



**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
ENGINEERING & COMPLIANCE DIVISION**

APPLICATION PROCESSING AND CALCULATIONS

APPL. NO.
544857 544859
544860 544861

DATE
5/8/13

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PERMIT TO CONSTRUCT

SUMMARY

The objective of this project is to construct one new domed crude storage tank and one new domed water draw tank, as well as to modify two existing tanks to add domes and increase their throughputs.

A/N 544857 is for the new construction of domed crude storage tank Tk 2640.

A/N 544859 is for the new construction of domed water draw storage tank Tk 2643.

A/N 544860 is for the modification of existing storage tank Tk 510 (D394).

A/N 544861 is for the modification of existing storage tank Tk 511 (D395).

COMPANY INFORMATION

Company Name: Phillips 66 Company, Facility ID No. 171109
 Mailing Address: 1520 E. Sepulveda Blvd., Carson, CA 90745
 Equipment Location: 1520 E. Sepulveda Blvd., Carson, CA 90745
 Contact Person: John Matthews, (310) 952-6213

EQUIPMENT DESCRIPTION

Table 1 shows the proposed Section H permit descriptions for the new and modified storage tanks. Additions to the descriptions are noted in underlines and deletions are noted in ~~strikeouts~~.

**Table 1. Permit Equipment Description
SECTION H: FACILITY DESCRIPTION AND EQUIPMENT SPECIFIC CONDITIONS**

Equipment	ID No.	Conn To	RECLAIM Source Type/ Monitoring Unit	Emissions * And Requirements	Conditions
Process 10 : STORAGE TANKS					P13.2
System 7 : DOMED EXTERNAL FLOATING ROOF TANKS					
<u>STORAGE TANK, DOMED EXTERNAL FLOATING ROOF, NO. 2640, CRUDE OIL, WELDED SHELL, WITH FOUR MIXERS, 615000 BBL; DIAMETER: 260 FT; HEIGHT: 65 FT WITH A/N: 544857</u> <u>DOME COVER, GEODESIC</u> <u>FLOATING ROOF, PONTOON</u> <u>PRIMARY SEAL, CATEGORY A METALLIC SHOE</u> <u>SECONDARY SEAL, CATEGORY A, RIM MOUNTED</u>	<u>Decc</u>			<u>HAP: (10) [40CFR 63 Subpart CC, #3A, 6-23-2003]</u>	<u>C1.xb, E193.x, H23.17</u>



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Equipment	ID No.	Conn To	RECLAIM Source Type/ Monitoring Unit	Emissions * And Requirements	Conditions
<u>GUIDEPOLE, GASKETED SLIDING COVER, WITH WIPER, UNSLOTTED</u>					
STORAGE TANK, <u>DOMED EXTERNAL FLOATING ROOF, NO. 2643, WASTEWATER, WELDED SHELL, 14000 BBL; DIAMETER: 44 FT; HEIGHT: 51 FT 7 IN WITH A/N: 544859</u> <u>DOMES COVER, GEODESIC</u> <u>FLOATING ROOF, DOUBLE DECK</u> <u>PRIMARY SEAL, CATEGORY A METALLIC SHOE</u> <u>SECONDARY SEAL, CATEGORY A, RIM MOUNTED</u> <u>GUIDEPOLE, GASKETED SLIDING COVER, WITH WIPER, UNSLOTTED</u>	Dddd			<u>HAP: (10) [40CFR 63 Subpart CC, #2, 6-23-2003]</u>	<u>C1.xc,</u> <u>E193.x,</u> <u>H23.17</u>
STORAGE TANK, <u>DOMED EXTERNAL FLOATING ROOF, NO. R-510, CRUDE OIL, WELDED, WITH TWO MIXERS, 320000 BBL; DIAMETER: 218 FT; HEIGHT: 50 FT WITH A/N: 535286 544860</u> <u>DOMES COVER, GEODESIC</u> <u>FLOATING ROOF, PONTOON, WELDED SHELL</u> <u>PRIMARY SEAL, CATEGORY A, MECHANICAL METALLIC SHOE</u> <u>SECONDARY SEAL, SHOE MOUNTED, CATEGORY B OR BETTER, WIPER TYPE</u> <u>GUIDEPOLE, GASKETED SLIDING COVER, WITH WIPER, UNSLOTTED</u>	D394			<u>HAP: (10) [40CFR 63 Subpart CC, #2, 6-23-2003]</u>	<u>C1.xa,</u> <u>C1.17,</u> <u>E193.x,</u> <u>H23.4</u>
STORAGE TANK, <u>DOMED EXTERNAL FLOATING ROOF, NO. R-511, CRUDE OIL, WELDED, WITH TWO MIXERS, 320000 BBL; DIAMETER: 218 FT; HEIGHT: 50 FT WITH A/N: 535287 544861</u> <u>DOMES COVER, GEODESIC</u> <u>FLOATING ROOF, PONTOON</u> <u>PRIMARY SEAL, CATEGORY A, MECHANICAL METALLIC SHOE</u> <u>SECONDARY SEAL, SHOE MOUNTED, CATEGORY B OR BETTER, WIPER TYPE</u> <u>GUIDEPOLE, GASKETED SLIDING COVER, WITH WIPER, UNSLOTTED</u>	D395			<u>HAP: (10) [40CFR 63 Subpart CC, #2, 6-23-2003]</u>	<u>C1.xa,</u> <u>C1.17,</u> <u>E193.x,</u> <u>H23.4</u>



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COMPLIANCE RECORD REVIEW

A query of the AQMD Compliance Database for the past two years (5/1/11 to 5/8/13) identified 4 Notices of Violation (NOVs) that were issued to the Phillips 66 Los Angeles Refinery Carson Plant (Facility ID 171109). No NOVs were issued during that period to the previous owner, ConocoPhillips Company (Facility ID 800362). The compliance database indicates that the facility is currently in compliance with applicable rules and regulations.

FEE EVALUATION

The BCAT for the two new tanks as well as the two existing tanks is 248919 (Storage Tank- Gas Dome Ext. Float Roof), Schedule C. The Schedule C modification fee is \$3,440.06. The facility also paid fees (50% additional) for expedited permitting per 301(u)(1). No additional fees are required for these permit applications.

BACKGROUND/HISTORY

The Phillips 66 Los Angeles Refinery Carson Plant operates crude supply storage tanks to handle incoming crude supplies from domestic and other sources such as the Port of Long Beach, Berth 121.

Phillips 66 Carson currently has four 320,000 bbl tanks for crude storage [(R-510 (D394), R-511 (D395), R-512 (D396), and R-513 (D397)]. These tanks typically store three segregated crude grades at a time, which limits delivery volumes to Panamax vessels (400,000 bbl capacity). For larger vessels, such as Aframax (720,000 bbl) or Suezmax (1,000,000 bbl), the refinery requires two ship calls to unload the full volume of the vessels, resulting in 7 to 10 days of demurrage between ship calls. The time period between ship calls is used to make room in the receiving tanks to accommodate the second discharge from the larger vessel. The objective of this project is to provide additional tankage and capacity to accommodate the larger vessels, allowing them to discharge their total volume in one call.

The objective of this permit evaluation is issue a permit to construct for two new domed storage tanks (a 575,000 bbl crude storage tank and a 11,500 bbl water draw tank) and to modify existing permits for two existing crude tanks [Tanks R-510 (D394) and R-511 (D395)] by increasing throughputs and installing tank domes.

The water draw from the existing crude storage tanks is currently processed in the sour water stripper, which is operating near its capacity. The water draw from the existing R-510 and R-511 tanks and new Tank 2640 will be routed to the new water draw tank, Tank 2643. The new tank will allow the water to be treated at the brine stripper, which has excess capacity available. Minor modifications are required to the Brine Stripper, including the installation of new heat exchangers and a steam trim heater to raise the temperature of the water before entering the Brine Stripper.

The permitting history for Tank R-510 and R-511 is shown in **Table 2**. These tanks are nearly identical, and the permitting history for both tanks is the same, with two exceptions. The tanks were constructed between 1976 and 1978 by Arco. The construction of the new tanks was delayed due to issues related to the Environmental Impact Report (EIR), causing the original permits to construct to expire, so applications for new construction (originally submitted in 1974) were re-submitted in 1976.



After a change of ownership from Arco to Shell Oil Co, the tanks were each modified to install secondary seals for Rule 463 compliance. Two additional change of ownerships followed (Shell to Unocal and Unocal to Tosco). As part of preliminary Title V permit changes, conditions were added to both tanks for rule applicability and a throughput limit. Next, the Tank R-511 was administratively changed from a riveted to a welded tank, followed by the R-510 tank description being administratively changed to reflect upgraded primary and secondary seals. Both tanks were administratively changed to add "two tank mixers" to the device description in 2008. The change of ownership from ConocoPhillips to Phillips 66 took place in 2012.

Table 2. Permitting History for Tanks R-510 (D394) and R-511 (D395)

A/N {Permit #}		Facility ID	Date Permit Issued	Description
Tank R-510 (D394)	Tank R-511 (D395)			
544860	544861	171109 Phillips 66	TBD	Modification to increase throughput and install tank domes.
535286 {G17717}	535287 {G17718}	171109	6/12/12	Change of ownership from ConocoPhillips to Phillips 66
487992 {F99603}	487990 {F99602}	800362 ConocoPhillips	11/7/08	Administrative change to add "two tank mixers" to device description
407453 {F62413}	-	800362	8/5/03	Administrative change to upgrade primary & secondary seals
-	393536 {F49712}	800362	3/7/02	Administrative change to equipment description; change from riveted to welded tank
-	-	800362	1/1/02 7/10/02	Permit changes to add conditions for throughput limit and rule applicability (vapor pressure limit added, then removed).
325644 {F6643}	325646 {F6645}	800362	6/10/97	Change of ownership from Unocal to Tosco
257958 {D45670}	257960 {D45668}	88892 Unocal Corp	12/9/91	Change of ownership from Shell to Unocal
C18850 {M12252}	C18849 {M12251}	8458 Shell Oil Co	1/10/84 12/29/82 11/13/80 10/16/78 PC	Modification to install secondary seals for Rule 463 compliance. Permit reissued twice; mixers added.
C08256	C08255	Shell Oil Co	na	Change of ownership from Arco to Shell
C03789	C03790	Arco	5/14/76 PC	Resubmittal of new construction application because construction was delayed by EIR (description changed to remove "pontoon" from floating roof and add "tube" to seal
A79818	A79819	Arco	4/5/74 PC	New construction of tanks 510-513, 951-953

EMISSIONS

Emissions for the new and modified tanks include contributions from the operation of the tank as well as from fugitive components associated with each tank. Emissions are based on tank physical and operating parameters reported by the facility as well as monthly throughputs of 2.5 million, 64,000, 1.5 million and 1.5 million barrels per month, respectively for Tanks 2640, 2643, 510 and 511.



APPLICATION PROCESSING AND CALCULATIONS

Emissions from the new and modified tanks were each calculated using the EPA TANKS 4.0.9d program. The TANKS results datasheets are provided in Attachment A for both the new and modified tanks. A TANKS chemical database entry was added to represent the crude oil stored in these tanks. The facility requested that a Reid vapor pressure of 11 psia be used as the maximum crude oil vapor pressure. Other characteristics of the crude oil used for TANKS calculations include a density of 7.1 lb/gal @ 60°F, a liquid molecular weight of 205 and a vapor molecular weight of 50. The toxic air contaminant (TAC) speciation for the crude oil stored was developed based on the highest measured concentration for each TAC from any of their typical crude oils. These maximum concentrations were combined to create a ‘crude hybrid’ speciation, as described in **Table 3**.

Table 3. Speciation of toxics from Crude Oil; worst-case for each TAC

Chemical	CAS	SJV Crude	AWB Crude	Cal Crude	Canadian Crude	Crude Hybrid Wt%
		Wt%	Wt%	Wt%	Wt%	
Benzene	71-43-2	0.03	0.1414124	0.0733333	0.120	0.1414124
Cumene (isopropyl benzene)	98-82-8		0.002471		ND	0.002471
Cyclohexane	110-82-7	0.1966667	0.62557	0.74	0.260	0.74
Ethylbenzene	100-41-4	0.01333	0.1492876	0.0766667	0.041	0.1492876
Naphthalene	91-20-3		0.0914786	0.05	ND	0.0914786
n-Hexane	110-54-3	0.2533333		0.8933333	0.960	0.960
Chrysene	218-01-9	0.002	0	0.001	ND	0.002
Phenol	108-95-2		0.0002283		ND	0.0002283
Toluene	108-88-3	0.0366667	0.5772455	0.27	0.230	0.5772455
1,2,4-Trimethylbenzene	95-63-6		0.2812269		0.047	0.2812269
Xylene (mixed isomers)	1330-20-7	0.026657	0.9441758	0.3633333	0.207	0.9441758
Cresol (mixed isomers)	1319-77-3		0.0005707		ND	0.0005707

New Tanks 2640 and 2643 will use 4” legs and not the standard 3” legs used for calculations in the TANKS program. In order to adjust the TANKS data, which assumes 3” legs, TANKS calculations were performed using the appropriate number of 3” legs, and compared to a TANKS calculation with zero legs (“legless”). This was done to identify the relationship between leg size and emissions. A square relationship between leg diameter and emissions was assumed. The difference in emissions between legless and 3” legs was multiplied by a factor of $4^2/3^2$ and added to the legless emissions total as shown below in **Table 4** for Tank 2640 and in **Table 5** for Tank 2643. Note that Tank 2643 emissions were calculated assuming crude oil, even though Tank 2643 will be used as the water draw tank; storing oily water that is removed from the crude tanks prior to reprocessing.

Table 4. Emissions from Tank 2640 based on TANKS calculations and accounting for 4” legs

Components	TANKS Emissions results -- 3"legs (lb/yr)	TANKS Emissions results – Legless (lb/yr)	Difference in emissions (3" vs legless) (lb/yr)	Estimated Emissions from 4" legs (lb/yr) (difference * $4^2/3^2$)	Total Tank 2640 Emissions (lb/yr) (w/ est. 4" legs)
Crude Oil (RVP 11)	6,431.08	5,855.16	575.92	1023.858	6,879.02
1,2,4-Trimethylbenzene	13.09	13.07	0.02	0.036	13.11
Benzene	8.1	7.6	0.50	0.889	8.49
Chrysene	0.09	0.09	0.00	0	0.09



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Cresol (-m)	0.03	0.03	0.00	0	0.03
Cyclohexane	42.63	39.96	2.67	4.747	44.71
Ethylbenzene	7.08	7.03	0.05	0.089	7.12
Hexane (-n)	61.45	56.01	5.44	9.671	65.68
Isopropyl benzene	0.12	0.12	0.00	0	0.12
Naphthalene	4.24	4.24	0.00	0	4.24
Phenol	0.01	0.01	0.00	0	0.01
Toluene	28.57	27.99	0.58	1.031	29.02
Xylenes (mixed isomers)	44.6	44.33	0.27	0.48	44.81
Unidentified Components	6,221.07	5,654.68	566.39	1006.91556	6,661.60

Table 5. Emissions from Tank 2643 based on TANKS calculations and accounting for 4" legs

Components	TANKS Emissions results -- 3" legs (lb/yr)	TANKS Emissions results – Legless (lb/yr)	Difference in emissions (3" vs legless) (lb/yr)	Estimated Emissions from 4" legs (lb/yr) (difference * 4 ² /3 ²)	Total Tank 2643 Emissions (lb/yr) (w/ est. 4" legs)
Crude Oil (RVP 11)	1,438.84	1,389.66	49.18	87.431	1,477.09
1,2,4-Trimethylbenzene	1.98	1.98	0.00	0.000	1.98
Benzene	1.62	1.58	0.04	0.071	1.65
Chrysene	0.01	0.01	0.00	0.000	0.01
Cresol (-m)	0	0	0.00	0.000	0.00
Cyclohexane	8.59	8.37	0.22	0.391	8.76
Ethylbenzene	1.1	1.1	0.00	0.000	1.10
Hexane (-n)	13.69	13.23	0.46	0.818	14.05
Isopropyl benzene	0.02	0.02	0.00	0.000	0.02
Naphthalene	0.64	0.64	0.00	0.000	0.64
Phenol	0	0	0.00	0.000	0.00
Toluene	4.77	4.72	0.05	0.089	4.81
Xylenes (mixed isomers)	6.91	6.89	0.02	0.036	6.93
Unidentified Components	1,399.49	1,351.12	48.37	85.991	1,437.11

Emissions from existing Tanks 510 and 511 are shown in **Table 6**.



Table 6. Emissions from Tank 510 & 511 based on TANKS calculations

Components	Total Emissions
Crude Oil (RVP 11)	5,949.37
1,2,4-Trimethylbenzene	9.4
Benzene	6.95
chrysene	0.07
Cresol (-m)	0.02
Cyclohexane	36.75
Ethylbenzene	5.18
Hexane (-n)	56.69
Isopropyl benzene	0.08
Naphthalene	3.03
phenol	0.01
Toluene	21.79
Xylenes (mixed isomers)	32.51
Unidentified Components	5,776.88

Emissions from fugitive components associated with the new tanks were calculated using the EPA Correlation Equations and Factors for Refineries, as described in **Tables 7 and 8**. These calculations are based on pre-construction estimated fugitive counts provided by the facility.

Table 7. Fugitive Component Counts and Emissions Calculations for new Tank 2640.

Source Unit		Service	Emission Factor (lb/yr / # of components)	Existing components	# Added	# Re-moved	Total #	Emissions (lb/yr)
Valves	Sealed bellows	All	0		190		190	0
	SCAQMD approved I&M Program	Gas/Vapor	4.55		14		14	64
		Light Liquid	4.55		83		83	378
		Heavy Liquid	4.55		0		0	0
Pumps	Sealless type	Light Liquid	0		5		5	0
	Double mechanical seals or equivalent	Light Liquid	46.73		0		0	0
		Single mechanical seals	Heavy Liquid	46.73		2		2
Flanges (ANSI 16.5-1988)		All	7.04		258		258	1816
Connectors		All	2.86		134		134	384
Compressors		Gas/Vapor	9.07*		0		0	0
Pressure Relief Valves		All			6		6	54
Process Drains with P-trap or seal pot		All			0		0	0
Other (incl. fittings, hatches, sight-glasses, & meters)		All			7		7	63
Emissions (lb/yr)								2852
Emissions (lb/day)								7.81
Emissions (lb/hr)								0.33

* Emission Factors from "CAPCOA-Revised 1995 EPA Correlation Equations and Factors for Refineries and Marketing Terminals" California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities, CAPCOA/ARB, February 1999. (Table IV-3a from AQMD Guidelines for Fugitive Emissions Calculations, June 2003) using a screening value, corrected for background, of 500 ppm.



Table 8. Fugitive Component Counts and Emissions Calculations for new Tank 2643.

Source Unit		Service	Emission Factor (lb/yr / # of components)	Existing components	# Added	# Re-moved	Total #	Emissions (lb/yr)
Valves	Sealed bellows	All	0		61		61	0
	SCAQMD approved I&M Program	Gas/Vapor	4.55		0		0	0
		Light Liquid	4.55		16		16	72.80
		Heavy Liquid	4.55		0		0	0
Pumps	Sealless type	Light Liquid	0		0		0	0
	Double mechanical seals or equivalent	Light Liquid	46.73		0		0	0
Flanges (ANSI 16.5-1988)		All	7.04		79		79	555.95
Connectors		All	2.86		20		20	57.28
Compressors		Gas/Vapor	9.07*		0		0	0
Pressure Relief Valves		All			0		0	0
Process Drains with P-trap or seal pot		All			0		0	0
Other (incl. fittings, hatches, sight-glasses, & meters)		All			1		1	9
Emissions (lb/yr)								695
Emissions (lb/day)								1.90
Emissions (lb/hr)								0.08

* Emission Factors from "CAPCOA-Revised 1995 EPA Correlation Equations and Factors for Refineries and Marketing Terminals" California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities, CAPCOA/ARB, February 1999. (Table IV-3a from AQMD Guidelines for Fugitive Emissions Calculations, June 2003) using a screening value, corrected for background, of 500 ppm.

After combining emissions from fugitives and from TANKS, **Table 9** is a summary of total project ROG emissions. Existing tanks 510 and 511 each had a previous PTE of 103.7 lb/day, but the proposed modifications will result in significant emissions reductions. **Table 9** shows that the total project will not have a net emission increase.

Table 9. Summary of Pre- and Post-Project ROG Emissions

	Total ROG Emissions (lb/day)	
	Pre-project	Post-project
New Tank 2640	-	27.03
New Tank 2643	-	6.03
Tank 510	103.7	16.53
Tank 511	103.7	16.53
Total project	207.4	66.12

The speciation of TACs in the fugitive emissions was estimated based on the hybrid crude oil speciation previously provided in Table 3.



The TACs emissions calculated using TANKS and the TACs emissions based on the wt% of the fugitive VOC emissions calculated in Tables 7 and 8 were combined for each of the two new tanks, resulting in total TAC emissions from each tank.

The total TAC emissions calculated as described above were used in Rule 1401 Tier 2 Screening analyses for the two new tanks: 2640 and 2643. The results are provided below in **Tables 10-13**. Tier 2 Screening Results for MICR are provided in **Tables 10 and 12**, which indicate that the calculated screening cancer risk is less than 1 in a million.. **Tables 11 and 13** provide the hazard indices for each target organ, showing that the acute and chronic hazard index levels are below the limit of 1.0 for each tank.

Table 10. Rule 1401 Tier 2 Screening Results- Tank 2640

MICR

$$\text{MICR} = \text{CP (mg/(kg-day))}^{-1} * \text{Q (ton/yr)} * (\text{X/Q}) * \text{AFann} * \text{MET} * \text{DBR} * \text{EVF} * 1\text{E-6} * \text{MP}$$

Compound	Residential	Commercial
Benzene (including benzene from gasoline)	4.54E-08	9.39E-08
Chrysene	6.19E-09	6.29E-09
Cresol mixtures		
Ethyl benzene	3.59E-09	7.43E-09
Hexane (n-)		
Naphthalene	2.98E-08	6.17E-08
Phenol		
Toluene (methyl benzene)		
Xylenes (isomers and mixtures)		
Total	8.50E-08	1.69E-07
	PASS	PASS

Table 11. Hazard Index – Tank 2640

$$\text{HIA} = [\text{Q(lb/hr)} * (\text{X/Q})_{\text{max}}] * \text{AF} / \text{Acute REL}$$

$$\text{HIC} = [\text{Q(ton/yr)} * (\text{X/Q}) * \text{MET} * \text{MP}] / \text{Chronic REL}$$

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL		7.65E-06	Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV		1.09E-07	Pass	Pass
Developmental - DEV	1.01E-04	4.85E-04	Pass	Pass
Endocrine system - END		7.54E-06	Pass	Pass
Eye	4.17E-05		Pass	Pass
Hematopoietic system - HEM	8.95E-05	2.77E-04	Pass	Pass
Immune system - IMM	8.95E-05		Pass	Pass
Kidney - KID		7.65E-06	Pass	Pass
Nervous system - NS	1.14E-05	6.31E-04	Pass	Pass
Reproductive system - REP	1.01E-04		Pass	Pass
Respiratory system - RES	4.17E-05	1.35E-03	Pass	Pass
Skin			Pass	Pass



Table 12. Rule 1401 Tier 2 Screening Results- Tank 2643

MICR

MICR = CP (mg/(kg-day))⁻¹ * Q (ton/yr) * (X/Q) * AFann * MET * DBR * EVF * 1E-6* MP

Compound	Residential	Commercial
Benzene (including benzene from gasoline)	9.56E-09	1.98E-08
Chrysene	1.01E-09	1.02E-09
Cresol mixtures		
Ethyl benzene	6.75E-10	1.40E-09
Hexane (n-)		
Naphthalene	5.55E-09	1.15E-08
Phenol		
Toluene (methyl benzene)		
Xylenes (isomers and mixtures)		
Total	1.68E-08	3.37E-08
	PASS	PASS

Table 13. Hazard Index – Tank 2643

HIA = [Q(lb/hr) * (X/Q)_{max}] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL		1.43E-06	Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV		1.05E-08	Pass	Pass
Developmental - DEV	2.10E-05	9.86E-05	Pass	Pass
Endocrine system - END		1.42E-06	Pass	Pass
Eye	7.91E-06		Pass	Pass
Hematopoietic system - HEM	1.88E-05	5.82E-05	Pass	Pass
Immune system - IMM	1.88E-05		Pass	Pass
Kidney - KID		1.43E-06	Pass	Pass
Nervous system - NS	2.21E-06	1.27E-04	Pass	Pass
Reproductive system - REP	2.10E-05		Pass	Pass
Respiratory system - RES	7.91E-06	2.52E-04	Pass	Pass
Skin			Pass	Pass



RULES EVALUATION

PART 1: SCAQMD REGULATIONS

Rule 212 Standards for Approving and Issuing Public Notice (Amended 11/14/97)

Rule 212 requires public notice for any new or modified permit unit, RECLAIM source or Title V equipment that increases emissions of toxic air contaminants and increases health risk as specified in 212(c)(1) - (c)(3). The proposed new equipment will not be located within 1000 feet of a school, so public notice is not required per 212(c)(1).

E&C Policy No. E2006-01, "Rule Implementation Guidance, Rule 212 Public Notices" provides guidance on assessing the Rule 212(g) applicability for projects that consist of multiple applications. This policy specifies that for multiple application projects (1) the total emissions from all the project's applications shall be used to determine if the emission increases at the facility exceed any of the daily maximums in subdivision (g); and (2) the total emissions shall include emissions reductions resulting from the modification of existing pieces of equipment in determining if the emission thresholds exceed that specified in subdivision (g). Four applications are included in this project; two have emissions increases (27 lb/day and 6 lb/day); and two have emissions decreases (87 lb/day and 87 lb/day). The total emissions from the project are thus 27 + 6 + 87 + 87 = 141 lb/day (a net decrease).

The daily maximum specified in Rule 212(g) for VOC emissions is 30 lb/day. The combined emissions from the entire project are a decrease in emissions of 141 lb/day, so there is no net increase in emissions from the project. Thus, the facility is below the daily maximum and public notice is not required per 212(c)(2). The proposed project is not expected to cause a maximum individual cancer risk greater than 1 in a million at this facility, or expose persons to any substances that pose a potential risk of nuisance; thus, public notice is not required per Rule 212(c)(3). No public notice is required for this project, and compliance with this rule is expected.

Rule 401 Visible Emissions (Amended 11/09/01)

Operation of this permit unit is not expected to result in visible emissions. The facility is currently in compliance with this rule and is expected to continue to operate in compliance with this rule.

Rule 402 Nuisance (Adopted 05/07/76)

Operation of this permit unit is not expected to result in a public nuisance. The facility is currently in compliance with this rule and is expected to continue to operate in compliance with this rule.

Rule 463 Organic Liquid Storage (Amended 05/06/05)

All four of the tanks in the proposed project are subject to Rule 463 requirements because they store volumes of greater than 19,815 gallons and they store organic liquids with true vapor pressures greater than 0.5 psia. Since the tanks are or will be converted to domed external floating roof tanks, they are subject to requirements in Rule 463(d) only.

463(d)(1) requires a pressure-vacuum valve to be set within 10 percent of the maximum working pressure of the tank, for storage tanks between 251 and 19,815 gallons. This requirement does not apply to these project tanks since each has a capacity greater than 19,815 gallons.



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463(d)(2) requires the roof to float on the stored organic liquid at all time, except when emptied for cleaning or repair. The applicant is expected to comply with this requirement, since the tanks will be constructed with external floating roofs.

463(d)(3) requires the roof to be refloated with water, or equivalent, when being refilled with gasoline. These tanks will be used exclusively for crude oil (or salt water with crude oil), and are not permitted to store gasoline. Thus, compliance with this requirement is expected.

463(d)(4) limits the maximum vapor pressure to no more than 11 psia. The permit will include a condition that limits the vapor pressure of stored commodities for each of the tanks to less than 11 psia. Compliance with this requirement is expected.

463(d)(5) requires replacement seals to be chosen from a list approved by the Executive Officer. The applicant is expected to comply with this requirement.

The facility is currently in compliance with applicable requirements of this rule and is expected to continue to comply with this rule.

Rule 464 Wastewater Separators (Amended 12/07/90)

Rule 464 requirements apply to wastewater separators used to separate petroleum-derived compounds from wastewater. The water-draw tank is used for wastewater storage, and it not considered a wastewater separator. Thus, no requirements of this rule apply.

Rule 1149 Storage Tank and Pipeline Cleaning and Degassing (Amended 05/02/08)

Cleaning and degassing of VOC storage tanks 2640, 2643, 510 and 511 are subject to the requirements of Rule 1149 per Conditions H23.4 and H23.17. Rule 1149 requires that the tanks not be opened to the atmosphere unless liquid balancing or other control techniques are employed such that the gaseous VOC concentration within the tank is reduced to less than 5,000 ppmv for at least one hour after degassing operations have ceased. The rule also requires prior notification at least 2 hours before the start of tank degassing as well as follow-up notification within 3 business days after the degassing activity. The facility is currently in compliance with applicable requirements of this rule and is expected to continue to comply with this rule.

Rule 1173 Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants (Amended 06/01/07)

The miscellaneous fugitive components of these project tanks are subject to Rule 1173 per Condition H23.1 (see miscellaneous fugitives for Process 10, System 7, D948). The facility has an approved Inspection and Maintenance (I&M) program for monitoring and repairing fugitive components. All new and existing fugitive components are tagged with Rule 1173 and are monitored according to the Phillips 66 Rule 1173 leak detection and repair plan. The facility is currently in compliance with applicable requirements of this rule and is expected to continue to comply with this rule.

Rule 1178 Further Reductions of VOC Emissions From Storage Tanks at Petroleum Facilities (Amended 04/07/06)

Rule 1178 requires facilities to install domed roofs on all external floating roof tanks that contain organic liquids with true vapor pressures greater than or equal to 3 psia [1178 (d)(2)(A)] unless



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they are permitted to contain more than 97% by volume crude oil; these crude oil tanks are exempt from doming requirements per 1178(j)(7). Although the crude tanks are exempt from the doming requirement per Rule 1178(j)(7), the new crude tank and existing crude tanks D395 and D396 will be domed to comply with BACT. The new water draw tank Dddd may be required to be domed per Rule 1178 (d)(2)(B), depending on the AER reported vapor pressure. However, this tank is being domed to comply with BACT.

The facility is currently in compliance with applicable requirements of this rule and is expected to continue to comply with this rule.

Reg XIII New Source Review (Amended 12/06/02)

Rule 1303 Requirements (Amended 12/6/02)

New Source Review requirements apply to new, modified or relocated sources. According to Table 1 of Rule 2001(j), RECLAIM facilities are exempt from the requirements of Regulation XIII with regard to NOx and SOx emissions (they are instead subject to the requirements of Rule 2005 (New Source Review for RECLAIM) for NOx and SOx emissions). RECLAIM facilities are subject to Reg XIII requirements for other (non-RECLAIM) pollutants.

New Source Review generally requires that new sources or modified sources which result in an emission increase do the following: make use of BACT [1303(a)], conduct modeling [1303(b)(1)], and provide Emission Offsets [1303(b)(2)]. In addition, the facility must comply with all applicable rules and regulations of the District before a new permit can be issued [1303(b)(4)], as well as demonstrate statewide compliance [1303(b)(5)(B)].

Existing Tanks 510 and 511 are post-NSR tanks that have baseline potential to emit (PTE) emissions of 103.7 lb/day each. These baseline emissions were calculated as part of A/N's C18849 and C18850, under New Source Review. Rule 1306 specifies that for determination of required offsets and BACT applicability, modifications of an existing source are to be calculated using the difference between post-modification potential to emit and pre-modification PTE (for equipment that was previously subject to Rule 213 or NSR). Only for pre-NSR equipment is the post-modification PTE compared to actual emissions.

The facility has proposed to increase the throughputs of Tanks 510 and 511, but is also installing tank domes on these tanks, resulting in a net emission reduction. BACT is not required for these tanks because the net emissions after modification are less than the pre-project PTE.

The proposed new Tanks 2640 and 2643 will each result in a net emission increase. Thus, BACT is required for each tank. BACT for storage tanks includes the installation of a dome on each tank. New Tanks 2640 and 2643 are designed as domed external floating roof tanks. In addition to compliance with Rule 463 and 1178 tank roof and seal requirements, these new tanks will make use of BACT, and thus meet the BACT requirements.

Rule 1304 (c)(2) specifies that an exemption from Offsets may be allowed for concurrent facility modifications with emission reductions resulting in a net emission decrease. The modifications to Tanks 510 and 511 were not required by the AQMP, a proposed rule, or an adopted rule. As described previously in the "Emissions" section of this evaluation, the post-project PTE is less than the pre-project PTE for the combined project including two new tanks and modification of



two existing tanks. Thus, the facility is exempt from the offset requirement of Rule 1303(b)(2) for this proposed project. Modeling is not required for VOC emissions,

Rule 1325 Federal PM2.5 New Source Review Program (Adopted 06/03/11)

Rule 1325 defines a major modification as a physical change that would result in a significant emission increase and a significant net emissions increase of a regulated NSR pollutant from a major polluting facility [Rule 1325(4)(A)]. A significant increase is defined in 1325(b)(13) as an increase equal to or greater than 40 tons/yr nitrogen oxides; 40 tons/yr sulfur dioxide, or 10 tons/yr PM_{2.5}. The modification of two crude storage tanks and concurrent facility modification including the construction of a new crude storage and a new water draw storage tank will not result in a significant emission increase, or a significant net emissions increase of any of these pollutants. Thus, this permit action is not a major modification, and the requirements of Rule 1325 do not apply [Rule 1325(a)].

Reg XIV Toxics and Other Non-Criteria Pollutants

Rule 1401: New Source Review of Toxic Air Contaminants (Amended 03/04/05)

Rule 1401 applies to new, modified or relocated permit units that emit Toxic Air Contaminants (TAC). The modifications of existing Tanks 510 and 511 will not result in any increase in emissions of TACs.

The new construction of Tanks 2640 and 2643 will each result in increases in emissions of TACs, so these proposed tanks are subject to Rule 1401 requirements. Fugitive emissions and emissions from tank operations include TACs, so a Rule 1401 Tier 2 evaluation was performed to assess the health risks associated with these permit actions. Results of the two Tier 2 screening were provided previously in the “Emissions” section of this evaluation. The screening results demonstrate that the chronic and acute hazard indices will not exceed 1.0 at any receptor location [1401(d)(2), (3)] and that the risk per year shall not exceed 1/70th of the maximum allowable chronic risk [1401(d)(4)]. The facility is expected to operate in compliance with this rule.

Reg XVII Prevention of Significant Deterioration

Rule 1701: General (Amended 08/13/99)

Prevention of Significant Deterioration (PSD) requirements apply to new sources with an increase in PTE of 100 or 250 tons/yr of attainment air contaminants, or existing sources with a significant emission increase, or any net emission increase at a source located within 10 km of a Class I area. The proposed project will not emit attainment air contaminants. Thus, the requirements of this rule do not apply to this proposed permit action.

Rule 1714: Prevention of Significant Deterioration for Greenhouse Gases (Adopted 11/05/10)

The requirements of Rule 1714 apply to preconstruction reviews for greenhouse gases. This rule incorporates by reference several section of 40CFR Part 52.21. This rule requires that a PSD permit be obtained prior to beginning construction of a new stationary source or a major modification to an existing major source. An emission increase of greenhouse gas (GHG), as defined in §52.21(b)(49)(v), is both a significant emissions increase and a significant net emissions increase. Since the new and modified tanks will not emit GHG, this project is not subject to PSD requirements for GHG.



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Reg XXX Title V Permits

Rule 3002 Requirements (Amended 11/14/97)

This application is classified as a significant permit revision as defined in 3000(b)(31), since it includes installation of new equipment subject to a New Source Performance Standard (NSPS). Significant permit revisions require public participation per 3006(a)(1), and are required to be submitted to the EPA for review per 3003(j)(1)(A).

PART II: STATE REGULATIONS

CEQA California Environmental Quality Act (Amended 01/01/05)

The facility prepared a CEQA document to specifically evaluate this project, and a Negative Declaration is currently being processed.

PART III: FEDERAL REGULATIONS

40CFR60 Subpart K Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced after June 11, 1973 and Prior to May 19, 1978 (Amended 10/17/00)

Tanks R-510 (D394) and R-511 (D395) were previously subject to the requirements of Subpart K per Condition H23.4. Reconstruction, as defined in 40CFR60 Subpart A [§60.15], means the replacement of components of an existing facility to such an extent that the fixed capital cost of the new components exceeds 50% of the fixed capital cost of a comparable new facility. The cost estimate for doming Tanks 510 and 511 is \$2.5 million, but the cost for replacing Tanks 510 and 511 is \$13.5 million. Thus, the construction costs are less than 50% of the replacement cost, so the project does not constitute reconstruction.

Modification, per 40CFR60 Subpart A [§60.15], means any physical change or change in method of operation of an existing facility which increases the amount of any air pollutant emitted into the atmosphere by that facility.

This permit action, which includes the installation of domed roof on these two tanks, will not cause or allow any increase in emissions, so it is not considered a modification. Thus, these two tanks continue to be subject to Subpart K rather than Subpart Ka or Kb.

Subpart K requires that the tanks be equipped with a floating roof, a vapor recovery system, or equivalent since they store materials with a true vapor pressure between 1.5 and 11.1 psia [§60.112(a)(1)]. Tanks 510 and 511 comply with this requirement because they are equipped with external floating roofs, and will be equipped with domed roofs as part of this permit action. Subpart K also requires recordkeeping of the maximum vapor pressures of commodities stored in these tanks, and also records of the time periods different commodities are stored. The facility is currently in compliance with this regulation and is expected to continue to operate in compliance with this regulation.

40CFR60 Subpart Kb Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984 (Amended 10/15/03)

New Tanks 2640 and 2643 will be subject to the requirements of Subpart Kb since they will each



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have a capacity greater than 75m³ (19,813 gallons), be used to store volatile liquids, and be constructed after July 23, 1984. Condition H23.17 specifies that these tanks are subject to Subpart Kb.

The two new tanks will each be equipped with a double deck floating roof with mechanical shoe primary seal and a rim mounted secondary seal to comply with Subpart Kb requirements.

Subpart Kb also requires recordkeeping of the maximum vapor pressures of commodities stored in these tanks, and also records of the time periods different commodities are stored. The facility is currently in compliance with this regulation and is expected to continue to operate in compliance with this regulation.

40CFR60 Subpart QQQ Standards of Performance for VOC Emissions from Petroleum Refinery Wastewater Systems (Amended 10/17/00)

The requirements of Subpart QQQ apply to individual drain systems and oil-water separators. Storage tanks that store oily wastewater, such as the water draw tank 2643, are included in the definition of oil-water separators:

“Oil-water separator means wastewater treatment equipment used to separate oil from water consisting of a separation tank, which also includes the forebay and other separator basins, skimmers, weirs, grit chambers, and sludge hoppers. Slop oil facilities, including tanks, are included in this term along with *storage vessels* and auxiliary equipment located between individual drain systems and the oil-water separator. This term does not include storage vessels or auxiliary equipment which do not come in contact with or store oily wastewater.” [§60.691]

However, §60.692-3(a) allows for exceptions, and § 60.692-3(d) states that:

“Storage vessels, including slop oil tanks and other auxiliary tanks that are subject to the standards in §§ 60.112, 60.112a, and 60.112b and associated requirements, 40CFR part 60, Subparts K, Ka, or Kb are not subject to the requirements of this section.”

The water draw tank 2643 is subject to the requirements of 40CFR60 Subpart Kb, thus no Subpart QQQ requirements apply. Tanks 2640, 510, and 511 are used for storing crude oil, not wastewater, so no Subpart QQQ requirements apply to these tanks.

40CFR61 Subpart FF National Emission Standard for Benzene Waste Operations (Amended 12/4/03)

Process condition P13.2 specifies that the Process 10 Storage tanks are subject to the requirements of Subpart FF. This facility is required to identify benzene-containing streams and limit the amount of uncontrolled benzene emitted. The Consent Decree (Section H, Paragraph 212) requires that the facility sample End-of-Line streams and other streams with significant contributions to total annual benzene (TAB) in accordance with the “Benzene Waste Operations Revised Sampling Plan (6BQ Compliance Option)” dated 2/26/09. Benzene emissions are included in the facility’s total annual benzene (TAB). The facility has chosen to comply with the 6 Megagrams per year (Mg/yr) limit for uncontrolled benzene streams.



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The Benzene NESHAP Annual Report – 2012, dated April 5, 2013, indicates that the 2012 TAB (both controlled and uncontrolled) was estimated at 18.49 Mg/yr. The 2012 total uncontrolled benzene quantity was estimated at 1.74 Mg/yr, below the facility's 6 Mg/yr limit for uncontrolled benzene. The facility is currently in compliance with this regulation and is expected to continue to operate in compliance with this regulation.

40CFR63 Subpart CC National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries (Amended 10/28/09)

Subpart CC includes requirements for miscellaneous process vents, storage vessels, wastewater streams, and equipment leaks. The Subpart CC provisions for storage vessels are detailed in §63.646. §63.641 of Subpart CC defines Group 1 storage vessels as follows:

Group 1 storage vessel means a storage vessel at an existing source that has a design capacity greater than or equal to 177 cubic meters (*1113 bbl*) and stored-liquid maximum true vapor pressure greater than or equal to 10.4 kilopascals (*1.5 psia*) and stored-liquid annual average true vapor pressure greater than or equal to 8.3 kilopascals (1.2 psia) and annual average HAP liquid concentration greater than 4 percent by weight total organic HAP; a storage vessel at a new source that has a design storage capacity greater than or equal to 151 cubic meters (*950 bbl*) and stored-liquid maximum true vapor pressure greater than or equal to 3.4 kilopascals (0.5 psia) and annual average HAP liquid concentration greater than 2 percent by weight total organic HAP; or a storage vessel at a new source that has a design storage capacity greater than or equal to 76 cubic meters (*478 bbl*) and less than 151 cubic meters (*950 bbl*) and stored-liquid maximum true vapor pressure greater than or equal to 77 kilopascals (11.2 psia) and annual average HAP liquid concentration greater than 2 percent by weight total organic HAP. [§63.641]

Based on the hybrid crude speciation, the crude oil has a HAP concentration of 2.8 wt%. *Note that Subpart CC does not consider 1,2,4-trimethylbenzene, chrysene, or cyclohexane to be HAPs, as they are not listed in Section 112(b) of the Clean Air Act.* For existing sources, HAP concentrations must be greater than 4 wt% to be categorized as Group 1 storage vessels, but for new sources, HAP concentrations greater than 2 wt% qualify as Group 1 storage vessels. Tanks 2640, 510 and 511 store crude oil as described previously. However, Tank 2643 will store wastewater with no more than 1 foot of an oil layer across the top of the 48-foot height tank. The combination of wastewater and crude oil will result in a HAP concentration less than 2 wt%.

New tank 2640 is thus categorized as a Group 1 storage vessel under Subpart CC, and is tagged with 40CFR63 Subpart CC requirements for Group 1 storage vessels, detailed in Section J of the facility permit [40CFR63 Subpart CC, #3A 6-23-2003]. These requirements include control, testing, inspection and recordkeeping requirements.

New tank 2643 and existing tanks 510 and 511 are tagged with 40CFR63 Subpart CC requirements for Group 2 tanks, detailed in Section J of the facility permit [40CFR63 Subpart CC, #2 6-23-2003]. Subpart CC requires that records be maintained for these tanks, and that any of the tanks not be reclassified a Group 1 tank without first obtaining a valid AQMD permit. The facility is currently in compliance with this rule and is expected to continue to operate in compliance with this rule.



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Subpart CC wastewater provisions [§63.647] apply to all wastewater streams and treatment operations associated with refining process units that are a major source of Hazardous Air Pollutants (HAPs) and emit or contact HAPs. The water draw tank, which stores wastewater, is not considered a treatment operation, thus the wastewater provisions do not apply.

RECOMMENDATIONS

Based on the above evaluation, it is recommended that the permit to construct be issued with the following conditions.

CONDITIONS

PROCESS CONDITIONS

P13.2 All devices under this process are subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
Benzene	40CFR61, SUBPART	FF

[40CFR 61 Subpart FF, 12-4-2003]

[Processes subject to this condition : 1, 2, 3, 4, 5, 6, 7, 8, 9, 10]

SYSTEM CONDITIONS

DEVICE CONDITIONS

~~C1.17 The operator shall limit the throughput to no more than 4.5625e+06 barrel(s) in any one year.~~

~~{RULE 1303(b)(2) Offset, 5-10-1996; RULE 1303(b)(2) Offset, 12-6-2002}~~

~~{Devices subject to this condition : D394, D395}~~

C1.xa The operator shall limit the throughput to no more than 1.52 million barrel(s) in any one calendar month.

The operator shall comply with the following throughput measurement practices.

The operator shall calculate the throughput, in barrels, by the following equation: $0.14 \times d \times d \times l$, where d is the diameter of the tank in feet based on the tank strapping chart and l is the total vertical one-way roof travel in feet per month.

The operator shall install and maintain an automatic tank level gauge (ATLG) and recorder to continuously record the vertical movement of the roof. For the purpose of this condition,



continuous recording is defined as once per hour.

The operator shall calculate the total one-way roof movement, in feet, on a daily and monthly basis.

The ATLG installed shall be verified once per quarter by comparing against a manual tank level measurement. If the ATLG differs from the manual tank level measurement by more than 1.0 inch or 0.8%, whichever is greater, the ATLG shall be repaired and put back into service within 10 days. While the ATLG is being repaired, the throughput shall be determined by the hourly tank level data averaged from the previous 30 days prior to the discovery of the discrepancy.

In the event of a failure or routine maintenance of the ATLG, the ATLG shall be repaired (if necessary) and put back into service within 10 days of the time that the ATLG failed or was removed from service for maintenance. While the ATLG is being repaired or maintained, the throughput shall be determined by the hourly tank level data averaged from the previous 30 days prior to time that the ATLG went out of service.

The operator shall keep adequate records to show compliance with the limitations specified in this permit. Such records shall be maintained and kept on file for at least two years and shall be made available to the executive officer or his authorized representative upon request.

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : D394, D395]

C1.xb The operator shall limit the throughput to no more than 2.5 million barrel(s) in any one calendar month.

The operator shall comply with the following throughput measurement practices.

The operator shall calculate the throughput, in barrels, by the following equation: $0.14 \times d \times d \times l$, where d is the diameter of the tank in feet based on the tank strapping chart and l is the total vertical one-way roof travel in feet per month.

The operator shall install and maintain an automatic tank level gauge (ATLG) and recorder to continuously record the vertical movement of the roof. For the purpose of this condition, continuous recording is defined as once per hour.

The operator shall calculate the total one-way roof movement, in feet, on a daily and monthly basis.

The ATLG installed shall be verified once per quarter by comparing against a manual tank level measurement. If the ATLG differs from the manual tank level measurement by more than 1.0 inch or 0.8%, whichever is greater, the ATLG shall be repaired and put back into service within 10 days. While the ATLG is being repaired, the throughput shall be determined by the hourly tank level data averaged from the previous 30 days prior to the discovery of the discrepancy.



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In the event of a failure or routine maintenance of the ATLG, the ATLG shall be repaired (if necessary) and put back into service within 10 days of the time that the ATLG failed or was removed from service for maintenance. While the ATLG is being repaired or maintained, the throughput shall be determined by the hourly tank level data averaged from the previous 30 days prior to time that the ATLG went out of service.

The operator shall keep adequate records to show compliance with the limitations specified in this permit. Such records shall be maintained and kept on file for at least two years and shall be made available to the executive officer or his authorized representative upon request.

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : Dccc]

C1.xc The operator shall limit the throughput to no more than 64,000 barrel(s) in any one calendar month.

The operator shall comply with the following throughput measurement practices.

The operator shall calculate the throughput, in barrels, by the following equation: $0.14 \times d \times d \times l$, where d is the diameter of the tank in feet based on the tank strapping chart and l is the total vertical one-way roof travel in feet per month.

The operator shall install and maintain an automatic tank level gauge (ATLG) and recorder to continuously record the vertical movement of the roof. For the purpose of this condition, continuous recording is defined as once per hour.

The operator shall calculate the total one-way roof movement, in feet, on a daily and monthly basis.

The ATLG installed shall be verified once per quarter by comparing against a manual tank level measurement. If the ATLG differs from the manual tank level measurement by more than 1.0 inch or 0.8%, whichever is greater, the ATLG shall be repaired and put back into service within 10 days. While the ATLG is being repaired, the throughput shall be determined by the hourly tank level data averaged from the previous 30 days prior to the discovery of the discrepancy.

In the event of a failure or routine maintenance of the ATLG, the ATLG shall be repaired (if necessary) and put back into service within 10 days of the time that the ATLG failed or was removed from service for maintenance. While the ATLG is being repaired or maintained, the throughput shall be determined by the hourly tank level data averaged from the previous 30 days prior to time that the ATLG went out of service.

The operator shall keep adequate records to show compliance with the limitations specified in this permit. Such records shall be maintained and kept on file for at least two years and shall be made available to the executive officer or his authorized representative upon request.

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]



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[Devices subject to this condition : Dddd]

E193.x The operator shall install this equipment according to the following specifications:

The operator shall not use this equipment with materials having a Reid vapor pressure of 11 psia or greater.

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : Dccc, Dddd, D394, D395]

H23.4 This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
VOC	District Rule	1149
VOC	40CFR60, SUBPART	K

[RULE 1149, 7-14-1995; RULE 1149, 5-2-2008; 40CFR 60 Subpart K, 10-17-2000]

[Devices subject to this condition : D394, D395, D396, D397]

H23.17 This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
VOC	District Rule	1149
VOC	40CFR60, SUBPART	Kb

[RULE 1149, 7-14-1995; RULE 1149, 5-2-2008; 40CFR 60 Subpart Kb, 10-15-2003]

[Devices subject to this condition : Dccc, Dddd]

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ATTACHMENT A: TANKS DATA SHEETS

Tank 2640 domed
 Tank 2640 legless
 Tank 2643 domed
 Tank 2643 legless
 Tank 510/511 (D394/D395)

TANKS 4.0.9d

Emissions Report - Detail Format

Tank Identification and Physical Characteristics

Identification

User Identification: 2640 domed
 City:
 State:
 Company:
 Type of Tank: Domed External Floating Roof Tank
 Description:

Tank Dimensions

Diameter (ft): 260.00
 Volume (gallons): 21,000,000.00
 Turnovers: 60.00

Paint Characteristics

Internal Shell Condition: Light Rust
 Shell Color/Shade: White/White
 Shell Condition: Good

Roof Characteristics

Type: Pontoon
 Fitting Category: Detail

Tank Construction and Rim-Seal System

Construction: Welded
 Primary Seal: Mechanical Shoe
 Secondary Seal: Rim-mounted

Deck Fitting/Status

	Quantity
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	5
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Gasketed	34
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Gasketed	134
Roof Drain (3-in. Diameter)/90% Closed	3

Meteorological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d

Emissions Report - Detail Format

Liquid Contents of Storage Tank

2640 domed - Domed External Floating Roof Tank

Mixture/Component	Month	Liquid Temperature (deg F)				Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Daily Avg.	Liquid Surf. Min.	Bulk Temp Max.	Liquid Bulk Temp	Avg.	Min.	Max.					
Crude RVP 11	All	66.43	60.99	71.87	64.33	9.4081	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0263	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56



APPLICATION PROCESSING AND CALCULATIONS

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Benzene	1.3922	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
chrysene	0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)	0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cyclohexane	1.4382	N/A	N/A	84.1600	0.0074	0.0046	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene	0.1353	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)	2.2563	N/A	N/A	86.1700	0.0096	0.0094	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isopropyl benzene	0.0610	N/A	N/A	120.2000	0.0000	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Naphthalene	0.0033	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
phenol	0.0075	N/A	N/A	94.1100	0.0000	0.0000	94.11	Option 2: A=7.41345, B=1516.07, C=174.57
Toluene	0.4021	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components	10.1818	N/A	N/A	49.6502	0.9611	0.9835	215.30	
Xylenes (mixed isomers)	0.1129	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

2640 domed - Domed External Floating Roof Tank

Annual Emission
 Calculations

Rim Seal Losses (lb):	779.7482
Seal Factor A (lb-mole/ft-yr):	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000
Average Wind Speed (mph):	0.0000
Seal-related Wind Speed Exponent:	1.0000
Value of Vapor Pressure Function:	0.2499
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	9.4081
Tank Diameter (ft):	260.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000
Product Factor:	0.4000
Withdrawal Losses (lb):	4,635.2077
Annual Net Throughput (gal/yr.):	1,260,000,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060
Average Organic Liquid Density (lb/gal):	7.1000
Tank Diameter (ft):	260.0000
Roof Fitting Losses (lb):	1,016.1219
Value of Vapor Pressure Function:	0.2499
Vapor Molecular Weight (lb/lb-mole):	50.0000
Product Factor:	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	203.2900
Average Wind Speed (mph):	0.0000
Total Losses (lb):	6,431.0778

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors			Losses(lb)
		KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	5	6.20	1.20	0.94	154.9500
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3	14.00	3.70	0.78	209.9322
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	2.3492



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APPLICATION PROCESSING AND CALCULATIONS

Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Gasketed	34	1.30	0.08	0.65	220.9287
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	13.9955
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4	1.60	0.00	0.00	31.9897
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Gasketed	134	0.53	0.11	0.13	354.9854
Roof Drain (3-in. Diameter)/90% Closed	3	1.80	0.14	1.10	26.9913

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

2640 domed - Domed External Floating Roof Tank

Components	Losses(lbs)				Total Emissions
	Rim Seal Loss	Withdrawal Loss	Deck Fitting Loss	Deck Seam Loss	
Crude RVP 11	779.75	4,635.21	1,016.12	0.00	6,431.08
Benzene	0.67	6.55	0.87	0.00	8.10
Isopropyl benzene	0.00	0.11	0.00	0.00	0.12
Cyclohexane	3.62	34.30	4.71	0.00	42.63
Ethylbenzene	0.07	6.92	0.09	0.00	7.08
Naphthalene	0.00	4.24	0.00	0.00	4.24
Hexane (-n)	7.36	44.50	9.59	0.00	61.45
Toluene	0.79	26.76	1.03	0.00	28.57
1,2,4-Trimethylbenzene	0.03	13.04	0.03	0.00	13.09
Xylenes (mixed isomers)	0.36	43.76	0.47	0.00	44.60
Cresol (-m)	0.00	0.03	0.00	0.00	0.03
chrysene	0.00	0.09	0.00	0.00	0.09
phenol	0.00	0.01	0.00	0.00	0.01
Unidentified Components	766.86	4,454.89	999.32	0.00	6,221.07

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APPLICATION PROCESSING AND CALCULATIONS

TANKS 4.0.9d

Emissions Report - Detail Format

Tank Identification and Physical Characteristics

Identification

User Identification: 2640domed legless
 City:
 State:
 Company:
 Type of Tank: Domed External Floating Roof Tank
 Description:

Tank Dimensions

Diameter (ft): 260.00
 Volume (gallons): 21,000,000.00
 Turnovers: 60.00

Paint Characteristics

Internal Shell Condition: Light Rust
 Shell Color/Shade: White/White
 Shell Condition: Good

Roof Characteristics

Type: Pontoon
 Fitting Category: Detail

Tank Construction and Rim-Seal System

Construction: Welded
 Primary Seal: Mechanical Shoe
 Secondary Seal: Rim-mounted

Deck Fitting/Status

	Quantity
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	5
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4
Roof Drain (3-in. Diameter)/90% Closed	3

Meteorological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d

Emissions Report - Detail Format

Liquid Contents of Storage Tank

2640domed legless - Domed External Floating Roof Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Crude RVP 11	All	66.43	60.99	71.87	64.33	9.4081	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0263	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3922	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cyclohexane						1.4382	N/A	N/A	84.1600	0.0074	0.0046	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1353	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2563	N/A	N/A	86.1700	0.0096	0.0094	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isopropyl benzene						0.0610	N/A	N/A	120.2000	0.0000	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=213.21



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Naphthalene	0.0033	N/A	N/A	128.2000	0.0009	0.0000	128.20	C=207.78 Option 2: A=7.3729, B=1968.36, C=222.61
phenol	0.0075	N/A	N/A	94.1100	0.0000	0.0000	94.11	Option 2: A=7.41345, B=1516.07, C=174.57
Toluene	0.4021	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components	10.1818	N/A	N/A	49.6502	0.9611	0.9835	215.30	
Xylenes (mixed isomers)	0.1129	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

2640domed legless - Domed External Floating Roof Tank

Annual Emission Calculations

Rim Seal Losses (lb):	779.7482
Seal Factor A (lb-mole/ft-yr):	0.6000
Seal Factor B (lb-mole/ft-yr (mph) ⁿ):	0.4000
Average Wind Speed (mph):	0.0000
Seal-related Wind Speed Exponent:	1.0000
Value of Vapor Pressure Function:	0.2499
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	9.4081
Tank Diameter (ft):	260.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000
Product Factor:	0.4000
Withdrawal Losses (lb):	4,635.2077
Annual Net Throughput (gal/yr.):	1,260,000,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060
Average Organic Liquid Density (lb/gal):	7.1000
Tank Diameter (ft):	260.0000
Roof Fitting Losses (lb):	440.2079
Value of Vapor Pressure Function:	0.2499
Vapor Molecular Weight (lb/lb-mole):	50.0000
Product Factor:	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	88.0700
Average Wind Speed (mph):	0.0000
Total Losses (lb):	5,855.1638

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors		m	Losses(lb)
		KFa(lb-mole/yr)	KFb(lb-mole/(yr mph ⁿ))		
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	5	6.20	1.20	0.94	154.9500
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3	14.00	3.70	0.78	209.9322
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	2.3492
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	13.9955
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4	1.60	0.00	0.00	31.9897
Roof Drain (3-in. Diameter)/90% Closed	3	1.80	0.14	1.10	26.9913

TANKS 4.0.9d



Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

2640domed legless - Domed External Floating Roof Tank

Components	Losses(lbs)				Total Emissions
	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	
Crude RVP 11	779.75	4,635.21	440.21	0.00	5,855.16
Benzene	0.67	6.55	0.38	0.00	7.60
Isopropyl benzene	0.00	0.11	0.00	0.00	0.12
Cyclohexane	3.62	34.30	2.04	0.00	39.96
Ethylbenzene	0.07	6.92	0.04	0.00	7.03
Naphthalene	0.00	4.24	0.00	0.00	4.24
Hexane (-n)	7.36	44.50	4.16	0.00	56.01
Toluene	0.79	26.76	0.45	0.00	27.99
1,2,4-Trimethylbenzene	0.03	13.04	0.01	0.00	13.07
Xylenes (mixed isomers)	0.36	43.76	0.20	0.00	44.33
Cresol (-m)	0.00	0.03	0.00	0.00	0.03
chrysene	0.00	0.09	0.00	0.00	0.09
phenol	0.00	0.01	0.00	0.00	0.01
Unidentified Components	766.86	4,454.89	432.93	0.00	5,654.68

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APPLICATION PROCESSING AND CALCULATIONS			

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification: 2643 water draw crude
 City:
 State:
 Company:
 Type of Tank: Domed External Floating Roof Tank
 Description:

Tank Dimensions

Diameter (ft): 44.00
 Volume (gallons): 421,470.00
 Turnovers: 77.00

Paint Characteristics

Internal Shell Condition: Light Rust
 Shell Color/Shade: White/White
 Shell Condition: Good

Roof Characteristics

Type: Double Deck
 Fitting Category: Detail

Tank Construction and Rim-Seal System

Construction: Welded
 Primary Seal: Mechanical Shoe
 Secondary Seal: Rim-mounted

Deck Fitting/Status

	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	12
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1
Roof Drain (3-in. Diameter)/90% Closed	1

Meteorological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

2643 water draw crude - Domed External Floating Roof Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Crude Oil (RVP 11)	All	66.43	60.99	71.87	64.33	9.4081	N/A	N/A	50.0000	0.0028	0.0000	205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0263	N/A	N/A	120.1900	0.0014	0.0009	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3922	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cyclohexane						1.4382	N/A	N/A	84.1600	0.0074	0.0046	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1353	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2563	N/A	N/A	86.1700	0.0096	0.0094	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isopropyl benzene						0.0610	N/A	N/A	120.2000	0.0000	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Naphthalene						0.0033	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
phenol						0.0075	N/A	N/A	94.1100	0.0000	0.0000	94.11	Option 2: A=7.41345, B=1516.07, C=174.57
Toluene						0.4021	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.1818	N/A	N/A	49.6502	0.9611	0.9835	215.30	
Xylenes (mixed isomers)						0.1129	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11

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APPLICATION PROCESSING AND CALCULATIONS			

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

2643 water draw crude - Domed External Floating Roof Tank

Annual Emission
 Calculations

Rim Seal Losses (lb):	131.9574
Seal Factor A (lb-mole/ft-yr):	0.6000
Seal Factor B (lb-mole/ft-yr (mph) ⁿ):	0.4000
Average Wind Speed (mph):	0.0000
Seal-related Wind Speed Exponent:	1.0000
Value of Vapor Pressure Function:	0.2499
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	9.4081
Tank Diameter (ft):	44.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000
Product Factor:	0.4000

Withdrawal Losses (lb):	695.5309
Annual Net Throughput (gal/yr.):	32,453,190.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060
Average Organic Liquid Density (lb/gal):	7.0000
Tank Diameter (ft):	44.0000

Roof Fitting Losses (lb):	611.3526
Value of Vapor Pressure Function:	0.2499
Vapor Molecular Weight (lb/lb-mole):	50.0000
Product Factor:	0.4000
Tot. Roof Fitting Loss Fact. (lb-mole/yr):	122.3100
Average Wind Speed (mph):	0.0000

Total Losses (lb): 1,438.8409

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors			Losses(lb)
		KFa(lb-mole/yr)	KFb(lb-mole/(yr mph ⁿ))	m	
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2	1.60	0.00	0.00	15.9948
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	13.9955
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	2.3492
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	12	0.82	0.53	0.14	49.1841
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3	14.00	3.70	0.78	209.9322
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	30.9900
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	279.9096
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	8.9971

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

2643 water draw crude - Domed External Floating Roof Tank



APPLICATION PROCESSING AND CALCULATIONS

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Components	Losses(lbs)				Total Emissions
	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	
Crude Oil (RVP 11)	131.96	695.53	611.35	0.00	1,438.84
1,2,4-Trimethylbenzene	0.00	1.96	0.02	0.00	1.98
Benzene	0.11	0.98	0.52	0.00	1.62
chrysene	0.00	0.01	0.00	0.00	0.01
Cresol (-m)	0.00	0.00	0.00	0.00	0.00
Isopropyl benzene	0.00	0.02	0.00	0.00	0.02
Cyclohexane	0.61	5.15	2.84	0.00	8.59
Ethylbenzene	0.01	1.04	0.05	0.00	1.10
Hexane (-n)	1.25	6.68	5.77	0.00	13.69
Naphthalene	0.00	0.64	0.00	0.00	0.64
phenol	0.00	0.00	0.00	0.00	0.00
Toluene	0.13	4.01	0.62	0.00	4.77
Xylenes (mixed isomers)	0.06	6.57	0.28	0.00	6.91
Unidentified Components	129.78	668.47	601.24	0.00	1,399.49

TANKS 4.0.9d

Emissions Report - Detail Format

Tank Identification and Physical Characteristics

Identification

User Identification: 2643 water draw legless
 City:
 State:
 Company:
 Type of Tank: Domed External Floating Roof Tank
 Description:

Tank Dimensions

Diameter (ft): 44.00
 Volume (gallons): 421,470.00
 Turnovers: 77.00

Paint Characteristics

Internal Shell Condition: Light Rust
 Shell Color/Shade: White/White
 Shell Condition: Good

Roof Characteristics

Type: Double Deck
 Fitting Category: Detail

Tank Construction and Rim-Seal System

Construction: Welded
 Primary Seal: Mechanical Shoe
 Secondary Seal: Rim-mounted

Deck Fitting/Status

Quantity

Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1



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APPLICATION PROCESSING AND CALCULATIONS

Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed
 Roof Drain (3-in. Diameter)/90% Closed

1
1

Meteorological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

2643 water draw legless - Domed External Floating Roof Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Crude Oil (RVP 11)	All	66.43	60.99	71.87	64.33	9.4081	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0263	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3922	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cyclohexane						1.4382	N/A	N/A	84.1600	0.0074	0.0046	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1353	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2563	N/A	N/A	86.1700	0.0096	0.0094	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isopropyl benzene						0.0610	N/A	N/A	120.2000	0.0000	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Naphthalene						0.0033	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
phenol						0.0075	N/A	N/A	94.1100	0.0000	0.0000	94.11	Option 2: A=7.41345, B=1516.07, C=174.57
Toluene						0.4021	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						10.1818	N/A	N/A	49.6502	0.9611	0.9835	215.30	
Xylenes (mixed isomers)						0.1129	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

2643 water draw legless - Domed External Floating Roof Tank

Annual Emission Calculations	
Rim Seal Losses (lb):	131.9574
Seal Factor A (lb-mole/ft-yr):	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000
Average Wind Speed (mph):	0.0000
Seal-related Wind Speed Exponent:	1.0000
Value of Vapor Pressure Function:	0.2499
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	9.4081
Tank Diameter (ft):	44.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000
Product Factor:	0.4000
Withdrawal Losses (lb):	695.5309
Annual Net Throughput (gal/yr.):	32,453,190.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060
Average Organic Liquid Density (lb/gal):	7.0000
Tank Diameter (ft):	44.0000
Roof Fitting Losses (lb):	562.1685
Value of Vapor Pressure Function:	0.2499
Vapor Molecular Weight (lb/lb-mole):	50.0000
Product Factor:	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	112.4700
Average Wind Speed (mph):	0.0000
Total Losses (lb):	1,389.6567



APPLICATION PROCESSING AND CALCULATIONS

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 J. West

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Roof Fitting/Status	Quantity	Roof Fitting Loss Factors			m	Losses(lb)
		KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))			
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2	1.60	0.00	0.00	15.9948	
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	13.9955	
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	2.3492	
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	3	14.00	3.70	0.78	209.9322	
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	30.9900	
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	279.9096	
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	8.9971	

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

2643 water draw legless - Domed External Floating Roof Tank

Components	Losses(lbs)				Total Emissions
	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	
Hexane (-n)	1.25	6.68	5.31	0.00	13.23
Naphthalene	0.00	0.64	0.00	0.00	0.64
Crude Oil (RVP 11)	131.96	695.53	562.17	0.00	1,389.66
1,2,4-Trimethylbenzene	0.00	1.96	0.02	0.00	1.98
Benzene	0.11	0.98	0.48	0.00	1.58
chrysene	0.00	0.01	0.00	0.00	0.01
Cresol (-m)	0.00	0.00	0.00	0.00	0.00
Isopropyl benzene	0.00	0.02	0.00	0.00	0.02
Cyclohexane	0.61	5.15	2.61	0.00	8.37
Ethylbenzene	0.01	1.04	0.05	0.00	1.10
phenol	0.00	0.00	0.00	0.00	0.00
Toluene	0.13	4.01	0.57	0.00	4.72
Xylenes (mixed isomers)	0.06	6.57	0.26	0.00	6.89
Unidentified Components	129.78	668.47	552.87	0.00	1,351.12

 SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING & COMPLIANCE DIVISION	APPL. NO. 544857 544859 544860 544861	DATE 5/8/13	PAGE 33 of 35
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APPLICATION PROCESSING AND CALCULATIONS			

TANKS 4.0.9d

Emissions Report - Detail Format

Tank Identification and Physical Characteristics

Identification

User Identification: Tank 510/511 (D394/D395)
 City:
 State:
 Company:
 Type of Tank: Domed External Floating Roof Tank
 Description:

Tank Dimensions

Diameter (ft): 218.00
 Volume (gallons): 11,970,000.00
 Turnovers: 64.00

Paint Characteristics

Internal Shell Condition: Light Rust
 Shell Color/Shade: White/White
 Shell Condition: Good

Roof Characteristics

Type: Pontoon
 Fitting Category: Detail

Tank Construction and Rim-Seal System

Construction: Welded
 Primary Seal: Mechanical Shoe
 Secondary Seal: Shoe-mounted

Deck Fitting/Status

	Quantity
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Gasketed	34
Automatic Gauge Float Well/Bolted Cover, Gasketed	2
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Gasketed	77
Roof Drain (3-in. Diameter)/90% Closed	1
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1

Meteorological Data used in Emissions Calculations: Long Beach, California (Avg Atmospheric Pressure = 14.7 psia)

TANKS 4.0.9d

Emissions Report - Detail Format

Liquid Contents of Storage Tank

Tank 510/511 (D394/D395) - Domed External Floating Roof Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Crude Oil (RVP 11)	All	66.43	60.99	71.87	64.33	9.4081	N/A	N/A	50.0000			205.00	Option 4: RVP=11
1,2,4-Trimethylbenzene						0.0263	N/A	N/A	120.1900	0.0028	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3922	N/A	N/A	78.1100	0.0014	0.0009	78.11	Option 2: A=6.905, B=1211.033, C=220.79
chrysene						0.0000	N/A	N/A	228.2800	0.0000	0.0000	228.28	Option 2: A=7.30847, B=2609.83, C=148.439
Cresol (-m)						0.0019	N/A	N/A	108.1000	0.0000	0.0000	108.10	Option 2: A=7.508, B=1856.36, C=199.07
Cyclohexane						1.4382	N/A	N/A	84.1600	0.0074	0.0046	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1353	N/A	N/A	106.1700	0.0015	0.0001	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.2563	N/A	N/A	86.1700	0.0096	0.0094	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isopropyl benzene						0.0610	N/A	N/A	120.2000	0.0000	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78



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Naphthalene	0.0033	N/A	N/A	128.2000	0.0009	0.0000	128.20	Option 2: A=7.3729, B=1968.36, C=222.61
phenol	0.0075	N/A	N/A	94.1100	0.0000	0.0000	94.11	Option 2: A=7.41345, B=1516.07, C=174.57
Toluene	0.4021	N/A	N/A	92.1300	0.0058	0.0010	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components	10.1818	N/A	N/A	49.6502	0.9611	0.9835	215.30	
Xylenes (mixed isomers)	0.1129	N/A	N/A	106.1700	0.0094	0.0005	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Tank 510/511 (D394/D395) - Domed External Floating Roof Tank

Annual Emission Calculations

Rim Seal Losses (lb):	1,743.4371
Seal Factor A (lb-mole/ft-yr):	1.6000
Seal Factor B (lb-mole/ft-yr (mph) ⁿ):	0.3000
Average Wind Speed (mph):	0.0000
Seal-related Wind Speed Exponent:	1.6000
Value of Vapor Pressure Function:	0.2499
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	9.4081
Tank Diameter (ft):	218.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000
Product Factor:	0.4000
Withdrawal Losses (lb):	3,313.8231
Annual Net Throughput (gal/yr.):	766,080,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0060
Average Organic Liquid Density (lb/gal):	7.0000
Tank Diameter (ft):	218.0000
Roof Fitting Losses (lb):	892.1119
Value of Vapor Pressure Function:	0.2499
Vapor Molecular Weight (lb/lb-mole):	50.0000
Product Factor:	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	178.4800
Average Wind Speed (mph):	0.0000
Total Losses (lb):	5,949.3721

Roof Fitting/Status	Quantity	KF _a (lb-mole/yr)	Roof Fitting Loss Factors		m	Losses(lb)
			KF _b (lb-mole/(yr mph ⁿ))			
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2	6.20	1.20	0.94	61.9800	
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	69.9774	
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1	0.47	0.02	0.97	2.3492	
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Gasketed	34	1.30	0.08	0.65	220.9287	
Automatic Gauge Float Well/Bolted Cover, Gasketed	2	2.80	0.00	0.00	27.9910	
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2	1.60	0.00	0.00	15.9948	
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Gasketed	77	0.53	0.11	0.13	203.9841	
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	8.9971	
Ladder Well (36-in. Diam.)/Sliding Cover, Gasketed	1	56.00	0.00	0.00	279.9096	



Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tank 510/511 (D394/D395) - Domed External Floating Roof Tank

Components	Losses(lbs)				Total Emissions
	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	
Crude Oil (RVP 11)	1,743.44	3,313.82	892.11	0.00	5,949.37
Benzene	1.50	4.69	0.77	0.00	6.95
Isopropyl benzene	0.00	0.08	0.00	0.00	0.08
Cyclohexane	8.09	24.52	4.14	0.00	36.75
Ethylbenzene	0.15	4.95	0.08	0.00	5.18
Naphthalene	0.00	3.03	0.00	0.00	3.03
Hexane (-n)	16.46	31.81	8.42	0.00	56.69
Toluene	1.76	19.13	0.90	0.00	21.79
1,2,4-Trimethylbenzene	0.06	9.32	0.03	0.00	9.40
Xylenes (mixed isomers)	0.81	31.29	0.41	0.00	32.51
Cresol (-m)	0.00	0.02	0.00	0.00	0.02
chrysene	0.00	0.07	0.00	0.00	0.07
phenol	0.00	0.01	0.00	0.00	0.01
Unidentified Components	1,714.61	3,184.91	877.36	0.00	5,776.88