Rule 1401:

HIs:

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
HNO_3	1.14E-04	1.00	0.086	-	1.33E-03	-	Yes
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
Total					1.33E-03	-	

Monthly throughput limit: 11,348 gals/month

ATTACMENT
POLY ETCH
T-155
Vertical
Control: 492806

Previous:	F54707	383502		A/N:	460730
Given:					
Tank dimention	ft	in			
DIA.	4	6			
H	5	6			
Working volume				375	gals
Desired thoughput:				136,176	gals/yr
Turnovers per year				363	
Month selected for emission calculations:				July	
Number of days in July:				31	
Total pressure:				0.55029	psia
Maximum emissions**					
Working				1.91	lb/month
Breathing				0.24	lb/month
Note: **From TANK 4.0.9d Emissions Report				2.15	
Weight% of PM in vapor:				78.93%	
Control efficiency:				95%	
Operating Schedule:					
hrs/day				24	hrs/day
days/wk				7	days/wk
weeks/yr				52	wks/yr
PM10 in PM				100%	
Calculations:					
Emissions:					
Total emission (working + breathing), lb/month			(1.91 + 0.24) lb/month =	2.15	lb/month
PM/HNO_3					
lb/day					
Uncontrolled			2.15 lb/month/31 days/month*0.7893 =	0.055	lb/day
Controlled			0.055 lb/day*(1-7) =	0.0027	lb/day
lb/hr					
Uncontrolled			0.055 lb/day/ hrs/day =	0.00228	lb/hr
Controlled			0.0027 lb/day/ hrs/day =	0.00011	lb/hr
lb/yr			0.0027 lb/day* days/wk*2.15 wks/yr =	1.00	lb/yr

	PM/PM10	HNO_3
lb/hr		
Uncontr.	2.28E-03	2.28E-03
Contr.	1.14E-04	1.14E-04
lb/day		
Uncontr.	5.47E-02	5.47E-02
Contr.	2.74E-03	2.74E-03
lb/yr (Contr.)	1.00	1.00

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

Emissions Report for: July

T-151 Previous - Vertical Fixed Roof Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Poly Etch	0.50	0.24	0.73

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

T-151 Previous - Vertical Fixed Roof Tank

Month:	January	February	March	April	May	June	July	August	September	Oct
Standing Losses (lb):							0.2350			
Vapor Space Volume (cu ft):							48.6458			
Vapor Density (lb/cu ft):							0.0040			
Vapor Space Expansion Factor:							0.0426			
Vented Vapor Saturation Factor:							0.9181			
Tank Vapor Space Volume:										
Vapor Space Volume (cu ft):							48.6458			
Tank Diameter (ft):							4.5000			
Vapor Space Outage (ft):							3.0587			
Tank Shell Height (ft):							5.5000			
Average Liquid Height (ft):							2.7500			
Roof Outage (ft):							0.3087			
Roof Outage (Dome Roof)										
Roof Outage (ft):							0.3087			
Dome Radius (ft):							4.5000			
Shell Radius (ft):							2.2500			
Vapor Density										
Vapor Density (lb/cu ft):							0.0040			
Vapor Molecular Weight (lb/lb-mole):							41.2800			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.5503			
Daily Avg. Liquid Surface Temp. (deg. R):							530.9285			
Daily Average Ambient Temp. (deg. F):							73.0500			
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):							10.731			
Liquid Bulk Temperature (deg. R):							523.9983			
Tank Paint Solar Absorptance (Shell):							0.1700			
Tank Paint Solar Absorptance (Roof):							0.1700			
Daily Total Solar Insulation Factor (Btu/sqft day):							2,302.7457			
Vapor Space Expansion Factor										
Vapor Space Expansion Factor:							0.0426			
Daily Vapor Temperature Range (deg. R):							24.8571			
Daily Vapor Pressure Range (psia):							0.0000			
Breather Vent Press. Setting Range(psia):							0.0600			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.5503			
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):							0.5503			
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):							0.5503			
Daily Avg. Liquid Surface Temp. (deg R):							530.9285			
Daily Min. Liquid Surface Temp. (deg R):							524.7142			
Daily Max. Liquid Surface Temp. (deg R):							537.1427			
Daily Ambient Temp. Range (deg. R):							19.3000			
Vented Vapor Saturation Factor										
Vented Vapor Saturation Factor:							0.9181			
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):							0.5503			
Vapor Space Outage (ft):							3.0587			
Working Losses (lb):							0.4960			
Vapor Molecular Weight (lb/lb-mole):							41.2800			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.5503			
Net Throughput (gal/mo.):							917.0000			
Annual Turnovers:							16.8257			
Turnover Factor:							1.0000			
Maximum Liquid Volume (gal):							654.0000			
Maximum Liquid Height (ft):							5.5000			
Tank Diameter (ft):							4.5000			
Working Loss Product Factor:							1.0000			
Total Losses (lb):							0.7310			

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

T-151 Previous - Vertical Fixed Roof Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Press Calculations
Poly Etch	Jul	71.26	65.04	77.47	64.33	0.5503	0.5503	0.5503	41.2800			0.00	

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

Identification

User Identification:	T-151 Previous
City:	
State:	
Company:	
Type of Tank:	Vertical Fixed Roof Tank
Description:	

Tank Dimensions

Shell Height (ft):	5.50
Diameter (ft):	4.50
Liquid Height (ft) :	5.50
Avg. Liquid Height (ft):	2.75
Volume (gallons):	654.00
Turnovers:	16.83
Net Throughput(gal/yr):	11,004.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	0.00
Radius (ft) (Dome Roof)	0.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

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

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

Emissions Report for: July

T-151 - Vertical Fixed Roof Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Poly Etch	1.91	0.24	2.14

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

T-151 - Vertical Fixed Roof Tank

Month:	January	February	March	April	May	June	July	August	September	Oct
Standing Losses (lb):							0.2350			
Vapor Space Volume (cu ft):							48.6458			
Vapor Density (lb/cu ft):							0.0040			
Vapor Space Expansion Factor:							0.0426			
Vented Vapor Saturation Factor:							0.9181			
Tank Vapor Space Volume:										
Vapor Space Volume (cu ft):							48.6458			
Tank Diameter (ft):							4.5000			
Vapor Space Outage (ft):							3.0587			
Tank Shell Height (ft):							5.5000			
Average Liquid Height (ft):							2.7500			
Roof Outage (ft):							0.3087			
Roof Outage (Dome Roof)										
Roof Outage (ft):							0.3087			
Dome Radius (ft):							4.5000			
Shell Radius (ft):							2.2500			
Vapor Density										
Vapor Density (lb/cu ft):							0.0040			
Vapor Molecular Weight (lb/lb-mole):							41.2800			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.5503			
Daily Avg. Liquid Surface Temp. (deg. R):							530.9285			
Daily Average Ambient Temp. (deg. F):							73.0500			
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):							10.731			
Liquid Bulk Temperature (deg. R):							523.9983			
Tank Paint Solar Absorptance (Shell):							0.1700			
Tank Paint Solar Absorptance (Roof):							0.1700			
Daily Total Solar Insulation Factor (Btu/sqft day):							2,302.7457			
Vapor Space Expansion Factor										
Vapor Space Expansion Factor:							0.0426			
Daily Vapor Temperature Range (deg. R):							24.8571			
Daily Vapor Pressure Range (psia):							0.0000			
Breather Vent Press. Setting Range(psia):							0.0600			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.5503			
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):							0.5503			
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):							0.5503			
Daily Avg. Liquid Surface Temp. (deg R):							530.9285			
Daily Min. Liquid Surface Temp. (deg R):							524.7142			
Daily Max. Liquid Surface Temp. (deg R):							537.1427			
Daily Ambient Temp. Range (deg. R):							19.3000			
Vented Vapor Saturation Factor										
Vented Vapor Saturation Factor:							0.9181			
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):							0.5503			
Vapor Space Outage (ft):							3.0587			
Working Losses (lb):							1.9072			
Vapor Molecular Weight (lb/lb-mole):							41.2800			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.5503			
Net Throughput (gal/mo.):							11,348.0000			
Annual Turnovers:							208.2202			
Turnover Factor:							0.3107			
Maximum Liquid Volume (gal):							654.0000			
Maximum Liquid Height (ft):							5.5000			
Tank Diameter (ft):							4.5000			
Working Loss Product Factor:							1.0000			
Total Losses (lb):							2.1423			

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

T-151 - Vertical Fixed Roof Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Press Calculations
Poly Etch	Jul	71.26	65.04	77.47	64.33	0.5503	0.5503	0.5503	41.2800			0.00	

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

Identification

User Identification:	T-151
City:	
State:	
Company:	
Type of Tank:	Vertical Fixed Roof Tank
Description:	

Tank Dimensions

Shell Height (ft):	5.50
Diameter (ft):	4.50
Liquid Height (ft) :	5.50
Avg. Liquid Height (ft):	2.75
Volume (gallons):	654.00
Turnovers:	208.22
Net Throughput(gal/yr):	136,176.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	0.00
Radius (ft) (Dome Roof)	0.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

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

Previous: F54711 381810 A/N: 460729

Mixture Vapor Pressure
POLY ETCH
T-151

Operating temperature 70 F

Compounds	Amount, lb	Solution wt%*	Molecular Weight	VP mmHg	# moles (L)	mole fraction (L)	Partial VP mmHg	Mole Fraction (V)	Wt Contribution	wt% w/ water	wt% w/o water
Columns	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
HNO_3	56	56%	63.01	55.00	0.0088871	2.67E-01	1.47E+01	5.17E-01	32.5832	78.93%	100.00%
NH_4F	0.3	0%	37.04	-	8.1E-05	2.44E-03	-	-	-	-	-
Water	44	44%	18.02	18.8	0.024257	0.7301	13.7390	0.48291	8.6998	21.07%	-
	100	100%			0.033225	1.0000	28.4503	1.0000	41.28	100.00%	100.00%
				Previous		psia	0.55029		W/o water	78.93%	

Desired throughput 11,348 gals/month 917 gals/month
136,176 gals/yr 11,004 gals/yr

L = Liquid

(2)=(1)/100
(5)=(2)/(3)
(6)=(5)/0.033225
(7)=(4)*(6)
(8)=(7)/28.4503
(9)=(3)*(8)

(10)=(9)/41.28
(11)=(10)/78.93%

Rule 1401:

HIs:

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
HNO_3	3.93E-05	0.34	0.086	-	4.57E-04	-	Yes
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
Total					4.57E-04	-	

Monthly throughput limit: 917 gals/month

ATTACMENT
POLY ETCH
T-151
Vertical
Control: Scrubbers

Subsequent:	460729			A/N:	381810
Given:					
Tank dimentior	ft	in	gals		
DIA.	4	6	654		
H	5	6			
Working volume				654	gals
Desired thoughput:				11,004	gals/yr
Turnovers per year				17	
Month selected for emission calculations:				July	
Number of days in July:				31	
Total pressure:				0.55029	psia
Maximum emissions**					
Working				0.50	lb/month
Breathing				0.24	lb/month
Note: **From TANK 4.0.9d Emissions Report				0.74	
Weight% of PM in vapor:				78.93%	
Control efficiency:				95%	
Operating Schedule:					
hrs/day				24	hrs/day
days/wk				7	days/wk
weeks/yr				52	wks/yr
PM10 in PM				100%	

Calculations:

Emissions:

Total emission (working + breathing), lb/month	(0.5 + 0.24) lb/month =	0.74 lb/month
PM/HNO_3		
lb/day		
Uncontrolled	0.74 lb/month/31 days/month*0.7893 =	0.019 lb/day
Controlled	0.019 lb/day*(1-7) =	0.0009 lb/day
lb/hr		
Uncontrolled	0.019 lb/day/ hrs/day =	0.00079 lb/hr
Controlled	0.0009 lb/day/ hrs/day =	0.00004 lb/hr
lb/yr	0.0009 lb/day* days/wk*0.74 wks/yr =	0.34 lb/yr

	PM/PM10	HNO_3
lb/hr		
Uncontr.	7.85E-04	7.85E-04
Contr.	3.93E-05	3.93E-05
lb/day		
Uncontr.	1.88E-02	1.88E-02
Contr.	9.42E-04	9.42E-04
lb/yr (Contr.)	0.34	0.34

Rule 1401:

HIs:

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
HNO_3	1.14E-04	1.00	0.086	-	1.33E-03	-	Yes
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
Total					1.33E-03	-	

Monthly throughput limit: 11,348 gals/month

ATTACMENT
POLY ETCH
T-151
Vertical
Control: 492806

Previous:	F54711	381810		A/N:	460729
Given:					
Tank dimentior	ft	in	gals		
DIA.	4	6	654		
H	5	6			
Working volume				654	gals
Desired thoughput:				136,176	gals/yr
Turnovers per year				208	
Month selected for emission calculations:				July	
Number of days in July:				31	
Total pressure:				0.55029	psia
Maximum emissions**					
Working				1.91	lb/month
Breathing				0.24	lb/month
Note: **From TANK 4.0.9d Emissions Report				2.15	
Weight% of PM in vapor:				78.93%	
Control efficiency:				95%	
Operating Schedule:					
hrs/day				24	hrs/day
days/wk				7	days/wk
weeks/yr				52	wks/yr
PM10 in PM				100%	

Calculations:

Emissions:

Total emission (working + breathing), lb/month	(1.91 + 0.24) lb/month =	2.15	lb/month
PM/HNO_3			
lb/day			
Uncontrolled	2.15 lb/month/31 days/month*0.7893 =	0.055	lb/day
Controlled	0.055 lb/day*(1-7) =	0.0027	lb/day
lb/hr			
Uncontrolled	0.055 lb/day/ hrs/day =	0.00228	lb/hr
Controlled	0.0027 lb/day/ hrs/day =	0.00011	lb/hr
lb/yr	0.0027 lb/day* days/wk*2.15 wks/yr =	1.00	lb/yr

	PM/PM10	HNO_3
lb/hr		
Uncontr.	2.28E-03	2.28E-03
Contr.	1.14E-04	1.14E-04
lb/day		
Uncontr.	5.47E-02	5.47E-02
Contr.	2.74E-03	2.74E-03
lb/yr (Contr.)	1.00	1.00

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

Emissions Report for: July

T-141 Previous A/N 381808 - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Aluminum Etch	0.10	0.51	0.60

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

T-141 Previous A/N 381808 - Horizontal Tank

Month:	January	February	March	April	May	June	July	August	September	Oct
Standing Losses (lb):							0.5057			
Vapor Space Volume (cu ft):							502.5047			
Vapor Density (lb/cu ft):							0.0008			
Vapor Space Expansion Factor:							0.0427			
Vented Vapor Saturation Factor:							0.9644			
Tank Vapor Space Volume:										
Vapor Space Volume (cu ft):							502.5047			
Tank Diameter (ft):							7.0000			
Effective Diameter (ft):							13.5204			
Vapor Space Outage (ft):							3.5000			
Tank Shell Length (ft):							20.5000			
Vapor Density										
Vapor Density (lb/cu ft):							0.0008			
Vapor Molecular Weight (lb/lb-mole):							22.5700			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.1991			
Daily Avg. Liquid Surface Temp. (deg. R):							530.9285			
Daily Average Ambient Temp. (deg. F):							73.0500			
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):							10.731			
Liquid Bulk Temperature (deg. R):							523.9983			
Tank Paint Solar Absorptance (Shell):							0.1700			
Daily Total Solar Insulation Factor (Btu/sqft day):							2,302.7457			
Vapor Space Expansion Factor										
Vapor Space Expansion Factor:							0.0427			
Daily Vapor Temperature Range (deg. R):							24.8571			
Daily Vapor Pressure Range (psia):							0.0000			
Breather Vent Press. Setting Range(psia):							0.0600			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.1991			
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):							0.1991			
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):							0.1991			
Daily Avg. Liquid Surface Temp. (deg R):							530.9285			
Daily Min. Liquid Surface Temp. (deg R):							524.7142			
Daily Max. Liquid Surface Temp. (deg R):							537.1427			
Daily Ambient Temp. Range (deg. R):							19.3000			
Vented Vapor Saturation Factor										
Vented Vapor Saturation Factor:							0.9644			
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):							0.1991			
Vapor Space Outage (ft):							3.5000			
Working Losses (lb):							0.0981			
Vapor Molecular Weight (lb/lb-mole):							22.5700			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.1991			
Net Throughput (gal/mo.):							917.0000			
Annual Turnovers:							1.8651			
Turnover Factor:							1.0000			
Tank Diameter (ft):							7.0000			
Working Loss Product Factor:							1.0000			
Total Losses (lb):							0.6038			

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

T-141 Previous A/N 381808 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Press Calculations
Aluminum Etch	Jul	71.26	65.04	77.47	64.33	0.1991	0.1991	0.1991	22.5700			0.00	

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

Identification

User Identification:	T-141 Previous A/N 381808
City:	
State:	
Company:	
Type of Tank:	Horizontal Tank
Description:	

Tank Dimensions

Shell Length (ft):	20.50
Diameter (ft):	7.00
Volume (gallons):	5,900.00
Turnovers:	1.87
Net Throughput(gal/yr):	11,004.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

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

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

Emissions Report for: July

T-141 - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Aluminum Etch	0.93	0.51	1.43

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

T-141 - Horizontal Tank

Month:	January	February	March	April	May	June	July	August	September	Oct
Standing Losses (lb):							0.5057			
Vapor Space Volume (cu ft):							502.5047			
Vapor Density (lb/cu ft):							0.0008			
Vapor Space Expansion Factor:							0.0427			
Vented Vapor Saturation Factor:							0.9644			
Tank Vapor Space Volume:										
Vapor Space Volume (cu ft):							502.5047			
Tank Diameter (ft):							7.0000			
Effective Diameter (ft):							13.5204			
Vapor Space Outage (ft):							3.5000			
Tank Shell Length (ft):							20.5000			
Vapor Density										
Vapor Density (lb/cu ft):							0.0008			
Vapor Molecular Weight (lb/lb-mole):							22.5700			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.1991			
Daily Avg. Liquid Surface Temp. (deg. R):							530.9285			
Daily Average Ambient Temp. (deg. F):							73.0500			
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):							10.731			
Liquid Bulk Temperature (deg. R):							523.9983			
Tank Paint Solar Absorptance (Shell):							0.1700			
Daily Total Solar Insulation Factor (Btu/sqft day):							2,302.7457			
Vapor Space Expansion Factor										
Vapor Space Expansion Factor:							0.0427			
Daily Vapor Temperature Range (deg. R):							24.8571			
Daily Vapor Pressure Range (psia):							0.0000			
Breather Vent Press. Setting Range(psia):							0.0600			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.1991			
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):							0.1991			
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):							0.1991			
Daily Avg. Liquid Surface Temp. (deg R):							530.9285			
Daily Min. Liquid Surface Temp. (deg R):							524.7142			
Daily Max. Liquid Surface Temp. (deg R):							537.1427			
Daily Ambient Temp. Range (deg. R):							19.3000			
Vented Vapor Saturation Factor										
Vented Vapor Saturation Factor:							0.9644			
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):							0.1991			
Vapor Space Outage (ft):							3.5000			
Working Losses (lb):							0.9253			
Vapor Molecular Weight (lb/lb-mole):							22.5700			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.1991			
Net Throughput (gal/mo.):							8,648.0000			
Annual Turnovers:							17.5892			
Turnover Factor:							1.0000			
Tank Diameter (ft):							7.0000			
Working Loss Product Factor:							1.0000			
Total Losses (lb):							1.4310			

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

T-141 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Press Calculations
Aluminum Etch	Jul	71.26	65.04	77.47	64.33	0.1991	0.1991	0.1991	22.5700			0.00	

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

Identification

User Identification:	T-141
City:	
State:	
Company:	
Type of Tank:	Horizontal Tank
Description:	

Tank Dimensions

Shell Length (ft):	20.50
Diameter (ft):	7.00
Volume (gallons):	5,900.00
Turnovers:	17.59
Net Throughput(gal/yr):	103,776.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

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

Previous: F54710 381808 A/N: 460728

Mixture Vapor Pressure
ALUMINUM ETCH
T-141

Operating temperature 70 F

Compounds	Amount, lb	Solution wt%*	Molecular Weight	VP mmHg	# moles (L)	mole fraction (L)	Partial VP mmHg	Mole Fraction (V)	Wt Contribution	wt% w/ water	wt% w/o water w/acetic	wt% w/o water w/o acetic
Columns	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
HNO_3	1	1%	63.01	55.00	0.0001587	8.62E-03	4.74E-01	4.61E-02	2.9038	12.86%	37.86%	96%
H_3PO_4	76	76%	98.00	0.03	0.0077555	4.21E-01	1.26E-02	1.23E-03	0.1204	0.53%	1.57%	4%
CH_3COOH	8	8%	37.04	11.00	0.00216	1.17E-01	1.29E+00	1.25E-01	4.6460	20.58%	60.57%	-
Water	15	15%	18.02	18.8	0.008326	0.4525	8.5154	0.82725	14.9030	66.02%	-	-
Total	100	100%			0.018401	1.0000	10.2937	1.0000	22.57	100.00%	100.00%	100.00%
						psia	0.19910		W/o water	33.98%		
									and w/o acetic	13.40%		

Desired throughput	8648 gals/month	917
	103,776 gals/yr	11,004

L = Liquid
V = Vapor

(2)=(1)/100
(5)=(2)/(3)
(6)=(5)/0.018401
(7)=(4)*(6)
(8)=(7)/10.2937
(9)=(3)*(8)

(10)=(9)/22.57
(11)=(10)/33.98%
(12)=(10)/13.4%

H_3PO_4 3.98% of PM

lb/day		
Uncontrolled	0.003 lb/day*0.0398 =	0.0001 lb/day
Controlled	0.0001 lb/day*(1-0.95) =	0.00001 lb/day
lb/hr		
Uncontrolled	0.0001 lb/day/24 hrs/day =	0.00000 lb/hr
Controlled	0.00001 lb/day/24 hrs/day =	2.19E-07 lb/hr
lb/yr	0.00001 lb/day*7 days/wk*52 wks/yr =	0.002 lb/yr

$C_2H_4O_2$

lb/day		
Uncontrolled	0.61 lb/month/31 days/month*0.3398*1 =	0.007 lb/day
Controlled	0.007 lb/day*(1-0) =	0.0067 lb/day
lb/hr		
Uncontrolled	0.007 lb/day/24 hrs/day =	0.0003 lb/hr
Controlled	0.0067 lb/day/24 hrs/day =	0.00028 lb/hr
lb/yr	0.0067 lb/day*7 days/wk*52 wks/yr =	2.43 lb/yr

	PM/PM10	HNO_3	H_3PO_4	$C_2H_4O_2$
lb/hr				
Uncontr.	1.10E-04	1.05E-04	4.37E-06	2.79E-04
Contr.	5.49E-06	5.27E-06	2.19E-07	2.79E-04
lb/day				
Uncontr.	2.64E-03	2.53E-03	1.05E-04	6.69E-03
Contr.	1.32E-04	1.27E-04	5.25E-06	6.69E-03
lb/yr (Contr.)	0.05	0.05	0.002	2.43

Rule 1401 Evaluation:

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
HNO_3	5.27E-06	0.05	0.043	-	1.23E-04	-	Yes
H_3PO_4	2.19E-07	0.002	-	231.00	-	8.27E-06	
			-	-	-	-	
Total					1.23E-04	8.27E-06	

Monthly throughput limit: 5902 gals*1.86 times/yr/12 months/yr*1 = 917 gals/month

ATTACMENT
ALUMINUM ETCH
T-141
Horizontal
Control: Scrubbers

Subsequent:	460728			A/N:	381808
Given:					
Tank dimentior	ft	in	gals		
DIA.	7	0	5,902		
L	20	6			
Working volume				5,902	gals
Desired thoughput:				11,004	gals/yr
Turnovers per year				1.86	
Month selected for emission calculations:				July	
Number of days in July:				31	
Total vapor pressure:				0.20	psia
Maximum emissions**					
Working				0.1	lb/month
Breathing				0.51	lb/month
Note: **From TANK 4.0.9d Emissions Report					
Weight fraction of all acids in vapor:				0.3398	
Weight fraction of acids (excluding acetic acid) in vapor:				0.1340	
Control efficiency:					
PM acids				95%	
Acetic acid				0%	
Operating Schedule:					
hrs/day				24	hrs/day
days/wk				7	days/wk
weeks/yr				52	wks/yr
PM10 in PM				100%	
Cushion factor:				1.0	
Calculations:					
Emissions:					
Total emission (working + breathing), lb/month			(0.1 + 0.51) lb/month =	0.61	lb/month
PM					
lb/day					
Uncontrolled			0.61 lb/month/31 days/month*0.134*1 =	0.003	lb/day
Controlled			0.003 lb/day*(1-0.95) =	0.0001	lb/day
lb/hr					
Uncontrolled			0.003 lb/day/24 hrs/day =	0.00011	lb/hr
Controlled			0.0001 lb/day/24 hrs/day =	0.00001	lb/hr
lb/yr			0.0001 lb/day*7 days/wk*52 wks/yr =	0.05	lb/yr
HNO_3	96.02% of PM				
lb/day					
Uncontrolled			0.003 lb/day*0.9602 =	0.003	lb/day
Controlled			0.003 lb/day*(1-0.95) =	0.0001	lb/day
lb/hr					
Uncontrolled			0.003 lb/day/24 hrs/day =	0.0001	lb/hr
Controlled			0.0001 lb/day/24 hrs/day =	0.00001	lb/hr
lb/yr			0.0001 lb/day*7 days/wk*52 wks/yr =	0.05	lb/yr

H_3PO_4 3.98% of PM

lb/day

Uncontrolled 0.006 lb/day*0.0398 = 0.0002 lb/day

Controlled 0.0002 lb/day*(1-0.95) = 0.00001 lb/day

lb/hr

Uncontrolled 0.0002 lb/day/24 hrs/day = 0.00001 lb/hr

Controlled 0.00001 lb/day/24 hrs/day = 5.16E-07 lb/hr

lb/yr 0.00001 lb/day*7 days/wk*52 wks/yr = 0.005 lb/yr

$C_2H_4O_2$

lb/day

Uncontrolled 1.44 lb/month/31 days/month*0.3398*1 = 0.016 lb/day

Controlled 0.016 lb/day*(1-0) = 0.0158 lb/day

lb/hr

Uncontrolled 0.016 lb/day/24 hrs/day = 0.0007 lb/hr

Controlled 0.0158 lb/day/24 hrs/day = 0.00066 lb/hr

lb/yr 0.0158 lb/day*7 days/wk*52 wks/yr = 5.75 lb/yr

	PM/PM10	HNO_3	H_3PO_4	$C_2H_4O_2$
lb/hr				
Uncontr.	2.59E-04	2.49E-04	1.03E-05	6.58E-04
Contr.	1.30E-05	1.24E-05	5.16E-07	6.58E-04
lb/day				
Uncontr.	6.22E-03	5.98E-03	2.48E-04	1.58E-02
Contr.	3.11E-04	2.99E-04	1.24E-05	1.58E-02
lb/yr (Contr.)	0.11	0.11	0.005	5.75

Rule 1401 Evaluation:

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
HNO_3	1.24E-05	0.11	0.043	-	2.90E-04	-	Yes
H_3PO_4	5.16E-07	0.005	-	231.00	-	1.95E-05	
			-	-	-	-	
Total					2.90E-04	1.95E-05	

Monthly throughput limit: 5902 gals*17.58 times/yr/12 months/yr*1 = 8,648 gals/month

ATTACMENT
ALUMINUM ETCH
T-141
Horizontal
Control: 492806

Previous:	F54710	381808		A/N:	460728
Given:					
Tank dimentior	ft	in	gals		
DIA.	7	0	5,902		
L	20	6			
Working volume				5,902	gals
Desired thoughput:				103,776	gals/yr
Turnovers per year				17.58	
Month selected for emission calculations:				July	
Number of days in July:				31	
Total vapor pressure:				0.20	psia
Maximum emissions**					
Working				0.93	lb/month
Breathing				0.51	lb/month
Note: **From TANK 4.0.9d Emissions Report					
Weight fraction of all acids in vapor:				0.3398	
Weight fraction of acids (excluding acetic acid) in vapor:				0.1340	
Control efficiency:					
PM acids				95%	
Acetic acid				0%	
Operating Schedule:					
hrs/day				24	hrs/day
days/wk				7	days/wk
weeks/yr				52	wks/yr
PM10 in PM				100%	
Cushion factor:				1.0	
Calculations:					
Emissions:					
Total emission (working + breathing), lb/month			(0.93 + 0.51) lb/month =	1.44	lb/month
PM					
lb/day					
Uncontrolled			1.44 lb/month/31 days/month*0.134*1 =	0.006	lb/day
Controlled			0.006 lb/day*(1-0.95) =	0.0003	lb/day
lb/hr					
Uncontrolled			0.006 lb/day/24 hrs/day =	0.00026	lb/hr
Controlled			0.0003 lb/day/24 hrs/day =	0.00001	lb/hr
lb/yr			0.0003 lb/day*7 days/wk*52 wks/yr =	0.11	lb/yr
HNO_3	96.02% of PM				
lb/day					
Uncontrolled			0.006 lb/day*0.9602 =	0.006	lb/day
Controlled			0.006 lb/day*(1-0.95) =	0.0003	lb/day
lb/hr					
Uncontrolled			0.006 lb/day/24 hrs/day =	0.0002	lb/hr
Controlled			0.0003 lb/day/24 hrs/day =	0.00001	lb/hr
lb/yr			0.0003 lb/day*7 days/wk*52 wks/yr =	0.11	lb/yr

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

Emissions Report for: July

T-504 - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Waste Ammonium Hydroxide	45.77	0.50	46.26

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

T-504 - Horizontal Tank

Month:	January	February	March	April	May	June	July	August	September	Oct
Standing Losses (lb):							0.4956			
Vapor Space Volume (cu ft):							35.4789			
Vapor Density (lb/cu ft):							0.0161			
Vapor Space Expansion Factor:							0.0404			
Vented Vapor Saturation Factor:							0.6946			
Tank Vapor Space Volume:										
Vapor Space Volume (cu ft):							35.4789			
Tank Diameter (ft):							3.1000			
Effective Diameter (ft):							5.3985			
Vapor Space Outage (ft):							1.5500			
Tank Shell Length (ft):							7.3800			
Vapor Density										
Vapor Density (lb/cu ft):							0.0161			
Vapor Molecular Weight (lb/lb-mole):							17.0900			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							5.3530			
Daily Avg. Liquid Surface Temp. (deg. R):							530.9285			
Daily Average Ambient Temp. (deg. F):							73.0500			
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):							10.731			
Liquid Bulk Temperature (deg. R):							523.9983			
Tank Paint Solar Absorptance (Shell):							0.1700			
Daily Total Solar Insulation Factor (Btu/sqft day):							2,302.7457			
Vapor Space Expansion Factor										
Vapor Space Expansion Factor:							0.0404			
Daily Vapor Temperature Range (deg. R):							24.8571			
Daily Vapor Pressure Range (psia):							0.0000			
Breather Vent Press. Setting Range(psia):							0.0600			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							5.3530			
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):							5.3530			
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):							5.3530			
Daily Avg. Liquid Surface Temp. (deg R):							530.9285			
Daily Min. Liquid Surface Temp. (deg R):							524.7142			
Daily Max. Liquid Surface Temp. (deg R):							537.1427			
Daily Ambient Temp. Range (deg. R):							19.3000			
Vented Vapor Saturation Factor										
Vented Vapor Saturation Factor:							0.6946			
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):							5.3530			
Vapor Space Outage (ft):							1.5500			
Working Losses (lb):							45.7686			
Vapor Molecular Weight (lb/lb-mole):							17.0900			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							5.3530			
Net Throughput (gal/mo.):							120,450.0000			
Annual Turnovers:							3,854.4000			
Turnover Factor:							0.1744			
Tank Diameter (ft):							3.1000			
Working Loss Product Factor:							1.0000			
Total Losses (lb):							46.2642			

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

T-504 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Press Calculations
Waste Ammonium Hydroxide	Jul	71.26	65.04	77.47	64.33	5.3530	5.3530	5.3530	17.0900			0.00	

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

Identification

User Identification:	T-504
City:	
State:	
Company:	
Type of Tank:	Horizontal Tank
Description:	

Tank Dimensions

Shell Length (ft):	7.38
Diameter (ft):	3.10
Volume (gallons):	375.00
Turnovers:	3,854.40
Net Throughput(gal/yr):	1,445,400.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

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

Total Vapor Pressure of Aqueous Solution of NH_3, psia

	Data*			Calculated
	NH_3, Wt%			NH_3, Wt %
	$W\%_1$	$Wt\%_2$		$W\%_3$
	19.1	23.94		20
°F	Total VP, psia		n+	Total VP_3++, psia
32	1.58	2.60	3.72	1.87
40	2.01	3.25	3.63	2.38
50	2.67	4.29	3.60	3.15
60	3.51	5.55	3.53	4.13
70	4.56	7.13	3.48	5.35
80	5.85	9.06	3.44	6.85
90	7.43	11.4	3.40	8.69
100	9.34	14.22	3.37	10.91

*Data from Chemical Engineers' Handbook, Perry & Chilton, Fifth Edition, Page 3-68.

+Calculated from Equation $(VP_2/VP_1) = (Wt\%_2/Wt\%_1)^n$

++Calculated from Equation $(VP3/VP_1) = (Wt\%_3/Wt\%_1)^n$

Partial Pressure of NH_3 over Aqueous Solution of NH_3, psia

	Data*		Calculated for				
	$W\%_1$	$Wt\%_2$		$Wt\%_3$			
	19.1	23.94		20			
°F	Partial VP, psia		n^+	Partial VP_3^{++}, psia	Total VP, psia	Volume ratio, NH_3/Total	
	VP_1	VP_2		(1)	(2)	(1)/(2)	NH_3 wt fraction
32	1.51	2.67	4.10	1.82	1.87	0.97	0.97
40	1.92	3.16	3.72	2.28	2.38	0.96	0.96
50	2.53	4.16	3.71	3.00	3.15	0.95	0.95
60	3.21	5.36	3.79	3.82	4.13	0.93	0.92
70	4.28	6.87	3.60	5.05	5.35	0.94	0.94
80	5.45	8.69	3.57	6.42	6.85	0.94	0.93
90	6.88	10.89	3.54	8.10	8.69	0.93	0.93
100	8.60	13.53	3.51	10.11	10.91	0.93	0.92

*Data from Chemical Engineers' Handbook, Perry & Chilton, Fifth Edition, Page 3-68.

**Applicant's data

$^+$Calculated from Equation $(VP_2/VP_1) = (Wt\%_2/Wt\%_1)^n$

$^{++}$Calculated from Equation $(VP3/VP_1) = (Wt\%_3/Wt\%_1)^n$

Sample calculation for NH_3 weight fraction at 32 F:

$0.97*17.03/(0.97*17.03+(1-0.97)*18.02) =$ 0.97

(The numbers used in the calculations are identified with the cells with double-line borders)

	NH_3	
	Uncontr.	Contr.
lb/hr	0.06	0.06
lb/day	2	2
lb/yr	-	562.14

Ammonia concentration (at stack exit):

0.06 lb/hr/60 minutes/hr/17.03 lb/lbmole*379.49 ft3/lbmole/60000 cfm*10^6 = 0.40 ppm

Note: This ammonia concentration is at the exhaust of the wet scrubber. At ground level, the concentration is much lower. Even at the wet scrubber exhaust, the ammonia concentration is well below the ACGIH (American Conference of Governmental Industrial Hygienist) threshold level of 25 ppm.

Rule 1401:

HIs:

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
Ammonia	0.06	562.14	1.60	6,610	0.04	0.09	Yes
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
Total					0.04	0.09	

Monthly throughput limit: 375 gallons*3854 times/yr/12 months/yr = 120,450 gals/month

ATTACMENT
WASTE AMMONIUM HYDROXIDE
T-504
Rectangular

Previous:	None			A/N:	460715
Given:					
Dimensions:	ft	inches	gals		
W	4	2	421		
L	7	4.5		Convert to	
H	1	10		Horizontal	
Tank diameter (Used for calculations)*			D	3.1	ft
Tank length (Used for calculations)			L	7.38	ft
*Diameter of a circle whose area is equal to the surface cross section area.					
Turnovers per year				3,854	
Working volume				375	gals
Month selected for emission calculations:				July	
Number of days in July:				31	
Total vapor pressure				5.35	psia
Maximum emissions**					
Working				45.77	lb/month
Breathing				0.50	lb/month
Note: **From TANK 4.0.9d Emissions Report				46.27	
Weight% of NH_3 in vapor:				94%	
Control efficiency:				0%	
Operating Schedule:					
hrs/day				24	hrs/day
days/wk				7	days/wk
weeks/yr				52	wks/yr
Exhaust flow rate				60,000	cfm
NH_3 molecular weight:				17.03	
Ideal gas molar volume	@	60 F		379.49	ft^3/lbmole
Cushion factor				1.1	
(Cushion factor is used to give a cushion on the limit to insure compliance)					
Calculations:					
Total emission (working + breathing), lb/month			(45.77 + 0.5) lb/month =	46.27	lb/month
NH3 emissions:					
lb/day					
Uncontrolled			46.27 lb/month/31 days/month*0.9406*1.1 =	1.54	lb/day
Controlled			1.54 lb/day*(1-0) =	1.54	lb/day
lb/hr					
Uncontrolled			1.54 lb/day/24 hrs/day =	0.06	lb/hr
Controlled			1.54 lb/day/24 hrs/day =	0.06	lb/hr
lb/yr			1.54 lb/day*7 days/wk*52 wks/yr =	562.14	lb/yr

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

Emissions Report for: July

T-503 - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Waste Acids	31.32	0.09	31.41

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

T-503 - Horizontal Tank

Month:	January	February	March	April	May	June	July	August	September	Oct
Standing Losses (lb):							0.0897			
Vapor Space Volume (cu ft):							34.9746			
Vapor Density (lb/cu ft):							0.0020			
Vapor Space Expansion Factor:							0.0426			
Vented Vapor Saturation Factor:							0.9487			
Tank Vapor Space Volume:										
Vapor Space Volume (cu ft):							34.9746			
Tank Diameter (ft):							3.3000			
Effective Diameter (ft):							5.1950			
Vapor Space Outage (ft):							1.6500			
Tank Shell Length (ft):							6.4200			
Vapor Density										
Vapor Density (lb/cu ft):							0.0020			
Vapor Molecular Weight (lb/lb-mole):							18.8900			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.6180			
Daily Avg. Liquid Surface Temp. (deg. R):							530.9285			
Daily Average Ambient Temp. (deg. F):							73.0500			
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):							10.731			
Liquid Bulk Temperature (deg. R):							523.9983			
Tank Paint Solar Absorptance (Shell):							0.1700			
Daily Total Solar Insulation Factor (Btu/sqft day):							2,302.7457			
Vapor Space Expansion Factor										
Vapor Space Expansion Factor:							0.0426			
Daily Vapor Temperature Range (deg. R):							24.8571			
Daily Vapor Pressure Range (psia):							0.0000			
Breather Vent Press. Setting Range(psia):							0.0600			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.6180			
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):							0.6180			
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):							0.6180			
Daily Avg. Liquid Surface Temp. (deg R):							530.9285			
Daily Min. Liquid Surface Temp. (deg R):							524.7142			
Daily Max. Liquid Surface Temp. (deg R):							537.1427			
Daily Ambient Temp. Range (deg. R):							19.3000			
Vented Vapor Saturation Factor										
Vented Vapor Saturation Factor:							0.9487			
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):							0.6180			
Vapor Space Outage (ft):							1.6500			
Working Losses (lb):							31.3160			
Vapor Molecular Weight (lb/lb-mole):							18.8900			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.6180			
Net Throughput (gal/mo.):							670,000.0000			
Annual Turnovers:							20,100.0000			
Turnover Factor:							0.1682			
Tank Diameter (ft):							3.3000			
Working Loss Product Factor:							1.0000			
Total Losses (lb):							31.4057			

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

T-503 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Press Calculations
Waste Acids	Jul	71.26	65.04	77.47	64.33	0.6180	0.6180	0.6180	18.8900			0.00	

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

Identification

User Identification:	T-503
City:	
State:	
Company:	
Type of Tank:	Horizontal Tank
Description:	

Tank Dimensions

Shell Length (ft):	6.42
Diameter (ft):	3.30
Volume (gallons):	400.00
Turnovers:	20,100.00
Net Throughput(gal/yr):	8,040,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

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

	PM/PM10/Acids
lb/hr	
Uncontr.	0.02
Contr.	0.001
lb/day	
Uncontr.	0.47
Contr.	0.02
lb/yr (Contr.)	8.55

	50 m Screening Levels	
Chemicals	lb/yr	lb/hr
HCl	780	2.1
H_2SO_4	86.7	0.12
HNO_3		0.0857
H_3PO_4	607	
HF		0.24

Rule 1401:

HIs:

The tank contains HCl, HNO_3, H_3PO_4, HF, and acetic acid. For vapor pressure calculations, we use HF.since it has higher vapor pressure than others. For risk screening, we use HNO_3 hourly emission and H_2SO_4 annual emission.

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
H_2SO_4	-	8.55	-	86.7	-	0.10	Yes
HNO_3	0.001	-	0.0857	-	0.01	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
Total					0.011	0.10	

Monthly throughput limit: 384 gals*20938 times/yr/12 months/yr*1 = 670,000 gals/month

ATTACMENT
WASTE ACIDS
T-503
Rectangular
Control: 483796/492808

Previous:	None	-		A/N:	460714
Given:					
Dimensions:	ft	inches	gals		
W	4	0	384		
L	6	5		Convert to	
H	2	0		Horizontal	
Tank diameter (Used for calculations)*			D	3.2	ft
Tank length (Used for calculations)			L	6.42	ft
*Diameter of a circle whose area is equal to the surface cross section area.					
Working volume				384	gals
Desired thoughput:				8,040,000	gals/yr
Turnovers per year				20,938	
Month selected for emission calculations:				July	
Number of days in July:				31	
Total vapor pressure				0.618	psia
Maximum emissions**					
Working				31.32	lb/month
Breathing				0.09	lb/month
Note: **From TANK 4.0.9d Emissions Report				31.41	
Weight% of acid in vapor:				46.3902%	
Control efficiency:				95%	
Operating Schedule:					
hrs/day				24	hrs/day
days/wk				7	days/wk
weeks/yr				52	wks/yr
PM10 in PM				100%	
Cushion factor:				1.0	
(Cushion factor is used to give a cushion on the limit to insure compliance)					
Calculations:					
Emissions:					
Total emission (working + breathing), lb/month			(31.32 + 0.09) lb/month =	31.41	lb/month
PM/PM10/Acids					
lb/day					
Uncontrolled			31.41 lb/month/31 days/month*0.4639*1 =	0.47	lb/day
Controlled			0.47 lb/day*(1-0.95) =	0.02	lb/day
lb/hr					
Uncontrolled			0.47 lb/day/24 hrs/day =	0.020	lb/hr
Controlled			0.02 lb/day/24 hrs/day =	0.001	lb/hr
lb/yr			0.02 lb/day*7 days/wk*52 wks/yr =	8.55	lb/yr

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

Emissions Report for: July

T-502 - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Waste Acids	31.38	0.11	31.48

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

T-502 - Horizontal Tank

Month:	January	February	March	April	May	June	July	August	September	Oct
Standing Losses (lb):							0.1072			
Vapor Space Volume (cu ft):							41.7843			
Vapor Density (lb/cu ft):							0.0020			
Vapor Space Expansion Factor:							0.0426			
Vented Vapor Saturation Factor:							0.9487			
Tank Vapor Space Volume:										
Vapor Space Volume (cu ft):							41.7843			
Tank Diameter (ft):							3.3000			
Effective Diameter (ft):							5.6783			
Vapor Space Outage (ft):							1.6500			
Tank Shell Length (ft):							7.6700			
Vapor Density										
Vapor Density (lb/cu ft):							0.0020			
Vapor Molecular Weight (lb/lb-mole):							18.8900			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.6180			
Daily Avg. Liquid Surface Temp. (deg. R):							530.9285			
Daily Average Ambient Temp. (deg. F):							73.0500			
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):							10.731			
Liquid Bulk Temperature (deg. R):							523.9983			
Tank Paint Solar Absorptance (Shell):							0.1700			
Daily Total Solar Insulation Factor (Btu/sqft day):							2,302.7457			
Vapor Space Expansion Factor										
Vapor Space Expansion Factor:							0.0426			
Daily Vapor Temperature Range (deg. R):							24.8571			
Daily Vapor Pressure Range (psia):							0.0000			
Breather Vent Press. Setting Range(psia):							0.0600			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.6180			
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):							0.6180			
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):							0.6180			
Daily Avg. Liquid Surface Temp. (deg R):							530.9285			
Daily Min. Liquid Surface Temp. (deg R):							524.7142			
Daily Max. Liquid Surface Temp. (deg R):							537.1427			
Daily Ambient Temp. Range (deg. R):							19.3000			
Vented Vapor Saturation Factor										
Vented Vapor Saturation Factor:							0.9487			
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):							0.6180			
Vapor Space Outage (ft):							1.6500			
Working Losses (lb):							31.3765			
Vapor Molecular Weight (lb/lb-mole):							18.8900			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.6180			
Net Throughput (gal/mo.):							670,000.0000			
Annual Turnovers:							16,509.2402			
Turnover Factor:							0.1685			
Tank Diameter (ft):							3.3000			
Working Loss Product Factor:							1.0000			
Total Losses (lb):							31.4636			

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

T-502 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Press Calculations
Waste Acids	Jul	71.26	65.04	77.47	64.33	0.6180	0.6180	0.6180	18.8900			0.00	

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

Identification

User Identification:	T-502
City:	
State:	
Company:	
Type of Tank:	Horizontal Tank
Description:	

Tank Dimensions

Shell Length (ft):	7.67
Diameter (ft):	3.30
Volume (gallons):	487.00
Turnovers:	16,509.24
Net Throughput(gal/yr):	8,040,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

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

	PM/PM10/HF
lb/hr	
Uncontr.	0.02
Contr.	0.001
lb/day	
Uncontr.	0.47
Contr.	0.02
lb/yr (Contr.)	8.58

	50 m Screening Levels	
Chemicals	lb/yr	lb/hr
HCl	780	2.1
H_2SO_4	86.7	0.12
HNO_3		0.0857
H_3PO_4	607	
HF		0.24

Rule 1401:

HIs:

The tank contains HCl, HNO_3, H_3PO_4, HF, and acetic acid. For vapor pressure calculations, we use HF.since it has higher vapor pressure than others. For risk screening, we use HNO_3 hourly emission and H_2SO_4 annual emission.

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
H_2SO_4	-	8.58	-	86.70	-	0.10	Yes
HNO_3	0.001	-	0.0857	-	0.01	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
Total					0.011	0.10	

Monthly throughput limit: 487 gals*16509 times/yr/12 months/yr*1 = 670,000 gals/month

ATTACMENT
WASTE ACIDS
T-502
Rectangular
Control: 483796/492808

Previous:	None	-		A/N:	460713
Given:					
Dimensions:	ft	inches	gals		
W	4	3	487		
L	7	8		Convert to	
H	2	0		Horizontal	
Tank diameter (Used for calculations)*			D	3.3	ft
Tank length (Used for calculations)			L	7.67	ft
*Diameter of a circle whose area is equal to the surface cross section area.					
Working volume				487	gals
Desired thoughput:				8,040,000	gals/yr
Turnovers per year				16,509	
Month selected for emission calculations:				July	
Number of days in July:				31	
Total vapor pressure				0.618	psia
Maximum emissions**					
Working				31.38	lb/month
Breathing				0.11	lb/month
Note: **From TANK 4.0.9d Emissions Report				31.49	
Weight% of acid in vapor:				46.3902%	
Control efficiency:				95%	
Operating Schedule:					
hrs/day				24	hrs/day
days/wk				7	days/wk
weeks/yr				52	wks/yr
PM10 in PM				100%	
Cushion factor:				1.0	
(Cushion factor is used to give a cushion on the limit to insure compliance)					
Calculations:					
Emissions:					
Total emission (working + breathing), lb/month			(31.38 + 0.11) lb/month =	31.49	lb/month
PM/PM10/HCl					
lb/day					
Uncontrolled			31.49 lb/month/31 days/month*0.4639*1 =	0.47	lb/day
Controlled			0.47 lb/day*(1-0.95) =	0.02	lb/day
lb/hr					
Uncontrolled			0.47 lb/day/24 hrs/day =	0.020	lb/hr
Controlled			0.02 lb/day/24 hrs/day =	0.001	lb/hr
lb/yr			0.02 lb/day*7 days/wk*52 wks/yr =	8.58	lb/yr

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

Emissions Report for: July

T-501 - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Waste Sulfuric Acid	17.25	0.04	17.30

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

T-501 - Horizontal Tank

Month:	January	February	March	April	May	June	July	August	September	Oct
Standing Losses (lb):							0.0447			
Vapor Space Volume (cu ft):							30.8888			
Vapor Density (lb/cu ft):							0.0011			
Vapor Space Expansion Factor:							0.0426			
Vented Vapor Saturation Factor:							0.9697			
Tank Vapor Space Volume:										
Vapor Space Volume (cu ft):							30.8888			
Tank Diameter (ft):							3.3000			
Effective Diameter (ft):							4.8822			
Vapor Space Outage (ft):							1.6500			
Tank Shell Length (ft):							5.6700			
Vapor Density										
Vapor Density (lb/cu ft):							0.0011			
Vapor Molecular Weight (lb/lb-mole):							18.0270			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.3570			
Daily Avg. Liquid Surface Temp. (deg. R):							530.9285			
Daily Average Ambient Temp. (deg. F):							73.0500			
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):							10.731			
Liquid Bulk Temperature (deg. R):							523.9983			
Tank Paint Solar Absorptance (Shell):							0.1700			
Daily Total Solar Insulation Factor (Btu/sqft day):							2,302.7457			
Vapor Space Expansion Factor										
Vapor Space Expansion Factor:							0.0426			
Daily Vapor Temperature Range (deg. R):							24.8571			
Daily Vapor Pressure Range (psia):							0.0000			
Breather Vent Press. Setting Range(psia):							0.0600			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.3570			
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):							0.3570			
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):							0.3570			
Daily Avg. Liquid Surface Temp. (deg R):							530.9285			
Daily Min. Liquid Surface Temp. (deg R):							524.7142			
Daily Max. Liquid Surface Temp. (deg R):							537.1427			
Daily Ambient Temp. Range (deg. R):							19.3000			
Vented Vapor Saturation Factor										
Vented Vapor Saturation Factor:							0.9697			
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):							0.3570			
Vapor Space Outage (ft):							1.6500			
Working Losses (lb):							17.2543			
Vapor Molecular Weight (lb/lb-mole):							18.0270			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.3570			
Net Throughput (gal/mo.):							670,000.0000			
Annual Turnovers:							21,440.0000			
Turnover Factor:							0.1681			
Tank Diameter (ft):							3.3000			
Working Loss Product Factor:							1.0000			
Total Losses (lb):							17.2990			

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

T-501 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Press Calculations
Waste Sulfuric Acid	Jul	71.26	65.04	77.47	64.33	0.3570	0.3570	0.3570	18.0270			0.00	

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

Identification

User Identification:	T-501
City:	
State:	
Company:	
Type of Tank:	Horizontal Tank
Description:	

Tank Dimensions

Shell Length (ft):	5.67
Diameter (ft):	3.30
Volume (gallons):	375.00
Turnovers:	21,440.00
Net Throughput(gal/yr):	8,040,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

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

Previous: None - A/N: 460712

Mixture Vapor Pressure
WASTE SULFURIC ACID
T-501

Operating temperature 70 F

Compounds	Amount, lb	Solution wt%*	Molecular Weight	VP mmHg	# moles (L)	mole fraction (L)	Partial VP mmHg	Mole Fraction (V)	Wt Contribution	wt% w/ water	wt% w/o water
Columns	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
H_2SO_4	10	10.00%	98.07	0.00055	0.0010196	2.00E-02	1.09E-05	5.94E-07	0.0001	0.0003%	100.00%
Water	90	90%	18.02	18.8	0.049958	0.9800	18.4420	1.00000	18.0152	99.9997%	-
	100	100%			0.050977	1.0000	18.4420	1.0000	18.02	100.00%	100.00%
						psia	0.35671		W/o water	0.0003%	

Desired throughput 670000 gals/month
8,040,000 gals/yr
OK 9/24/08

L = Liquid
V = Vapor

(2)=(1)/100
(5)=(2)/(3)
(6)=(5)/0.050977
(7)=(4)*(6)
(8)=(7)/18.442
(9)=(3)*(8)

(10)=(9)/18.02
(11)=(10)/0.0003%

	PM/PM10/HF
lb/hr	
Uncontr.	7.51E-08
Contr.	3.75E-09
lb/day	
Uncontr.	1.80E-06
Contr.	9.01E-08
lb/yr (Contr.)	0.000033

Rule 1401:
HIs:

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
H_2SO_4	3.75E-09	3.28E-05	1.20E-01	-	3.13E-08	-	Yes
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
Total					3.13E-08	-	

Monthly throughput limit: 375 gals*21440 times/yr/12 months/yr*1 = 670,000 gals/month

ATTACMENT
WASTE SULFURIC ACID
T-501
Rectangular
Control: 483796/492808

Previous:	None			A/N:	460712
Given:					
Dimensions:	ft	inches	gals		
W	4	3	487		
L	7	8		Convert to	
H	2	0		Horizontal	
Tank diameter (Used for calculations)*			D	3.3	ft
Tank length (Used for calculations)			L	7.67	ft
*Diameter of a circle whose area is equal to the surface cross section area.					
Working volume				375	gals
Desired thoughput:				8,040,000	gals/yr
Turnovers per year				21,440	
Month selected for emission calculations:				July	
Number of days in July:				31	
Total vapor pressure				0.357	psia
Maximum emissions**					
Working				17.25	lb/month
Breathing				0.04	lb/month
Note: **From TANK 4.0.9d Emissions Report					
Weight% of acid in vapor:				0.0003%	
Control efficiency:				95%	
Operating Schedule:					
hrs/day				24	hrs/day
days/wk				7	days/wk
weeks/yr				52	wks/yr
PM10 in PM				100%	
Cushion factor:				1.0	
(Cushion factor is used to give a cushion on the limit to insure compliance)					
Calculations:					
Emissions:					
Total emission (working + breathing), lb/month			(17.25 + 0.04) lb/month =	17.29	lb/month
PM/PM10/HCl					
lb/day					
Uncontrolled			17.29 lb/month/31 days/month*0*1 =	0.0000018	lb/day
Controlled			0.0000018 lb/day*(1-0.95) =	0.00000009	lb/day
lb/hr					
Uncontrolled			0.0000018 lb/day/24 hrs/day =	0.000000075	lb/hr
Controlled			0.00000009 lb/day/24 hrs/day =	0.0000000038	lb/hr
lb/yr			0.00000009 lb/day*7 days/wk*52 wks/yr =	0.000033	lb/yr

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

Emissions Report for: July

T-511 - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Waste Acids	2.13	0.06	2.19

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

T-511 - Horizontal Tank

Month:	January	February	March	April	May	June	July	August	September	Oct
Standing Losses (lb):							0.0580			
Vapor Space Volume (cu ft):							22.5114			
Vapor Density (lb/cu ft):							0.0021			
Vapor Space Expansion Factor:							0.0426			
Vented Vapor Saturation Factor:							0.9531			
Tank Vapor Space Volume:										
Vapor Space Volume (cu ft):							22.5114			
Tank Diameter (ft):							3.0000			
Effective Diameter (ft):							4.3713			
Vapor Space Outage (ft):							1.5000			
Tank Shell Length (ft):							5.0000			
Vapor Density										
Vapor Density (lb/cu ft):							0.0021			
Vapor Molecular Weight (lb/lb-mole):							18.8900			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.6183			
Daily Avg. Liquid Surface Temp. (deg. R):							530.9285			
Daily Average Ambient Temp. (deg. F):							73.0500			
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):							10.731			
Liquid Bulk Temperature (deg. R):							523.9983			
Tank Paint Solar Absorptance (Shell):							0.1700			
Daily Total Solar Insulation Factor (Btu/sqft day):							2,302.7457			
Vapor Space Expansion Factor										
Vapor Space Expansion Factor:							0.0426			
Daily Vapor Temperature Range (deg. R):							24.8571			
Daily Vapor Pressure Range (psia):							0.0000			
Breather Vent Press. Setting Range(psia):							0.0600			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.6183			
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):							0.6183			
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):							0.6183			
Daily Avg. Liquid Surface Temp. (deg R):							530.9285			
Daily Min. Liquid Surface Temp. (deg R):							524.7142			
Daily Max. Liquid Surface Temp. (deg R):							537.1427			
Daily Ambient Temp. Range (deg. R):							19.3000			
Vented Vapor Saturation Factor										
Vented Vapor Saturation Factor:							0.9531			
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):							0.6183			
Vapor Space Outage (ft):							1.5000			
Working Losses (lb):							2.1295			
Vapor Molecular Weight (lb/lb-mole):							18.8900			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.6183			
Net Throughput (gal/mo.):							45,000.0000			
Annual Turnovers:							8,571.4286			
Turnover Factor:							0.1702			
Tank Diameter (ft):							3.0000			
Working Loss Product Factor:							1.0000			
Total Losses (lb):							2.1875			

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

T-511 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Press Calculations
Waste Acids	Jul	71.26	65.04	77.47	64.33	0.6183	0.6183	0.6183	18.8900			0.00	

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

Identification

User Identification:	T-511
City:	
State:	
Company:	
Type of Tank:	Horizontal Tank
Description:	

Tank Dimensions

Shell Length (ft):	5.00
Diameter (ft):	3.00
Volume (gallons):	63.00
Turnovers:	8,571.43
Net Throughput(gal/yr):	540,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

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

Previous: None - A/Nos: 460711 460713 460714

Mixture Vapor Pressure
WASTE ACIDS
T-502/T-503/T-511

Operating temperature 70 F 460711, 13, 14

Compounds	Amount, lb	Solution wt%*	Molecular Weight	VP* mmHg	# moles (L)	mole fraction (L)	Partial VP mmHg	Mole Fraction (V)	Wt Contribution	wt% w/ water	wt% w/o water
Columns	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
HF	5	5.00%	20.01	309.40	0.0024992	4.52E-02	14.000	4.38E-01	8.7618	46.39%	100.00%
Water	95	95%	18.02	18.8	0.052733	0.9548	17.9669	0.56205	10.1254	53.61%	-
	100	100%			0.055232	1.0000	31.9669	1.0000	18.89	100.00%	100.00%
	T-502	T-503	T-511			psia	0.61831		W/o water	46.3902%	
Desired throughput	670,000	670,000	45,000	gals/month							
	8,040,000	8,040,000	540,000	gals/yr							
OK	9/24/08		L = Liquid								

*For HF, the vapor pressure is back calculated from a partial pressure of 14 mm Hg, the available vapor pressure of HF solution for 48% HF, used as vapor pressure at 5%, and mole fraction of HF in solution.

The tank contains HCl, HNO_3, H_3PO_4, HF, and acetic acid. For vapor pressure calculations, we use HF, since it has higher vapor pressure than others.

(2)=(1)/100
(5)=(2)/(3)
(6)=(5)/0.055232
(7)=(4)*(6)
(8)=(7)/31.9669
(9)=(3)*(8)
(10)=(9)/18.89
(11)=(10)/46.3902%

	PM/PM10/Acid
lb/hr	
Uncontr.	0.001
Contr.	0.001
lb/day	
Uncontr.	0.03
Contr.	0.03
lb/yr (Contr.)	9.17

	50 m Screening Levels	
Chemicals	lb/yr	lb/hr
HCl	780	2.1
H_2SO_4	86.7	0.12
HNO_3		0.0857
H_3PO_4	607	
HF		0.24

Rule 1401:

HIs:

The tank contains HCl, HNO_3, H_3PO_4, HF, and acetic acid. For vapor pressure calculations, we use HF.since it has higher vapor pressure than others. For risk screening, we use HNO_3 hourly emission and H_2SO_4 annual emission.

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
H_2SO_4	-	9.17	-	86.70	-	0.11	Yes
HNO_3	0.001	-	0.0857	-	0.01	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
Total					0.01	0.11	

Monthly throughput limit: 63 gals*8544 times/yr/12 months/yr*1 = 45,000 gals/month

ATTACMENT
WASTE ACIDS
T-511
Rectangular
Control: None

Previous:	None			A/N:	460711
Dimensions:	ft	inches	gals		
W	1	8	63		
L	3	0.5		Convert to	
H	1	8		Horizontal	
Tank diameter (Used for calculations)*			D	1.9	ft
Tank length (Used for calculations)			L	3.04	ft
*Diameter of a circle whose area is equal to the surface cross section area.					
Working volume				63	gals
Desired thoughput:				540,000	gals/yr
Turnovers per year				8,544	
Month selected for emission calculations:				July	
Number of days in July:				31	
Total pressure:				0.6183	psia
Maximum emissions**					
Working				2.13	lb/month
Breathing				0.06	lb/month
Note: **From TANK 4.0.9d Emissions Report				2.19	
Weight% of acid in vapor:				35.67%	
Control efficiency:				0%	
Operating Schedule:					
hrs/day				24	hrs/day
days/wk				7	days/wk
weeks/yr				52	wks/yr
PM10 in PM				100%	
Cushion factor:				1.0	
(Cushion factor is used to give a cushion on the limit to insure compliance)					

Calculations:

Emissions:

Total emission (working + breathing), lb/month	(2.13 + 0.06) lb/month =	2.19 lb/month
PM/PM10/Acid		
lb/day		
Uncontrolled	2.19 lb/month/31 days/month*0.3567*1 =	0.025 lb/day
Controlled	0.025 lb/day*(1-0) =	0.025 lb/day
lb/hr		
Uncontrolled	0.025 lb/day/24 hrs/day =	0.001 lb/hr
Controlled	0.025 lb/day/24 hrs/day =	0.001 lb/hr
lb/yr	0.025 lb/day*7 days/wk*52 wks/yr =	9.17 lb/yr

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

Emissions Report for: July

T-408 - Vertical Fixed Roof Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Acid	0.05	0.01	0.07

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

T-408 - Vertical Fixed Roof Tank

Month:	January	February	March	April	May	June	July	August	September	Oct
Standing Losses (lb):							0.0147			
Vapor Space Volume (cu ft):							4.3580			
Vapor Density (lb/cu ft):							0.0027			
Vapor Space Expansion Factor:							0.0426			
Vented Vapor Saturation Factor:							0.9591			
Tank Vapor Space Volume:										
Vapor Space Volume (cu ft):							4.3580			
Tank Diameter (ft):							2.0000			
Vapor Space Outage (ft):							1.3872			
Tank Shell Height (ft):							2.5000			
Average Liquid Height (ft):							1.2500			
Roof Outage (ft):							0.1372			
Roof Outage (Dome Roof)										
Roof Outage (ft):							0.1372			
Dome Radius (ft):							2.0000			
Shell Radius (ft):							1.0000			
Vapor Density										
Vapor Density (lb/cu ft):							0.0027			
Vapor Molecular Weight (lb/lb-mole):							26.1400			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.5800			
Daily Avg. Liquid Surface Temp. (deg. R):							530.9285			
Daily Average Ambient Temp. (deg. F):							73.0500			
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):							10.731			
Liquid Bulk Temperature (deg. R):							523.9983			
Tank Paint Solar Absorptance (Shell):							0.1700			
Tank Paint Solar Absorptance (Roof):							0.1700			
Daily Total Solar Insulation Factor (Btu/sqft day):							2,302.7457			
Vapor Space Expansion Factor										
Vapor Space Expansion Factor:							0.0426			
Daily Vapor Temperature Range (deg. R):							24.8571			
Daily Vapor Pressure Range (psia):							0.0000			
Breather Vent Press. Setting Range(psia):							0.0600			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.5800			
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):							0.5800			
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):							0.5800			
Daily Avg. Liquid Surface Temp. (deg R):							530.9285			
Daily Min. Liquid Surface Temp. (deg R):							524.7142			
Daily Max. Liquid Surface Temp. (deg R):							537.1427			
Daily Ambient Temp. Range (deg. R):							19.3000			
Vented Vapor Saturation Factor										
Vented Vapor Saturation Factor:							0.9591			
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):							0.5800			
Vapor Space Outage (ft):							1.3872			
Working Losses (lb):							0.0541			
Vapor Molecular Weight (lb/lb-mole):							26.1400			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.5800			
Net Throughput (gal/mo.):							150.0000			
Annual Turnovers:							30.5085			
Turnover Factor:							1.0000			
Maximum Liquid Volume (gal):							59.0000			
Maximum Liquid Height (ft):							2.5000			
Tank Diameter (ft):							2.0000			
Working Loss Product Factor:							1.0000			
Total Losses (lb):							0.0688			

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

T-408 - Vertical Fixed Roof Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Acid	Jul	71.26	65.04	77.47	64.33	0.5800	0.5800	0.5800	26.1400			142.29	

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

Identification

User Identification:	T-408
City:	
State:	
Company:	
Type of Tank:	Vertical Fixed Roof Tank
Description:	

Tank Dimensions

Shell Height (ft):	2.50
Diameter (ft):	2.00
Liquid Height (ft) :	2.50
Avg. Liquid Height (ft):	1.25
Volume (gallons):	59.00
Turnovers:	30.51
Net Throughput(gal/yr):	1,800.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	0.00
Radius (ft) (Dome Roof)	0.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

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

Previous: None A/N: 460709

Mixture Vapor Pressure
SCALE INHIBITOR
T-408

Operating temperature 70 F

Compounds	Amount, lb	Solution wt%*	Molecular Weight	VP mmHg	# moles (L)	mole fraction (L)	Partial VP mmHg	Mole Fraction (V)	Wt Contribution	wt% w/ water	wt% w/o water
Columns	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
H_3PO_4	10	10%	98.00	0.03	0.0010205	2.34E-02	7.02E-04	2.34E-05	0.0023	0.01%	0.01%
H_2SO_4	10	10%	98.07	0.00055	0.0010196	2.34E-02	1.28E-05	4.27E-07	0.00004	0.00%	0.0003%
HCl	10	10%	36.46	210.00	0.0027427	6.28E-02	1.32E+01	4.41E-01	16.0649	61.45%	99.99%
Water	70	70%	18.02	18.8	0.038856	0.8904	16.7559	0.55937	10.0772	38.54%	-
	100	100%			0.0436	1.0000	29.9550	1.0000	26.14	100.00%	100.00%
						psia	0.57939		W/o water	61.46%	

Desired throughput 150 gals/month
1,800 gals/yr

L = Liquid

Calculations:
(2)=(1)/100
(5)=(2)/(3)
(6)=(5)/0.043639
(7)=(4)*(6)
(8)=(7)/29.955
(9)=(3)*(8)
(10)=(9)/26.14
(11)=(10)/61.46%

lb/yr	0.01%*0.43 =	6.18E-05 lb/yr
H_2SO_4		
lb/day		
Uncontrolled	0.0003%*0.001 =	3.1E-09 lb/day
Controlled	0.0003%*0.001 =	3.1E-09 lb/day
lb/hr		
Uncontrolled	0.0003%*0.00005 =	1.29E-10 lb/hr
Controlled	0.0003%*0.00005 =	1.29E-10 lb/hr
lb/yr	0.0003%*0.43 =	1.13E-06 lb/yr
HCl		
lb/day		
Uncontrolled	99.99%*0.001 =	0.001189 lb/day
Controlled	99.99%*0.001 =	0.001189 lb/day
lb/hr		
Uncontrolled	99.99%*0.00005 =	4.96E-05 lb/hr
Controlled	99.99%*0.00005 =	4.96E-05 lb/hr
lb/yr	99.99%*0.43 =	0.43 lb/yr

	PM/PM10	H_3PO_4	H_2SO_4	HCl
lb/hr				
Uncontr.	4.96E-05	7.08E-09	1.29E-10	4.96E-05
Contr.	4.96E-05	7.08E-09	1.29E-10	4.96E-05
lb/day				
Uncontr.	0.001	1.7E-07	3.1E-09	0.0012
Contr.	0.001	1.7E-07	3.1E-09	0.0012
lb/yr (Contr.)	0.43	6.18E-05	1.13E-06	0.43

	50 m Screening Levels	
Chemicals	lb/yr	lb/hr
HCl	780	2.1
H_2SO_4	86.7	0.12
HNO_3		0.0857
H_3PO_4	607	
HF		0.24

Rule 1401:

HIs:

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
H_3PO_4	7.08E-09	6.18E-05	-	607.00	-	1.02E-07	
H_2SO_4	1.29E-10	1.13E-06	0.12	86.70	1.08E-09	1.30E-08	
HCl	4.96E-05	0.43	2.10	780.00	2.36E-05	5.55E-04	Yes
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
Total					2.36E-05	5.55E-04	

Monthly throughput limit: 150 gals/month

ATTACMENT
SCALE INHIBITOR
T-408
Vertical
Control: None

Previous:	None			A/N:	460709
Given:					
Tank dimention	ft	in	gals		
DIA.	2	0	59		
L	2	6			
Working volume				50	gals
Desired thoughput:				1,800	gals/yr
Turnovers per year				36.00	
Month selected for emission calculations:				July	
Number of days in July:				31	
Total vapor pressure:				0.58	psia
Maximum emissions**					
Working				0.05	lb/month
Breathing				0.01	lb/month
Note: **From TANK 4.0.9d Emissions Report				0.06	
Weight% of PM in vapor:				61.46%	
Acids in PM:					
H_3PO_4				0.01%	
H_2SO_4				0.0003%	
HCl				99.99%	
Control efficiency:				0%	
Operating Schedule:					
hrs/day				24	hrs/day
days/wk				7	days/wk
weeks/yr				52	wks/yr
PM10 in PM				100%	
Cushion factor:				1.0	

(Cushion factor is used to give a cushion on the limit to insure compliance)

Calculations:

Emissions:

Total emission (working + breathing), lb/month	(0.05 + 0.01) lb/month =	0.06 lb/month
PM/PM10		
lb/day		
Uncontrolled	0.06 lb/month/31 days/month*0.6146*1 =	0.001 lb/day
Controlled	0.001 lb/day*(1-0) =	0.001 lb/day
lb/hr		
Uncontrolled	0.001 lb/day/24 hrs/day =	0.00005 lb/hr
Controlled	0.001 lb/day/24 hrs/day =	0.00005 lb/hr
lb/yr	0.001 lb/day*7 days/wk*52 wks/yr =	0.43 lb/yr
H_3PO_4		
lb/day		
Uncontrolled	0.01%*0.001 =	1.7E-07 lb/day
Controlled	0.01%*0.001 =	1.7E-07 lb/day
lb/hr		
Uncontrolled	0.01%*0.00005 =	7.08E-09 lb/hr
Controlled	0.01%*0.00005 =	7.08E-09 lb/hr

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

Emissions Report for: July

T-928 - Horizontal Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Tank 928 Chemicals	1.91	1.98	3.88

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

T-928 - Horizontal Tank

Month:	January	February	March	April	May	June	July	August	September	Oct
Standing Losses (lb):							1.9756			
Vapor Space Volume (cu ft):							430.0705			
Vapor Density (lb/cu ft):							0.0036			
Vapor Space Expansion Factor:							0.0427			
Vented Vapor Saturation Factor:							0.9627			
Tank Vapor Space Volume:										
Vapor Space Volume (cu ft):							430.0705			
Tank Diameter (ft):							7.7000			
Effective Diameter (ft):							11.9260			
Vapor Space Outage (ft):							3.8500			
Tank Shell Length (ft):							14.5000			
Vapor Density										
Vapor Density (lb/cu ft):							0.0036			
Vapor Molecular Weight (lb/lb-mole):							108.1400			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.1900			
Daily Avg. Liquid Surface Temp. (deg. R):							530.9285			
Daily Average Ambient Temp. (deg. F):							73.0500			
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):							10.731			
Liquid Bulk Temperature (deg. R):							523.9983			
Tank Paint Solar Absorptance (Shell):							0.1700			
Daily Total Solar Insulation Factor (Btu/sqft day):							2,302.7457			
Vapor Space Expansion Factor										
Vapor Space Expansion Factor:							0.0427			
Daily Vapor Temperature Range (deg. R):							24.8571			
Daily Vapor Pressure Range (psia):							0.0000			
Breather Vent Press. Setting Range(psia):							0.0600			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.1900			
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):							0.1900			
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):							0.1900			
Daily Avg. Liquid Surface Temp. (deg R):							530.9285			
Daily Min. Liquid Surface Temp. (deg R):							524.7142			
Daily Max. Liquid Surface Temp. (deg R):							537.1427			
Daily Ambient Temp. Range (deg. R):							19.3000			
Vented Vapor Saturation Factor										
Vented Vapor Saturation Factor:							0.9627			
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):							0.1900			
Vapor Space Outage (ft):							3.8500			
Working Losses (lb):							1.9091			
Vapor Molecular Weight (lb/lb-mole):							108.1400			
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):							0.1900			
Net Throughput (gal/mo.):							3,902.5000			
Annual Turnovers:							9.3660			
Turnover Factor:							1.0000			
Tank Diameter (ft):							7.7000			
Working Loss Product Factor:							1.0000			
Total Losses (lb):							3.8848			

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

T-928 - Horizontal Tank

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pres Calculations
Tank 928 Chemicals	Jul	71.26	65.04	77.47	64.33	0.1900	0.1900	0.1900	108.1400			0.00	

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

Identification

User Identification:	T-928
City:	
State:	
Company:	
Type of Tank:	Horizontal Tank
Description:	

Tank Dimensions

Shell Length (ft):	14.50
Diameter (ft):	7.70
Volume (gallons):	5,000.00
Turnovers:	9.37
Net Throughput(gal/yr):	46,830.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

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

Tank T-928 Contents

		Highest vapor pressure	
	Volume %	mmHg	psi
Edge Bead Remover EBR 10A	77%	3.7	0.071
System 815	21%	9.7	0.19
SPR 3615 + 700-1.2 + AZ 3330F	2%	9.7	0.19
	100%	9.7	0.19

Note: Since we do not have enough data to calculate the composite vapor pressure, we will use the maximum.
We will use molecular weight of anisole for emission calculaltions.

Rule 1401:

To simplify our rist analysis, we use cresol emissions as total emissions.

HIs:

	Emissions		Screening Levels		HIs Contributions		Compliance
	lb/hr	lb/yr	lb/hr	lb/yr	Acute	Chronic	
Cresol	-	50.24	-	1.98E+04	-	2.54E-03	Yes
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
Total					-	2.54E-03	

Monthly throughput limit: 3,903 gals/month

ATTACMENT
WASTE SOLVENTS
T-928
Horizontal
Control: None

Previous: None A/N: 460708

Given:

Tank dimentions:	ft	in	gals		
DIA.	7	8	5,022 OK		
L	14	6.5			
Tank diameter				7.7	ft
Tank length				14.5	ft
Turnovers per year				9.4	
Working volume				5,000	gals
Month selected for emission calculations:				July	
Number of days in the selected month:				31	
Total vapor pressure				0.19	psia
Maximum emissions**					
Working				1.91	lb/month
Breathing				1.98	lb/month
Note: **From TANK 4.0.9d Emissions Report				3.89	
Weight% of VOC in vapor: (worst case)				100%	
Control efficiency:				0%	
Operating Schedule:					
hrs/day				24	hrs/day
days/wk				7	days/wk
weeks/yr				52	wks/yr
Exhaust flow rate				60,000	cfm
Ideal gas molar volume	@	60 F		379.49	ft^3/lbmole
Cushion factor				1.1	

(Cushion factor is used to give a cushion on the limit to insure compliance)

Calculations:

Annual throughput:		46,830 gals
Emissions:		
Total emission, lb/month (working + breathing)	(1.91+1.98) lb/month =	3.89 lb/month
VOC		
lb/day		
Uncontrolled	3.89 lb/month*1/31 days/month*1.1 =	0.14 lb/day
Controlled	0.14 lb/day*(1-0) =	0.14 lb/day
lb/hr		
Uncontrolled	0.14 lb/day/24 hrs/day =	0.01 lb/hr
Controlled	0.14 lb/day/24 =	0.01 lb/hr
lb/yr	0.14 lb/day*7 days/wk*52 wks/year =	50.24 lb/yr

	VOC	
	Uncontr.	Controlled
lb/hr	0.01	0.01
lb/day	0.14	0.14
lb/yr	-	50.24

APPLICATION NO. 492804: Wet Chemical/Solvent IPA

MICR is less than 1 in a million and HI is less than 1. Complies.

APPLICATION NO. 495576: IC Manufacturing AsH_3, PH_3, Cl_2, HBr

MICR is less than 1 in a million and HI is less than 1. Complies.

Rule 1703 - PSD Analysis:

There is no CO emission increase due the modification, all requirements of Regulation XVII - Prevention of Significant Deterioration - are not applicable.

DISCUSSIONS

McGill & John Zink oxidizers fuel limit & NSR emissions:

The existing combined fuel limit for John Zink Oxidizer and McGill Oxidizer, 116,500 ft^3/day, is equivalent to the fuel for one of the two oxidizers (with the same rating) operating at full load (114,286 ft^3/day) plus 1.94%. No explanation for this 1.94% was found in the previous applications.

John Zink oxidizer:

Emissions as shown in NSR Application Emissions Report for A/N 301239 (previous to A/N 492810) are as follows:

	ROG	NOx	SOx	CO	PM10
lb/hr	0.025	0.242	0.003	0.095	0.01
lb/day	1	6	0	2	1
lb/yr	109	1036	12	411	102.86

The above emissions (calculated at the oxidizer full load) will be used for A/N 492810.

McGill oxidizer:

The emissions as shown in NSR Application Emission Report for A/N 187887 (previous to A/N 492807 - McGill oxidizer) are zeros. With the combined fuel limit for McGill and John Zink oxidizers remains unchanged (100% load of one of the two oxidizers with the same heat input rating). To be consistent with the 30-day average emission calculations, we will impose the monthly fuel limit (instead of the existing daily limit). Since emissions for John Zink oxidizer operated at full load are recorded under A/N 492810 (John Zink oxidizer), emissions from McGill oxidizer (A/N 492807) should again be recorded as zeros.

Conclusion:

Based on information submitted with the applications and the above evaluation, it is determined that the equipment operates or will operate in compliance with all the applicable rules and regulations of the District.

RECOMMENDATIONS:

Issue Permits to Operate or Permit to Construct/Operate subject to the permit conditions as stated in Section D.

Per AQMD's January 9, 2009 Permit Moratorium Fact Sheet, since the facility has an NSR cap on VOC and the modification and change of conditions will not increase emissions beyond the cap, the permit can be issued without requiring VOC ERCs to offset the VOC emission increase due to the modification or change of conditions.

NOx/SOx

There is no emission increase from the project. No external offsets are required.

PM10:

Per AQMD's January 9, 2009 Permit Moratorium Fact Sheet, since the project PM10 emission increase is less than 0.5 lb/day, the permit can be issued without requiring PM10 ERCs to offset the PM10 emission increase due to the modification or change of conditions. See Table 1 - Project PM10 Emissions (in CALCULATIONS Section).

Rule 1401: Rule 1401 Chemicals

APPLICATION NO. 460708: T-928 Cresol

MICR is less than 1 in a million and HI is less than 1. Complies.

APPLICATION NO. 460709: T-408 HCl, H_2SO_4, H_3PO_4

MICR is less than 1 in a million and HI is less than 1. Complies.

APPLICATION NO. 460711: T-511 HCl, HNO_3, H_3PO_4, HF, H_2SO_4

MICR is less than 1 in a million and HI is less than 1. Complies.

APPLICATION NO. 460712: T-501 H_2SO_4

MICR is less than 1 in a million and HI is less than 1. Complies.

APPLICATION NO. 460713: T-502 HCl, HNO_3, H_3PO_4, HF, H_2SO_4

MICR is less than 1 in a million and HI is less than 1. Complies.

APPLICATION NO. 460714: T-503 HCl, HNO_3, H_3PO_4, HF, H_2SO_4

MICR is less than 1 in a million and HI is less than 1. Complies.

APPLICATION NO. 460715: T-504 NH_3

MICR is less than 1 in a million and HI is less than 1. Complies.

APPLICATION NO. 460728: T-141 HNO_3, H_3PO_4

MICR is less than 1 in a million and HI is less than 1. Complies.

APPLICATION NO. 460729: T-151 HNO_3

MICR is less than 1 in a million and HI is less than 1. Complies.

APPLICATION NO. 460730: T-155 HNO_3

MICR is less than 1 in a million and HI is less than 1. Complies.

APPLICATION NO. 460732: T-191 HNO_3, H_3PO_4

MICR is less than 1 in a million and HI is less than 1. Complies.

APPLICATION NO. 460733: T-195 HNO_3, H_3PO_4

MICR is less than 1 in a million and HI is less than 1. Complies.

APPLICATION NO. 460734: T-14 HNO_3, H_3PO_4, HF, H_2SO_4, NH_3

MICR is less than 1 in a million and HI is less than 1. Complies.

APPLICATION NO. 460735: T-405 H_2SO_4

MICR is less than 1 in a million and HI is less than 1. Complies.

APPLICATION NO. 460744: T-406 H_2SO_4

MICR is less than 1 in a million and HI is less than 1. Complies.

APPLICATION NO. 460747: Photolithographic System Cresol

MICR is less than 1 in a million and HI is less than 1. Complies.

APPLICATION NO. 492802: IC Manufacturing AsH_3, PH_3, Cl_2, HBr

MICR is less than 1 in a million and HI is less than 1. Complies.

APPLICATION NO. 492805: Photolithographic System Cresol

No Rule 1401 chemicals are used in this equipment.

APPLICATION NO. 492803: Wet Chemical/Solvent IPA, Xylene

MICR is less than 1 in a million and HI is less than 1. Complies.

RULE EVALUATION

Rule 212:

(c) (1): Emissions near a school

The equipment is not located within 1000 feet from the outer boundary of a school. (The nearest school, Mountain View Christian School, is 3168 feet from the facility). The equipment is not subject to the public notice requirements of subdivision (c).

Note: The listed River Springs Charter School, located at 43466 Business Park Dr., CA 92590, listed 0.1 mile (as shown on the map, more than 0.3 mile actually) away from the facility, is an administration building, and there is no class held at the location address.

(c) (2): On-site emission increases exceeding the daily maximums

The emission increases do not exceed any of the daily maximums specified in subdivision (g) of this rule. The equipment is not subject to the public notice requirements of subdivision (c).

(c) (3): Emissions of toxic air contaminants

The emission increases are less than the screening levels: MICR is less than 1 in a million. The equipment is not subject to the public notice requirements of subdivision (c).

(g) Emission increases exceeding the daily maximums

The emission increases do not exceed any of the daily maximums specified in subdivision (g) of this rule. The equipment is not subject to the public notice requirements specified in subdivision (g).

Rule 401 - Visible Emissions:

Based on experience with this type of equipment, compliance with this rule is expected.

Rule 402 - Nuisances:

Nuisance problems due to the equipment operation are unlikely.

Rule 1164 - Semiconductor Manufacturing:

VOC emissions from solvent benches and photoresist operations are controlled by over 90%. Complies.

Regulation XIII:

BACT:

Tank T-504 (Waste Ammonium Hydroxide Storage Tank: A/N 460715::

BACT Achieved in Practice for ammonia hydroxide storage tanks is a vapor balance system to route vapors displaced from the tanks back to the truck during filling operations. However, this tank is not filled from a filling truck but from processes in the facility. No BACT Achieved in Practice for this operation.

Tanks T-928 (Waste Solvent A/N 460708), T-408 (Scale Inhibitor A/N 460709), T-511 (Waste H_2SO_4 A/N 460711), T-405 Waste H_2SO_4 A/N 460735), and T-406 (Waste H_2SO_4 A/N 460744).

The maximum daily emissions are less than 1 lb. No BACT analysis is required.

T-501 (Waste Sulfuric Acid Tank A/N 460712), T-502 (Waste Acid Tank A/N 460713), T-503 (Waste Acid Tank A/N 460714), IC Manufacturing A/N 492802, IC Manufacturing Pending, Photolithographic System A/N 492805, Wet Chemical/Solvent Cleaning A/N 492803, Wet Chemical /Solvent Cleaning A/N 492804, T-141 (Aluminum Etch Tank A/N 460728), T-151 (Poly Etch Mix Tank A/N 460729), T-155 (Poly Etch Mix Tank A/N 460730), T-191 (Aluminum Etch Tank A/N 460732), T-195 (Aluminum Etch Tank A/N 460733), T-14 (Waste Acid Tank A/N 460734), Photolithographic System A/N 460747:

Scrubbers for PM control and afterburners for VOC control are BACT for the equipment. Complies.

Modeling:

Currently, no modeling is required for VOC. The PM10 emissions are lower than the limit in Table A-1 of Rule 1303. No further evaluation is necessary.

Offsets:

CO:

CO is in attainment. See Rule 1703 evaluation.

VOC:

The facility has a VOC facility limit of 1830 pounds in one calendar month. This limit is not expected to be exceeded with the modification and change of conditions. Reported VOC emissions from July 07 to August 08 show that VOC emissions from this facility were less than 1400 lbs/month.

A/N 495576 IC Manufacturing	PM10			
	A/N 495576		Prev A/N	Increase
	Uncont.	Controlled	Controlled	Controlled
lb/hr	0.75	0.04		
lb/day	18.06	0.89	0.57	0.32
lb/yr		323.20		
MICR	9.24E-07 < 1 in a million			

Table 1
Project PM10 Emissions

Applications		PM10 Emissions, lb/day			Previous Pending A/Ns	Permit Types	Remarks
Current	Previous	Current	Previous	Increases			
460708	None	-	-	-		P/O	VOC source
460709	None	0.001	-	0.001		P/O	
460711	None	0.03	-	0.03		P/O	
460712	None	9.01E-08	-	9.01E-08		P/O	
460713	None	0.02	-	0.02		P/O	
460714	None	0.02	-	0.02		P/O	
460715	None	-	-	-		P/O	NH_3 source
492802	337634	0.26	0.23	0.03	460716	P/C	Higher chemical usage after modification
495576	302034	0.89	0.57	0.32	460717	P/C	Higher chemical usage after modification
492805	381809	-	-	-	460725	P/C	VOC source
492803	270414	1.92	1.92	-	460726	P/C	Chemical amounts unchanged
492804	302033	1.66	1.66	-	460727	P/C	Chemical amounts unchanged
460728	381808	0.0003	0.0001	0.0002		P/O	
460729	381810	0.0027	0.0009	0.0018		P/O	
460730	383502	0.0027	0.0009	0.0018		P/O	
460732	381815	0.00007	0.00003	0.00004		P/O	
460733	383506	0.00008	0.00003	0.00005		P/O	
460734	134700	0.18	0.18	-		P/O	Corrected stored chemicals
460735	414242	3.45E-07	1.73E-08	0.0000003		P/O	Removed venting to APC equipment requirement
460744	414236	2.53E-07	1.27E-08	0.0000002		P/O	Removed venting to APC equipment requirement
460747	None	-	-	-		P/O	VOC source
Total project impact				0.42			

Note: Facility existing PM10 PTE = 9 lb/day

In addition the calculated emissions using Raoult's law for the composite vapor pressure determinations, a new set of calculations for storage tanks except waste ammonia tank and T-298 for which Raoult's law was not used in the earlier emission calculations, have been performed to verify the emissions calculated with the use of Raoult's law. The vapor pressures for the second set are determined by adding all individual vapor pressure of each component in the mixture. Results from the second set of calculations (attached at the end of the evaluation package) show that the calculated emissions are consistent with the first set.

A/N 460734 Waste Acid Tank T-14	Uncont.	Controlled	Uncont.	Controlled
lb/hr	0.15	0.01	0.0005	0.0005
lb/day	3.55	0.18	0.011	0.011
lb/yr		64.56		4.13

	PM10			
	A/N 460735		Prev A/N 414242	Increases
A/N 460735 Waste Sulfuric Acid T-405	Uncont.	Controlled	Controlled	Controlled
lb/hr	1.44E-08	1.44E-08		
lb/day	3.45E-07	3.45E-07	1.73E-08	0.0000003
lb/yr		1.26E-04		

	PM10			
	A/N 460744		Prev A/N 414236	Increase
A/N 460744 Waste Sulfuric Acid T-406	Uncont.	Controlled	Controlled	Controlled
lb/hr	1.06E-08	1.06E-08		
lb/day	2.53E-07	2.53E-07	1.27E-08	0.0000002
lb/yr		9.22E-05		

	VOC	
A/N 460747 Photolithographic System	Uncont.	Controlled
lb/hr	22.42	0.29
lb/day	538.05	6.99
lb/yr		2546.05

	PM10			
	A/N 492802		Prev A/N 337634	Increases
A/N 492802 IC Manufacturing	Uncont.	Controlled	Controlled	Controlled
lb/hr	0.22	0.011		
lb/day	5.18	0.26	0.23	0.03
lb/yr		95.05		
MICR	9.48E-07 < 1 in a million			

	VOC		PM10	
A/N 492803 Wet Chemical/Solvent	Uncont.	Controlled	Uncont.	Controlled
lb/hr	0.23	0.00	6.41	0.08
lb/day	5.58	0.06	153.84	1.92
lb/yr		20.30		698.88

	VOC		PM10	
A/N 492804 Wet Chemical/Solvent	Uncont.	Controlled	Uncont.	Controlled
lb/hr	1.00	0.02	0.69	0.07
lb/day	24.02	0.37	16.56	1.66
lb/yr		134.37		602.78

	VOC	
A/N 492805 Photolithographic System	Uncont.	Controlled
lb/hr	5.61	0.28
lb/day	134.65	6.73
lb/yr		2450.61

A/N 460715 Waste Ammonium Hydroxide T-504

	NH_3	
	Uncont.	Controlled
lb/hr	0.06	0.06
lb/day	1.54	1.54
lb/yr		562.14

Ammonia concentration (at stack exit): 0.40 ppm

Note: This ammonia concentration is at the exhaust of the wet scrubber. At ground level, the concentration is much lower. Even at the wet scrubber exhaust, the ammonia concentration is well below the ACGIH (American Conference of Governmental Industrial Hygienist) threshold level of 25 ppm.

A/N 460728 Aluminum Etch Tank T-141

	PM10				$C_2H_4O_2$	
	A/N 460728		Prev A/N 381808	Increase	A/N 460728	
	Uncont.	Controlled	Controlled	Controlled	Uncont.	Controlled
lb/hr	0.0003	0.00001			0.0007	0.0007
lb/day	0.01	0.0003	0.0001	0.0002	0.02	0.02
lb/yr		0.11				5.75

A/N 460729 Poly Etch Tank T-151

	PM10			
	A/N 460729		Prev A/N 381810	Increase
	Uncont.	Controlled	Controlled	Controlled
lb/hr	0.002	0.0001		
lb/day	0.05	0.0027	0.0009	0.0018
lb/yr		1.00		

A/N 460730 Poly Etch Tank T-155

	PM10			
	A/N 460730		Prev A/N 383502	Increase
	Uncont.	Controlled	Controlled	Controlled
lb/hr	0.002	0.0001		
lb/day	0.05	0.0027	0.0009	0.0018
lb/yr		1.00		

A/N 460732 Aluminum Etch Tank T-192

	PM10				$C_2H_4O_2$	
	A/N 460732		Prev A/N 381815	Increase	A/N 460732	
	Uncont.	Controlled	Controlled	Controlled	Uncont.	Controlled
lb/hr	0.0001	0.000003			0.0002	0.0002
lb/day	0.001	0.00007	0.00003	0.00004	0.004	0.004
lb/yr		0.03				1.36

A/N 460733 Aluminum Etch Tank T-195

	PM10				$C_2H_4O_2$	
	A/N 460733		Prev A/N 383506	Increase	A/N 460733	
	Uncont.	Controlled	Controlled	Controlled	Uncont.	Controlled
lb/hr	0.0001	0.000003			0.0002	0.0002
lb/day	0.002	0.00008	0.00003	0.00005	0.004	0.004
lb/yr		0.03				1.49

PROCESS DESCRIPTION

The equipment is for semiconductor device manufacturing. Oxidizers or carbon adsorbers are used for VOC control and wet scrubbers are used for PM control. In addition, resin adsorbers are used to control arsine emission from ion implanters.

CALCULATIONS

Burn boxes:

Burn boxes are fueled with hydrogen. Since it is believed that combustion of hydrogen does not produce any criteria pollutants, no calculations for emissions from hydrogen combustion will be performed.

TANK 4.0.9d is used to calculate emissions from storage tanks. Vapor pressures are estimated using ideal gas law and Raoult's Law.

VOC control efficiencies:

The control efficiency depends on what APC equipment the equipment vents to. 95% for McGill oxidizer, 98.7% for Zink oxidizer, and 99% for carbon adsorbers.

Photoresist Operations & Solvent Cleaning:

This facility has a VOC cap of 1,800 lbs in any one calendar month. VOC emissions are calculated using the amount of solvent used (excluding salvage solvent) and VOC control efficiencies. For emission calculation purpose, controlled VOC emissions from the previous applications are used to calculate the emission rates.

All calculations are in attachments to this evaluation. Below is a summary of calculated emissions.

A/N 460708 Waste Solvent Tank T-928	VOC	
	Uncont.	Controlled
lb/hr	0.01	0.01
lb/day	0.14	0.14
lb/yr		50.24

A/N 460709 Scale Inhibitor Tank T-408	PM10	
	Uncont.	Controlled
lb/hr	0.00005	0.00005
lb/day	0.001	0.001
lb/yr		0.43

A/N 460711 Waste Acid Tank T-511	PM10	
	Uncont.	Controlled
lb/hr	0.00	0.00
lb/day	0.03	0.03
lb/yr		9.17

A/N 460712 Waste Sulfuric Acid T-501	PM10	
	Uncont.	Controlled
lb/hr	7.51E-08	3.75E-09
lb/day	1.80E-06	9.01E-08
lb/yr		3.28E-05

A/N 460713 Waste Sulfuric Acid T-502	PM10	
	Uncont.	Controlled
lb/hr	0.02	0.001
lb/day	0.47	0.02
lb/yr		8.58

A/N 460714 Waste Acid Tank T-503	PM10	
	Uncont.	Controlled
lb/hr	0.02	0.001
lb/day	0.47	0.02
lb/yr		8.55

Modification P/O applications:

Permit units associated with those applications have been modified without a permit to construct. Either new items have been added, or existing items in the permit units have been removed, or both. See Equipment Description Section.

APPLICATION NO. 459172:

The existing permit has two parallel trains, each with 3 canisters. The third train, a standby, has been installed.

APPLICATION NO. 460734:

This storage tank was designated to store "Fluoride Waste." It has been used to store "Waste Acids."

A check on the records for A/N 134700, previous to A/N 460734, shows that the tank was specified to store "Dilute acids (H_3PO_4, HNO_3, HCl, HF) in water." It is believed that the same waste acids as those current ones. Permit M56107 (A/N 134700) has no throughput limit.

C/C P/O applications:

Permit units associated with applications listed below have not been modified. The applications are for a change in throughput limits or removing the venting to control equipment where the required venting is not needed due to low emissions.

APPLICATION NO. 460728:

Aluminum Etch throughput increased from 917 gals/month to 8648 gals/month.

APPLICATION NO. 460729:

Poly Etch throughput increased from 917 gals/month to 11348 gals/month.

APPLICATION NO. 460730:

Poly Etch throughput increased from 917 gals/month to 11348 gals/month.

APPLICATION NO. 460732:

Aluminum Etch throughput increased from 917 gals/month to 6244 gals/month.

APPLICATION NO. 460733:

Aluminum Etch throughput increased from 917 gals/month to 6244 gals/month.

APPLICATION NO. 460735:

Removed the venting to the control requirement. At the time of filing the company also wanted an increase in throughput, but later decided to keep the same throughput as previously permitted.

APPLICATION NO. 460744:

Removed the venting to the control requirement. At the time of filing the company also wanted an increase in throughput, but later decided to keep the same throughput as previously permitted.

P/O application:

A/N 460747 was originally designated as subsequent to A/N 302035. However, a check on the history in PAATS (Permit Administration and Application Tracking System) data base shows that A/N 302035 is previous to A/N 381809 which is previous to 460725. Therefore A/N 460747 cannot be subsequent to A/N 302035 and, for permit processing purpose, it is processed as P/O with no previous application.

P/C applications:

A/Ns 492802 & 495576:

PM emissions are controlled by the Vector scrubber and existing wet scrubbers. However, to further reduce PM10 emissions, the company has proposed to replace the low efficient integrated filters in furnaces with LTO tubes with high efficient filters, and install high efficient filters to furnaces with Poly, Nitride and TEOS tubes, and four PECVD machines. The high efficient filters are expected to reduce SiO_2 emissions by 98%. The low efficient filters in LTO furnaces only reduce SiO_2 emissions by 95%. These filters are located at inlets of the vacuum pumps. Silane and phosphine are not used in atmospheric tubes or atmospheric diffusion furnaces. Therefore, traps are not needed for those tubes and furnaces.

A/Ns 492803-8:

Modifications include the addition of new tools to, or removal of existing tools from permit units to meet operational needs. The associated air pollution control equipment is also modified by the addition of new venting points or the removal of existing venting points. Wet scrubbers and carbon adsorbers by themselves do not emit any air emissions. There is no change in emissions from the involved oxidizers since the fuel limit remains the same.

THE VENTING REMOVAL OF:
- THREE PHOTOTRACKS.

APPLICATION NO. 492808: (Previous P/C A/N 483796) Scrubbers/Adsorbers Scrubbers 101 & 102
ALTERATION TO AIR POLLUTION CONTROL SYSTEM PERMIT TO CONSTRUCT A/N 483796 BY: Modification P/C
THE VENTING ADDITION OF :
- SIXTEEN ETCHERS
- ONE WAFER GRINDER
- ONE MAINTENANCE BENCH
- THREE ACID WET BENCHES
- TWO QUARTZ CLEANING MACHINES
- TWO ACID STORAGE CABINETS
- ONE DRAG SOLDER MACHINE
- ONE REFLOW OVEN

APPLICATION NO. 492810: (Previous A/Ns 473021 & 301239) Zink Oxidizer Modification P/C
ALTERATION TO AIR POLLUTION CONTROL SYSTEM BY:
THE VENTING ADDITION OF :
- TWO SOVENT BENCHES.
THE VENTING REMOVAL OF:
- THIRTY-FIVE PHOTOLITHOGRAPHIC TRACKS.

APPLICATION NO. 495576: (Previous A/Ns 460717 & 302034) IC Manufacturing Modification P/C
ALTERATION TO INTEGRATED CIRCUIT FABRICATION SYSTEM BY:
THE ADDITION OF:
- ONE NOVELLUS PLASMA ETCHER
- HIGH EFFICIENT INTEGRATED FILTERS TO POLY PROCESS FURNACES
THE REPLACEMENT OF:
- LOW EFFICIENT INTERGATED FILTERS WITH HIGH EFFICIENT INTEGRATED FILTERS IN LTO FURNACES

HISTORY:

Application(s) received on:	7/28/06	10/3/06	12/12/08
Equipment installed/modified:	Yes		
Violations recorded:			

1 Notice of Violation has been issued since 1/1/06. The notice, P53318, was issued on 10/21/08 for six permits units that had exceeded the permitted throughput limits and three permit units that had been modified without a permit. The company has filed several applications to revise the equipment descriptions and throughputs. Based on the evaluation of those applications, it has been determined that the equipment operates in compliance with all the rules and regulations of the District with the revised throughput limits and modifications.

	RECLAIM	Title V
Facility type:	No	Yes

Application Types:

P/O no P/C applications:

Permit units associated with those applications have been installed without a permit to construct.

APPLICATION NO. 460747: Photoresist Operation P/O

PHOTOLITHOGRAPHIC SYSTEM CONSISTING OF:

1. PHOTOLITHOGRAPHIC TRACK, SVG, MODEL 86 SERIES, 4' - 2"W. x 6' - 4"L. x 3' - 4"H., 21.6 KVA.
2. TWENTY-ONE PHOTOLITHOGRAPHIC TRACKS, SVG, MODEL 88 SERIES, 4' - 2"W. x 9' - 0"L. x 3' - 4"H., 21.6 KVA.

APPLICATION NO. 492802: (Previous A/Ns 460716 & 337634) IC Manufacturing Modification P/C

ALTERATION TO INTEGRATED CIRCUIT FABRICATION SYSTEM BY:
THE ADDITION OF:
- TWO HORIZONTAL DIFFUSION FURNACE BANKS
- ONE ION IMPLANTER, ULVAC, MODEL IW-630
- ONE PLASMA ETCHER, GASONICS, MODEL AE2001
- ONE PLASMA ETCHER, APPLIED MATERIALS
- ONE PLASMA ETCHER, NOVELLUS

AND THE REMOVAL OF:
- FIVE DIFFUSION FURNACES
- ONE ION IMPLANTER, VARIAN, MODEL DF-3000-350D

APPLICATION NO. 492803: (Previous A/Ns 460726 & 270414) Wet Chemical/Solvent Modification P/C

ALTERATION TO WET CHEMICAL PROCESSING AND SOLVENT CLEANING SYSTEM BY:
THE ADDITION OF:
- ONE SOLVENT BENCH, RHETECH.
- THREE WET PROCESS STATIONS, SPEC
- ONE ACID ETCH/CLEAN MACHINE, FSI MODEL MERCURY

THE REMOVAL OF:
- SEVEN ACID ETCH/CLEAN MACHINES, FSI MODEL SATURN & ZEUS.

APPLICATION NO. 492804: (Previous A/Ns 460727 & 302033) Wet Chemical/Solvent Modification P/C

ALTERATION TO WET CHEMICAL PROCESSING AND CLEANING SYSTEM BY:
THE ADDITION OF:
- ONE ACID ETCHER

THE REMOVAL OF:
- ONE ACID ETCH/CLEAN MACHINE

APPLICATION NO. 492805: (Previous A/Ns 460725 & 381809) Modification P/C

ALTERATION TO PHOTOLITHOGRAPHIC SYSTEM BY:
THE REMOVAL OF:
- ONE PHOTOLITHOGRAPHIC TRACK, SVG, MODEL 86

APPLICATION NO. 492806: (Previous A/Ns 460718 & 416235) Scrubbers/Adsorbers Scrubbers 1 & 2 Modification P/C

ALTERATION TO AIR POLLUTION CONTROL SYSTEM BY:
THE VENTING ADDITION OF :
- ONE PLASMA ETCHER
- THREE ACID WET BENCHES

THE VENTING REMOVAL:
- THREE DIFFUSION FURNACES
- SIX ACID ETCHERS

APPLICATION NO. 492807: (Previous A/Ns 467796 & 187887) McGill Oxidizer Modification P/C

ALTERATION TO AIR POLLUTION CONTROL SYSTEM BY:
THE VENTING ADDITION OF :
- ONE SOLVENT BENCH, RHETECH.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT	Page	1 of 11
	A/N	492802, et al
ENGINEERING & COMPLIANCE	Processed By	KH
	Checked By	
APPLICATION PROCESSING AND CALCULATIONS	Date	12/29/08

Applicant's Name: International Rectifier

Mailing Address: 41915 Business Park Dr.
Temecula, CA 92590

Equipment Location: Same

Equipment Description:

APPLICATION NO. 459172:
ALTERATION TO AIR POLLUTION CONTROL SYSTEM PERMIT TO OPERATE F52984 (A/N 387061) BY:
THE ADDITION OF: Modification P/O

- ONE PARALLEL TRAIN OF THREE CARBON CANISTERS

APPLICATION NO. 460708: Control: None P/O no P/C
STORAGE TANK T-928, WASTE SOLVENTS, 7' - 8"DIA. x 14' - 6.5"L., 4,500 GALLON CAPACITY.

APPLICATION NO. 460709: Control: None P/O no P/C
STORAGE TANK T-408, SCALE INHIBITOR, 2' - 0"DIA. x 2' - 6"H., 50 GALLON CAPACITY.

APPLICATION NO. 460711: Control: None P/O no P/C
STORAGE TANK T-511, WASTE ACIDS, 1' - 8"W. x 3' - 0.5"L. x 1' - 8"H., 50 GALLON CAPACITY.

APPLICATION NO. 460712: Control: 96/492808 Scrubber P/O no P/C
STORAGE TANK T-501, WASTE SULFURIC ACID, 4' - 3"W. x 7' - 8"L. x 2' - 0"H., 375 GALLON CAPACITY.

APPLICATION NO. 460713: Control: 96/492808 Scrubber P/O no P/C
STORAGE TANK T-502, WASTE ACIDS, 4' - 3"W. x 7' - 8"L. x 2' - 0"H., 375 GALLON CAPACITY.

APPLICATION NO. 460714: Control: 96/492808 Scrubber P/O no P/C
STORAGE TANK T-503, WASTE ACIDS, 4' - 2"W. x 6' - 5"L. x 2' - 0"H., 375 GALLON CAPACITY.

APPLICATION NO. 460715: Control: 96/492808 Scrubber P/O no P/C
STORAGE TANK T-504, WASTE AMMONIUM HYDROXIDE, 4' - 2"W. x 7' - 4.5"L. x 1' - 10"H., 375 GALLON CAPACITY.

APPLICATION NO. 460728: Control: 492806 Scrubber C/C P/O
STORAGE TANK T-141, ALUMINUM ETCH, 7' - 0"DIA. x 20' - 6"L., 5,000 GALLON CAPACITY.

APPLICATION NO. 460729: Control: 492806 Scrubber C/C P/O
MIXING TANK T-151, POLY ETCH, 4' - 6"DIA. x 5' - 6"H., 500 GALLON CAPACITY, WITH ONE 0.43 HP MIXER.

APPLICATION NO. 460730: Control: 492806 Scrubber C/C P/O
HOLDING TANK T-155, POLY ETCH, 4' - 6"DIA. x 5' - 6"H., 500 GALLON CAPACITY.

APPLICATION NO. 460732: Control: 492806 Scrubber C/C P/O
MIXING TANK T-191, ALUMINUM ETCH, 4' - 6"DIA. x 5' - 6"H., 500 GALLON CAPACITY, WITH ONE 0.43 HP MIXER.

APPLICATION NO. 460733: Control: 492806 Scrubber C/C P/O
HOLDING TANK T-195, ALUMINUM ETCH, 4' - 6"DIA. x 5' - 6"H., 500 GALLON CAPACITY.

APPLICATION NO. 460734: Control: 492806 Scrubber Modification P/O

STORAGE TANK T-14, WASTE ACIDS, 10' - 0"DIA. x 11' - 6"L., 5,728 GALLON CAPACITY, WITH TWO 10 HP TRANSFER PUMPS.

APPLICATION NO. 460735: Control: None C/C P/O
HOLDING TANK T-405, WASTE SULFURIC ACID, 2' - 6"DIA. x 4' - 0"H., 140 GALLON CAPACITY.

APPLICATION NO. 460744: Control: None C/C P/O
HOLDING TANK T-406, WASTE SULFURIC ACID, 2' - 7"DIA. x 2' - 9"H., 100 GALLON CAPACITY.

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

February 26, 2009

Mr. Gerardo C. Rios
Chief, Permit Office
US EPA Region IX Air 3
75 Hawthorne Street
San Francisco, CA 94105-3901

Dear Mr. Rios:

Subject: International Rectifier Hexfet America (I.D. 48522) Title V Permit Revision

International Rectifier Hexfet America has proposed to revise their Title V permit by:

1. Adding seven storage tanks and one photolithographic system.
2. Modifying five air pollution control systems, two integrated circuit manufacturing systems, one photolithographic system, and two wet chemical and solvent cleaning systems.
3. Increasing the throughputs of five storage tanks.
4. Removing the venting to the control requirement for two storage tanks.
5. Correcting the designated chemicals in Storage Tank T-14.

This is an integrated circuits manufacturing facility (SIC 3674) located at 41915 Business Park Drive, Temecula, CA 92590. This proposed permit revision is considered as a "de minimis significant permit revision" to their Title V permit. Enclosed for your review are the permit evaluation and the proposed Section D. With your receipt of the proposed Title V permit revision today, we will note that the EPA 45-day review period begins on February 26, 2009.

If you have any questions or need additional information regarding the proposed permit revision, please contact Mr. Kien Huynh at (909) 396-2635.

Sincerely,

Brian L. Yeh
Senior Manager
Chemical/Mechanical Operations

BLY:kh

Enclosures