

February 21, 2023

Arizona Department of Environmental Quality Air Quality Division 1110 West Washington Street Phoenix, Arizona 85007

Subject: Musket - Winslow Terminal

Air Quality Control Permit No. 71416 – Permit Renewal Application

Musket Corporation (Musket) would like to present the following permit renewal application to the Arizona Department of Environmental Quality (ADEQ), Air Quality Division. Musket's Winslow Terminal is currently permitted with ADEQ as a Class II source under permit number 71416, issued on August 28, 2018. The changes associated with the proposed renewal application are the recalculation of the storage tank emissions using the software TankESP and then the associated recalculation of loading rack VOC emissions using the TankESP parameters (vapor pressure, vapor molecular weight, bulk storage temperature) and loading rack HAP emissions using the TankESP generated vapor mass fractions.

The facility has three fuel storage tanks for storage of gasoline, crude oil, and diesel fuel, as well as a tanker loading facility and vapor combustion unit for destruction of vapors during loading operations. The facility is designed to receive, store, and load 300,000,000 gallons of product per year, including 100,000,000 gallons of gasoline & crude oil (combined), and 200,000,000 gallons of diesel fuel. The facility receives products by railcar, each with a capacity of 27,500 gallons. Products are unloaded by 6 pumps at 300 gallons per minute each. The unloaded products are pumped to one of three storage tanks. Tank #1 is a 25,000-gallon tank with a closed vent system that is connected to a vapor combustion unit. Tank #2 is a 670,000-gallon tank equipped with an internal floating roof. Tank #3 is an 845,000-gallon tank with a fixed roof. Four pumps transfer product from the tanks to the trucks for delivery to offsite locations. Vapors displaced from truck loading are collected and piped to the vapor combustion unit. The facility is authorized to operate 24 hours per day, 365 days per year. Please refer to the attached facility flow diagram and potential to emit calculations for further details.

The following table exhibits facility-wide Potential to Emit associated with the proposed renewal application:

Pollutant	РМ	PM 10	PM2.5	NOx	СО	SOx	VOC	HAPs
Tons per Year	0.20	0.20	0.13	1.95	1.13	0.0008	22.77	0.43

Musket would appreciate the opportunity to review a draft copy of the permit prior to issuance. Should you have any questions regarding this submittal, please contact Wendy Alexander of Broadbent & Associates, Inc. at (702) 563-0600 (walexander@broadbentinc.com) or myself at (346) 397-7792 (kevin.sokolowski@loves.com).

On behalf of Musket Corporation,

Kevin Sokolowski Manager of Musket Environmental Compliance

Att:

STANDARD CLASS II PERMIT RENEWAL APPLICATION

SECTION 3.1 ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

Air Quality Division

1110 West Washington • Phoenix, AZ 85007 • Phone: (602) 771-2338

STANDARD CLASS II PERMIT APPLICATION FORM

(As required by A.R.S. § 49-426, and Chapter 2, Article 3, Arizona Administrative Code)

- Permit to be issued to (Business license name of organization that is to receive permit): Musket Corporation
- 2. Mailing Address: P.O. Box 26210 City: Oklahoma City State: Oklahoma ZIP: 73126
- 3.
 Name (or names) of Responsible Official: Kevin Sokolowski

 Phone: (346) 397-7792
 Fax: Email: Kevin.Sokolowski@loves.com
- 4.
 Facility Manager/Contact Person and Title: <u>Kevin Sokolowski</u>

 Phone: (346) 397-7792
 Fax: Email: <u>Kevin.Sokolowski@</u>loves.com
- 5. Facility Name: <u>Musket Winslow Terminal</u> Facility Location/Address (Current/Proposed): <u>1620 Coopertown Road</u> City: <u>Winslow</u> <u>County: Navajo</u> <u>ZIP: 86047</u> Indian Reservation (if applicable, which one): <u>Not Applicable</u> Latitude/Longitude, Elevation: <u>Latitude: 35°02'13"; Longitude: 110°43'11"; Elevation: 4900 Feet</u>
 6. General Nature of Business: <u>This facility operates as a bulk fuel transfer terminal</u>
 7. Type of Organization:
 2 Corporation
 2 Individual Owner
 2 Partnership
 3 Government Entity
- 8. Permit Application Basis: Dew Source Revision Revision
 For renewal or modification, include existing permit number (and exp. date): <u>71416 (exp. 08/27/23)</u>
 Date of Commencement of Construction or Modification:
 Primary Standard Industrial Classification Code: 5171
- 9. I certify that I have knowledge of the facts herein set forth, that the same are true, accurate and complete to the best of my knowledge and belief, and that all information not identified by me as confidential in nature shall be treated by ADEQ as public record. I also attest that I am in compliance with the applicable requirements of the Permit and will continue to comply with such requirements and any future requirements that become effective during the life of the Permit. I will present a certification of compliance to ADEQ no less than annually and more frequently if specified by ADEQ. I further state that

Other

I will assume responsibility for the construction, modification, or operation of the source in accordance with Arizona Administrative Code, Title 18, Chapter 2 and any permit issued thereof.

Signature of Responsible Official:

Printed Name of Signer/Official Title:	Kevin Sokolowski, Musket Manager of Environmental Compliance
_{Date:} February 23, 2023	Telephone Number: <u>(346) 397-7792</u>

Section 3.5 - Equipment List

Type of Equipment	Maximum Rated Capacity [1]	Make	Model	Serial Number	Date of Manufacture	Equipment ID Number
Gasoline/Crude Oil Storage Tank	25,000 Gallons	We-Mac	T-3	593201	2003	Tank #1
Gasoline/Crude Oil Storage Tank	670,000 Gallons	UltraFlote Aluminum	Pontoon	001	2002	Tank #2
Diesel Storage Tank	845,000 Gallons	UltraFlote Aluminum	Pontoon	002	2002	Tank #3
Hydrocarbon Vapor Combustion Burner	1,009 BTU/scf	Lit Vapor Combustion System	John Zink	003	2001	VCU

[1] For generator sets, enter the maximum rated capacity of the engine rather than the maximum rated capacity of the generator.

All relevant equipment utilized at the facility should be included in the equipment list. Please complete all fields.

The date of manufacture must be included in order to determine applicability of regulations.

Indicate the units (tons/hour, horsepower, etc.) when recording the maximum rated capacity.

Make additional copies of this form if necessary.

*Submit photographs of the faceplates for all engines listed above.

*If an engine is certified, please also include a copy of the engine certification with the application.

*For any newly added equipment, include a copy of the specification sheet.

*These documents will be used to verify equipment information and determine applicable regulations.

FLOW DIAGRAM



SOURCE-WIDE POTENTIAL TO EMIT CALCULATIONS

NEW PTE VS. PERMITTED PTE

Table 1. New PTE vs Permitted PTE

Pollutant	PM ₁₀	PM _{2.5}	NOx	CO	SOx	VOC	HAP	
Tonutant	tons/year							
New Potential to Emit	0.20	0.13	1.95	1.13	0.0008	22.77	0.43	
Permitted Potential to Emit	0.20	0.13	1.95	1.13	0.0008	20.09	1.72	
Emission Increase	0.00	0.00	0.00	0.00	0.00	2.68	-1.29	
Significance Threshold	15	10	40	100	40	40	-	
Public Notice Required (Yes/No)	No	No	No	No	No	No	No	

TANKS EMISSIONS

Table 1. Tank VOC Emissions

Tonk	Material	Throughput	Control	TankESP	VOC	
Тапк	Calculated	gallons/year	Device	Output	lbs/year	tons/year
Tank #1	Gasoline (RVP 15)	100,000,000	Vapor Combustion Unit	221,867.22	4,437.34	2.22
Tank #2	Gasoline (RVP 15)	100,000,000	Internal Floating Roof	9,356.96	9,356.96	4.68
Tank #3	Diesel	200,000,000	-	1,315.25	1,315.25	0.66
Total VOC					15,109.55	7.55

* VOC emissions for the three tanks were obtained from TankESP program. Tank #1's VOC emissions account for 98% control of the TankESP uncontrolled output.

Table 2. Total Tanks HAP Emissions*

Dollutant	H	AP
ronutant	lbs/year	tons/year
Hexane (-n)	33.02	0.02
Benzene	40.75	0.02
Isooctane	49.20	0.02
Toluene	89.54	0.04
Ethylbenzene	10.74	0.01
Xylene (-m)	110.34	0.06
Isopropyl benzene	1.98	0.00
1,2,4-Trimethylbenzene	0.00	0.00
Cyclohexane	5.21	0.00
Naphthalene	1.89	0.00
Total HAP	342.66	0.17

* HAP emissions for the three tanks were obtained from TankESP program. Tank #1's HAP emissions account for 98% control of the TankESP uncontrolled output.

Table 3. Individual Tanks HAP Emissions

II A D	Tank #1	Tank #2	Tank #3			
НАР	lbs/year					
Hexane (-n)	0.01	32.44	0.57			
Benzene	0.06	37.92	2.77			
Isooctane	0.00	49.20	-			
Toluene	0.62	57.75	31.17			
Ethylbenzene	0.08	6.71	3.95			
Xylene	1.53	32.15	76.66			
Isopropyl benzene	0.00	1.98	0.00			
1,2,4-Trimethylbenzene	-	-	-			
Cyclohexane	0.00	5.21	0.00			
Naphthalene	0.01	1.36	0.52			
Total HAP	2.31	224.72	115.62			

LOADING LOSSES EMISSIONS

Table 4. VOC Loading Losses

	VOC						
Pollutant	Pre	VCU	Post VCU				
	lbs/year	tons/year	lbs/year	tons/year			
Gasoline Loading/Unloading	750,954.15	375.48	30,038.17	15.02			
Diesel Loading/Unloading	2,330.56	1.17	93.22	0.05			
Total VOC	753,284.71	376.64	30,131.39	15.07			

* Detailed calculations are presented in the attached Gasoline and Diesel Loading/Unloading Emissions sheets.

Table 5. HAP Loading Losses

	Vapor Mass Fraction		Post VCU V(OC Emissions	Loading L		
				JC Emissions	Emissions		TOTAL HAP
НАР	Gasoline	Diesel	Gasoline	Diesel	Gasoline	Diesel	
	fraction of com	ponent in VOC					
	vap	or	tons/year	tons/year	tons/year	tons/year	tons/year
Hexane (-n)	0.003	0.0004			0.048	1.864E-05	0.048
Benzene	0.004	0.002			0.059	9.788E-05	0.059
Isooctane	0.004	-			0.060	-	0.060
Toluene	0.004	0.024			0.059	1.105E-03	0.060
Ethylbenzene	0.0002	0.003			0.003	1.398E-04	0.003
Xylene (-m)	0.001	0.058	15.02	0.05	0.017	2.717E-03	0.019
Isopropyl benzene	0.000	-			0.000	-	0.000
1,2,4-Trimethylbenzene	-	-			-	-	-
Cyclohexane	0.001	-			0.008	-	0.008
Naphthalene	0.000	0.0004]		0.000	1.864E-05	0.000
Total HAPs	0.017	0.088			0.25	0.00	0.26

* Loading losses for HAP emissions were calculated by using equation 4-1 from the AP-42 Chapter 7 Organic Liquid Storage Tanks . Equation 4-1: $L_{ti} = (Z_{vi})(L_T)$, where L_{Ti} is emission rate of HAP component, Z_{vi} is vapor fraction of component, and L_T represents total VOC losses.

GASOLINE LOADING/UNLOADING EMISSIONS

U.S. EPA Publication AP-42: Compilation of Air Pollutant Emission Factors Chapter 5.2 Transportation and Marketing of Petroleum Liquids Chapter 7.1 Organic Liquid Storage Tanks TankESP progam

Emissions for loading (Gasoline RVP15) :

L_L	=	12.46 (SPM)/T
L_L	=	[12.46 * (0.6)(7.87 psia)(66.0 lbs/lb-mole)] / 517.1°R
L_L	=	7.51 lbs of emissions/1000 gals of Gasoline Loaded

L	=	loading loss, pounds per 1000 gallons of liquid loaded
S	=	0.6 Saturation factor from AP 42 Table 5.2-1, Submerged Loading; dedicated vapor balance service.
		7.87 psia
Р	=	true vapor pressure of liquid loaded, pounds per square inch absolute (psia) from TankESP. True vapor pressure with a Liquid Bulk Temperature of 57.1°F.
		66.0 lbs/lb-mole
М	=	molecular weight of vapors, pounds per pound-mole from TankESP
		517.1°R
Т	=	temperature of bulk liquid loaded, $^{\circ}R = (^{\circ}F+460) =$ 57.1 + 460 = 517.1 $^{\circ}R$

The total loading losses due to loading and unloading of gasoline can then be calculated as follows:

TL _L TL _L TL _L (Pre VCU)	= =	 (L_L) * Q (7.51)(100,000) 750,594 lbs/year or 375.48 tons/year vapors routed to the VCU, assumption was made that 100% of vapors are captured and routed to the VCU
TL _L (Post VCU) TL _L (Post VCU)	=	(TL _L) * (1-98%) 15,019 lbs/year or 7.51 tons/year

TLL	=	total annual loading losses in pounds
L	=	7.51 lbs of emissions/1000 gallons of gasoline loaded
Q	=	annual throughput in thousands of gallons of gasoline loaded
% efficiency	=	98% VCU destruction efficiency

Gasoline Loading and Unloading Emissions Potential Emissions					
Pollutant	lbs/year	tons/year			
VOC	30,038	15.02			

* Since gasoline loading occurs twice, from rail cars to the tanks and from the tanks to tanker trucks, total loading losses are doubled.

DIESEL LOADING/UNLOADING EMISSIONS

U.S. EPA Publication AP-42: Compilation of Air Pollutant Emission Factors Chapter 5.2 Transportation and Marketing of Petroleum Liquids Chapter 7.1 Organic Liquid Storage Tanks TankESP program

Emissions for loading Diesel (Diesel) :

L_L	=	12.46 (SPM)/T
L_L	=	[12.46 * (0.6)(0.0062psia)(130 lbs/lb-mole)] / 517.1 °R
L	=	0.012 lbs of emissions/1000 gals of Diesel Loaded

L	=	loading loss, pounds per 1000 gallons of liquid loaded
S	=	0.60
		Saturation factor from AP 42 Table 5.2-1, Submerged Loading; dedicated vapor balance service. Saturation factor of 1.00.
		0.0062 psia
Р	=	true vapor pressure of liquid loaded, pounds per square inch absolute (psia) from TankESP. True vapor pressure with a Liquid Bulk Temperature of 57.1°F.
		130 lbs/lb-mole
М	=	molecular weight of vapors, pounds per pound-mole from TankESP
		517.1 °R
Т	=	temperature of bulk liquid loaded, $^{\circ}R = (^{\circ}F+460) = 57.1 + 460 = 517.1 ^{\circ}R$

The total loading losses due to loading and unloading of diesel can then be calculated as follows:

TL_L	=	$(L_L) * Q$
TL_L	=	(0.012)(200,000)
TL _L (Pre VCU)	=	2,331 lbs/year or 1.2 tons/year
		vapors routed to the VCU, assumption was made that 100% of vapors are captured and routed to the VCU
TL _L (Post VCU)	=	(TL _L)(1-98%)
TL _L (Post VCU)	=	46.6 lbs/year or 0.023 tons/year

TLL	=	total annual loading losses in pounds
L	=	0.0116 lbs of emissions/1000 gallons of diesel loaded
Q	=	annual throughput in thousands of gallons of diesel loaded
% efficiency	=	98.0 % VCU destruction efficiency

Diesel Loading and Unloading Emissions Potential Emissions				
Pollutant	lbs/year	tons/year		
VOC	93	0.05		

* Since diesel loading occurs twice, from rail cars to the tanks and from the tanks to tanker trucks, total loading losses are doubled.

VCU EMISSIONS

Table 6. VCU Emissions

Pollutant	Emission Factor ¹	Propane Gas Consumption	Potential Emissions		
	lb/1,000 gal	gal	lbs/year	tons/year	
PM ₁₀	0.7		210	0.11	
$^{2}PM_{2.5}$	0.7		210	0.11	
NO _x	13		3,900	1.95	
CO	7.5		2,250	1.13	
³ SO _x	0.00524	300	1.57	0.0008	
VOC	1		300	0.15	
GHG			CO ₂ e lbs/year	CO ₂ e Metric tons/year	
			3,831,960	1741.80	

¹ Emission factors obtained from AP-42 Chapter 1, Section 1.5 Liquified

Petroleum Gas Combustion, Table 1.5-1.

 $^2\ \text{PM}_{10}$ and $\text{PM}_{2.5}$ emission factors are assumed to be the same.

³ Sulfur content of propane gas is assumed to be 1.2 ppm.

Table 7. GHG VCU Emissions

Pollutant	Emission Factor ¹	Propane Gas Consumption	GHG Emissions				
	lb/1,000 gal	gal/year	lbs/year	Metric tons/year	GWP ²	CO 2 e lbs/year	CO ₂ e Metric tons/year
CO ₂	12,500		3,750,000	1,704.55	1	3,750,000	1,704.55
CH ₄	0.20	300	60	0.03	25	1,500	0.68
N ₂ O	0.90		270	0.12	298	80,460	36.57
					Total CO ₂ e	3,831,960	1,741.80

¹ Emission factors obtained from AP-42 Chapter 1, Section 1.5 Liquified Petroleum Gas Combustion, Table 1.5-1.

² Global Warming Potential (GWP) is used to compare the abilities of different greenhouse gases to trap heat in the atmosphere. GWP is based on the heat-absorbing ability of each gas relative to that of carbon dioxide (CQ). Once the individual GHG emissions are calculated, they have to be multiplied by the GWP to obtain the CQe value. Values for GWP are presented in 40 CFR 98 Table A-1: *Global Warming Potentials.*

HAUL ROADS

PM10 and PM2.5 Emission Factors Determination

AP-42 Section 13.2.1.3 Equation (1) $E = k * (sL)^{0.91} * (W)^{1.02}$

where:

- E = particulate emission factor (lbs/VMT)
- k = particle size multiplier for particle size range and units of interest (lbs/VMT)
- sL = road surface silt loading (g/m²)
- W = average weight of the vehicles traveling the road (tons)

Table 8. Emission Factor Parameters for Haul Road Emission Calculations

Pollutant	k ¹	sL ²	W ³	Е
Tonutant	lb/VMT	g/m^2	tons	lbs/VMT
PM_{10}	0.0022	0.6	26	0.038
PM _{2.5}	0.00054	0.0		0.009

¹ k values were obtained from table 13.2.1-1.

 2 sL values were obtained from table 13.2.1-2 for an ADT less than 500 which represent low volume roads.

³ An average tanker truck weight was assumed to be approximately 26 tons.

Table 9. Vehicle Miles Traveled

Tanker Truck Storage	Annual Fuel	Total Vehicle	Haul Road	Vehicle Miles
Capacity	Throughput	Count	Length	Traveled
gal	gal/year	vehicles/year	miles	VMT
8,000	300,000,000	37,500	0.13	4,875

Table 10. Haul Road Emissions

		Vehicle Miles	Potential
Pollutant	Е	Traveled	Emissions
	lb/VMT	VMT	tons/year
PM ₁₀	0.038	1 975	0.09
PM _{2.5}	0.009	4,075	0.02

EMISSION SOURCES

EN	IISSION POINT	CHEMICAL COMPOSITION OF TOTAL STREAM	AIR POLLUTANT EMISSION RATE		UTM C EM	UTM COORDINATES OF EMISSION POINT			STACK SOURCES					NONPOINT	
Number	Name	Regulated Air Pollutant Name			Zone	East	North	Height above ground	Height above structure	dia	Exit data	temp	Sou	rces	
			lbs/hr	tons/year		meters	meters	feet	feet	feet	ft/sec	F	feet	feet	
4	Tank #1: Gasoline Storage Tank	VOC Total HAPs	0.51 0.00	2.22 0.00	12	525668	3876221	32	-	1	n/a	57.1	-	-	
1	with Fixed Roof Tank #2: Gasoline Storage Tank with Internal Floating	VOC Total HAPs	1.07 0.03	4.68 0.11	12	525505	3879604	32	-	1	0.2	57.1	_	-	
	Roof Tank #3	VOC	0.15	0.66											
2	Diesel Storage Tank with Vertical Fixed Roof	Total HAPs	0.013	0.058	12	525538	3879589	32	-	1	0.7	57.1	-	-	
3	VCU Propane Burner Combustion	$\begin{array}{c} PM_{10} \\ PM_{2.5} \\ NO_x \\ CO \\ SO_x \\ VOC \\ \\ GHG \\ \hline \\ VOC \\ HAP \end{array}$	$\begin{array}{c} 0.02 \\ 0.02 \\ 0.45 \\ 0.26 \\ 0.0002 \\ 0.03 \\ CO_2e \\ lbs/year \\ \hline 3,831,960 \\ 3.44 \\ 0.06 \\ \end{array}$	0.11 0.11 1.95 1.13 0.0008 0.15 CO 2 e metric tons/year 1,741.80 15.07 0.26	12	525535	3879557	20	-	1	13.9	1500	-	-	
	Haul Roads	PM ₁₀ PM _{2.5}	0.02 0.01	0.09 0.02	12	525668	3876221	-	-	-	-	-	-	-	
	Total Site	$\begin{array}{c} PM_{10} \\ PM_{2.5} \\ NO_x \\ CO \\ SO_x \\ VOC \\ Total HAPs \\ GHG \end{array}$	$\begin{array}{r} 0.05 \\ \hline 0.03 \\ 0.45 \\ 0.26 \\ \hline 0.0002 \\ \hline 5.20 \\ 0.10 \\ CO_2e \\ lbs/year \\ \hline 3,831,960 \end{array}$	0.20 0.13 1.95 1.13 0.0008 22.77 0.43 CO 2 e metric tons/year 1,741.80											

TANKESP REPORTS

TankESP Emissions Report - Detail Format Tank Identification and Physical Characteristics Tank #1

Identification	
User Identification:	Tank #1
City:	Winslow
State:	AZ
Company:	Musket Corporation
Type of Tank:	FRT (no floating roof)
Description:	Bulk fuel transfer terminal
Tank Dimensions	
Shell Height (ft):	32.00
Diameter (ft):	12.00
Liquid Height (ft) :	30.00
Avg. Liquid Height (ft):	15.50
Volume (gallons):	27,072.79
Turnovers:	4,075.86
Net Throughput(gal/yr):	100,000,000.80
Is Tank Insulated (y/n):	Ν
Paint Characteristics	
Shell Color/Shade:	White Paint
Shell Condition	Good
Roof Color/Shade:	White Paint
Roof Condition:	Good
Roof Characteristics	
Туре:	Self-Supporting (Dome)
Height (ft)	0.00
Dome Radius (ft)	12.00
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig):	0.03

Meteorological Data used in Emissions Calculations: Winslow, AZ (Avg Atmospheric Pressure = 12.31 psia)

TankESP Emissions Report - Detail Format Liquid Contents of Storage Tank

Tank #1 - Vertical Fixed Roof Tank

Winslow, AZ

					Liquid Bulk							
		Daily Liquid	Surf. Tempera	iture (deg. F)	Temp	Vap	or Pressure (p	sia)	Vapor Mol.	Liquid Mass	Vapor Mass	
Mixture/Component	Month	Avg.	Min.	Max.	(deg F)	Avg.	Min.	Max.	Weight.	Fract.	Fract.	Mol. Weight. Basis for Vapor Pressure Calculations
Gasoline RVP_X	All	58.10	49.73	66.47	57.10	7.8689	6.7277	9.1580	66.0000			92.00 Option 4: RVP=15, ASTM Slope=3
Benzene									78.1100	0.0180	0.0035	78.11 Option 2: A=6.906, B=1211, C=220.79
Benzo(g,h,i)perylene									276.3300	0.0000	0.0000	276.33 Option 2: A=11.82, B=6580, C=273.15
Cumene {isopropylbenzene}									120.1900	0.0050	0.0000	120.19 Option 2: A=6.929, B=1455.8, C=207.2
Cyclohexane									84.1600	0.0024	0.0005	84.16 Option 2: A=6.845, B=1203.5, C=222.86
Ethylbenzene									106.1700	0.0140	0.0002	106.17 Option 2: A=6.95, B=1419.3, C=212.61
Hexane (n-)									86.1800	0.0100	0.0032	86.18 Option 2: A=6.878, B=1171.5, C=224.37
Iso-octane {2,2,4 trimethylpentane}									114.2300	0.0400	0.0040	114.23 Option 2: A=6.812, B=1257.8, C=220.74
Naphthalene									128.1700	0.0042	0.0000	128.17 Option 2: A=7.146, B=1831.6, C=211.82
PACs {Chrysene}									228.2900	0.0000	0.0000	228.29 Option 2: A=12.32, B=6160, C=273.15
Toluene									92.1400	0.0700	0.0039	92.14 Option 2: A=7.017, B=1377.6, C=222.64
Xylene									106.1700	0.0700	0.0010	106.17 Option 2: A=7.009, B=1462.3, C=215.11

TankESP Emissions Report - Detail Format Detail Calculations (AP-42)

Tank #1 - Vertical Fixed Roof Tank Winslow, AZ

Annual Emission Calculations	
Standing Losses (lb):	4,853.6375
Vapor Space Volume (cu ft):	1,959.1948
Vapor Density (lb/cu ft):	0.0935
Vapor Space Expansion Factor:	0.5984
Vented Vapor Saturation Factor:	0.1216
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,959.1948
Tank Diameter (ft):	12.0000
Vapor Space Outage (ft):	17.3231
Tank Shell Height (ft):	32.0000
Average Liquid Height (ft):	15.5000
Roof Outage (ft):	0.8231
Roof Outage (Dome Roof)	
Roof Outage (ft):	0.8231
Dome Radius (ft)	12.0000
Shell Radius (ft):	6.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0935
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.8689
Daily Avg. Liquid Surface Temp. (deg. F):	58.0980
Daily Average Ambient Temp. (deg. F):	55.7551
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.7310
Liquid Bulk Temperature (deg. F):	57.0969
Tank Paint Solar Absorptance (Shell):	0.2500
Tank Paint Solar Absorptance (Roof):	0.2500
Daily Total Solar Insulation Factor (Btu/sqft day):	1,789.0592
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.5984
Daily Vapor Temperature Range (deg. R):	33.4767
Daily Vapor Pressure Range (psia):	2.4303
Breather Vent Press. Setting Range (psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.8689
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	6.7277
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	9.1580
Daily Avg. Liquid Surface Temp. (deg F):	58.0980
Daily Min. Liquid Surface Temp. (deg F):	49.7288
Daily Max. Liquid Surface Temp. (deg F):	66.4671
Daily Ambient Temp. Range (deg. R):	30.1732
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.1216
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.8689
Vapor Space Outage (ft):	17.3231

Working Losses (lb):	217,013.5800	
Vapor Molecular Weight (lb/lb-mole):	66.0000	
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.8689	
Annual Net Throughput (gal/yr.):	100,000,000.8000	
Annual Turnovers:	4,075.8576	
Turnover Factor:	0.1740	
Maximum Liquid Volume (gal):	27,072.7878	
Maximum Liquid Height (ft):	30.0000	
Tank Diameter (ft):	12.0000	
Working Loss Product Factor:	1.0000	
Total Losses (Ib):	221,867.2175	

TankESP Emissions Report - Detail Format Individual Tank Emission Totals

Emissions Report for: Annual Tank #1 - Vertical Fixed Roof Tank Winslow, AZ

Components	Working loss	Breathing Loss	Total Emissions
Gasoline RVP_X	217,013.58	4,853.64	221,867.22
Unidentified Components	216,942.18	4,852.04	221,794.22
Benzene	15.37	0.34	15.71
Benzo(g,h,i)perylene	0.00	0.00	0.00
Cumene {isopropylbenzene}	0.17	0.00	0.18
Cyclohexane	2.12	0.05	2.17
Ethylbenzene	1.04	0.02	1.07
Hexane (n-)	13.99	0.31	14.30
Iso-octane {2,2,4 trimethylpentane}	17.35	0.39	17.74
Naphthalene	0.01	0.00	0.01
PACs {Chrysene}	0.00	0.00	0.00
Toluene	16.79	0.38	17.17
Xylene	4.55	0.10	4.65

TankESP Emissions Report - Detail Format Tank Identification and Physical Characteristics Tank #2

Identification	T1-10
User Identification:	lank#2
City:	Winslow
State:	AZ
Company:	Musket Corporation
Type of Tank:	cone-roof tank with IFR
Description:	Bulk fuel transfer terminal
Tank Dimensions	
Diameter (ft):	58.35
Volume (gallons):	670,111.45
Turnovers:	158.70
Self Supp. Roof? (y/n):	N
No. of Columns:	0.00
Eff. Col. Diam. (ft):	1.00
Paint Characteristics	
Internal Shell Condition:	Light Rust
Shell Color/Shade:	White Paint
Shell Condition	Good
Boof Color/Shade:	White Paint
Roof Condition:	Good
Rim-Seal System	
Primary Seal:	Mechanical Shoe
Secondary Seal	None
Dock Characteristics	
Deck Fitting Category:	Detail
Deck Type:	Welded
Construction:	
Deck Seam	
Deck Seam Len. (ft):	
Dock Fitting/Statue	
Access Hatch (24 in Diam)/Unholted Cover, Ungasketed	
Stub Drain (1 in Diameter)	
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	
Comple Dise of Well (24 in Diam)(Sit Enkris Seel 10%) Open	
Sample Fipe of Weil (24-in: Drant.)/Silt Fabric Seal 10% Open Roof Les of Hanger Weil/Adjustable	
Non Leg or manyel well/Aujustable	
vacuum breaker (10-in: biam.)/weighted Mech. Actuation, Gask.	

Quantity 1 1 1

1 17 1

Meteorological Data used in Emissions Calculations: Winslow, AZ (Avg Atmospheric Pressure = 12.31 psia)

TankESP Emissions Report - Detail Format Liquid Contents of Storage Tank

Tank #2 - Internal Floating Roof Tank Winslow, AZ

					Liquid Bulk							
		Daily Liquid	Surf. Tempera	ture (deg. F)	Temp	Vapor Pressure (psia)		Vapor Mol.	Liquid Mass	Vapor Mass		
Mixture/Component	Month	Avg.	Min.	Max.	(deg F)	Avg.	Min.	Max.	Weight.	Fract.	Fract.	Mol. Weight. Basis for Vapor Pressure Calculations
Gasoline RVP_X	All	58.48	58.48	58.48	57.10	7.9250	7.9250	7.9250	66.0000			92.00 Option 4: RVP=15, ASTM Slope=3
Benzene									78.1100	0.0180	0.0036	78.11 Option 2: A=6.906, B=1211, C=220.79
Benzo(g,h,i)perylene									276.3300	0.0000	0.0000	276.33 Option 2: A=11.82, B=6580, C=273.15
Cumene (isopropylbenzene)									120.1900	0.0050	0.0000	120.19 Option 2: A=6.929, B=1455.8, C=207.2
Cyclohexane									84.1600	0.0024	0.0005	84.16 Option 2: A=6.845, B=1203.5, C=222.86
Ethylbenzene									106.1700	0.0140	0.0002	106.17 Option 2: A=6.95, B=1419.3, C=212.61
Hexane (n-)									86.1800	0.0100	0.0032	86.18 Option 2: A=6.878, B=1171.5, C=224.37
Iso-octane {2,2,4 trimethylpentane}									114.2300	0.0400	0.0040	114.23 Option 2: A=6.812, B=1257.8, C=220.74
Naphthalene									128.1700	0.0042	0.0000	128.17 Option 2: A=7.146, B=1831.6, C=211.82
PACs {Chrysene}									228.2900	0.0000	0.0000	228.29 Option 2: A=12.32, B=6160, C=273.15
Toluene									92.1400	0.0700	0.0039	92.14 Option 2: A=7.017, B=1377.6, C=222.64
Xylene									106.1700	0.0700	0.0011	106.17 Option 2: A=7.009, B=1462.3, C=215.11

TankESP Emissions Report - Detail Format Detail Calculations (AP-42)

Tank #2 - Internal Floating Roof Tank Winslow, AZ

Month:	All
Rim Seal Losses (Ib):	5,639.3990
Seal Factor A (lb-mole/ft-yr):	5.8000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.3000
Value of Vapor Pressure Function:	0.2525
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	7.9250
Tank Diameter (ft):	58.3500
Vapor Molecular Weight (lb/lb-mole):	66.0000
Product Factor:	1.0000
Withdrawal Losses (lb):	323.2219
Number of Columns:	0.0000
Effective Column Diameter (ft):	1.0000
Net Throughput (gal/mo.):	100,000,000.8000
Shell Clingage Factor (bbl/1000 sqft):	0.0015
Average Organic Liquid Density (Ib/gal):	5.6000
Tank Diameter (ft):	58.3500
Deck Fitting Losses (Ib):	3,394.3373
Value of Vapor Pressure Function:	0.2525
Vapor Molecular Weight (lb/lb-mole):	66.0000
Product Factor:	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	203.7000
Deck Seam Losses (Ib):	0.0000
Deck Seam Length (ft):	
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000
Deck Seam Length Factor(ft/sqft):	0.2000
Tank Diameter (ft):	58.3500

Total Losses (Ib):	9,356.9582				
		Roc	of Fitting Loss Factors		
Roof Fitting/Status	Quantity	KFa(lb-mole/yr) KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1	36.00	5.90	1.20	599.8829
Stub Drain (1-in. Diameter)	1	1.20	0.00	1.00	19.9961
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	233.2878
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	1.00	199.9610
Roof Leg or Hanger Well/Adjustable	17	7.90	0.00	1.00	2,237.8964
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	103.3132

TankESP Emissions Report - Detail Format Individual Tank Emission Totals

Emissions Report for: Annual Tank #2 - Internal Floating Roof Tank Winslow, AZ

	Losses (lbs)					
		Withdrawal	Deck Fitting	Deck Seam	Total	
Components	Rim Seal Loss	Loss	Loss	Loss	Emissions	
Gasoline RVP_X	5,639.40	323.22	3,394.34	0.00	9,356.96	
Unidentified Components	5,546.24	247.72	3,338.27	0.00	9,132.23	
Benzene	20.04	5.82	12.06	0.00	37.92	
Benzo(g,h,i)perylene	0.00	0.00	0.00	0.00	0.00	
Cumene {isopropylbenzene}	0.22	1.62	0.13	0.00	1.98	
Cyclohexane	2.77	0.78	1.67	0.00	5.21	
Ethylbenzene	1.37	4.53	0.82	0.00	6.71	
Hexane (n-)	18.23	3.23	10.98	0.00	32.44	
Iso-octane {2,2,4 trimethylpentane}	22.64	12.93	13.63	0.00	49.20	
Naphthalene	0.01	1.34	0.01	0.00	1.36	
PACs {Chrysene}	0.00	0.01	0.00	0.00	0.01	
Toluene	21.93	22.63	13.20	0.00	57.75	
Xylene	5.95	22.63	3.58	0.00	32.15	

TankESP Emissions Report - Detail Format Tank Identification and Physical Characteristics Tank #3

Identification	
User Identification:	Tank #3
City:	Winslow
State:	AZ
Company:	Musket Corporation
Type of Tank:	FRT (no floating roof)
Description:	Bulk fuel transfer terminal
Tank Dimensions	
Shell Height (ft):	32.00
Diameter (ft):	67.40
Liquid Height (ft) :	31.00
Avg. Liquid Height (ft):	16.00
Volume (gallons):	854,063.73
Turnovers:	249.79
Net Throughput(gal/yr):	200,000,001.60
Is Tank Insulated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	White Paint
Shell Condition	Good
Roof Color/Shade:	White Paint
Roof Condition:	Good
Roof Characteristics	
Type:	Self-Supporting (Dome)
Height (ft)	0.00
Dome Radius (ft)	67.40
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig):	0.03

Meteorological Data used in Emissions Calculations: Winslow, AZ (Avg Atmospheric Pressure = 12.31 psia)

TankESP Emissions Report - Detail Format Liquid Contents of Storage Tank

Tank #3 - Vertical Fixed Roof Tank

Winslow, AZ

					Liquid Bulk							
		Daily Liquid Surf. Temperature (deg. F)		Temp	emp Vapor Pressure (psia)		Vapor Mol.	Liquid Mass	Vapor Mass			
Mixture/Component	Month	Avg.	Min.	Max.	(deg F)	Avg.	Min.	Max.	Weight.	Fract.	Fract.	Mol. Weight. Basis for Vapor Pressure Calculations
Diesel	All	58.67	51.11	66.23	57.10	0.0062	0.0048	0.0079	130.0000			188.00 Option 3: A=12.101, B=8907
Benzene									78.1100	0.0000	0.0021	78.11 Option 2: A=6.906, B=1211, C=220.79
Benzo(g,h,i)perylene									276.3300	0.0000	0.0000	276.33 Option 2: A=11.82, B=6580, C=273.15
Cumene {isopropylbenzene}									120.1900	0.0000	0.0000	120.19 Option 2: A=6.929, B=1455.8, C=207.2
Cyclohexane									84.1600	0.0000	0.0000	84.16 Option 2: A=6.845, B=1203.5, C=222.86
Ethylbenzene									106.1700	0.0001	0.0030	106.17 Option 2: A=6.95, B=1419.3, C=212.61
Hexane (n-)									86.1800	0.0000	0.0004	86.18 Option 2: A=6.878, B=1171.5, C=224.37
Iso-octane {2,2,4 trimethylpentane}									114.2300	0.0000	0.0000	114.23 Option 2: A=6.812, B=1257.8, C=220.74
Naphthalene									128.1700	0.0008	0.0004	128.17 Option 2: A=7.146, B=1831.6, C=211.82
PACs {Chrysene}									228.2900	0.0000	0.0000	228.29 Option 2: A=12.32, B=6160, C=273.15
Toluene									92.1400	0.0003	0.0237	92.14 Option 2: A=7.017, B=1377.6, C=222.64
Xylene									106.1700	0.0029	0.0583	106.17 Option 2: A=7.009, B=1462.3, C=215.11

TankESP Emissions Report - Detail Format Detail Calculations (AP-42)

Tank #3 - Vertical Fixed Roof Tank Winslow, AZ

Annual Emission Calculations	
Standing Losses (lb):	207.0578
Vapor Space Volume (cu ft):	73,580.2818
Vapor Density (lb/cu ft):	0.0001
Vapor Space Expansion Factor:	0.0537
Vented Vapor Saturation Factor:	0.9933
Tank Vanor Space Volume	
Vapor Space Volume (cu ft):	73.580.2818
Tank Diameter (ft):	67,4000
Vapor Space Outage (ft):	20.6230
Tank Shell Height (ft):	32,0000
Average Liquid Height (ft):	16.0000
Roof Outage (ft):	4.6230
Roof Outage (Dame Roof)	
Roof Outage (fb):	4 6230
Domo Badius (ft)	4.0230
	07.4000
Shell Radius (ft):	33.7000
Vapor Density	
Vapor Density (lb/cu ft):	0.0001
Vapor Molecular Weight (Ib/Ib-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0062
Daily Avg. Liquid Surface Temp. (deg. F):	58.6720
Daily Average Ambient Temp. (deg. F):	55.7551
Ideal Gas Constant R (psia cuft / (Ib-mol-deg R)):	10.7310
Liquid Bulk Temperature (deg. F):	57.0969
Tank Paint Solar Absorptance (Shell):	0.2500
Tank Paint Solar Absorptance (Roof):	0.2500
Daily Total Solar Insulation Factor (Btu/sqft day):	1,789.0592
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0537
Daily Vapor Temperature Range (deg. R):	30.2302
Daily Vapor Pressure Range (psia):	0.0031
Breather Vent Press. Setting Range (psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0062
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0048
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia)	0.0079
Daily Avg. Liquid Surface Temp. (deg F):	58.6720
Daily Min. Liquid Surface Temp. (deg F):	51.1144
Daily Max. Liquid Surface Temp. (deg F):	66.2295
Daily Ambient Temp. Range (deg. R):	30.1732
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9933
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0062
Vapor Space Outage (ft):	20.6230

Working Losses (Ib):	1,108.1876
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0062
Annual Net Throughput (gal/yr.):	200,000,001.6000
Annual Turnovers:	249.7862
Turnover Factor:	0.2868
Maximum Liquid Volume (gal):	854,063.7324
Maximum Liquid Height (ft):	31.0000
Tank Diameter (ft):	67.4000
Working Loss Product Factor:	1.0000
Total Losses (Ib):	1,315.2454

TankESP Emissions Report - Detail Format Individual Tank Emission Totals

Emissions Report for: Annual Tank #3 - Vertical Fixed Roof Tank Winslow, AZ

	Losses(lbs)				
Components	Working loss	Breathing Loss	Total Emissions		
Diesel	1,108.19	207.06	1,315.25		
Unidentified Components	1,010.77	188.86	1,199.62		
Benzene	2.33	0.44	2.77		
Benzo(g,h,i)perylene	0.00	0.00	0.00		
Cumene {isopropylbenzene}	0.00	0.00	0.00		
Cyclohexane	0.00	0.00	0.00		
Ethylbenzene	3.33	0.62	3.95		
Hexane (n-)	0.48	0.09	0.57		
Iso-octane {2,2,4 trimethylpentane}	0.00	0.00	0.00		
Naphthalene	0.44	0.08	0.52		
PACs {Chrysene}	0.00	0.00	0.00		
Toluene	26.26	4.91	31.17		
Xylene	64.59	12.07	76.66		