013	Cement Kiln

Recommendation to ORMT: APPROVED

Comments/concerns:

- The plant accepts non-hazardous wastes for use as alternative fuels and raw materials
- All staff was found to be knowledgeable and competent in their positions
- The housekeeping in the vicinity of the alternative fuel (AF) storage area, shredder area, and in the kiln conveyor area was observed to be very good
- Currently accepts non-hazardous spent iron and copper sandblast slag as an alternate feedstock material and green delayed petroleum coke as alternative fuel for the kiln
- facility has an extensively documented waste acceptance protocol
- No major fires, explosions, or releases since the start of site operations
- TIR was 2.63 and 5.34 for 2011 and 2012, respectively
- area in the immediate vicinity of the cement plant is rural and sparcely populated by other business
- Altman-Z scores are acceptable
- Security measures appear adequate

A. Company Overview:

Nevada Cement Company (NCC) is owned by Eagle Materials Inc. (NYSE: EXP), a leading U.S. manufacturer and distributor of building materials including portland cement, concrete and aggregates, gypsum wallboard and recycled paperboard. Founded in 1964, Eagles Materials is the nation's fifth largest wallboard producer and the eighth largest cement manufacturer. Originally part of Centex Corporation, Eagle Materials became a fully independent company through a spin-off transaction in January 2004. This independence allowed greater flexibility to invest in growth opportunities. Over the years, Eagle Materials has increased market share and profitability through acquisitions, internal expansion and facility upgrades, taking advantage of the growing demand for their products.

NCC has been manufacturing and distributing bulk and sack cement in Northern Nevada and Northern California since 1964. Construction began in 1962 and the production of portland cement began in 1964. Original design capacity was 540 tons per day. In 1969 construction of a second kiln, raw mill, and two finish mills began and was completed in 1970. By 1976, a coal handling and firing system had been added to the plant. In 1986, a Fuller single stage preheater was added to the number two kiln. Today, NCC's production capacity is 500,000 tons of clinker and 560,000 tons of cement annually.

B. General Facility Information:

The cement manufacturing plant is located thirty-five miles east of Reno off I-80 Exit 46 in Fernley, Nevada. NCC owns and operates a limestone quarry that located seven miles southeast of the cement manufacturing facility, off Highway 95 Alternate. Currently, NCC manufactures an all-purpose Type I/II low alkali moderate sulfate resistant cement, Type II/V low alkali high sulfate resistant cement, IP portland-pozzolan moderate sulfate resistant cement and Class N Pozzolan. NCC produce and distribute over five hundred thousand tons

of cement annually. The facility operates 24 hours per day/7 days per week. The plant is equipped with a rock crushing facility, two raw grinding mills, two rotary kilns, three finish mills, seventy thousand tons of clinker storage, thirty-four thousand tons of cement storage, and an onsite laboratory. NCC also operates two limestone quarries. The Fernley quarry is located seven miles southeast of our cement manufacturing facility, off Highway 95 Alternate. The Churchill quarry is located forty miles east of the cement manufacturing facility. Other raw materials used in manufacturing the cement include calcium, silica, alumina, and iron. The AASHTO-accredited laboratory operates twenty-four hours a day to monitor and maintain production quality and consistency.

NCC accepts non-hazardous wastes for use as alternative fuels and raw materials.

The facility quickly and proactively supported the Shell audit, including completion of the questionnaire and access to all facility areas and records during the site visit. All staff was found to be knowledgeable and competent in their positions, and most have long term service and experience with NCC.

The housekeeping in the vicinity of the alternative fuel (AF) storage area, shredder area, and in the kiln conveyor area was observed to be very good for a cement kiln facility. Although there was some accumulated dust in the kiln feed building, no other excessive accumulations of dust were noted throughout the facility. Stockpiles were in well maintained, separate piles with signs indicating their contents. Adequate spacing was left between piles to safely allow for passage of large material handling equipment (loaders).

C. <u>Waste Handling Operations</u>:

The facility only handles non-hazardous wastes for use as alternative fuel and raw materials. NCC does not accept materials that are regulated. The facility currently accepts non-hazardous spent iron and copper sandblast slag as an alternate feedstock material and green delayed petroleum coke as alternative fuel for the kiln. NCC is open to discussing potential alternate feedstock and fuel sources with 3rd party facilities. Other materials that may be accepted as alternative raw materials including alumina catalyst (typically used for sulfur reduction and drying); Fluid Cracking Catalyst (FCC - aluminum-silicates); iron catalysts; boiler fly ash; aluminum process residue; lime kiln rejects; and molecular sieve. The use of alternative fuel and raw materials commenced at the facility in the early 2000's. The facility receives approximately 20,000-25,000 tons of alternative fuels and raw materials annually.

All wastes arrive at the facility in bulk form, and all wastes received are transported by generator arranged transporters. The only residual wastes generated from the cement production are maintenance fluids and related wastes, which are sent off site for recycling/disposal.

The facility has an extensively documented waste acceptance protocol. Given the importance of cement quality, the waste acceptance process for alternative fuels and raw materials is very stringent. All new waste types accepted are also subject to trial processing prior to full acceptance for a routinely generated waste type. Once testing has been completed and approved by the above, NCC will initiate contracting with the supplying facility.

All wastes are visually inspected upon arrival, and are also tested prior to processing to ensure that the waste materials meet the approved waste profile. A single composite sample is collected from each incoming waste truckload and sent for analysis at the onsite laboratory. Analysis of the raw and cement materials are examined by an MDX-1000+ X-ray fluorescence spectrometer. A Pearl'X Fusion machine fuses the raw materials to ensure accurate spectrometer results. All of our physical and chemical tests conform to ASTM standards and procedures.

D. Facility Design:

The general design of the facility is typical for that of cement manufacturing facility. The plant is equipped with a rock crushing facility, two raw grinding mills, two rotary kilns, three finish mills, seventy thousand tons of clinker storage, thirty-four thousand tons of cement storage, and an onsite laboratory. The two rotary kilns are the heart of the manufacturing process. Each is eleven feet in diameter and three hundred eighty-eight feet long. The rotary kilns are long cylinders rotating on a slightly inclined axis such that raw materials fed in the upper end travel slowly to the lower discharge end where fuels such as coal and coke are ignited to produce temperatures exceeding three thousand degrees Fahrenheit. The raw materials are a blend of limestone, silica bearing clays and iron that are ground into a homogeneous powder by the raw mills and then metered to the kilns from blending tanks. As gravity slowly conveys the raw feed downward through the heating zones of the kilns, it undergoes specific physical and chemical reactions producing an intermediate product called clinker. Clinker is composed primarily of tricalcium silicate and dicalcium silicate crystals; two components which when mixed with water form cementitious materials called calcium silicate hydrates (CSH). The clinker is then ground once more with a small amount of gypsum in the finish mills to produce the final cement product that serves as the "paste" that is used to bond the coarse and fine aggregates together to produce various concrete products.

With respect to alternative fuels and feedstocks, these bulk materials are kept in a uncovered and unpaved areas. Alternative raw materials are added to the raw mill with the other cement production raw materials. The feed rate of the conveyor is controlled by the control room. The process is relatively simple, and requires only a single loader operator.

Stormwater at the facility is managed in an evaporation/percolation pond, located northwest of the facility. This lagoon is also for non-contact cooling tower water.

E. Regulatory Compliance:

The NCC facility has a Nevada Department of Environmental Protection (NDEP) Air Quality Operating Permit (AP32410387.02) and NDEP- Bureau of Water Pollution Control Stormwater Permit (ISW-1364).
These permits are renewed every five and one year, respectively. The types of fuels that can specifically be used by NCC is addressed within Section V(W)(3)(c) of the permit. There is no specific language regarding what can be used as raw materials, however, permit limitations and conditions must be satisfied.

The facility is subject to periodic NDEP and two Mine Safety and Health Administration (MSHA) inspections per year. The last NDEP inspection was conducted in 2007 on the stormwater discharge pond and found that NCC was in compliance with all applicable regulations. MSHA noted several defiencies during their inspections, many of which were minor. However, there were some MSHA citations that related directly to employee injuries that they facility indicated had been settled and addressed.

There have been no major fires, explosions, or releases. There are also no known past operations that have caused or have suspected to have caused subsurface contamination.

The facility has reported lost time injuries. The facility TIR was 2.63 and 5.34 for 2011 and 2012, respectively. The year to date TIR for 2013 was 2.87. NCC maintains an extensive safety culture which includes monthly safety meetings, weekly safety briefings, and daily tool box meetings.

NCC does not conform to any third party certified ISO quality or environmental management systems; however, there is a strong internal corporate management system with established policies and procedures. There is also an established corporate audit program, as well as routine preventative maintenance inspections conducted at the facility.

F. Environmental Evaluation:

The Nevada Cement facility is located in Lyon County, just south of the Washoe County line and approximately 5000 feet east of the Storey County line. The facility is immediately north of Interstate 80 Exit 46 (West Fernley exit).

Groundwater elevation is normally 71 feet below surface; flow is generally to the northwest. The facility is at the edge of the 6000-foot buffer zones of three public water supply wells. Cooling water for the facility is supplied by two groundwater wells. Analyses of groundwater quality over the term of the current permit indicate background concentrations of Arsenic at 0.069 mg/l - U. S. EPA primary drinking water standard is 0.01 mg/l. Manganese concentration is 0.078 mg/l - secondary drinking water regulation is 0.01 mg/l. Total Dissolved Solid concentration is 479 mg/l - secondary drinking water regulation is 500 mg/l. Elevated Arsenic concentration in the groundwater is a common condition in the local area.

The area in the immediate vicinity of the cement plant is rural and sparcely populated by other business. East of NCC is truck stop facility and immediately south is Interstate 80. On the opposite side of the highway are additional trucking facilities and a sports casino.

G. Financial Strength:

The facility is owned by Eagles Materials, which is a publically traded company, and operated by NCC. For the year 2013, (ending on March 31), Eagle Materials, Inc., reported sales of over $642 million, with over $57 million in net income and $696 million inequity. The current ratio was 2.61 and the debt-to-equity ratio was 1.12. Altman Z-scores are as follows:

- 2013: 6.76
- 2012: 6.44

There has been no environmental related litigation against the facility, and there are no known potential remediation or restoration costs associated with this facility.

H. Financial Assurance and Insurance:

There are no regulatory mandated requirements for closure planning or financial assurance for the alternative fuels or raw materials operations or any other aspect of the cement plant. Although there are no closure requirements, the closure of the alternative fuel storage area and shredder would be a minor effort given the relative small size of this operation. It is not likely that the cost for such closure activities would be substantial.

The facility maintains liability insurance including general liability, auto liability, umbrella liability and workers compensation liability. Insurance policies are in the following amounts: General Liability $10 million each/$10 million aggregate; Automobile Liability $1million; Excess Liability $2 million each and $2 million aggregate; and Workers Compensation $1M.

I. Community Relations and Security:

There are no community complaints or opposition to site operations. NCC participates in and supports a wide variety of community programs and has been recognized by the community on several occasions. The majority of the facility has a barb wire fence barrier and the single entrance gate is normally open (24-hour facility). NCC relies on facility personnel to assist with plant security. There have been past instances of minor scavenging for scrap metals. These activities have not resulted in any damage to the facility. Although the facility is located within the earthquake zone, NCC has not experienced any natural disasters to date.

ED_001593_00015790

Shell Oil Products US

Straight Bill of Lading
SHORT FORM

CARRIER: Philips West Industrial Services CONTACT: Ph. # (800) 800-7472		DATE: 10/22/14	SOPUS BOL # 14-00300
CONSIGNEE: Kleen Industrial Services ADDRESS: 30028 Industrial Parkway SW Hayward, CA 94544 ATTN: Flonn O'Neil 800-227-1134	License # 9F02613	END DUMP / ROLLOFF BIN # 2W014	
	SPECIAL INSTRUCTIONS		
	PROFILE AUTH. NUMBER:		PO # 2014:
SHIPPER: Shell Oil Products US - Martinez Refinery ADDRESS: P.O. Box 711 Martinez, CA 94553 ATTN: C. B. Dunham 925-313-3329	NOTES: Shipper certifies that all materials are properly classified, described, packaged marked and labeled according to all applicable US DOT regulations. Placards required, rendered, and displayed - Initial Shell: _____ Driver: _____		
FOR PAYMENT SEND BILL TO: ADDRESS: Shell Oil Products US - Martinez Refinery Accounts Payable Dept. P.O. Box 4637 Houston, TX 77210	A complete M.S.D.S. must be provided for any Hazardous Material For Emergencies Contact: 1-800-424-9300 All Materials for Recycling / Reclaimation ONLY CAD# 0091640221		

PACKAGING	PIECE CT	COMMODITY / DESCRIPTION / SPECIAL MARKINGS	DOT / EPA CODE (if applicable)	CROSS WT.	TARE	NET WT.
DT End Dump	1	**Excludable Recyclable Material Iron Solids**	NON-HAZ-MATERIAL For Beneficial Reuse	74 180	30 660	43520
			MSDS			

NOTE - Where the rate is dependant on value, shippers are required to state specifically in writing the agreed or declared value of the property.
The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding

$ per

The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

Signature or Consignor P.O.D

FREIGHT CHARGES ARE PREPAID UNLESS MARKED COLLECT

CHECK BOX IF COLLECT ☐

RECEIVED, subject to the classifications and lawfully filed tariffs in effect on the date of the issue of this Bill of Lading, the property described above in apparent good order, except as noted (contents and conditions of contents of packages unknown),
It is mutually agreed as to each carrier of all or any of the said property, over all or any portion of said route to destination and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall

SHIPPER Shell Oil Products US - Martinez Refinery PER shipper's signature	CARRIER Philips West Industrial Services PER driver's signature

Mark "X" or "RQ" if appropriate to designate Hazardous Materials as defined in the Department of Transport Regulations governing the transportation of hazardous materials. The use of this column is an optional method for identifying hazardous material.

LC 09055

5

GATE PASS

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

Date: April 18, 2014

Mr. Fionn O'Neill
Kleen Industrial Services
50 Oak Court, Suite 210
Danville, CA 94526
Tel(925)831-9800 Email:fionn@kleenblast.com

Project: **SFO-14-051 / Shell Oil / MRC Irion Solids**
Lab I.D.: **140411-10**

Dear Mr. O'Neill:

The **additional TCLP-Se results** for the solid sample, received by our laboratory on April 11, 2014, (via United Parcel Services), are attached. The sample was received intact, accompanying chain of custody and also stored per the EPA protocols.

Enviro-Chem appreciates the opportunity to provide you and your company this and other services. Please do not hesitate to call us if you have any questions.

Sincerely,

Curtis Desilets
Vice President/Program Manager

Andy Wang
Laboratory Manager

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: **Kleen Industrial Services**
50 Oak Court, Suite 210
Danville, CA 94526
Tel(925)831-9800 Email:fionn@kleenblast.com

PROJECT: **SFO-14-051 / Shell Oil / MRC Irion Solids**
MATRIX: SOLID
SAMPLING DATE: 04/10/14
REPORT TO: MR. FIONN O'NEILL

DATE RECEIVED: 04/11/14
DATE ANALYZED: 04/16-17/14
DATE REPORTED: 04/18/14

SAMPLE I.D.: **SFO-14-051**
LAB I.D.: 140411-10

TCLP-METALS ANALYSIS (PER 40 CFR 261.24)
CONCENTRATION UNIT: mg/L IN LEACHATE

PARAMETER	RESULT	PQL	DF	EPA#	LIMIT@	EPA METHOD
SELENIUM (Se)	ND	0.10	1	D010	1.0	6010B

COMMENTS
mg/L = Milligram per Liter = PPM
TCLP Extraction Method = EPA 1311
DF = Dilution Factor
PQL = Practical Quantitation Limit
Actual Detection Limit = PQL X DF
ND = Below the Actual Detection Limit or non-detected
EPA# = The EPA Hazardous Waste Number
LIMIT@ = The "EPA Acceptable Land Disposal Limit"
*** = The concentration exceeds the TCLP Limit (if marked)

Data Reviewed and Approved by: _____
CAL-DHS ELAP CERTIFICATE No.: 1555

KIS CHAIN OF CUSTODY RECORD

KLEEN Industrial Services

50 Oak Court, Suite 210
Danville, CA 94526
Phone 925-831-9800 – Fax 925-831-9183

FAX RESULTS TO ALL PARTIES LISTED BELOW:	
Fionn O'Neill	925-831-9183

Project Number: SFO 14-051 CLIENT: Shell Oil

JOBSITE: MRC IRON Solids

COLLECTED BY:

SPECIAL INSTRUCTIONS:

ANALYSIS REQUESTED:
- (X) CAM 17- TTLC with 10X STLC, Cu only if over 2200
- ( ) 8 Metal TCLP
- ( ) STLC
- ( ) Other, Note above in Special Instructions Section

SELECT THE TURNAROUND TIME DESIRED BY MARKING OR HIGHLIGHTING:
- ( ) 72hrs Standard Rate
- (X) 48hrs SR + 25% Premium
- ( ) 24hrs SR + 30% Premium
- ( ) Same Day SR+50%

Sample ID	Lab ID	Collection Date	Matrix	Notes or Sample Map, Etc.
SFO 14-051	1404 11-10	4-10-14	Solid	RUSH
	1Xbwf		Solid	
			Solid	

By my signature below I attest that this sample was collected in accordance with KIS' sample directive SOP#1-B or by other regulatory compliant means

Relinquished By:	Date & Time	Received By:	Date & Time
[signature]	4/10/14 12:00	[signature]	4/11/14 13:10
Relinquished By:	Date & Time	Received By:	Date & Time
Relinquished By:	Date & Time	Received By:	Date & Time

Send Sample To: Enviro-Chem, Inc. Laboratories
1214 E. Lexington Avenue
Pomona, CA 91766

Ph: 909-590-5905
Fax: 909-590-5907
CA-DHS ELAP Certificate #1555

C:\KIS DOCS\Recycling Docs\CoC\090928-01 CoC_Standard.doc

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Tel: (925)484-1919

TestAmerica Job ID: 720-43214-1

For:
Shell Oil Products US
3485 Pacheco Blvd
Martinez, California 64553

SE SOLIDS

Attn: Mr. Michael Hecker

Authorized for release by:
7/16/2012 7:04:28 PM

Micah Smith
Project Manager I
micah.smith@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Cover Page 1
Table of Contents 2
Definitions/Glossary 3
Case Narrative 4
Detection Summary 5
Client Sample Results 6
QC Sample Results 12
QC Association Summary 21
Lab Chronicle 24
Certification Summary 25
Method Summary 26
Sample Summary 27
Chain of Custody 28
Receipt Checklists 29

ED_001593_00015790

Definitions/Glossary

Client: Shell Oil Products US

TestAmerica Job ID: 720-43214-1

Qualifiers

Metals

Qualifier	Qualifier Description
F	MS or MSD exceeds the control limits
4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DL, RA, RE, IN	Indicates a Dilution, Reanalysis, Re-extraction, or additional Initial metals/anion analysis of the sample
EDL	Estimated Detection Limit
EPA	United States Environmental Protection Agency
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 720-43214-1

Laboratory: TestAmerica Pleasanton

Narrative

4

Job Narrative
720-43214-1

Comments
No additional comments.

Receipt
The samples were received on 7/11/2012 4:35 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.9° C and 1.5° C.

Metals
Method(s) 7470A: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for prep batch 117141 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

Method(s) 7470A: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for prep batch 117224 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

Method(s) 7471A: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 117036 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

No other analytical or quality issues were noted.

Detection Summary

Client: Shell Oil Products US

TestAmerica Job ID: 720-43214-1

Client Sample ID: Se Solids **Lab Sample ID: 720-43214-1**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	12		3.7		mg/Kg	4		6010B	Total/NA
Barium	140		1.9		mg/Kg	4		6010B	Total/NA
Cadmium	0.74		0.47		mg/Kg	4		6010B	Total/NA
Chromium	27		1.9		mg/Kg	4		6010B	Total/NA
Cobalt	4.0		0.75		mg/Kg	4		6010B	Total/NA
Copper	24		5.6		mg/Kg	4		6010B	Total/NA
Molybdenum	7.5		1.9		mg/Kg	4		6010B	Total/NA
Nickel	41		1.9		mg/Kg	4		6010B	Total/NA
Selenium	180		3.7		mg/Kg	4		6010B	Total/NA
Silver	4.4		0.93		mg/Kg	4		6010B	Total/NA
Vanadium	840		1.9		mg/Kg	4		6010B	Total/NA
Zinc	300		5.6		mg/Kg	4		6010B	Total/NA
Barium	0.73		0.13		mg/L	2.5		6010B	TCLP
Zinc	1.8		0.50		mg/L	2.5		6010B	TCLP
Arsenic	0.38		0.25		mg/L	2.5		6010B	STLC Citrate
Barium	5.1		0.25		mg/L	2.5		6010B	STLC Citrate
Chromium	1.5		0.25		mg/L	2.5		6010B	STLC Citrate
Molybdenum	0.40		0.25		mg/L	2.5		6010B	STLC Citrate
Nickel	0.62		0.25		mg/L	2.5		6010B	STLC Citrate
Vanadium	52		0.25		mg/L	2.5		6010B	STLC Citrate
Zinc	5.3		0.50		mg/L	2.5		6010B	STLC Citrate
Mercury	0.013		0.0050		mg/L	1		7470A	STLC Citrate
Mercury	1.2		0.017		mg/Kg	2		7471A	Total/NA

5

Client Sample Results

Client: Shell Oil Products US

TestAmerica Job ID: 720-43214-1

Method: 6010B - Metals (ICP)

Client Sample ID: Se Solids
Date Collected: 07/11/12 08:00
Date Received: 07/11/12 16:35

Lab Sample ID: 720-43214-1
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		1.9		mg/Kg		07/11/12 18:03	07/12/12 12:16	4
Arsenic	**12**		3.7		mg/Kg		07/11/12 18:03	07/12/12 12:16	4
Barium	**140**		1.9		mg/Kg		07/11/12 18:03	07/12/12 12:16	4
Beryllium	ND		0.37		mg/Kg		07/11/12 18:03	07/12/12 12:16	4
Cadmium	**0.74**		0.47		mg/Kg		07/11/12 18:03	07/12/12 12:16	4
Chromium	**27**		1.9		mg/Kg		07/11/12 18:03	07/12/12 12:16	4
Cobalt	**4.0**		0.75		mg/Kg		07/11/12 18:03	07/12/12 12:16	4
Copper	**24**		5.6		mg/Kg		07/11/12 18:03	07/12/12 12:16	4
Lead	ND		1.9		mg/Kg		07/11/12 18:03	07/12/12 12:16	4
Molybdenum	**7.5**		1.9		mg/Kg		07/11/12 18:03	07/12/12 12:16	4
Nickel	**41**		1.9		mg/Kg		07/11/12 18:03	07/12/12 12:16	4
Selenium	**180**		3.7		mg/Kg		07/11/12 18:03	07/12/12 12:16	4
Silver	**4.4**		0.93		mg/Kg		07/11/12 18:03	07/12/12 12:16	4
Thallium	ND		1.9		mg/Kg		07/11/12 18:03	07/12/12 12:16	4
Vanadium	**840**		1.9		mg/Kg		07/11/12 18:03	07/12/12 12:16	4
Zinc	**300**		5.6		mg/Kg		07/11/12 18:03	07/12/12 12:16	4

6

Client Sample Results

Client: Shell Oil Products US

TestAmerica Job ID: 720-43214-1

Method: 6010B - Metals (ICP) - TCLP

Client Sample ID: Se Solids
Date Collected: 07/11/12 08:00
Date Received: 07/11/12 16:35

Lab Sample ID: 720-43214-1
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.25		mg/L		07/13/12 07:51	07/13/12 17:51	2.5
Arsenic	ND		0.25		mg/L		07/13/12 07:51	07/13/12 17:51	2.5
Barium	**0.73**		0.13		mg/L		07/13/12 07:51	07/13/12 17:51	2.5
Beryllium	ND		0.050		mg/L		07/13/12 07:51	07/13/12 17:51	2.5
Cadmium	ND		0.063		mg/L		07/13/12 07:51	07/13/12 17:51	2.5
Chromium	ND		0.25		mg/L		07/13/12 07:51	07/13/12 17:51	2.5
Cobalt	ND		0.050		mg/L		07/13/12 07:51	07/13/12 17:51	2.5
Copper	ND		0.50		mg/L		07/13/12 07:51	07/13/12 17:51	2.5
Lead	ND		0.13		mg/L		07/13/12 07:51	07/13/12 17:51	2.5
Molybdenum	ND		0.25		mg/L		07/13/12 07:51	07/13/12 17:51	2.5
Nickel	ND		0.25		mg/L		07/13/12 07:51	07/13/12 17:51	2.5
Selenium	ND		0.50		mg/L		07/13/12 07:51	07/13/12 17:51	2.5
Silver	ND		0.13		mg/L		07/13/12 07:51	07/13/12 17:51	2.5
Thallium	ND		0.25		mg/L		07/13/12 07:51	07/13/12 17:51	2.5
Vanadium	ND		0.25		mg/L		07/13/12 07:51	07/13/12 17:51	2.5
Zinc	**1.8**		0.50		mg/L		07/13/12 07:51	07/13/12 17:51	2.5

Client Sample Results

Client: Shell Oil Products US

TestAmerica Job ID: 720-43214-1

Method: 6010B - Metals (ICP) - STLC Citrate

Client Sample ID: Se Solids
Date Collected: 07/11/12 08:00
Date Received: 07/11/12 16:35

Lab Sample ID: 720-43214-1
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.25		mg/L		07/16/12 10:40	07/16/12 16:30	2.5
Arsenic	**0.38**		0.25		mg/L		07/16/12 10:40	07/16/12 16:30	2.5
Barium	**5.1**		0.25		mg/L		07/16/12 10:40	07/16/12 16:30	2.5
Beryllium	ND		0.050		mg/L		07/16/12 10:40	07/16/12 16:30	2.5
Cadmium	ND		0.050		mg/L		07/16/12 10:40	07/16/12 16:30	2.5
Chromium	**1.5**		0.25		mg/L		07/16/12 10:40	07/16/12 16:30	2.5
Cobalt	ND		0.050		mg/L		07/16/12 10:40	07/16/12 16:30	2.5
Copper	ND		0.50		mg/L		07/16/12 10:40	07/16/12 16:30	2.5
Lead	ND		0.13		mg/L		07/16/12 10:40	07/16/12 16:30	2.5
Molybdenum	**0.40**		0.25		mg/L		07/16/12 10:40	07/16/12 16:30	2.5
Nickel	**0.62**		0.25		mg/L		07/16/12 10:40	07/16/12 16:30	2.5
Selenium	ND		0.50		mg/L		07/16/12 10:40	07/16/12 16:30	2.5
Silver	ND		0.13		mg/L		07/16/12 10:40	07/16/12 16:30	2.5
Thallium	ND		0.25		mg/L		07/16/12 10:40	07/16/12 16:30	2.5
Vanadium	**52**		0.25		mg/L		07/16/12 10:40	07/16/12 16:30	2.5
Zinc	**5.3**		0.50		mg/L		07/16/12 10:40	07/16/12 16:30	2.5

6

Client Sample Results

Client: Shell Oil Products US

TestAmerica Job ID: 720-43214-1

Method: 7470A - Mercury (CVAA) - TCLP

Client Sample ID: Se Solids
Date Collected: 07/11/12 08:00
Date Received: 07/11/12 16:35

Lab Sample ID: 720-43214-1
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.0020		mg/L		07/13/12 11:06	07/13/12 16:10	1

6

Client Sample Results

Client: Shell Oil Products US

TestAmerica Job ID: 720-43214-1

Method: 7470A - Mercury (CVAA) - STLC Citrate

Client Sample ID: Se Solids
Date Collected: 07/11/12 08:00
Date Received: 07/11/12 16:35

Lab Sample ID: 720-43214-1
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.013		0.0050		mg/L		07/16/12 13:51	07/16/12 18:33	1

6

Client Sample Results

Client: Shell Oil Products US

TestAmerica Job ID: 720-43214-1

Method: 7471A - Mercury (CVAA)

Client Sample ID: Se Solids
Date Collected: 07/11/12 08:00
Date Received: 07/11/12 16:35

Lab Sample ID: 720-43214-1
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	1.2		0.017		mg/Kg		07/12/12 09:53	07/12/12 21:43	2

6

QC Sample Results

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 720-117003/1-A
Matrix: Solid
Analysis Batch: 117053

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 117003

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.50		mg/Kg		07/11/12 18:03	07/12/12 10:51	1
Arsenic	ND		1.0		mg/Kg		07/11/12 18:03	07/12/12 10:51	1
Barium	ND		0.50		mg/Kg		07/11/12 18:03	07/12/12 10:51	1
Beryllium	ND		0.10		mg/Kg		07/11/12 18:03	07/12/12 10:51	1
Cadmium	ND		0.13		mg/Kg		07/11/12 18:03	07/12/12 10:51	1
Chromium	ND		0.50		mg/Kg		07/11/12 18:03	07/12/12 10:51	1
Cobalt	ND		0.20		mg/Kg		07/11/12 18:03	07/12/12 10:51	1
Copper	ND		1.5		mg/Kg		07/11/12 18:03	07/12/12 10:51	1
Lead	ND		0.50		mg/Kg		07/11/12 18:03	07/12/12 10:51	1
Molybdenum	ND		0.50		mg/Kg		07/11/12 18:03	07/12/12 10:51	1
Nickel	ND		0.50		mg/Kg		07/11/12 18:03	07/12/12 10:51	1
Selenium	ND		1.0		mg/Kg		07/11/12 18:03	07/12/12 10:51	1
Silver	ND		0.25		mg/Kg		07/11/12 18:03	07/12/12 10:51	1
Thallium	ND		0.50		mg/Kg		07/11/12 18:03	07/12/12 10:51	1
Vanadium	ND		0.50		mg/Kg		07/11/12 18:03	07/12/12 10:51	1
Zinc	ND		1.5		mg/Kg		07/11/12 18:03	07/12/12 10:51	1

Lab Sample ID: LCS 720-117003/2-A
Matrix: Solid
Analysis Batch: 117053

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 117003

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	50.0	48.5		mg/Kg		97	80 - 120
Arsenic	50.0	48.5		mg/Kg		97	80 - 120
Barium	50.0	50.0		mg/Kg		100	80 - 120
Beryllium	50.0	50.2		mg/Kg		100	80 - 120
Cadmium	50.0	49.0		mg/Kg		98	80 - 120
Chromium	50.0	50.2		mg/Kg		100	80 - 120
Cobalt	50.0	50.2		mg/Kg		100	80 - 120
Copper	50.0	49.9		mg/Kg		100	80 - 120
Lead	50.0	50.5		mg/Kg		101	80 - 120
Molybdenum	50.0	50.4		mg/Kg		101	80 - 120
Nickel	50.0	50.3		mg/Kg		101	80 - 120
Selenium	50.0	47.7		mg/Kg		95	80 - 120
Silver	25.0	24.1		mg/Kg		97	80 - 120
Thallium	50.0	50.5		mg/Kg		101	80 - 120
Vanadium	50.0	50.2		mg/Kg		100	80 - 120
Zinc	50.0	49.2		mg/Kg		98	80 - 120

Lab Sample ID: LCSD 720-117003/3-A
Matrix: Solid
Analysis Batch: 117053

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 117003

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	50.0	47.7		mg/Kg		95	80 - 120	2	20
Arsenic	50.0	47.9		mg/Kg		96	80 - 120	1	20
Barium	50.0	48.6		mg/Kg		97	80 - 120	3	20
Beryllium	50.0	48.4		mg/Kg		97	80 - 120	4	20
Cadmium	50.0	48.3		mg/Kg		97	80 - 120	1	20
Chromium	50.0	48.7		mg/Kg		97	80 - 120	3	20
Cobalt	50.0	49.4		mg/Kg		99	80 - 120	2	20

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: LCSD 720-117003/3-A
Matrix: Solid
Analysis Batch: 117053

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 117003

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Copper	50.0	48.5		mg/Kg		97	80 - 120	3	20
Lead	50.0	49.4		mg/Kg		99	80 - 120	2	20
Molybdenum	50.0	49.3		mg/Kg		99	80 - 120	2	20
Nickel	50.0	49.2		mg/Kg		98	80 - 120	2	20
Selenium	50.0	47.1		mg/Kg		94	80 - 120	1	20
Silver	25.0	23.7		mg/Kg		95	80 - 120	2	20
Thallium	50.0	49.2		mg/Kg		98	80 - 120	3	20
Vanadium	50.0	48.3		mg/Kg		97	80 - 120	4	20
Zinc	50.0	48.4		mg/Kg		97	80 - 120	2	20

Lab Sample ID: LCSSRM 720-117003/23-A
Matrix: Solid
Analysis Batch: 117053

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 117003

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	76.3	45.7		mg/Kg		60	11 - 101
Arsenic	84.1	72.3		mg/Kg		86	69 - 119
Barium	517	450		mg/Kg		87	61 - 117
Beryllium	153	135		mg/Kg		88	56 - 102
Cadmium	42.0	35.5		mg/Kg		85	67 - 118
Chromium	269	244		mg/Kg		91	67 - 121
Cobalt	323	280		mg/Kg		87	64 - 133
Copper	263	246		mg/Kg		94	68 - 126
Lead	280	248		mg/Kg		88	62 - 113
Molybdenum	215	196		mg/Kg		91	62 - 128
Nickel	106	93.6		mg/Kg		88	65 - 117
Selenium	138	120		mg/Kg		87	63 - 126
Silver	50.4	44.6		mg/Kg		89	51 - 130
Thallium	331	294		mg/Kg		89	64 - 124
Vanadium	142	132		mg/Kg		93	67 - 123
Zinc	574	479		mg/Kg		83	62 - 110

Lab Sample ID: MB 720-117093/1-A
Matrix: Solid
Analysis Batch: 117148

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 117093

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.010		mg/L		07/13/12 07:51	07/13/12 16:43	1
Arsenic	ND		0.010		mg/L		07/13/12 07:51	07/13/12 16:43	1
Barium	ND		0.0050		mg/L		07/13/12 07:51	07/13/12 16:43	1
Beryllium	ND		0.0020		mg/L		07/13/12 07:51	07/13/12 16:43	1
Cadmium	ND		0.0025		mg/L		07/13/12 07:51	07/13/12 16:43	1
Chromium	ND		0.010		mg/L		07/13/12 07:51	07/13/12 16:43	1
Cobalt	ND		0.0020		mg/L		07/13/12 07:51	07/13/12 16:43	1
Copper	ND		0.020		mg/L		07/13/12 07:51	07/13/12 16:43	1
Lead	ND		0.0050		mg/L		07/13/12 07:51	07/13/12 16:43	1
Molybdenum	ND		0.010		mg/L		07/13/12 07:51	07/13/12 16:43	1
Nickel	ND		0.010		mg/L		07/13/12 07:51	07/13/12 16:43	1
Selenium	ND		0.020		mg/L		07/13/12 07:51	07/13/12 16:43	1
Silver	ND		0.0050		mg/L		07/13/12 07:51	07/13/12 16:43	1
Thallium	ND		0.010		mg/L		07/13/12 07:51	07/13/12 16:43	1

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: MB 720-117093/1-A
Matrix: Solid
Analysis Batch: 117148

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 117093

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vanadium	ND		0.010		mg/L		07/13/12 07:51	07/13/12 16:43	1
Zinc	ND		0.020		mg/L		07/13/12 07:51	07/13/12 16:43	1

Lab Sample ID: LCS 720-117093/2-A
Matrix: Solid
Analysis Batch: 117148

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 117093

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	1.00	0.940		mg/L		94	80 - 120
Arsenic	1.00	0.948		mg/L		95	80 - 120
Barium	1.00	0.972		mg/L		97	80 - 120
Beryllium	1.00	0.981		mg/L		98	80 - 120
Cadmium	1.00	0.955		mg/L		95	80 - 120
Chromium	1.00	1.01		mg/L		101	80 - 120
Cobalt	1.00	0.978		mg/L		98	80 - 120
Copper	1.00	0.992		mg/L		99	80 - 120
Lead	1.00	0.980		mg/L		98	80 - 120
Molybdenum	1.00	0.984		mg/L		98	80 - 120
Nickel	1.00	0.996		mg/L		100	80 - 120
Selenium	1.00	0.925		mg/L		93	80 - 120
Silver	0.500	0.474		mg/L		95	80 - 120
Thallium	1.00	0.982		mg/L		98	80 - 120
Vanadium	1.00	0.985		mg/L		99	80 - 120
Zinc	1.00	0.965		mg/L		97	80 - 120

Lab Sample ID: LCSD 720-117093/3-A
Matrix: Solid
Analysis Batch: 117148

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 117093

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	1.00	0.949		mg/L		95	80 - 120	1	20
Arsenic	1.00	0.958		mg/L		96	80 - 120	1	20
Barium	1.00	0.988		mg/L		99	80 - 120	2	20
Beryllium	1.00	0.987		mg/L		99	80 - 120	1	20
Cadmium	1.00	0.969		mg/L		97	80 - 120	2	20
Chromium	1.00	1.01		mg/L		101	80 - 120	0	20
Cobalt	1.00	0.990		mg/L		99	80 - 120	1	20
Copper	1.00	0.996		mg/L		100	80 - 120	0	20
Lead	1.00	0.985		mg/L		99	80 - 120	1	20
Molybdenum	1.00	0.991		mg/L		99	80 - 120	1	20
Nickel	1.00	0.998		mg/L		100	80 - 120	0	20
Selenium	1.00	0.935		mg/L		93	80 - 120	1	20
Silver	0.500	0.463		mg/L		97	80 - 120	2	20
Thallium	1.00	0.986		mg/L		99	80 - 120	0	20
Vanadium	1.00	0.991		mg/L		99	80 - 120	1	20
Zinc	1.00	0.975		mg/L		97	80 - 120	1	20

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: MB 720-117204/1-A
Matrix: Solid
Analysis Batch: 117247

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 117204

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.010		mg/L		07/16/12 10:40	07/16/12 16:03	1
Arsenic	ND		0.010		mg/L		07/16/12 10:40	07/16/12 16:03	1
Barium	ND		0.010		mg/L		07/16/12 10:40	07/16/12 16:03	1
Beryllium	ND		0.0020		mg/L		07/16/12 10:40	07/16/12 16:03	1
Cadmium	ND		0.0020		mg/L		07/16/12 10:40	07/16/12 16:03	1
Chromium	ND		0.010		mg/L		07/16/12 10:40	07/16/12 16:03	1
Cobalt	ND		0.0020		mg/L		07/16/12 10:40	07/16/12 16:03	1
Copper	ND		0.020		mg/L		07/16/12 10:40	07/16/12 16:03	1
Lead	ND		0.0050		mg/L		07/16/12 10:40	07/16/12 16:03	1
Molybdenum	ND		0.010		mg/L		07/16/12 10:40	07/16/12 16:03	1
Nickel	ND		0.010		mg/L		07/16/12 10:40	07/16/12 16:03	1
Selenium	ND		0.020		mg/L		07/16/12 10:40	07/16/12 16:03	1
Silver	ND		0.0050		mg/L		07/16/12 10:40	07/16/12 16:03	1
Thallium	ND		0.010		mg/L		07/16/12 10:40	07/16/12 16:03	1
Vanadium	ND		0.010		mg/L		07/16/12 10:40	07/16/12 16:03	1
Zinc	ND		0.020		mg/L		07/16/12 10:40	07/16/12 16:03	1

Lab Sample ID: LCS 720-117204/2-A
Matrix: Solid
Analysis Batch: 117247

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 117204

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	1.00	0.941		mg/L		94	80 - 120
Arsenic	1.00	1.02		mg/L		102	80 - 120
Barium	1.00	0.954		mg/L		95	80 - 120
Beryllium	1.00	0.995		mg/L		99	80 - 120
Cadmium	1.00	0.937		mg/L		94	80 - 120
Chromium	1.00	0.999		mg/L		100	80 - 120
Cobalt	1.00	0.952		mg/L		95	80 - 120
Copper	1.00	0.987		mg/L		99	80 - 120
Lead	1.00	1.01		mg/L		101	80 - 120
Molybdenum	1.00	0.976		mg/L		98	80 - 120
Nickel	1.00	0.994		mg/L		99	80 - 120
Selenium	1.00	0.994		mg/L		99	80 - 120
Silver	0.500	0.478		mg/L		96	80 - 120
Thallium	1.00	1.01		mg/L		101	80 - 120
Vanadium	1.00	1.01		mg/L		101	80 - 120
Zinc	1.00	0.948		mg/L		95	80 - 120

Lab Sample ID: LCSD 720-117204/3-A
Matrix: Solid
Analysis Batch: 117247

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 117204

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	1.00	0.918		mg/L		92	80 - 120	2	20
Arsenic	1.00	0.978		mg/L		98	80 - 120	4	20
Barium	1.00	0.924		mg/L		92	80 - 120	3	20
Beryllium	1.00	0.956		mg/L		96	80 - 120	4	20
Cadmium	1.00	0.921		mg/L		92	80 - 120	2	20
Chromium	1.00	0.969		mg/L		97	80 - 120	3	20
Cobalt	1.00	0.932		mg/L		93	80 - 120	2	20

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: LCSD 720-117204/3-A
Matrix: Solid
Analysis Batch: 117247

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 117204

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Copper	1.00	0.952		mg/L		95	80 - 120	4	20
Lead	1.00	0.976		mg/L		98	80 - 120	3	20
Molybdenum	1.00	0.949		mg/L		95	80 - 120	3	20
Nickel	1.00	0.966		mg/L		97	80 - 120	3	20
Selenium	1.00	0.966		mg/L		97	80 - 120	3	20
Silver	0.500	0.464		mg/L		93	80 - 120	3	20
Thallium	1.00	0.980		mg/L		98	80 - 120	3	20
Vanadium	1.00	0.979		mg/L		98	80 - 120	4	20
Zinc	1.00	0.931		mg/L		93	80 - 120	2	20

Lab Sample ID: LB 720-117070/1-B LB
Matrix: Solid
Analysis Batch: 117148

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 117093

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.10		mg/L		07/13/12 07:51	07/13/12 16:56	1
Arsenic	ND		0.10		mg/L		07/13/12 07:51	07/13/12 16:56	1
Barium	ND		0.050		mg/L		07/13/12 07:51	07/13/12 16:56	1
Beryllium	ND		0.020		mg/L		07/13/12 07:51	07/13/12 16:56	1
Cadmium	ND		0.025		mg/L		07/13/12 07:51	07/13/12 16:56	1
Chromium	ND		0.10		mg/L		07/13/12 07:51	07/13/12 16:56	1
Cobalt	ND		0.020		mg/L		07/13/12 07:51	07/13/12 16:56	1
Copper	ND		0.20		mg/L		07/13/12 07:51	07/13/12 16:56	1
Lead	ND		0.050		mg/L		07/13/12 07:51	07/13/12 16:56	1
Molybdenum	ND		0.10		mg/L		07/13/12 07:51	07/13/12 16:56	1
Nickel	ND		0.10		mg/L		07/13/12 07:51	07/13/12 16:56	1
Selenium	ND		0.20		mg/L		07/13/12 07:51	07/13/12 16:56	1
Silver	ND		0.050		mg/L		07/13/12 07:51	07/13/12 16:56	1
Thallium	ND		0.10		mg/L		07/13/12 07:51	07/13/12 16:56	1
Vanadium	ND		0.10		mg/L		07/13/12 07:51	07/13/12 16:56	1
Zinc	ND		0.20		mg/L		07/13/12 07:51	07/13/12 16:56	1

Lab Sample ID: LB4 720-117017/1-B LB4
Matrix: Solid
Analysis Batch: 117247

Client Sample ID: Method Blank
Prep Type: STLC Citrate
Prep Batch: 117204

Analyte	LB4 Result	LB4 Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.25		mg/L		07/16/12 10:40	07/16/12 16:17	2.5
Arsenic	ND		0.25		mg/L		07/16/12 10:40	07/16/12 16:17	2.5
Barium	ND		0.25		mg/L		07/16/12 10:40	07/16/12 16:17	2.5
Beryllium	ND		0.050		mg/L		07/16/12 10:40	07/16/12 16:17	2.5
Cadmium	ND		0.050		mg/L		07/16/12 10:40	07/16/12 16:17	2.5
Chromium	ND		0.25		mg/L		07/16/12 10:40	07/16/12 16:17	2.5
Cobalt	ND		0.050		mg/L		07/16/12 10:40	07/16/12 16:17	2.5
Copper	ND		0.50		mg/L		07/16/12 10:40	07/16/12 16:17	2.5
Lead	ND		0.13		mg/L		07/16/12 10:40	07/16/12 16:17	2.5
Molybdenum	ND		0.25		mg/L		07/16/12 10:40	07/16/12 16:17	2.5
Nickel	ND		0.25		mg/L		07/16/12 10:40	07/16/12 16:17	2.5
Selenium	ND		0.50		mg/L		07/16/12 10:40	07/16/12 16:17	2.5
Silver	ND		0.13		mg/L		07/16/12 10:40	07/16/12 16:17	2.5
Thallium	ND		0.25		mg/L		07/16/12 10:40	07/16/12 16:17	2.5

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: LB4 720-117017/1-B LB4
Matrix: Solid
Analysis Batch: 117247

Client Sample ID: Method Blank
Prep Type: STLC Citrate
Prep Batch: 117204

Analyte	LB4 Result	LB4 Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vanadium	ND		0.25		mg/L		07/16/12 10:40	07/16/12 16:17	2.5
Zinc	ND		0.50		mg/L		07/16/12 10:40	07/16/12 16:17	2.5

Lab Sample ID: 720-43214-1 MS
Matrix: Solid
Analysis Batch: 117247

Client Sample ID: Se Solids
Prep Type: STLC Citrate
Prep Batch: 117204

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	ND		10.0	9.14		mg/L		91	75 - 125
Arsenic	0.38		10.0	10.4		mg/L		101	75 - 125
Barium	5.1		10.0	14.5		mg/L		94	75 - 125
Beryllium	ND		10.0	9.53		mg/L		95	75 - 125
Cadmium	ND		10.0	9.06		mg/L		91	75 - 125
Chromium	1.5		10.0	11.3		mg/L		98	75 - 125
Cobalt	ND		10.0	9.07		mg/L		90	75 - 125
Copper	ND		10.0	9.53		mg/L		95	75 - 125
Lead	ND		10.0	9.24		mg/L		92	75 - 125
Molybdenum	0.40		10.0	9.86		mg/L		95	75 - 125
Nickel	0.62		10.0	9.98		mg/L		94	75 - 125
Selenium	ND		10.0	9.87		mg/L		96	75 - 125
Silver	ND		5.00	4.75		mg/L		95	75 - 125
Thallium	ND		10.0	8.78		mg/L		88	75 - 125
Vanadium	52		10.0	62.9	4	mg/L		111	75 - 125
Zinc	5.3		10.0	14.7		mg/L		94	75 - 125

Lab Sample ID: 720-43214-1 MSD
Matrix: Solid
Analysis Batch: 117247

Client Sample ID: Se Solids
Prep Type: STLC Citrate
Prep Batch: 117204

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND		10.0	8.93		mg/L		89	75 - 125	2	20
Arsenic	0.38		10.0	10.1		mg/L		97	75 - 125	3	20
Barium	5.1		10.0	14.2		mg/L		90	75 - 125	2	20
Beryllium	ND		10.0	9.22		mg/L		92	75 - 125	3	20
Cadmium	ND		10.0	8.83		mg/L		88	75 - 125	3	20
Chromium	1.5		10.0	11.0		mg/L		95	75 - 125	2	20
Cobalt	ND		10.0	8.84		mg/L		88	75 - 125	3	20
Copper	ND		10.0	9.22		mg/L		92	75 - 125	3	20
Lead	ND		10.0	9.01		mg/L		90	75 - 125	3	20
Molybdenum	0.40		10.0	9.58		mg/L		92	75 - 125	3	20
Nickel	0.62		10.0	9.70		mg/L		91	75 - 125	3	20
Selenium	ND		10.0	9.70		mg/L		94	75 - 125	2	20
Silver	ND		5.00	4.61		mg/L		92	75 - 125	3	20
Thallium	ND		10.0	8.50		mg/L		85	75 - 125	3	20
Vanadium	52		10.0	62.3	4	mg/L		104	75 - 125	1	20
Zinc	5.3		10.0	14.4		mg/L		91	75 - 125	2	20

QC Sample Results

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 720-117115/1-A
Matrix: Solid
Analysis Batch: 117141

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 117115

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.0020		mg/L		07/13/12 11:06	07/13/12 15:55	1

Lab Sample ID: LCS 720-117115/2-A
Matrix: Solid
Analysis Batch: 117141

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 117115

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.0100	0.0105		mg/L		105	80 - 120

Lab Sample ID: LCSD 720-117115/3-A
Matrix: Solid
Analysis Batch: 117141

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 117115

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.0100	0.0110		mg/L		110	80 - 120	5	20

Lab Sample ID: MB 720-117224/1-A
Matrix: Solid
Analysis Batch: 117257

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 117224

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00013		mg/L		07/16/12 13:51	07/16/12 18:17	1

Lab Sample ID: LCS 720-117224/2-A
Matrix: Solid
Analysis Batch: 117257

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 117224

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00625	0.00649		mg/L		104	85 - 115

Lab Sample ID: LCSD 720-117224/3-A
Matrix: Solid
Analysis Batch: 117257

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 117224

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.00625	0.00640		mg/L		102	85 - 115	1	20

Lab Sample ID: LB 720-117070/1-C LB
Matrix: Solid
Analysis Batch: 117141

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 117115

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.0020		mg/L		07/13/12 11:06	07/13/12 16:03	1

Lab Sample ID: 720-43214-1 MS
Matrix: Solid
Analysis Batch: 117141

Client Sample ID: Se Solids
Prep Type: TCLP
Prep Batch: 117115

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND		0.0100	0.0143	F	mg/L		139	75 - 125

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: 720-43214-1 MSD
Matrix: Solid
Analysis Batch: 117141

Client Sample ID: Se Solids
Prep Type: TCLP
Prep Batch: 117115

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND		0.0100	0.0125		mg/L		121	75 - 125	14	20

Lab Sample ID: LB4 720-117017/1-C LB4
Matrix: Solid
Analysis Batch: 117257

Client Sample ID: Method Blank
Prep Type: STLC Citrate
Prep Batch: 117224

Analyte	LB4 Result	LB4 Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.0050		mg/L		07/16/12 13:51	07/16/12 18:24	1

Lab Sample ID: 720-43214-1 MS
Matrix: Solid
Analysis Batch: 117257

Client Sample ID: Se Solids
Prep Type: STLC Citrate
Prep Batch: 117224

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.013		0.250	0.343	F	mg/L		132	70 - 130

Lab Sample ID: 720-43214-1 MSD
Matrix: Solid
Analysis Batch: 117257

Client Sample ID: Se Solids
Prep Type: STLC Citrate
Prep Batch: 117224

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.013		0.250	0.296		mg/L		113	70 - 130	15	20

Method: 7471A - Mercury (CVAA)

Lab Sample ID: MB 720-117036/1-A
Matrix: Solid
Analysis Batch: 117086

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 117036

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.010		mg/Kg		07/12/12 09:52	07/12/12 20:07	1

Lab Sample ID: LCS 720-117036/2-A
Matrix: Solid
Analysis Batch: 117086

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 117036

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.833	0.825		mg/Kg		99	80 - 120

Lab Sample ID: LCSD 720-117036/3-A
Matrix: Solid
Analysis Batch: 117086

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 117036

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.833	0.850		mg/Kg		102	80 - 120	3	20

Lab Sample ID: 720-43214-1 MS
Matrix: Solid
Analysis Batch: 117086

Client Sample ID: Se Solids
Prep Type: Total/NA
Prep Batch: 117036

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	1.2		0.746	2.13	F	mg/Kg		129	75 - 125

Method: 7471A - Mercury (CVAA) (Continued)

Lab Sample ID: 720-43214-1 MSD
Matrix: Solid
Analysis Batch: 117086

Client Sample ID: Se Solids
Prep Type: Total/NA
Prep Batch: 117036

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	1.2		0.694	1.96		mg/Kg		113	75 - 125	9	20

7

QC Association Summary

Client: Shell Oil Products US

TestAmerica Job ID: 720-43214-1

Metals

Prep Batch: 117003

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-43214-1	Se Solids	Total/NA	Solid	3050B	
LCS 720-117003/2-A	Lab Control Sample	Total/NA	Solid	3050B	
LCSD 720-117003/3-A	Lab Control Sample Dup	Total/NA	Solid	3050B	
LCSSRM 720-117003/23-A	Lab Control Sample	Total/NA	Solid	3050B	
MB 720-117003/1-A	Method Blank	Total/NA	Solid	3050B	

Leach Batch: 117017

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-43214-1	Se Solids	STLC Citrate	Solid	CA WET Citrate	
720-43214-1 MS	Se Solids	STLC Citrate	Solid	CA WET Citrate	
720-43214-1 MSD	Se Solids	STLC Citrate	Solid	CA WET Citrate	
LB4 720-117017/1-B LB4	Method Blank	STLC Citrate	Solid	CA WET Citrate	
LB4 720-117017/1-C LB4	Method Blank	STLC Citrate	Solid	CA WET Citrate	

8

Prep Batch: 117036

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-43214-1	Se Solids	Total/NA	Solid	7471A	
720-43214-1 MS	Se Solids	Total/NA	Solid	7471A	
720-43214-1 MSD	Se Solids	Total/NA	Solid	7471A	
LCS 720-117036/2-A	Lab Control Sample	Total/NA	Solid	7471A	
LCSD 720-117036/3-A	Lab Control Sample Dup	Total/NA	Solid	7471A	
MB 720-117036/1-A	Method Blank	Total/NA	Solid	7471A	

Analysis Batch: 117053

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-43214-1	Se Solids	Total/NA	Solid	6010B	117003
LCS 720-117003/2-A	Lab Control Sample	Total/NA	Solid	6010B	117003
LCSD 720-117003/3-A	Lab Control Sample Dup	Total/NA	Solid	6010B	117003
LCSSRM 720-117003/23-A	Lab Control Sample	Total/NA	Solid	6010B	117003
MB 720-117003/1-A	Method Blank	Total/NA	Solid	6010B	117003

Leach Batch: 117070

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-43214-1	Se Solids	TCLP	Solid	1311	
720-43214-1 MS	Se Solids	TCLP	Solid	1311	
720-43214-1 MSD	Se Solids	TCLP	Solid	1311	
LB 720-117070/1-B LB	Method Blank	TCLP	Solid	1311	
LB 720-117070/1-C LB	Method Blank	TCLP	Solid	1311	

Analysis Batch: 117086

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-43214-1	Se Solids	Total/NA	Solid	7471A	117036
720-43214-1 MS	Se Solids	Total/NA	Solid	7471A	117036
720-43214-1 MSD	Se Solids	Total/NA	Solid	7471A	117036
LCS 720-117036/2-A	Lab Control Sample	Total/NA	Solid	7471A	117036
LCSD 720-117036/3-A	Lab Control Sample Dup	Total/NA	Solid	7471A	117036
MB 720-117036/1-A	Method Blank	Total/NA	Solid	7471A	117036

Prep Batch: 117093

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-43214-1	Se Solids	TCLP	Solid	3010A	117070
LB 720-117070/1-B LB	Method Blank	TCLP	Solid	3010A	117070
LCS 720-117093/2-A	Lab Control Sample	Total/NA	Solid	3010A	

Metals (Continued)

Prep Batch: 117093 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 720-117093/3-A	Lab Control Sample Dup	Total/NA	Solid	3010A	
MB 720-117093/1-A	Method Blank	Total/NA	Solid	3010A	

Prep Batch: 117115

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-43214-1	Se Solids	TCLP	Solid	7470A	117070
720-43214-1 MS	Se Solids	TCLP	Solid	7470A	117070
720-43214-1 MSD	Se Solids	TCLP	Solid	7470A	117070
LB 720-117070/1-C LB	Method Blank	TCLP	Solid	7470A	117070
LCS 720-117115/2-A	Lab Control Sample	Total/NA	Solid	7470A	
LCSD 720-117115/3-A	Lab Control Sample Dup	Total/NA	Solid	7470A	
MB 720-117115/1-A	Method Blank	Total/NA	Solid	7470A	

Analysis Batch: 117141

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-43214-1	Se Solids	TCLP	Solid	7470A	117115
720-43214-1 MS	Se Solids	TCLP	Solid	7470A	117115
720-43214-1 MSD	Se Solids	TCLP	Solid	7470A	117115
LB 720-117070/1-C LB	Method Blank	TCLP	Solid	7470A	117115
LCS 720-117115/2-A	Lab Control Sample	Total/NA	Solid	7470A	117115
LCSD 720-117115/3-A	Lab Control Sample Dup	Total/NA	Solid	7470A	117115
MB 720-117115/1-A	Method Blank	Total/NA	Solid	7470A	117115

Analysis Batch: 117148

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-43214-1	Se Solids	TCLP	Solid	6010B	117093
LB 720-117070/1-B LB	Method Blank	TCLP	Solid	6010B	117093
LCS 720-117093/2-A	Lab Control Sample	Total/NA	Solid	6010B	117093
LCSD 720-117093/3-A	Lab Control Sample Dup	Total/NA	Solid	6010B	117093
MB 720-117093/1-A	Method Blank	Total/NA	Solid	6010B	117093

Prep Batch: 117204

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-43214-1	Se Solids	STLC Citrate	Solid	3005A	117017
720-43214-1 MS	Se Solids	STLC Citrate	Solid	3005A	117017
720-43214-1 MSD	Se Solids	STLC Citrate	Solid	3005A	117017
LB4 720-117017/1-B LB4	Method Blank	STLC Citrate	Solid	3005A	117017
LCS 720-117204/2-A	Lab Control Sample	Total Recoverable	Solid	3005A	
LCSD 720-117204/3-A	Lab Control Sample Dup	Total Recoverable	Solid	3005A	
MB 720-117204/1-A	Method Blank	Total Recoverable	Solid	3005A	

Prep Batch: 117224

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-43214-1	Se Solids	STLC Citrate	Solid	7470A	117017
720-43214-1 MS	Se Solids	STLC Citrate	Solid	7470A	117017
720-43214-1 MSD	Se Solids	STLC Citrate	Solid	7470A	117017
LB4 720-117017/1-C LB4	Method Blank	STLC Citrate	Solid	7470A	117017
LCS 720-117224/2-A	Lab Control Sample	Total/NA	Solid	7470A	
LCSD 720-117224/3-A	Lab Control Sample Dup	Total/NA	Solid	7470A	
MB 720-117224/1-A	Method Blank	Total/NA	Solid	7470A	

8

QC Association Summary

Client: Shell Oil Products US

TestAmerica Job ID: 720-43214-1

Metals (Continued)

Analysis Batch: 117247

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-43214-1	Se Solids	STLC Citrate	Solid	6010B	117204
720-43214-1 MS	Se Solids	STLC Citrate	Solid	6010B	117204
720-43214-1 MSD	Se Solids	STLC Citrate	Solid	6010B	117204
LB4 720-117017/1-B LB4	Method Blank	STLC Citrate	Solid	6010B	117204
LCS 720-117204/2-A	Lab Control Sample	Total Recoverable	Solid	6010B	117204
LCSD 720-117204/3-A	Lab Control Sample Dup	Total Recoverable	Solid	6010B	117204
MB 720-117204/1-A	Method Blank	Total Recoverable	Solid	6010B	117204

Analysis Batch: 117257

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-43214-1	Se Solids	STLC Citrate	Solid	7470A	117224
720-43214-1 MS	Se Solids	STLC Citrate	Solid	7470A	117224
720-43214-1 MSD	Se Solids	STLC Citrate	Solid	7470A	117224
LB4 720-117017/1-C LB4	Method Blank	STLC Citrate	Solid	7470A	117224
LCS 720-117224/2-A	Lab Control Sample	Total/NA	Solid	7470A	117224
LCSD 720-117224/3-A	Lab Control Sample Dup	Total/NA	Solid	7470A	117224
MB 720-117224/1-A	Method Blank	Total/NA	Solid	7470A	117224

8

ED_001593_00015790

Lab Chronicle

Client Sample ID: Se Solids — **Lab Sample ID: 720-43214-1**

Date Collected: 07/11/12 08:00 — Matrix: Solid

Date Received: 07/11/12 16:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			117003	07/11/12 18:03	CDT	TAL SF
Total/NA	Analysis	6010B		4	117053	07/12/12 12:16	EFH	TAL SF
Total/NA	Prep	7471A			117036	07/12/12 09:53	ET	TAL SF
Total/NA	Analysis	7471A		2	117086	07/12/12 21:43	SK	TAL SF
TCLP	Leach	1311			117070	07/12/12 15:38	ET	TAL SF
TCLP	Prep	7470A			117115	07/13/12 11:06	ET	TAL SF
TCLP	Analysis	7470A		1	117141	07/13/12 16:10	CAM	TAL SF
TCLP	Prep	3010A			117093	07/13/12 07:51	JR	TAL SF
TCLP	Analysis	6010B		2.5	117148	07/13/12 17:51	CAM	TAL SF
STLC Citrate	Leach	CA WET Citrate			117017	07/11/12 21:14	SK	TAL SF
STLC Citrate	Prep	3005A			117204	07/16/12 10:40	ET	TAL SF
STLC Citrate	Analysis	6010B		2.5	117247	07/16/12 16:30	BA	TAL SF
STLC Citrate	Prep	7470A			117224	07/16/12 13:51	JR	TAL SF
STLC Citrate	Analysis	7470A		1	117257	07/16/12 18:33	CAM	TAL SF

9

Laboratory References:

TAL SF = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Certification Summary

Client: Shell Oil Products US

TestAmerica Job ID: 720-43214-1

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Pleasanton	California	State Program	9	2496

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

Method Summary

Client: Shell Oil Products US

TestAmerica Job ID: 720-43214-1

Method	Method Description	Protocol	Laboratory
6010B	Metals (ICP)	SW846	TAL SF
7470A	Mercury (CVAA)	SW846	TAL SF
7471A	Mercury (CVAA)	SW846	TAL SF

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SF = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Sample Summary

Client: Shell Oil Products US

TestAmerica Job ID: 720-43214-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
720-43214-1	Se Solids	Solid	07/11/12 08:00	07/11/12 16:35

12

ED_001593_00015790

13

Test America

1220 Quarry Lane

Pleasion, CA 94566

925-484-1919

Shell OPUS Chain Of Custody Record

139401

7/16/2012

Alliance Project Manager to be invoiced:

☐ SCIENCE & ENGINEERING

☐ TECHNICAL SERVICES

☐ CRMT HOUSTON

720-43214

INCIDENT NUMBER (S&E ONLY)

SAP or CRMT NUMBER (TSC/CRMT)

DATE: _____

PAGE: _____ of _____

CONSULTANT COMPANY: Shell OPUS

ADDRESS: 3485 Pacheco Blvd

CITY: Martinez, CA 94553

TELEPHONE: 925-313-3329 FAX: 925-313-3065 E-MAIL: gordon.johnson@shell.com / michael.hwecker@shell.com

SITE ADDRESS (Street and City): 3485 Pacheco Blvd

PROJECT CONTACT (Name/Title): Michael Hecker 925-313-3329

CONSULTANT PROJECT NO.:

SAMPLER NAME(S) (Print):

LAB USE ONLY

TURNAROUND TIME (BUSINESS DAYS):

☑ 10 DAYS ☐ 5 DAYS ☑ 72 HOURS ☐ 48 HOURS ☐ 24 HOURS ☐ LESS THAN 24 HOURS

REQUESTED ANALYSIS

☐ LA - RWQCB REPORT FORMAT ☐ UST AGENCY: _____

GCIMS MTBE CONFIRMATION: HIGHEST _____ HIGHEST per BORING _____ ALL _____

SPECIAL INSTRUCTIONS OR NOTES:

TEMPERATURE ON RECEIPT C°

PO # 4551049012

FIELD NOTES: Container/Preservative or PID Readings or Laboratory Notes

METALS:

RUSH

Field Sample Identification (Must Be Unique: Include Well or SB If Applicable, And At Least A 6-Digit Date And A 2-Digit Counter) 20 CHARS MAX	SAMPLING DATE mm/dd/yy	SAMPLING TIME 24-hr	SAMPLE MATRIX (W=Monitoring Well, WP=Drinking Water, WG=Discrete Depth Water, WAS=Air Stripper Water, WQ=QA/QC Water, SO=Soil, SE=Sediment, AA=Ambient Air, AQ=QA/QC Air)	Sample Type	Number of Containers	NUMBER OF CONTAINERS	Volatiles EPA SW846/8260B	TTLC, STLC, TCLP (CAM 17 Metals Including Mercury)	TTLC (CAM 17 Metals Including Mercury)
ETP-2 Aerator Influent	06/28/12	1300	Water	Environmental	two 40-ml VOA (HCL)				
ETP-2 Aerator Effluent	06/28/12	1300	Water	Environmental	Two 40-ml VOA (HCL)				
Se Solids	07/11/12	8:00am	Solid	Environmental	1 - Pint Container			X	
SeRU Thickener Tank	06/29/12	8:00am	Water with Solids	Environmental	1 - Pint Container				

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
[signature]	[signature]	7·11·12	1010
[signature]	[signature]	7·11·12	1635

DISTRIBUTION: White with final report, Green to File, Yellow and Pink to Client.

06-23-04 Revision

1.5°c , 0.9°c

Login Sample Receipt Checklist

Client: Shell Oil Products US

Job Number: 720-43214-1

Login Number: 43214
List Number: 1
Creator: Mullen, Joan

List Source: TestAmerica Pleasanton

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	N/A	
The cooler's custody seal, if present, is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

14

ED_001593_00015790

Selenium unit
sludge → ERM

Melissa Hagen to: Melissa Hagen 01/15/2015 12:1:

MJH

Sent from my iPhone
Melissa J. Hagen

CONTRA COSTA HEALTH SERVICES

Contra Costa Health Services / Hazardous Materials Programs
4585 Pacheco Boulevard, Suite 100, Martinez, CA 94553
Telephone (925) 335-3200 FAX (925) 646-2073
WWW.CCHEALTH.ORG/GROUPS/HAZMAT
WILLIAM B. WALKER, M.D., HEALTH SERVICES DIRECTOR • RANDALL L. SAWYER, DIRECTOR

Tiered Permitting Inspection/Compliance Checklist

FACILITY NAME	SITE ID	INSPECTION DATE
Martinez Refinery, Shell Oil	729718	1-14-15

INSPECTION TYPE: Routine / Follow-Up / Other

VIOLATION CLASSIFICATIONS: M = Minor Cl I = Major Cl II = Medium / Repeat Minor

EPA ID CAD009164021

Onsite Permitting Tier: PBR CA CESW CESQT CEL CECL

Unit Number	Unit Name	Tank/Container	Notified Tier	Correct Tier
AT 1 & 2	WWT	2	PBR	PBR
ST 1	selenium	1	CA	CA
CR 1	container	1	CESW	CESW

California Code of Regulations (CCR), Title 22, Chapter 45, §67450.1 et al
California Health and Safety Code (HSC), Division 20, Chapter 6.5, §25201 et al

Viol Code	Authority	Requirement	Viol Class	Violation Due Date/ Violation Corrected
TP01	HSC 25201 (a)	Unauthorized Treatment		
		ONSITE TREATMENT REQUIREMENT		
TP02	CCR 67450.2 (b)	Form DTSC 1772 Properly Completed		
TP03	CCR 67450.2 (b)	Facility Diagram Submitted/Adequate		
TP04	CCR 67450.3 (c)(5) & HSC 25200.3 (c)(7)	Records of Pretreatment Compliance		
		ALL UNITS		
TP05	HSC 25201	Only hazardous waste generated onsite is treated onsite		
TP06	CCR 67450.2 (b) & CCR 67450.3 (c)	Unit Notification Information		
TP07	HSC 25201.5 (d)(7)(A)	Estimated Treatment Volume		
TP08	HSC 25201.5 (d)(7)(A)	Waste Evaluation/Identification		
		WASTE STREAM NOTIFICATION		
TP09	HSC 25201.5 (a)(b)(c)	Treatment Process		
TP10	HSC 25201.5 (d)(6)(9)	Residual Management Information		
TP11	HSC 25201.5 (d)(2)	Federal Permit Requirement		
TP12	HSC 25200.3 (c)(6)	Written Instructions & Logs		
TP13	CCR 67450.3 (c)(8)(B)	Written Inspection Schedule		
TP14	CCR 67450.3 (c)(8), HSC 25200.3 (c)(6)(7), & HSC 25201.5 (d)(5)	Written Inspection Log		
TP15	HSC 25246 & CCR 67450.3 (c)(11)	Closure Notification		
		FOR CA OR PBR NOTIFIERS:		
TP16	HSC 25209.0 & HSC 25205.14 (c)	Waste Minimization Certification		
		FOR CA OR PBR NOTIFIERS:		
TP17	CCR 67450.3 (c)(12)(E)	Secondary Containment		
TP18	HSC 25245.4 & CCR 67450.13	Financial Assurance for closure		
TP19	HSC 25200.10, HSC 25200.14, & CCR 67450.7	Phase 1 Assessment		
		PBR UNITS		
TP20	CCR 67450.3 (c)(7)	Unit Labeled		
TP21	CCR 67450.3 (c)(8)(A)	Written Waste Analysis Plan		
TP22	CCR 67450.3 (c)(8)(A)	Waste Analysis Records		
TP 23	HSC 25246 & CCR 67450.3	Written Closure Plan		
TP24	—	Other:		

ENTERED

Total Time for Review and Inspection (in 15 minute increments): 2 HR ☐ Notice to Comply ☐ Notice of Violation ☒ No Violations Observed

Facility Rep Initials NAB CC Hazmat Rep Initials MJH Date 1-14-15

Form TP / rev. 06/10

CONTRA COSTA
HEALTH SERVICES

Contra Costa Health Services / Hazardous Materials Programs
4585 Pacheco Boulevard, Suite 100, Martinez, CA 94553
Telephone (925) 335-3200 FAX (925) 646-2073
WWW.CCHEALTH.ORG/GROUPS/HAZMAT
WILLIAM B. WALKER, M.D., HEALTH SERVICES DIRECTOR • RANDALL L. SAWYER, DIRECTOR

CONTINUATION SHEET

Program: ☐ UST ☐ BP ☐ HW ☒ TP ☐ SWP ☐ APSA ☐ CalARP ☐ GB ☐ Other

FACILITY NAME	SITE ID	DATE
Martinez Refinery - Shell Oil	729718	1-14-15

Comments:

Note to file: ST-1

Shell has contract on file for Selenium removal unit waste to be managed as an E.R.M.

CCHS reviewed documentation

MSA

Facility Rep Initials	CC Hazmat Rep Initials	Date
NAB	MSA	1-14-15

Contra Costa Health Services / Hazardous Materials Programs
4585 Pacheco Boulevard, Suite 100, Martinez, CA 94553
Telephone (925) 335-3200 FAX (925) 646-2073
WWW.CCHEALTH.ORG/GROUPS/HAZMAT
CONTRA COSTA HEALTH SERVICES
WILLIAM B. WALKER, M.D., HEALTH SERVICES DIRECTOR • RANDALL L. SAWYER, DIRECTOR

Aboveground Petroleum Storage Tanks Inspection/Compliance Checklist

FACILITY NAME	SITE ID	INSPECTION DATE
Martinez Refinery, Shell	729718	1-14-15

INSPECTION TYPE: Routine / Follow-Up / Other

VIOLATION CLASSIFICATIONS: M = Minor Cl I = Major Cl II = Medium / Repeat Minor

TOTAL QUANTITY: 413 000 000 G

Date facility began operations: ~1915

Date of initial SPCC Plan:

Date of current SPCC Plan: (7/14) July 2010

FACILITY CAPACITY/CLASSIFICATION: ☐ EXEMPT ☐ < 10,000 ☐ ≥ 10,000
Qualified Facility: ☐ Tier I ☐ Tier II

Code of Federal Regulations (CFR) Title 40, Chapter 1, Subpart D, Part 112
California Health & Safety Code (HSC) Division 20, Chapter 6.67, Section 2570

Viol Code	Authority	Violation Description	Viol Class	Violation Due Date/ Violation Corrected
AS01	CFR 112.3	Failed to prepare a SPCC Plan on site		
AS02	CFR 112.5(a)(d)	Failed to review or amend SPCC Plan		
AS03	CFR 112.3(e)	SPCC Plan not available onsite		
AS04	CFR 112.7(e)	Failed to conduct inspections & tests in accordance with written procedures		
AS05	CFR 112.7(e)	Failed to maintain records of inspections, tests and/or procedures		
AS06	CFR 112.7(e)	Record of inspections or tests not signed by supervisor or inspector		
		SPCC PLAN ELEMENTS – Pursuant to 25270.4.5(a), 25270.12(a) / The SPCC Plan is missing the following elements:		
AS07	CFR 112.6(a)(1), (b)(1)	Self-certification for Tier I or II Qualified Facility		
AS08	CFR 112.3(d) & CFR 112.6(b)(4)	Professional Engineer certification		
AS09	CFR 112.5(b)	Documentation of 5-year review & evaluation of the SPCC Plan ✓		
AS10	CFR 112.7(f)	Training program ✓		
AS11	CFR 112.5(a), CFR 112.6(a)(2), (b)(2)	Amendments required within 6 months of change/certification of technical amendments		
AS12	CFR 112.7, CFR 112.6(a)	Management authorization of resource commitment to implement the SPCC Plan		
AS13	CFR 112.7(a)(3)	Diagram with location & contents of regulated containers, transfer stations & connecting pipes		
AS14	CFR 112.7(a)(3)	Type of oil & storage capacity for each container ✓		
AS15	CFR 112.7(a)(3)	Discharge prevention measures; procedures for routine handling		
AS16	CFR 112.7(a)(3)	Countermeasures for discovery, response & cleanup		
AS17	CFR 112.7(a)(3)	Required contact list & phone numbers		
		GENERAL SPCC REQUIREMENTS – Pursuant to 25270.4.5(a), 25270.5 & 25270.12(a)		
AS18	CFR 112.8(c)(4), (c)(5), (d)(1)	Failed to provide corrosion protection ✓		
AS19	CFR 112.8(c)(1)	Containers not compatible with materials stored		
AS20	CCR 112.5(a), (d)	Failed to implement SPCC Plan review changes and/or amendment changes within 6 months		
AS21	CFR 112.7(f)	Failed to train oil-handling personnel in operation & maintenance of equipment to prevent discharges		
AS22	CCR 112.7(f)(3)	Failed to conduct annual spill prevention briefings		
AS23	CFR 112.7(d)	Failed to prepare an oil contingency plan or provide written control/removal commitments		
		FACILITY INSPECTION – Pursuant to 25270.4.5, 25270.5 & 25270.12(a)		
AS24	H&SC 25270.4.5(b)	Failed to meet provisions of conditional exemption 25270.4.5(b)		
AS25	CFR 112.7(g)	Facility security not adequate		
AS26	CFR 112.7(c)	Clean-up materials not readily available		
AS27	CFR 112.8(c)	Tank in poor condition/leaking		
AS28	CFR 112.8(c)(8)	Overfill protection procedures or devices missing, not maintained or inoperative		
AS29	CFR 112.8(c)(11)	Portable/mobile containers not positioned to prevent a discharge		
AS30	CFR 112.7(h)	Loading/unloading rack does not drain to containment		
AS31	CFR 112.8(b)(c)	Facility drainage not functioning, or improperly operated or engineered ✓ ENTERED		
AS32	CFR 112.8(a), CFR 112.7(c)	Failed to provide appropriate containment or diversionary structures to prevent discharge		
AS33	CFR 112.8(c)	Secondary containment inadequate to contain capacity of largest container plus precipitation		
AS34	CFR 112.8(c)(10)	Failed to remove accumulation of oil in secondary containment		
AS35	CFR 112.8	Secondary containment valve(s) not closed		
AS36	CFR 112.3	Failed to implement SPCC Plan element:		
AS37	—	Other:		

Total Time for Review and Inspection (in 15 minute increments): 2HR ☐ Notice to Comply ☐ Notice of Violation ☒ No Violations Observed

Facility Rep Initials NAB CC Hazmat Initials MDH Date 1-14-15

Form AP / rev. 06/10

CONTRA COSTA HEALTH SERVICES

Contra Costa Health Services / Hazardous Materials Programs
4585 Pacheco Boulevard, Suite 100, Martinez, CA 94553
Telephone (925) 335-3200 FAX (925) 646-2073
WWW.CCHEALTH.ORG/GROUPS/HAZMAT
WILLIAM B. WALKER, M.D., HEALTH SERVICES DIRECTOR • RANDALL L. SAWYER, DIRECTOR

Underground Storage Tanks Inspection/Compliance Checklist

FACILITY NAME	SITE ID	INSPECTION DATE
Martinez Refinery	729718	1-14-15

INSPECTION TYPE: Routine / Follow-Up / Other

VIOLATION CLASSIFICATIONS: M = Minor / Cl I = Major / Cl II = Medium / Repeat Minor

Tank Type: DW FG | Lines: DW | Alarm Panel: TLS 350

California Health & Safety Code (HSC) Chapter 6.7
California Code of Regulations (CCR) Title 23

Viol Code	Authority	Violation Description	Viol Class	Violation Due Date/ Violation Corrected
US01	CCR 2630(d)	Annual Monitoring Certification. last 3-28-14		
US02	CCR 2630(d), CCR 2641(a)	Monitoring system is able to detect a release at the earliest possible opportunity.		
US03	HSC 25299(a)(9)	Disabling and/or raising leak detector test.		
US04	CCR 2636(f), CCR 2643(c)	Annual Line Leak detector test.		
US05	CCR 2636(f), CCR 2643(c)	Annual line tightness test.		
US06	CCR 2635(b)	Overfill prevention system.		
US07	CCR 2637	Secondary containment testing (SB989). last 3-28-14		
US08	CCR 2631(d)(4)	Secondary containment system is free of liquid.		
US09	CCR 2643(d)	Triennial tightness test of suction piping.		
US10	CCR 2635(a)(2)(A)	Cathodic protection testing.		
US11	CCR 2636(g), CCR 2666(e)	UDC installed with continuous monitoring.		
US12	CCR 2635(b)(1)	Spill container in good condition and empty. OK		
US13	HSC 25284.2	Spill container tested annually. ✓		
US14	CCR 2663(h)	Tank lining inspection/certification has been conducted.		
US15	CCR 2712(b)	Maintenance & monitoring records. ✓		
US16	CCR 2632, CCR 2712	Monitoring & response plan complete, submitted, and on site.		
US17	CCR 2711(b) & (c)	Operating Permit Application - Facility Information and Tank Information ✓		
US18	HSC 25292.2	Certification of financial responsibility. OK		
US19	HSC 25292.1	UST system is operated to prevent unauthorized release.		
US20	CCR 2651(b)	Owner/Operator has written records of all unauthorized releases including repairs and prevention methods used to prevent future releases.		
US21	HSC 25284, CCR 2712(i)	Operating permit and conditions are current, and are retained at the facility.		
US22	HSC 25284 (a)(3)(A)	Written agreement between owner and operator requiring the operator to meet all permit and regulatory requirements. N/A		
US23	CCR 2661	Permit to repair UST system.		
US24	CCR 2715	Designated Operator Requirements. OK		
US25	—	Other Violations:		

Observed: ☐ Monitor panel ☐ Overfill alarm ☐ Sensors ☐ E-Stop ☐ Line leak detector ☐ Sensor out & failsafe ☐ Automatic shut off at dispenser ☐ Spill container test

Testing Observed: ☐ Secondary Containment Testing SB-989 ☐ Tank Annular ☐ Tank Sumps ☐ Piping Interstitial ☐ UDC

☐ Cathodic Protection ☐ Impressed Current Rectifier

Comments/Observed: File review only this date. Observed monitoring panel (OK) & Spill bucket (OK) D.O. Reports on site.

For Office Use Only
Significant Operational Compliance (SOC):

☐ NO leak detection OR prevention violations
☐ BOTH leak detection AND prevention violations
☐ Only leak prevention violations
☐ Only leak detection violations

Total Time for Review and Inspection (in 15 minute increments): 2HR

☐ Notice to Comply ☐ Notice of Violation ☒ No Violations Observed

Facility Rep Initials NAB | CC Hazmat Rep Initials MDH | Date 1-14-15

Form US / rev. 06/10

CONTRA COSTA HEALTH SERVICES

Contra Costa Health Services / Hazardous Materials Programs
4585 Pacheco Boulevard, Suite 100, Martinez, CA 94553
Telephone (925) 335-3200 FAX (925) 646-2073
WWW.CCHEALTH.ORG/GROUPS/HAZMAT
WILLIAM B. WALKER, M.D., HEALTH SERVICES DIRECTOR • RANDALL L. SAWYER, DIRECTOR

Hazardous Materials Business Plan Inspection/Compliance Checklist

FACILITY NAME	SITE ID	INSPECTION DATE
Martinez Refinery, Shell	729718	1-14-15

INSPECTION TYPE: (Routine) / Follow-Up / Other

VIOLATION CLASSIFICATIONS: M = Minor CI I = Major CI II = Medium / Repeat Minor

California Code of Regulations, Title 19, Division 2, Chapter 4, §2620 et al; Title 27, Div 1, Subdiv. 2, Chap. 1, Part II
California Health and Safety Code, Division 20, Chapter 6.95, §25404, §25500-25520

Viol Code	Authority	Requirement	Viol Class	Violation Due Date/ Violation Corrected
BP01	19CCR 2729.2	Adequate submission / completion of Business Activities & Owner / Operator Identification Forms.		
BP02	19CCR 2729.2	Adequate submission / completion of chemical inventory forms.	M	2-16-15
BP03	19CCR 2729.4	Maximum quantity of all hazardous materials stored on site in reportable quantities are listed in the HMBP.		
BP04	19CCR 2729.5	Original signature on inventory forms for acutely hazardous materials ≥ Threshold Planning Quantities.		
BP05	19CCR 2729.2	Adequate submission / completion of site map.		
BP06	H&SC 25504	Adequate submission / completion / retention of written Emergency Response Plan.		
BP07	27CCR 15210 & H&SC 25404	Full and timely payment of the HMBP program annual fee.		
BP08	H&SC 25503.5	HMBP is maintained on-site or is accessible.		
BP09	H&SC 25504(c) & 19CCR 2732	Initial employee training program for hazardous materials/emergency response implemented and adequate.		
BP10	H&SC 25504(c) & 19CCR 2732	Annual hazardous materials/emergency response refresher component of the employee training program implemented and adequate.		
BP11	19CCR 2731(c) & H&SC 25503(e)(1)	Procedures in place to mitigate, prevent or abate hazards to persons, property or the environment from a release or threatened release of hazardous materials. **See back for Best Management Practices (BMP).**		
BP12	—	Other:		

See back for Best Management Practices (BMP)

Observation:

Spot checked inventory submitted via CERS (R.E.S #3-4 and Main Shop areas)

BP02 - Review of CERS inventory showed many chemical "largest containers" in correct

Please review CERS inventory and update the largest container field

Due: 2-16-15 HSC 25507(a)

Also be sure compressed gases are in cubic feet

Total Time for Review and Inspection (in 15 minute increments): 2 hr ☒ Notice to Comply ☐ Notice of Violation ☐ No Violations Observed

Facility Rep Initials NAB CC Hazmat Initials MDA Date 1-14-15

Form BP / rev. 06/10

ENTERED

CONTRA COSTA HEALTH SERVICES

Contra Costa Health Services / Hazardous Materials Programs
4585 Pacheco Boulevard, Suite 100, Martinez, CA 94553
Telephone (925) 335-3200 FAX (925) 646-2073
WWW.CCHEALTH.ORG/GROUPS/HAZMAT
WILLIAM B. WALKER, M.D., HEALTH SERVICES DIRECTOR • RANDALL L. SAWYER, DIRECTOR

INSPECTION COVER SHEET

FACILITY NAME	FACILITY ADDRESS	INSPECTION DATE
Martinez Refinery, Shell Oil	3485 Pacheco Blvd Martinez CA 94553	1-14-15
Contact Name: Natalie Braden	EPA ID: CAD 009 164021	SITE ID: 729718
Contact Telephone: 925-313-3705		

Program(s): (check all that apply)

[X] Hazardous Materials Release Response Plan / Business Plan (BP)	[X] Tiered Permitting (TP)
[X] Hazardous Waste Generator (HW)	[ ] Green Business (GB)
[X] Underground Storage Tank (UST)	[ ] Storm Water Program (SWP)
[X] Aboveground Petroleum Storage Act (APSA)	[ ] California Accidental Release Prevention Program (CalARP)

CUPA Permit Current: Yes [X] No [ ]

REPRESENTATIVES PRESENT:

Name	Title	Organization
Melissa J Hagen	HMS II	CCHS HMP
Natalie Braden	Environmental Mgr	Shell
Michael Morson	Waste Engineer	Shell
Michael Armour	Water Engineer	Shell
Michael W. Hacker	Haz Waste Coordinator	Shell

Facility Description/Comments:

Routine annual inspection
Facility is a petroleum refinery.

ISSUANCE OF NOTICES:

A **NOTICE TO COMPLY** or **NOTICE OF VIOLATION** is issued to identify conditions observed this day that are alleged to be violations of one or more sections of the California Health and Safety Code (HSC), the California Code of Regulations (CCR), Code of Federal Regulations (CFR), or Contra Costa County Code (CCC). The facility may be subject to reinspection at any time by Contra Costa Health Services Hazardous Materials Programs (CCHSHMP) to ensure that observed violations cited on the Notices are corrected. Failure to correct violations within the scheduled period provided may result in CCHSHMP citing the facility for continuing or additional violations. Issuances of Notices do not preclude CCHSHMP from taking any administrative, civil, or criminal action as a result of the violations noted. (See back)

CONSENT:

Consent includes inspecting hazardous material/waste handling areas, taking photographs, reviewing and copying documents, questioning personnel and sampling activities to determine compliance with applicable laws and regulations.

Facility Rep: Natalie Braden (Consent to inspect given by)	Facility Rep Signature: Natalie Braden	Date: 1/14/15
CC Hazmat Rep: Melissa J Hagen	CC Hazmat Signature: Melissa Hagen	Date: 1-14-15

California Environmental Reporting System: Regulator

Melissa Hagen's Account Sign Out Tools Reports Help

Submittals Facilities Businesses Regulators Compliance Responders Reports

Hazardous Material Inventory: MARTINEZ REFINERY, DIV OF SHELL OIL...

Home » Submittal Search » Submittal: 2/28/2014 (10476676) » Materials Inventory: Hazardous Material Inventory (Accepted) » Material Detail

You must complete a separate inventory page for each individual hazardous material and hazardous waste that you handle at your facility in an aggregate quantity subject to Hazardous Material Business Plan (HMBP) reporting requirements. The completed inventory must reflect all hazardous materials at your facility, reported **separately** for each building or outside storage area, with **separate** entries for unique occurrences of physical state, storage temperature, storage pressure. Where the aggregate quantities of some hazardous materials are below the HMBP threshold reporting quantity, report the general hazard class of the materials (e.g., "Misc. Flammable Liquids"), rather than the Common Name, and the aggregate quantity of all hazardous materials having this hazard class which individually are below the threshold reporting quantity.

Submittal Element History

Submitted for CERS ID **10476676** on 2/28/2014 1:11PM by *Patrick Owens* of Martinez Refinery, Div of Shell Oil Products, U.S. (Martinez, CA)
Submittal was ***Accepted*** on 3/21/2014 by *Alexandra McMullen* for Contra Costa County Health Services Department

Return to Submittal Inventory

Chemical Identification and Physical Properties

Chemical Name
CRUDE OIL

CERS Chemical Library ID
-

Common Name CAS Number
CRUDE OIL

US EPA SRS ID

Physical State
Liquid

Hazardous Material Type
Mixture

Trade Secret
No

Chemical Hazard Classification

EHS
No

Radioactive
No

Curies
-

Fire Code Hazard Classes (by priority)
Carcinogen
-
Toxic
-
-

Federal Hazard Categories
Yes Fire
No Reactive
No Pressure Release
Yes Acute Health
Yes Chronic Health

DOT Hazard Class
-

State Waste Code
Lookup Code

Inventory Location and Quantity

Chemical Location
539 STRING

Chemical Location Confidential EPCRA
No

Map# (Optional) Grid# (Optional)
3 3

Average Daily Amount
1726953368

Maximum Daily Amount
1726953368

Largest Container
5.81

Annual Waste Amount

Days on Site
365

Units
pounds

To be corrected

Inventory Storage Information

No Aboveground Tank
No Underground Tank
No Tank Inside Building
No Steel Drum
No Plastic/Non-Metallic Drum

No Can
No Carboy
No Silo
No Fiber Drum
No Bag

No Box
No Cylinder
No Glass Bottle
No Plastic Bottle
No Tote Bin

No Tank Truck, Tank Wagon
No Tank Car, Rail Car
Yes Other

Storage Pressure
Ambient

Storage Temperature
Ambient

Mixture Components

Hazardous Component Name	CAS Number	% by Weight	EHS
CRUDE OIL	8002-05-9	99.00	No
N-HEXANE	110-54-3	0.50	No
NATURAL GAS	8006-14-2	0.50	No
BENZENE	71-43-2	0.10	No
HYDROGEN SULFIDE	7783-06-4	0.10	Yes

Additional Mixture Components

Additional Chemical/Material Description

Additional Chemical Description Information

CERS Help Settings Notifications

To: Arora, Asha@DTSC[Asha.Arora@dtsc.ca.gov]; Lin, Sharon[Lin.Sharon@epa.gov]
From: Schofield, John
Sent: Tue 4/14/2015 4:58:20 PM
Subject: RE: available May7?

Larry lead. Andy is the report/enforcement lead for CA waste management violations. Andy needs to learn. He seems pretty sharp. Not jaded (yet).

****
John Schofield
U. S. Environmental Protection Agency
Region 9
Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2
75 Hawthorne Street
San Francisco, CA 94105
(415) 972-3386
(415) 947-3530 (fax)
schofield.john@epa.gov
****

NOTE: This email, including any attachments, may contain material that is confidential, privileged and/or attorney work product and is for the sole use of the intended recipient. Any review, reliance or distribution by others or forwarding without expressed permission is strictly prohibited. If you are not the intended recipient, please contact the sender and delete all copies.

From: Arora, Asha@DTSC [mailto:Asha.Arora@dtsc.ca.gov]
Sent: Tuesday, April 14, 2015 9:53 AM
To: Schofield, John; Lin, Sharon
Subject: RE: available May7?

I agree with you and recommend that Andy to participate if he conducted TP inspection at Shell Catalyst facility.

Thanks
Asha

From: Schofield, John [Schofield.John@epa.gov]
Sent: Tuesday, April 14, 2015 9:44 AM
To: Arora, Asha@DTSC; Lin, Sharon
Subject: RE: available May7?

If possible, I would recommend that Andy and/or Melissa participate in meeting in person or by phone.

****
John Schofield
U. S. Environmental Protection Agency
Region 9
Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2
75 Hawthorne Street
San Francisco, CA 94105
(415) 972-3386
(415) 947-3530 (fax)
schofield.john@epa.gov
****

NOTE: This email, including any attachments, may contain material that is confidential, privileged and/or attorney work product and is for the sole use of the intended recipient. Any review, reliance or distribution by others or forwarding without expressed permission is strictly prohibited. If you are not the intended recipient, please contact the sender and delete all copies.

From: Arora, Asha@DTSC [mailto:Asha.Arora@dtsc.ca.gov]
Sent: Tuesday, April 14, 2015 9:11 AM
To: Lin, Sharon
Cc: Schofield, John
Subject: RE: available May7?

Hi Lin,

Yes, I am available in the afternoon of May 7th. Melissa had been approving Shell's notification with multiple CESQT units when they were treating thousand of gallons of waste. It will good if you can forward their file to me to review and discuss with you. I will be conducting Contra Costa County CUPA evaluation on May 5-6, 2015. I already completed two oversight inspections and a plan to conduct and a third oversight inspection on April 20th in Richmond.

I informed the following to Melissa for Shell on March 24, 2014 as I was traveling:
I just looked at CERS for Shell, Martinez in my hotel. Please tell me what are your Qs. It appears that you guys have been accepting their TP submission until 2014. Their TP submission should have been rejected from the beginning.

During the February 2014 training, I explained that if a facility has a CESQT unit, then they can't have any other treatment occurring facility wide. Please look at HSC, section 25201.5(a)(2)

25201.5. (a) Notwithstanding any other provision of law, a

hazardous waste facilities permit is not required for a generator who treats hazardous waste of a total weight of **not more than 500 pounds, or a total volume of not more than 55 gallons,** in any calendar month, if both of the following conditions are met:

(1) The hazardous waste is not an extremely hazardous waste and is listed in Section 67450.11 of Title 22 of the California Code of Regulations, as in effect on January 1, 1992, as eligible for treatment pursuant to the regulations adopted by the department for operation under a permit-by-rule and the treatment technology used is approved for that waste stream in Section 67450.11 of Title 22 of the California Code of Regulations for treatment under a permit-by-rule.

(2) The **generator is not otherwise required to obtain a hazardous waste facilities permit or other grant of authorization for any other hazardous waste management activity at the facility.**

Melissa has attended my trainings a number of times....

Thank you
Asha

Asha Arora

Senior Environmental Scientist (Specialist)

Department of Toxic Substances Control

(510) 540-3874

Asha.Arora@dtsc.ca.gov

From: Lin, Sharon [Lin.Sharon@epa.gov]
Sent: Tuesday, April 14, 2015 8:56 AM
To: Arora, Asha@DTSC
Cc: Schofield, John
Subject: available May7?

Hi, Asha,

It looks like we are coming to your office to discuss CUPA enforcement referral process on May 7. The meeting is supposed to take place from 10-noon. I am wondering if you are available in the afternoon to chat about the tiered permits at the Shell Martinez Refinery. We, along with two inspectors from your Clovis office, were at the facility at the end of March. I am the lead for the EPA enforcement action.

Melissa Higgins with CC County CUPA gave us her TP file which was over 1500 pages (many of the pages are multiple copies of the same reports). Yesterday I asked her to prepare a short summary of the status of all the units at the facility that are covered under the tiered permitting program. I have some questions for you since you are the TP expert. I am particularly interested in finding out the facility's tiered permitting history and whether TP is sufficiently protective for some of the operating units (especially where is significant VOC air emission).

I am still reading through the TP file. Look forward to talking. Thanks!

Sharon Lin, P.E.

U.S. Environmental Protection Agency Region 9

Enforcement Division

Air, Waste and Toxics Branch, ENF-2-2
75 Hawthorne Street

San Francisco, CA 94105

Tel: (415) 972-3446

Email: Lin.Sharon@epa.gov

To: Lin, Sharon[Lin.Sharon@epa.gov]
From: Arora, Asha@DTSC
Sent: Thur 9/3/2015 6:29:12 PM
Subject: RE: Shell Refinery Receiving Offsite Wastes

I think when this NPDES permit was issued, they used to be one company and in 1998 (?) Shell Catalyst facility became as separate facility.

Thanks
Asha

From: Lin, Sharon [mailto:Lin.Sharon@epa.gov]
Sent: Thursday, September 03, 2015 11:26 AM
To: Arora, Asha@DTSC
Subject: RE: Shell Refinery Receiving Offsite Wastes

I checked the block flow diagram of the effluent treatment plant. Yes, catalyst plant wastewater flows to the shell refinery effluent treatment plant, ETP-1.

Sharon

From: Arora, Asha@DTSC [mailto:Asha.Arora@dtsc.ca.gov]
Sent: Thursday, September 03, 2015 9:58 AM
To: Lin, Sharon
Subject: Shell Refinery Receiving Offsite Wastes

Hi Sharon,

One of the Contra Costa County CUPA inspector called me today for questions at Shell Catalyst facility (Adjacent to the Shell Refinery. If you recall that Shell Catalyst was included in their evacuation plan). She also informed me that Shell catalyst discharges rinses from their drum rinsing operations under a tiered permit (CESW) and QA/QC lab to the of Shell Refinery's wastewater treatment.

She is a good inspector and she came from the Ventura County CUPA to the Contra Costa County CUPA a couple of years ago.

Thank you
Asha

Asha Arora

Senior Environmental Scientist (Specialist)

Department of Toxic Substances Control

Berkeley Office

(510) 540-3874

Asha.Arora@dtsc.ca.gov