

**INTERNAL FLOATING ROOF TANK TANK ID NO. HT-901**

Aloha Petroleum Ltd., Hilo Terminal

Roof Type (Internal, External) =	<b>Internal</b>				
Capacity (bbl)=	8,963	Capacity (gal) =	376,450	Paint Absorptance (pg. 7.1-69) =	0.170
Tank Diameter (ft) =	49	Fuel Type =	Gasoline	Insulation Factor (pg. 7.1-71) =	1,639
Tank Height (ft) =	32	VMW (lb/lb-mole)=	66	Avg. Wind Speed (pg. 7.1-77, below)=	7.20
Liquid Height (ft) =	26.68	Distillation Slope =	3		Hilo 7.20
Throughput (bbl/yr) =	205,000	RVP=	11.500		Honolulu 11.40
Tournovers =	23				Kahului 12.80
					Lihue 12.20

$L_T = L_R + L_{WD} + L_F + L_D =$

$L_R = \text{rim seal loss} = (K_{Ra} + K_{Rb}V^n)DP^*M_VK_C =$  **4,104 lbs**

$K_{Ra}$  (table 7.1-8, pg. 7.1-76) = 5.8

$K_{Rb}$  (table 7.1-8, pg. 7.1-76) = 0.3

$n$  (table 7.1-8, pg. 7.1-76) = 2.1

$v$  (note 1, pg.7.1-23) = 0.00

$P^*$  (vapor pres. function) = 0.219

$K_C$  (page7.1-23)= 1.00

$P_{VA} = 8.661$

$T_{LA} = 539.162$

$A = 11.7$

$B = 5,134$

$T_{AA} = 536.95$

$T_B = 536.97$

$L_{WD} = \text{withdrawl loss} = \{(0.943QCW_L/D)\}[1+(N_C F_C/D)] =$  **34 lbs**

$C$  (table 7.1-10, pg. 7.1-81) = 0.0015

$W_L$  (tables 7.1-2 & 3, pg. 7.1-63) = 5.60

$N_C$  (note 2, pg. 7.1-24, 81) = 1

$F_C$  (note 3, pg. 7.1-24) = 1

$L_F = \text{deck fitting loss} = F_P P^* M_V K_C =$  **4,688 lbs**

$F_P$  (table 7.1-12)= 324.60

$L_D = \text{deck seam loss} = K_D S_D D^2 P^* M_V K_C =$  **- lbs**

$K_D$  (0 for welded, else 0.14 pg. 7.1-26) = 0.00

Total length of deck seam (ft)= 362

$S_D$  (pg. 7.1-26)= 0.000

$L_T =$  **4.4 T/yr VOC**

HAPs	CAS #	Vapor Mass	Emissions
		Fraction	(lb/yr)
1,2,4-Trimethylbenzene		0.0002	1.77
Benzene	71-43-2	0.0034	30.01
Ethylbenzene	100-41-4	0.0004	3.53
Hexane (-n)	100-54-3	0.0058	51.19
Isooctane		0.0073	64.43
Toluene	108-88-3	0.0051	45.01
Xylene (-m)	108-38-3	0.0006	5.30
Xylene (-o)	95-47-6	0.0005	4.41
Xylene (-p)	106-42-3	0.0006	5.30

**Total HAPs (lb/yr) 210.9**

**Total HAPs (TPY) 0.11**

Deck Fitting Loss (table 7.1-12, pg 82)	QTY	$K_F$	Deck Fitting Loss	QTY	$K_F$
<u>Access hatch (24" dia)</u>					
bolted cover, gasket		0.00	Weighted mechanical, gasket		0.00
unbolted cover, gasket		0.00	Weighted mechanical, ungasket		0.00
unbolted cover, no gasket	1	36.00	Slit fabric seal, 10% open area	1	12.00
<u>Fixed roof support column well</u>					
Round pipe, ungasketed sliding cover		0.00	Vacuum breaker		
Round pipe, gasketed sliding cover		0.00	Weighted mechanical, ungasketed		0.00
Round pipe, flex fabric sleeve seal		0.00	Weighted mechanical, gasketed	1	6.20
<u>Built-up col., ungasketed sliding cover</u>					
Built-up col., ungasketed sliding cover	1	47.00	Open		0.00
<u>Built-up col., gasketed sliding cover</u>					
Built-up col., gasketed sliding cover		0.00	90% closed		0.00
<u>Unslotted guide-pole and well</u>					
Ungasketed sliding cover		0.00	Stub drain	19	22.80
Ungasketed sliding cover w/ pole sleeve		0.00	Deck leg		
Gasketed sliding cover		0.00	Adjustable, internal floating	14	110.60
Gasketed sliding cover w/pole wiper		0.00	Adjustable, pontoon area, ungasketed		0.00
Gasketed sliding cover w/pole sleeve		0.00	Adjustable, pontoon area, gasketed		0.00
<u>Slotted guide-pole/sample well</u>					
Ungasketed or gasketed sliding cover		0.00	Adjustable, pontoon area, sock		0.00
Ungasketed or gasketed sliding cover w/float		0.00	Adjustable, center area, ungasketed		0.00
Gasketed sliding cover w/pole wiper		0.00	Adjustable, center area, gasketed		0.00
Gasketed sliding cover w/pole sleeve		0.00	Adjustable, center area, sock		0.00
Gasketed sliding cover w/float & pole wiper		0.00	Adjustable, double deck roofs		0.00
Gasketed sliding cover w/float, wiper & sleeve		0.00	Rim vent		
<u>Automatic gauge float well</u>					
unbolted cover, ungasketed	1	14.00	Weighted mechanical, ungasketed		0.00
unbolted cover, gasket		0.00	Weighted mechanical, gasketed		0.00
bolted cover, gasket		0.00	Ladder well		
			Sliding cover, ungasketed	1	76.00
			Sliding cover, gasketed		0.00
<b>TOTAL</b>					<b>324.60</b>

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Tank Height (ft) =	32	VMW (lb/lb-mole)=	66	Avg. Wind Speed (pg. 7.1-77, below)=	7.20
Liquid Height (ft) =	26.68	Distillation Slope =	3		Hilo 7.20
Throughput (bbl/yr) =	250,000	RVP=	11.500		Honolulu 11.40
Tournovers =	28				Kahului 12.80
					Lihue 12.20

$L_T = L_R + L_{WD} + L_F + L_D =$

$L_R = \text{rim seal loss} = (K_{Ra} + K_{Rb}V^n)DP^*M_VK_C =$  **4,104 lbs**

$K_{Ra}$  (table 7.1-8, pg. 7.1-76) = 5.8

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$n$  (table 7.1-8, pg. 7.1-76) = 2.1

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$K_C$  (page 7.1-23) = 1.00

$P_{VA} = 8.661$

$T_{LA} = 539.162$

$A = 11.7$

$B = 5,134$

$T_{AA} = 536.95$

$T_B = 536.97$

$L_{WD} = \text{withdrawl loss} = \{(0.943QCW_L/D)\}[1+(N_C F_C/D)] =$  **41 lbs**

$C$  (table 7.1-10, pg. 7.1-81) = 0.0015

$W_L$  (tables 7.1-2 & 3, pg. 7.1-63) = 5.60

$N_C$  (note 2, pg. 7.1-24, 81) = 1

$F_C$  (note 3, pg. 7.1-24) = 1

$L_F = \text{deck fitting loss} = F_P P^* M_V K_C =$  **4,688 lbs**

$F_P$  (table 7.1-12) = 324.60

$L_D = \text{deck seam loss} = K_D S_D D^2 P^* M_V K_C =$  **- lbs**

$K_D$  (0 for welded, else 0.14 pg. 7.1-26) = 0.00

Total length of deck seam (ft) = 362

$S_D$  (pg. 7.1-26) = 0.000

$L_T =$  **4.4 T/yr VOC**

HAPs	CAS #	Vapor Mass	Emissions
		Fraction	(lb/yr)
1,2,4-Trimethylbenzene		0.0002	1.77
Benzene	71-43-2	0.0034	30.03
Ethylbenzene	100-41-4	0.0004	3.53
Hexane (-n)	100-54-3	0.0058	51.23
Isooctane		0.0073	64.48
Toluene	108-88-3	0.0051	45.05
Xylene (-m)	108-38-3	0.0006	5.30
Xylene (-o)	95-47-6	0.0005	4.42
Xylene (-p)	106-42-3	0.0006	5.30

**Total HAPs (lb/yr) 211.1**

**Total HAPs (TPY) 0.11**

Deck Fitting Loss (table 7.1-12, pg 82)	QTY	K <sub>F</sub>	Deck Fitting Loss	QTY	K <sub>F</sub>
<u>Access hatch (24" dia)</u>			<u>Gauge-hatch/sample port</u>		
bolted cover, gasket		0.00	Weighted mechanical, gasket		0.00
unbolted cover, gasket		0.00	Weighted mechanical, ungasket		0.00
unbolted cover, no gasket	1	36.00	Slit fabric seal, 10% open area	1	12.00
<u>Fixed roof support column well</u>			<u>Vacuum breaker</u>		
Round pipe, ungasketed sliding cover		0.00	Weighted mechanical, ungasketed		0.00
Round pipe, gasketed sliding cover		0.00	Weighted mechanical, gasketed	1	6.20
Round pipe, flex fabric sleeve seal		0.00	<u>Deck drain (3" dia.)</u>		
Built-up col., ungasketed sliding cover	1	47.00	Open		0.00
Built-up col., gasketed sliding cover		0.00	90% closed		0.00
<u>Unslotted guide-pole and well</u>			<u>Stub drain</u>	19	22.80
Ungasketed sliding cover		0.00	<u>Deck leg</u>		
Ungasketed sliding cover w/ pole sleeve		0.00	Adjustable, internal floating	14	110.60
Gasketed sliding cover		0.00	Adjustable, pontoon area, ungasketed		0.00
Gasketed sliding cover w/pole wiper		0.00	Adjustable, pontoon area, gasketed		0.00
Gasketed sliding cover w/pole sleeve		0.00	Adjustable, pontoon area, sock		0.00
<u>Slotted guide-pole/sample well</u>			Adjustable, center area, ungasketed		0.00
Ungasketed or gasketed sliding cover		0.00	Adjustable, center area, gasketed		0.00
Ungasketed or gasketed sliding cover w/float		0.00	Adjustable, center area, sock		0.00
Gasketed sliding cover w/pole wiper		0.00	Adjustable, double deck roofs		0.00
Gasketed sliding cover w/pole sleeve		0.00	<u>Rim vent</u>		
Gasketed sliding cover w/float & pole wiper		0.00	Weighted mechanical, ungasketed		0.00
Gasketed sliding cover w/float, wiper & sleeve		0.00	Weighted mechanical, gasketed		0.00
<u>Automatic gauge float well</u>			<u>Ladder well</u>		
unbolted cover, ungasketed	1	14.00	Sliding cover, ungasketed	1	76.00
unbolted cover, gasket		0.00	Sliding cover, gasketed		0.00
bolted cover, gasket		0.00			

**TOTAL 324.60**