

**INTERNAL FLOATING ROOF TANK TANK ID NO. 101**

Aloha Petroleum CIP

Roof Type (Internal, External) = Internal  
 Capacity (bbl)= 50,000 Capacity (gal)= 2,100,000 Paint Absorptance (pg. 7.1-61) = 0.170  
 Tank Diameter (ft)= 79 Fuel Type= UNLEADED PREM Insulation Factor (pg. 7.1-64) = 1,639  
 Tank Height (ft)= 60 VMW (lb/lb-mole)= 66 Avg. Wind Speed (pg. 7.1-74, below)= 11.40  
 Liquid Height (ft)= 57.27 Distillation Slope= 3 Hilo 7.20  
 Throughput (bbl/yr)= 1,169,000 RVP= 11.500 Honolulu 11.40  
 Turnovers= 23 Kahului 12.80  
 Lihue 12.20

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

$L_R = \text{rim seal loss} = (K_{Ra} + K_{Rb}v^n)DP^*M_VK_C = 6617$

$K_{Ra}$  (table 7.1-8, pg. 7.1-73) = 5.8  
 $K_{Rb}$  (table 7.1-8, pg. 7.1-73) = 0.3  
 $n$  (table 7.1-8, pg. 7.1-73) = 2.1  
 $v$  (note 1, pg.7.1-21) = 0.00  
 $P^*$  (vapor pres. function) = 0.219  
 $K_C$  (page 7.1-21) = 1.00

A = 11.7  
 B = 5,134  
 $T_{AA}$  = 536.95  
 $T_B$  = 536.97

$P_{VA}$  = 8.661  
 $T_{LA}$  = 539.162

$L_{WD} = \text{withdrawal loss} = \{(0.943QCW_L)/D\}[1+(N_C F_C/D)] = 119$

C (table 7.1-10, pg. 7.1-78) = 0.0015  
 $W_L$  (tables 7.1-2 & 3, pg. 7.1-53) = 5.60  
 $N_C$  (note 2, pg. 7.1-22) = 1  
 $F_C$  (note 3, pg. 7.1-21) = 1

$L_F = \text{deck fitting loss} = F_F P^* M_V K_C = 5999$

$F_F$  (table 7.1-12) = 415.36

$L_D = \text{deck seam loss} = K_D S_D D^2 P^* M_V K_C = 0$

$K_D$  (0 for welded, else 0.14 pg. 7.1-24) = 0.00  
 Total length of deck seam (ft) = 0  
 $S_D$  (pg. 7.1-25) = 0.000

$L_T = 6.4 \text{ T/yr VOC}$

HAPs	CAS #	Vapor Mass Fraction	Emissions (lb/yr)
Benzene	71432	0.0052	66.22
Cyclohexane	110827	0.0007	8.91
Ethylbenzene	95476	0.0004	5.09
Hexane	110543	0.0046	58.58
Isooctane	540841	0.0064	81.50
Toluene	108883	0.0061	77.68
1,2,4-Trimethylbenzene	95636	0.0002	2.55
Isopropyl benzene	98828	0.0001	1.27
Naphthalene	91203	0.0000	0.00
Xylene, mixed	108383	0.0018	22.92

**Total HAPs (lb/yr) 324.7**  
**Total HAPs (TPY) 0.16**

Deck Fitting Loss	QTY	$K_F$	Deck Fitting Loss	QTY	$K_F$
<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>	29	34.56
Ungasketed sliding cover		0.00	<u>Deck leg</u>		
Ungasketed sliding cover w/ pole sleeve		0.00	Adjustable, internal floating	24	189.60
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 415.36

**INTERNAL FLOATING ROOF TANK TANK ID NO. 102**

Aloha Petroleum CIP

Roof Type (Internal, External) = Internal  
 Capacity (bbl)= 50,000 Capacity (gal)= 2,100,000 Paint Absorptance (pg. 7.1-61) = 0.170  
 Tank Diameter (ft)= 79 Fuel Type= UNLEADED PREM Insulation Factor (pg. 7.1-64) = 1,639  
 Tank Height (ft)= 60 VMW (lb/lb-mole)= 66 Avg. Wind Speed (pg. 7.1-74, below)= 11.40  
 Liquid Height (ft)= 57.27 Distillation Slope= 3 Hilo 7.20  
 Throughput (bbl/yr)= 1,169,000 RVP= 11.500 Honolulu 11.40  
 Turnovers= 23 Kahului 12.80  
 Lihue 12.20

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

$L_R = \text{rim seal loss} = (K_{Ra} + K_{Rb}v^n)DP^*M_VK_C = 6617$

$K_{Ra}$  (table 7.1-8, pg. 7.1-73) = 5.8  
 $K_{Rb}$  (table 7.1-8, pg. 7.1-73) = 0.3  
 n (table 7.1-8, pg. 7.1-73) = 2.1  
 v (note 1, pg.7.1-21) = 0.00  
 $P^*$  (vapor pres. function) = 0.219  
 $K_C$  (page 7.1-21) = 1.00

A = 11.7  
 B = 5,134  
 $T_{AA}$  = 536.95  
 $T_B$  = 536.97

$P_{VA}$  = 8.661  
 $T_{LA}$  = 539.162

$L_{WD} = \text{withdrawal loss} = \{(0.943QCW_L)/D\}[1+(N_C F_C/D)] = 119$

C (table 7.1-10, pg. 7.1-78) = 0.0015  
 $W_L$  (tables 7.1-2 & 3, pg. 7.1-53) = 5.60  
 $N_C$  (note 2, pg. 7.1-22) = 1  
 $F_C$  (note 3, pg. 7.1-21) = 1

$L_F = \text{deck fitting loss} = F_F P^* M_V K_C = 5999$

$F_F$  (table 7.1-12) = 415.36

$L_D = \text{deck seam loss} = K_D S_D D^2 P^* M_V K_C = 0$

$K_D$  (0 for welded, else 0.14 pg. 7.1-24) = 0.00  
 Total length of deck seam (ft) = 0  
 $S_D$  (pg. 7.1-25) = 0.000

$L_T = 6.4 \text{ T/yr VOC}$

HAPs	CAS #	Vapor Mass Fraction	Emissions (lb/yr)
Benzene	71432	0.0052	66.22
Cyclohexane	110827	0.0007	8.91
Ethylbenzene	95476	0.0004	5.09
Hexane	110543	0.0046	58.58
Isooctane	540841	0.0064	81.50
Toluene	108883	0.0061	77.68
1,2,4-Trimethylbenzene	95636	0.0002	2.55
Isopropyl benzene	98828	0.0001	1.27
Naphthalene	91203	0.0000	0.00
Xylene, mixed	108383	0.0018	22.92

**Total HAPs (lb/yr) 324.7**  
**Total HAPs (TPY) 0.16**

Deck Fitting Loss	QTY	$K_F$	Deck Fitting Loss	QTY	$K_F$
<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>	29	34.56
Ungasketed sliding cover		0.00	<u>Deck leg</u>		
Ungasketed sliding cover w/ pole sleeve		0.00	Adjustable, internal floating	24	189.60
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 415.36

**INTERNAL FLOATING ROOF TANK TANK ID NO. 103**

Aloha Petroleum CIP

Roof Type (Internal, External) = Internal  
 Capacity (bbl)= 50,000 Capacity (gal)= 2,100,000 Paint Absorptance (pg. 7.1-61) = 0.170  
 Tank Diameter (ft)= 79 Fuel Type= UNLEADED PREM Insulation Factor (pg. 7.1-64) = 1,639  
 Tank Height (ft)= 60 VMW (lb/lb-mole)= 66 Avg. Wind Speed (pg. 7.1-74, below)= 11.40  
 Liquid Height (ft)= 57.27 Distillation Slope= 3 Hilo 7.20  
 Throughput (bbl/yr)= 1,169,000 RVP= 11.500 Honolulu 11.40  
 Turnovers= 23 Kahului 12.80  
 Lihue 12.20

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

$L_R = \text{rim seal loss} = (K_{Ra} + K_{Rb}v^n)DP^*M_VK_C = 6617$

$K_{Ra}$  (table 7.1-8, pg. 7.1-73) = 5.8  
 $K_{Rb}$  (table 7.1-8, pg. 7.1-73) = 0.3  
 $n$  (table 7.1-8, pg. 7.1-73) = 2.1  
 $v$  (note 1, pg.7.1-21) = 0.00  
 $P^*$  (vapor pres. function) = 0.219  
 $K_C$  (page 7.1-21) = 1.00

A = 11.7  
 B = 5,134  
 $T_{AA}$  = 536.95  
 $T_B$  = 536.97

$P_{VA}$  = 8.661  
 $T_{LA}$  = 539.162

$L_{WD} = \text{withdrawal loss} = \{(0.943QCW_L)/D\}[1+(N_C F_C/D)] = 119$

C (table 7.1-10, pg. 7.1-78) = 0.0015  
 $W_L$  (tables 7.1-2 & 3, pg. 7.1-53) = 5.60  
 $N_C$  (note 2, pg. 7.1-22) = 1  
 $F_C$  (note 3, pg. 7.1-21) = 1

$L_F = \text{deck fitting loss} = F_F P^* M_V K_C = 5999$

$F_F$  (table 7.1-12) = 415.36

$L_D = \text{deck seam loss} = K_D S_D D^2 P^* M_V K_C = 0$

$K_D$  (0 for welded, else 0.14 pg. 7.1-24) = 0.00  
 Total length of deck seam (ft) = 0  
 $S_D$  (pg. 7.1-25) = 0.000

$L_T = 6.4 \text{ T/yr VOC}$

HAPs	CAS #	Vapor Mass Fraction	Emissions (lb/yr)
Benzene	71432	0.0052	66.22
Cyclohexane	110827	0.0007	8.91
Ethylbenzene	95476	0.0004	5.09
Hexane	110543	0.0046	58.58
Isooctane	540841	0.0064	81.50
Toluene	108883	0.0061	77.68
1,2,4-Trimethylbenzene	95636	0.0002	2.55
Isopropyl benzene	98828	0.0001	1.27
Naphthalene	91203	0.0000	0.00
Xylene, mixed	108383	0.0018	22.92

**Total HAPs (lb/yr) 324.7**  
**Total HAPs (TPY) 0.16**

Deck Fitting Loss	QTY	$K_F$	Deck Fitting Loss	QTY	$K_F$
<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>	29	34.56
Ungasketed sliding cover		0.00	<u>Deck leg</u>		
Ungasketed sliding cover w/ pole sleeve		0.00	Adjustable, internal floating	24	189.60
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 415.36		

**INTERNAL FLOATING ROOF TANK TANK ID NO. 201**

Aloha Petroleum CIP

Roof Type (Internal, External) = Internal  
 Capacity (bbl)= 35,000 Capacity (gal)= 1,470,000 Paint Absorptance (pg. 7.1-61) = 0.170  
 Tank Diameter (ft)= 65 Fuel Type= UNLEADED PREM Insulation Factor (pg. 7.1-64) = 1.639  
 Tank Height (ft)= 60 VMW (lb/lb-mole)= 66 Avg. Wind Speed (pg. 7.1-74, below)= 11.40  
 Liquid Height (ft)= 59.22 Distillation Slope= 3 Hilo 7.20  
 Throughput (bbl/yr)= 818,300 RVP= 11.500 Honolulu 11.40  
 Turnovers= 23 Kahului 12.80  
 Lihue 12.20

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

$L_R = \text{rim seal loss} = (K_{Ra} + K_{Rb}v^n)DP^*M_VK_C = 5445$

$K_{Ra}$  (table 7.1-8, pg. 7.1-73) = 5.8  
 $K_{Rb}$  (table 7.1-8, pg. 7.1-73) = 0.3  
 $n$  (table 7.1-8, pg. 7.1-73) = 2.1  
 $v$  (note 1, pg.7.1-21) = 0.00  
 $P^*$  (vapor pres. function) = 0.219  
 $K_C$  (page 7.1-21) = 1.00

A = 11.7  
 B = 5,134  
 $T_{AA}$  = 536.95  
 $T_B$  = 536.97

$L_{WD} = \text{withdrawal loss} = \{(0.943QCW_L)/D\}[1+(N_C F_C/D)] = 101$

C (table 7.1-10, pg. 7.1-78) = 0.0015  
 $W_L$  (tables 7.1-2 & 3, pg. 7.1-53) = 5.60  
 $N_C$  (note 2, pg. 7.1-22) = 1  
 $F_C$  (note 3, pg. 7.1-21) = 1

$L_F = \text{deck fitting loss} = F_F P^* M_V K_C = 5428$

$F_F$  (table 7.1-12) = 375.86

$L_D = \text{deck seam loss} = K_D S_D D^2 P^* M_V K_C = 0$

$K_D$  (0 for welded, else 0.14 pg. 7.1-24) = 0.00  
 Total length of deck seam (ft) = 0  
 $S_D$  (pg. 7.1-25) = 0.000

$L_T = 5.5 \text{ T/yr VOC}$

HAPs	CAS #	Vapor Mass Fraction	Emissions (lb/yr)
Benzene	71432	0.0052	57.06
Cyclohexane	110827	0.0007	7.68
Ethylbenzene	95476	0.0004	4.39
Hexane	110543	0.0046	50.48
Isooctane	540841	0.0064	70.23
Toluene	108883	0.0061	66.94
1,2,4-Trimethylbenzene	95636	0.0002	2.19
Isopropyl benzene	98828	0.0001	1.10
Naphthalene	91203	0.0000	0.00
Xylene, mixed	108383	0.0018	19.75

**Total HAPs (lb/yr) 279.8**  
**Total HAPs (TPY) 0.14**

Deck Fitting Loss	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>	29	34.56
Ungasketed sliding cover		0.00	<u>Deck leg</u>		
Ungasketed sliding cover w/ pole sleeve		0.00	Adjustable, internal floating	19	150.10
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 375.86

**INTERNAL FLOATING ROOF TANK TANK ID NO. 202**

Aloha Petroleum CIP

Roof Type (Internal, External) = Internal  
 Capacity (bbl)= 60,000 Capacity (gal)= 2,520,000 Paint Absorptance (pg. 7.1-61) = 0.170  
 Tank Diameter (ft)= 85 Fuel Type= UNLEADED PREM Insulation Factor (pg. 7.1-64) = 1,639  
 Tank Height (ft)= 60 VMW (lb/lb-mole)= 66 Avg. Wind Speed (pg. 7.1-74, below)= 11.40  
 Liquid Height (ft)= 59.36 Distillation Slope= 3 Hilo 7.20  
 Throughput (bbl/yr)= 1,402,800 RVP= 11.500 Honolulu 11.40  
 Turnovers= 23 Kahului 12.80  
 Lihue 12.20

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

$L_R = \text{rim seal loss} = (K_{Ra} + K_{Rb}v^n)DP^*M_VK_C = 7120$

$K_{Ra}$  (table 7.1-8, pg. 7.1-73) = 5.8  
 $K_{Rb}$  (table 7.1-8, pg. 7.1-73) = 0.3  
 n (table 7.1-8, pg. 7.1-73) = 2.1  
 v (note 1, pg.7.1-21) = 0.00  
 $P^*$  (vapor pres. function) = 0.219  
 $K_C$  (page 7.1-21) = 1.00

A = 11.7  
 B = 5,134  
 $T_{AA}$  = 536.95  
 $T_B$  = 536.97

$P_{VA}$  = 8.661  
 $T_{LA}$  = 539.162

$L_{WD} = \text{withdrawal loss} = \{(0.943QCW_L)/D\}[1+(N_C F_C/D)] = 132$

C (table 7.1-10, pg. 7.1-78) = 0.0015  
 $W_L$  (tables 7.1-2 & 3, pg. 7.1-53) = 5.60  
 $N_C$  (note 2, pg. 7.1-22) = 1  
 $F_C$  (note 3, pg. 7.1-21) = 1

$L_F = \text{deck fitting loss} = F_F P^* M_V K_C = 6227$

$F_F$  (table 7.1-12) = 431.16

$L_D = \text{deck seam loss} = K_D S_D D^2 P^* M_V K_C = 0$

$K_D$  (0 for welded, else 0.14 pg. 7.1-24) = 0.00  
 Total length of deck seam (ft) = 0  
 $S_D$  (pg. 7.1-25) = 0.000

$L_T = 6.7 \text{ T/yr VOC}$

HAPs	CAS #	Vapor Mass Fraction	Emissions (lb/yr)
Benzene	71432	0.0052	70.09
Cyclohexane	110827	0.0007	9.44
Ethylbenzene	95476	0.0004	5.39
Hexane	110543	0.0046	62.00
Isooctane	540841	0.0064	86.26
Toluene	108883	0.0061	82.22
1,2,4-Trimethylbenzene	95636	0.0002	2.70
Isopropyl benzene	98828	0.0001	1.35
Naphthalene	91203	0.0000	0.00
Xylene, mixed	108383	0.0018	24.26

**Total HAPs (lb/yr) 343.7**  
**Total HAPs (TPY) 0.17**

Deck Fitting Loss	QTY	$K_F$	Deck Fitting Loss	QTY	$K_F$
<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>	29	34.56
Ungasketed sliding cover		0.00	<u>Deck leg</u>		
Ungasketed sliding cover w/ pole sleeve		0.00	Adjustable, internal floating	26	205.40
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 431.16

**INTERNAL FLOATING ROOF TANK TANK ID NO. 203**

Aloha Petroleum CIP

Roof Type (Internal, External) = Internal  
 Capacity (bbl)= **68,000** Capacity (gal)= 2,856,000 Paint Absorptance (pg. 7.1-61) = **0.170**  
 Tank Diameter (ft)= **92** Fuel Type= **UNLEADED PREM** Insulation Factor (pg. 7.1-64) = 1,639  
 Tank Height (ft)= **60** VMW (lb/lb-mole)= **66** Avg. Wind Speed (pg. 7.1-74, below)= **11.40**  
 Liquid Height (ft)= 57.43 Distillation Slope= **3** Hilo 7.20  
 Throughput (bbl/yr)= **383,520** RVP= **11.500** Honolulu 11.40  
 Turnovers= 6 Kahului 12.80  
 Lihue 12.20

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

$L_R = \text{rim seal loss} = (K_{Ra} + K_{Rb}v^n)DP^*M_VK_C = 7706$

$K_{Ra}$  (table 7.1-8, pg. 7.1-73) = **5.8**  
 $K_{Rb}$  (table 7.1-8, pg. 7.1-73) = **0.3**  
 $n$  (table 7.1-8, pg. 7.1-73) = **2.1**  
 $v$  (note 1, pg.7.1-21) = 0.00  
 $P^*$  (vapor pres. function) = 0.219  
 $K_C$  (page 7.1-21) = 1.00

A = 11.7  
 B = 5,134  
 $T_{AA}$  = 536.95  
 $T_B$  = 536.97

$P_{VA}$  = 8.661  
 $T_{LA}$  = 539.162

$L_{WD} = \text{withdrawal loss} = \{(0.943QCW_L)/D\}[1+(N_C F_C/D)] = 33$

C (table 7.1-10, pg. 7.1-78) = **0.0015**  
 $W_L$  (tables 7.1-2 & 3, pg. 7.1-53) = **5.60**  
 $N_C$  (note 2, pg. 7.1-22) = **1**  
 $F_C$  (note 3, pg. 7.1-21) = **1**

$L_F = \text{deck fitting loss} = F_F P^* M_V K_C = 10295$

$F_F$  (table 7.1-12) = 712.86

$L_D = \text{deck seam loss} = K_D S_D D^2 P^* M_V K_C = 0$

$K_D$  (0 for welded, else 0.14 pg. 7.1-24) = **0.00**  
 Total length of deck seam (ft) = **0**  
 $S_D$  (pg. 7.1-25) = 0.000

$L_T = 9.0 \text{ T/yr VOC}$

HAPs	CAS #	Vapor Mass Fraction	Emissions (lb/yr)
Benzene	71432	0.0052	93.78
Cyclohexane	110827	0.0007	12.62
Ethylbenzene	95476	0.0004	7.21
Hexane	110543	0.0046	82.96
Isooctane	540841	0.0064	115.42
Toluene	108883	0.0061	110.01
1,2,4-Trimethylbenzene	95636	0.0002	3.61
Isopropyl benzene	98828	0.0001	1.80
Naphthalene	91203	0.0000	0.00
Xylene, mixed	108383	0.0018	32.46

**Total HAPs (lb/yr) 459.9**  
**Total HAPs (TPY) 0.23**

Deck Fitting Loss	QTY	$K_F$	Deck Fitting Loss	QTY	$K_F$
<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>			Stub drain	29	34.56
Ungasketed sliding cover		0.00	<u>Deck leg</u>		
Ungasketed sliding cover w/ pole sleeve		0.00	Adjustable, internal floating	29	229.10
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	6	258.00	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 712.86

**INTERNAL FLOATING ROOF TANK TANK ID NO. 204**

Aloha Petroleum CIP

Roof Type (Internal, External) = Internal  
 Capacity (bbl)= 68,000 Capacity (gal)= 2,856,000 Paint Absorptance (pg. 7.1-61) = 0.170  
 Tank Diameter (ft)= 92 Fuel Type= UNLEADED PREM Insulation Factor (pg. 7.1-64) = 1,639  
 Tank Height (ft)= 60 VMW (lb/lb-mole)= 66 Avg. Wind Speed (pg. 7.1-74, below)= 11.40  
 Liquid Height (ft)= 57.43 Distillation Slope= 3 Hilo 7.20  
 Throughput (bbl/yr)= 383,520 RVP= 11.500 Honolulu 11.40  
 Turnovers= 6 Kahului 12.80  
 Lihue 12.20

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

$L_R = \text{rim seal loss} = (K_{Ra} + K_{Rb}v^n)DP^*M_VK_C = 7706$

$K_{Ra}$  (table 7.1-8, pg. 7.1-73) = 5.8  
 $K_{Rb}$  (table 7.1-8, pg. 7.1-73) = 0.3  
 $n$  (table 7.1-8, pg. 7.1-73) = 2.1  
 $v$  (note 1, pg.7.1-21) = 0.00  
 $P^*$  (vapor pres. function) = 0.219  
 $K_C$  (page 7.1-21) = 1.00

A = 11.7  
 B = 5,134  
 $T_{AA}$  = 536.95  
 $T_B$  = 536.97

$P_{VA}$  = 8.661  
 $T_{LA}$  = 539.162

$L_{WD} = \text{withdrawal loss} = \{(0.943QCW_L)/D\}[1+(N_C F_C/D)] = 33$

C (table 7.1-10, pg. 7.1-78) = 0.0015  
 $W_L$  (tables 7.1-2 & 3, pg. 7.1-53) = 5.60  
 $N_C$  (note 2, pg. 7.1-22) = 1  
 $F_C$  (note 3, pg. 7.1-21) = 1

$L_F = \text{deck fitting loss} = F_F P^* M_V K_C = 10295$

$F_F$  (table 7.1-12) = 712.86

$L_D = \text{deck seam loss} = K_D S_D D^2 P^* M_V K_C = 0$

$K_D$  (0 for welded, else 0.14 pg. 7.1-24) = 0.00  
 Total length of deck seam (ft) = 0  
 $S_D$  (pg. 7.1-25) = 0.000

$L_T = 9.0 \text{ T/yr VOC}$

HAPs	CAS #	Vapor Mass Fraction	Emissions (lb/yr)
Benzene	71432	0.0052	93.78
Cyclohexane	110827	0.0007	12.62
Ethylbenzene	95476	0.0004	7.21
Hexane	110543	0.0046	82.96
Isooctane	540841	0.0064	115.42
Toluene	108883	0.0061	110.01
1,2,4-Trimethylbenzene	95636	0.0002	3.61
Isopropyl benzene	98828	0.0001	1.80
Naphthalene	91203	0.0000	0.00
Xylene, mixed	108383	0.0018	32.46

**Total HAPs (lb/yr) 459.9**  
**Total HAPs (TPY) 0.23**

Deck Fitting Loss	QTY	$K_F$	Deck Fitting Loss	QTY	$K_F$
<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>	29	34.56
Ungasketed sliding cover		0.00	<u>Deck leg</u>		
Ungasketed sliding cover w/ pole sleeve		0.00	Adjustable, internal floating	29	229.10
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	6	258.00	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 712.86

**INTERNAL FLOATING ROOF TANK TANK ID NO. 205**

Aloha Petroleum CIP

Roof Type (Internal, External) = Internal  
 Capacity (bbl)= 50,000 Capacity (gal)= 2,100,000 Paint Absorptance (pg. 7.1-61) = 0.170  
 Tank Diameter (ft)= 79 Fuel Type= UNLEADED PREM Insulation Factor (pg. 7.1-64) = 1,639  
 Tank Height (ft)= 60 VMW (lb/lb-mole)= 66 Avg. Wind Speed (pg. 7.1-74, below)= 11.40  
 Liquid Height (ft)= 57.27 Distillation Slope= 3 Hilo 7.20  
 Throughput (bbl/yr)= 1,169,000 RVP= 11.500 Honolulu 11.40  
 Turnovers= 23 Kahului 12.80  
 Lihue 12.20

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

$L_R = \text{rim seal loss} = (K_{Ra} + K_{Rb}v^n)DP^*M_VK_C = 6617$

$K_{Ra}$  (table 7.1-8, pg. 7.1-73) = 5.8  
 $K_{Rb}$  (table 7.1-8, pg. 7.1-73) = 0.3  
 $n$  (table 7.1-8, pg. 7.1-73) = 2.1  
 $v$  (note 1, pg.7.1-21) = 0.00  
 $P^*$  (vapor pres. function) = 0.219  
 $K_C$  (page 7.1-21) = 1.00

A = 11.7  
 B = 5,134  
 $T_{AA}$  = 536.95  
 $T_B$  = 536.97

$P_{VA}$  = 8.661  
 $T_{LA}$  = 539.162

$L_{WD} = \text{withdrawal loss} = \{(0.943QCW_L)/D\}[1+(N_C F_C/D)] = 119$

C (table 7.1-10, pg. 7.1-78) = 0.0015  
 $W_L$  (tables 7.1-2 & 3, pg. 7.1-53) = 5.60  
 $N_C$  (note 2, pg. 7.1-22) = 1  
 $F_C$  (note 3, pg. 7.1-21) = 1

$L_F = \text{deck fitting loss} = F_F P^* M_V K_C = 5999$

$F_F$  (table 7.1-12) = 415.36

$L_D = \text{deck seam loss} = K_D S_D D^2 P^* M_V K_C = 0$

$K_D$  (0 for welded, else 0.14 pg. 7.1-24) = 0.00  
 Total length of deck seam (ft) = 0  
 $S_D$  (pg. 7.1-25) = 0.000

$L_T = 6.4 \text{ T/yr VOC}$

HAPs	CAS #	Vapor Mass Fraction	Emissions (lb/yr)
Benzene	71432	0.0052	66.22
Cyclohexane	110827	0.0007	8.91
Ethylbenzene	95476	0.0004	5.09
Hexane	110543	0.0046	58.58
Isooctane	540841	0.0064	81.50
Toluene	108883	0.0061	77.68
1,2,4-Trimethylbenzene	95636	0.0002	2.55
Isopropyl benzene	98828	0.0001	1.27
Naphthalene	91203	0.0000	0.00
Xylene, mixed	108383	0.0018	22.92

**Total HAPs (lb/yr) 324.7**  
**Total HAPs (TPY) 0.16**

Deck Fitting Loss	QTY	$K_F$	Deck Fitting Loss	QTY	$K_F$
<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>	29	34.56
Ungasketed sliding cover		0.00	<u>Deck leg</u>		
Ungasketed sliding cover w/ pole sleeve		0.00	Adjustable, internal floating	24	189.60
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 415.36		

**INTERNAL FLOATING ROOF TANK TANK ID NO. 301**

Aloha Petroleum CIP

Roof Type (Internal, External) = Internal  
 Capacity (bbl)= 5,000 Fuel Type= UNLEADED PREM  
 Tank Diameter (ft)= 41 VMW (lb/lb-mole)= 66  
 Tank Height (ft)= 24 Distillation Slope= 3  
 Liquid Height (ft)= 21.26 RVP= 11.500  
 Throughput (bbl/yr)= 23,800  
 Turnovers= 5

Paint Absorptance (pg. 7.1-61) = 0.170  
 Insulation Factor (pg. 7.1-64) = 1,639  
 Avg. Wind Speed (pg. 7.1-74, below)= 11.40

Hilo 7.20  
 Honolulu 11.40  
 Kahului 12.80  
 Lihue 12.20

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

$L_R = \text{rim seal loss} = (K_{Ra} + K_{Rb}v^n)DP^*M_VK_C = 3434$

$K_{Ra}$  (table 7.1-8, pg. 7.1-73) = 5.8  
 $K_{Rb}$  (table 7.1-8, pg. 7.1-73) = 0.3  
 $n$  (table 7.1-8, pg. 7.1-73) = 2.1  
 $v$  (note 1, pg.7.1-21) = 0.00  
 $P^*$  (vapor pres. function) = 0.219  
 $K_C$  (page 7.1-21) = 1.00

A = 11.7  
 B = 5,134  
 $T_{AA}$  = 536.95  
 $T_B$  = 536.97

$P_{VA}$  = 8.661  
 $T_{LA}$  = 539.162

$L_{WD} = \text{withdrawl loss} = \{(0.943QCW_L)/D\}[1+(N_C F_C/D)] = 5$

C (table 7.1-10, pg. 7.1-78) = 0.0015  
 $W_L$  (tables 7.1-2 & 3, pg. 7.1-53) = 5.60  
 $N_C$  (note 2, pg. 7.1-22) = 1  
 $F_C$  (note 3, pg. 7.1-21) = 1

$L_F = \text{deck fitting loss} = F_F P^* M_V K_C = 4210$

$F_F$  (table 7.1-12) = 291.53

$L_D = \text{deck seam loss} = K_D S_D D^2 P^* M_V K_C = 0$

$K_D$  (0 for welded, else 0.14 pg. 7.1-24) = 0.00  
 Total length of deck seam (ft) = 0  
 $S_D$  (pg. 7.1-25) = 0.000

$L_T = 3.8 \text{ T/yr VOC}$

HAPs	CAS #	Vapor Mass Fraction	Emissions (lb/yr)
Benzene	71432	0.0052	39.78
Cyclohexane	110827	0.0007	5.35
Ethylbenzene	95476	0.0004	3.06
Hexane	110543	0.0046	35.19
Isooctane	540841	0.0064	48.96
Toluene	108883	0.0061	46.66
1,2,4-Trimethylbenzene	95636	0.0002	1.53
Isopropyl benzene	98828	0.0001	0.76
Naphthalene	91203	0.0000	0.00
Xylene, mixed	108383	0.0018	13.77

**Total HAPs (lb/yr) 195.1**  
**Total HAPs (TPY) 0.10**

Deck Fitting Loss	QTY	$K_F$	Deck Fitting Loss	QTY	$K_F$
<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>	5	5.53
Ungasketed sliding cover		0.00	<u>Deck leg</u>		
Ungasketed sliding cover w/ pole sleeve		0.00	Adjustable, internal floating	12	94.80
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 291.53