U 97017-412754

TITLE V PERMIT RENEWAL
FOR
AIR QUALITY OPERATING PERMIT
NO. V97-017

LUKE AIR FORCE BASE
LUKE AFB, ARIZONA

April 2016

Contracted To:
Prudent Engineering
Task Order: ID07130023011-000

Prepared Under Subcontract By:
AECOM and Providence

Prepared By:
Providence Engineering and Environmental Group LLC
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Round Rock, TX 78664
(512) 920-0315

MARCH 2016

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1.0 INTRODUCTION AND FACILITY DESCRIPTION

1.0 INTRODUCTION AND FACILITY DESCRIPTION

Luke Air Force Base (AFB) is a military training installation, owned and operated by the United Sates Department of Defense. Luke AFB is located within Maricopa County approximately 9 miles west of downtown Glendale, Arizona on approximately 3,862 acres, and employs approximately 8,200 military and non-military personnel. The location of Luke AFB in shown in Figure 1-1. Luke AFB is the largest and only active-duty F-16 training base in the world, and will soon train United States and Partner F-35A pilots. Operations at the base include support activities for housing and feeding personnel, and maintenance and support of military equipment and operations. Figure 1-1 provides the layout of the Base.

Luke AFB is a large multi-faceted installation which is comparable in size and function to a small city. Operations at Luke AFB include training of military personnel, support activities for housing and feeding personnel, and maintenance and support of military equipment and operations. Specifically, the base has operations including, but not limited to: retail markets, hospital and dental clinics, public works, warehouse facilities, utilities, recreational facilities, an airfield, maintenance operations, and auto/wood hobby shops. It is important to note that Luke AFB has several tenant operations. With the exception of the Army Air Force Exchange Service (AAFES) service station and the auto hobby paint booth, emissions from tenant operations are regulated as a part of Luke AFB operations even though they are not under "common control". The AAFES service station and auto hobby paint booth are regulated separately and are not discussed further in this renewal application.

Luke AFB has historically operated as a major source under the Title V Operating Permitting program administered by the Maricopa County Air Quality Department. Luke AFB is a major source for two criteria pollutants, NOx and VOC, but not for Hazardous Air Pollutants (HAPs) either as a single HAP or as a combination of HAPs. The base currently has a Title V permit to authorize operations under Standard Industrial Classification (SIC) code 9711, National Security.

This Title V Operating Permit Renewal Application package is submitted for Luke AFB, Title V Operating Permit No. V97-017, in accordance with the requirements of Maricopa County Air Pollution Control Regulation (MCAPCR) Rule 200 and Rule 210, promulgated pursuant to Title V of the Clean Air Act Amendments of 1990. The remainder of this application includes a completed Standard Permit Application Form, equipment list, regulatory review, process descriptions, flow diagrams, supporting emissions calculations, and all other forms and analyses required by MCAPCR Rule 210 for the permit amendment.

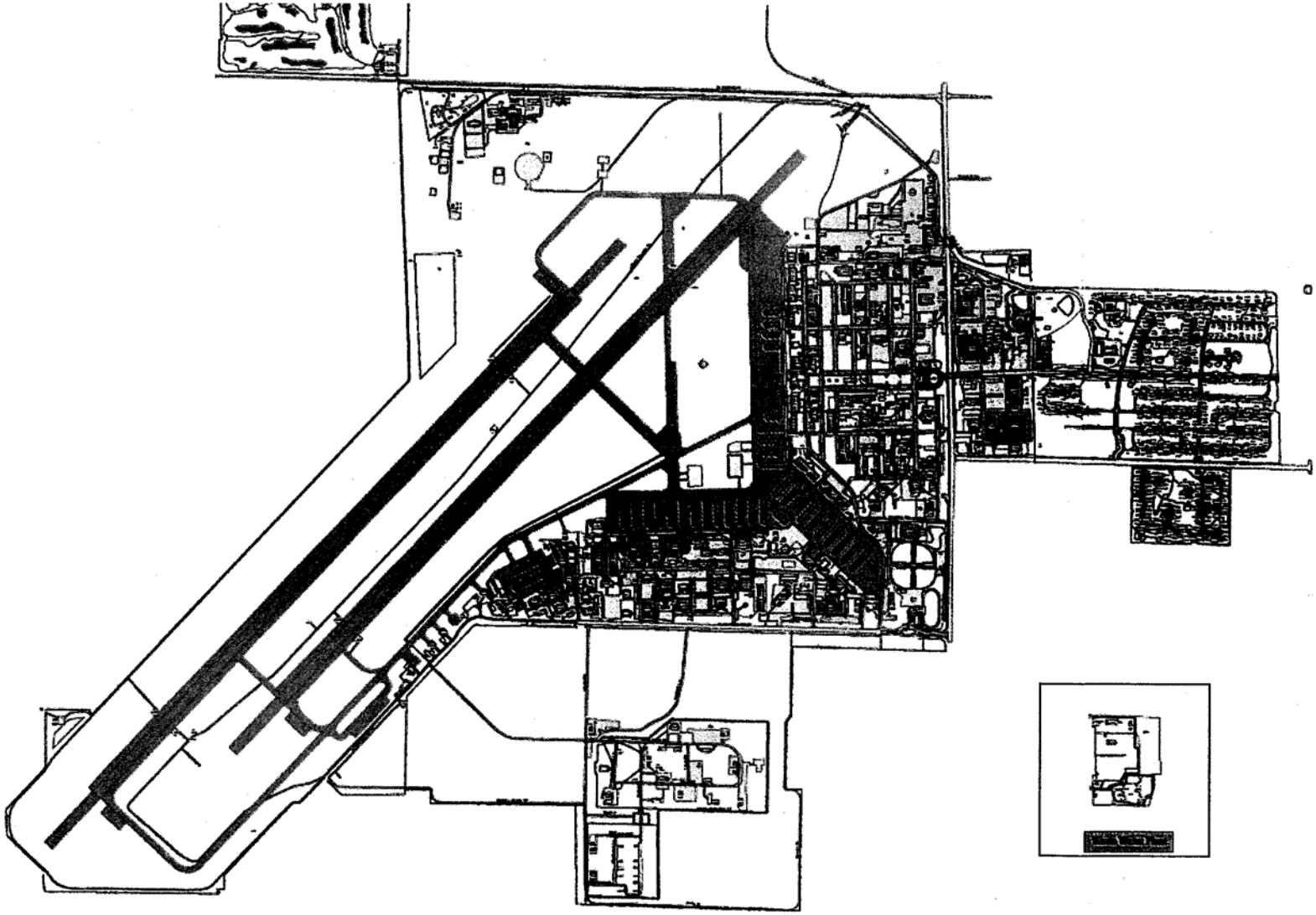

Figure 1-1: Base Map

2.0 STANDARD PERMIT APPLICATION FORM

V97017-412754

Maricopa County
Air Quality Department

Maricopa County Air Quality Department
1001 N Central Ave, Suite 125, Phoenix, AZ 85004
Phone (602) 506-6010 Fax (602) 372-0587
AQPermits@mail.maricopa.gov

APR 22 2016

TITLE V GENERAL PERMIT - APPLICATION

APPLICATION FOR THE AUTHORITY TO OPERATE AND/OR CONSTRUCT A TITLE V OPERATION UNDER THE GENERAL PERMIT

(As required by A.R.S. §49-480 and and Chapter 3, Article 3, Arizona Administrative Code)

ALL APPLICANTS MUST COMPLETE THE ENTIRE APPLICATION

Important: Please note that email will be our primary means for routine communication with you, unless you do not have an email account. Please be sure that your email address is entered correctly.

1. Permit to be issued to: (Business license name of organization that is to receive permit)
Luke Air Force Base - 56th Fighter Wing

2. Mailing Address: 56 CES/CEIE ATTN: Mr. Jeffery Schone, 13970 Gillespie Dr.

City: Luke AFB | State: AZ | Zip Code: 85309

3. Plant Name (if different from item #1 above) :

4. Name (or names) of Owner or Operator :
Department of Defense
Phone : (623) 856-0056

5. Name of Owner's Agent :
Phone :

6. Plant/Site Manager or Contact Person :
Mr. Jeffery Schone
Phone : (623) 856-8486

7. Proposed Equipment/Plant Location Address:
13970 Gillespie Dr.

City: Luke AFB | County: MARICOPA | Zip Code: 85309

Indian Reservation (if applicable) : N/A

Section/Township/Range : 4/T2N/R1W

Latitude: 32° 30' 0" | Longitude: 112° 22' 30" | Zip Code: 85309

8. General Nature of Business : National Security, Fighter Pilot/Aircrew Training

Standard Industrial Classification Code : 3089, 3083

9. Type of Organization: ☐ Corporation ☐ Individual Owner ☐ Partnership ☒ Government Entity
Government Facility Code : 9711

10. Permit Application Basis (Check all that apply.) : ☐ New Source ☒ Renewal of Existing Permit ☐ Revision ☐ General Permit ☐ Portable Source

For renewal or modification, include existing permit number and Date of Commencement of Construction or Modification: V97-017

Is **any** of the equipment to be leased to another individual or entity? ☐ Yes ☒ No

11. Signature of Responsible :
Official of Organization : SCOTT L. PLEUS, Brigadier General, USAF
Official Title of Signer : Commander, 56th Fighter Wing

12. Typed or Printed Name of Signer: SCOTT L. PLEUS, Brigadier General, USAF, Commander, 56th Fighter Wing

Date : 13 APR 16 Phone : (623) 856-0056

For Office Use Only	Date Received:	Log Number:

3.0 CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS

CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS

FOR

LUKE AIR FORCE BASE

OPERATING PERMIT NUMBER V97-017

Based on information and belief formed after reasonable inquiry, the statements and information in the attached Title V Permit Renewal for Air Quality Operating Permit No. V97-017, is true, accurate, and complete.

SCOTT L. PLEUS
Brigadier General, USAF
Commander, 56th Fighter Wing

13 APR 16
Date

4.0 EQUIPMENT LIST

Permitting	Facility	Equipment Type	Manufacturer	Model #	Serial #	Year Manufactured	Year Installed	HP Rating	kW Rating	Phase	Voltage	Input MMTBU/hr Rating	Fuel Type	Tank Type	Tank Capacity	Tank Ro
Significant	11	Generator	Onan	60.0DVB-15R	B870876603	1987		80.5	60	3	277/480		D	CV	500	
Insignificant	11	Storage Tank										0.3	Diesel		600	Fix
Significant	25	Boiler	American Standard Products	38AKS024---S21--	4609G10045							0.04				
Insignificant	25	Chiller	Carrier	G40H-6	A2222648							1.7				
Insignificant	25	Water Heater	American	G-6013	1BN - J3							0.525				
Significant	26	Boiler	American Standard Products	WGFD-525	84-36369		1984									
Significant	122	Boiler	Ajax Boiler & Heater	DQDAA-2688033	A100079521	2010	2010	335.3	250	3	120/208		D	CV	1,000	
Significant	122	Generator	Onan	RN 1000 35F	N635665								Diesel	Convault	1,000	Fix
Insignificant	122	Storage Tank	Convault	~~WNG1750~~	~~54308~~							0.5				
Significant	~~133~~	~~Boiler~~	~~Ajax Boiler & Heater~~	CHN0502	L11H00237684							0.5				
Significant	133	Boiler	Lochinvar	CFN0652PM	H11H00234942											
Significant	133	Boiler	Lochinvar	AT14612	10401373											
Insignificant	133	Chiller	EVAPCO	~~D100 199 AS~~	~~L04 5321~~							0.7				
Insignificant	~~133~~	~~Water Heater~~	~~American Standard~~	659-T	079463							0.04				
Significant	156	Boiler	RayPak, Inc.	PH50	RUNG0303V22548	2003						2.2				
Insignificant	156	Water Heater	Ruud	T-2160	37993	1990										
Significant	161	Boiler	Parker Boiler	MD-10016059-A1	MD500ENAD11-CAP	2009						0.4				
Insignificant	161	Chiller	Marley	40P250AGX	19069172											
Significant	161	Water Heater	PVI	~~40P250AGX~~	~~19069173~~							0.39				
Insignificant	~~161~~	~~Water Heater~~	~~PVI~~	BTR 400 A 118	1145M001283	2011						0.53				
Significant	161	Water Heater	A.O. Smith	WG-525	167177R								D	CV	500	
Significant	176	Boiler	Ajax Boiler & Heater	100.0DGDB-L/30 523A	H870917873	1988		134.1	100	3	120/208		Diesel	Convault	500	Fi
Significant	176	Generator	Onan				1993					0.04				
Insignificant	176	Storage Tank	Convault													
Insignificant	176	Water Heater	American	GV303T	A863408240								D	CV	~~500~~	
Significant	~~179~~	~~Generator~~	~~Onan~~	~~DGEA5003553~~	~~J010290749~~	~~3000~~	~~2000~~	~~167.6~~	~~125~~	~~3~~	~~120/208~~		Diesel	Convault	500	F
Insignificant	179	Storage Tank	Convault/Old Castle				1993					0.55				
Significant	219	Boiler	Rite Heating Boiler	55	8821222		1988									
Insignificant	219	Chiller	EVAPCO	AT1499	10401371							0.03				
Insignificant	219	Water Heater	Ruud	PE30-2 D	RU 1298B30040											
Insignificant	~~234~~	~~Storage Tank~~					~~1996~~						~~Used Oil o/w sep~~	~~Mild Steel~~	~~500~~	
Significant	235	Paint Booth	DeVilbiss	System 2000												
Insignificant	~~235~~	~~Solvent Cleaner~~	~~Build All~~	~~SKL-48~~	~~10854000~~								Used Oil	Mild Steel	500	F
Insignificant	235	Storage Tank					2000									
Insignificant	247	10" Drill Press	Rockwell	15-655	1811564			0.75								
Insignificant	247	10" Miter Saw	Mikita	LS1030N	102859K											
Insignificant	247	24" Planer	Grizzly	G9961	J6B1908	2006		10								
Insignificant	247	Bandsaw	Delta	52-963	9380439											
Insignificant	247	Bandsaw	Laguna	B40	1027	2006		3								
Insignificant	247	Bandsaw	Centauro	Minimax MM	19082		2011	4.8								
Insignificant	247	Belt Disk Sander	Delta	52-625	011166			1.5								
Insignificant	247	Bench Grinder	Craftsmen	319.190621	B9533			0.33								
Insignificant	247	Boiler	Trane	VCH181C3L0CA	533101090D	2005						0.25				
Insignificant	247	Cyclone Dust Collector	Farr	GS-16	851210001		2008	25								
Significant	247	Drill Press	Powermatic	2800	10020884			1								
Insignificant	247	Drum Sander	Grizzly	G1071	1430477	2014	2014	1								
Insignificant	247	Dust Collector	Delta	50-720	2008 01-XL 001502		62012	1								
Insignificant	247	Dust Collector	Jet	DC-110RC	07116686		62012	1.5								
Insignificant	247	Inverted Router	CR Onsrud	3025	30682			5								
Insignificant	247	Jointer	Delta	DJ-20	SH000630			1.5								
Insignificant	~~247~~	~~Lathe~~	~~Delta~~	~~A02458~~	~~4000~~			~~2~~								
Insignificant	247	Mini Lathe	Jet	JML 10141	11098690		102012	0.5								
Exempt	247	Paint Booth						2.5								
Insignificant	247	Panel Saw	Milwaukee	6410	YF149CFRIAE			5								
Insignificant	247	Radial Arm Saw	Delta	43802314O989	~~784251009~~											
Insignificant	~~247~~	~~Radial Arm Saw~~	~~Booth~~	~~4410L~~	024634			0.75								
Insignificant	247	Router	Porter Cable	75182	024675			0.75								
Insignificant	247	Router	Porter Cable	75182	23686M			20.75								
Insignificant	247	Sander	Time Saver	137-1HD760	XX115050960		102012	5								
Insignificant	247	Sander	Ridged	EB44242	AEP56B4R	1999		0.1								
Insignificant	247	Scroll Saw	Hedgner	415718	061046F6001			0.33								
Insignificant	247	Shop Master Sander	Delta	SA180	7207703			3								
Insignificant	247	Table Saw	Saw Stop	CB31230	7207697			3								
Insignificant	247	Table Saw	Saw Stop	CB31230	3ARB105FF08							0.4				
Significant	247	Water Heater	Rezner	RGBL400-S	3ARB106FF08							0.4				
Significant	247	Water Heater	Rezner	RGBL400-S	2102238							0.034				
Insignificant	247	Water Heater	American PROLine	G61-40T34-3N	~~10020884~~		~~2011~~	~~1~~								
Insignificant	~~247~~	~~Wood Working~~	~~Powermatic~~	~~18" VS Drill Press~~	5834L08819	1984						0.1				
Insignificant	289	Boiler	Lennox	G1203E-137-7	588410881							0.1				
Insignificant	289	Boiler	Lennox	G1203E-137-7	8-9205DJG							0.2				
Insignificant	289	Boiler	Lennox	G1205E-165-7								0.04				
Insignificant	289	Water Heater	A.O. Smith	KGA 30910									Mineral Oil	Steel Drum	55	
Insignificant	290	Storage Tank														
Insignificant	291	Aqueous Brake Cleaner	Safety Kleen	26.1	9030362											

Permitting	Facility	Equipment Type	Manufacturer	Model #	Serial #	Year Manufactured	Year Installed	HP Rating	kW Rating	Phase	Voltage	Input MMTBU/hr Rating	Fuel Type	Tank Type	Tank Capacity	Tank Roof T
Insignificant	291	Aqueous Cleaner	Cuda	H20-2840	10434220-100213											
Significant	291	Heater - Paint Booth	Power Flame	J50A-15	99620558							1.5	Natural Gas			
Significant	291	Paint Booth	Blowtherm	Ultra 2000	4940PBLO-3750											
Insignificant	291	Sand Blaster	TRINCO Seat Blaster	36x30/PC	62164-5											
~~Significant~~	~~291~~	~~Solvent Cleaner~~	~~Safety Kleen paint gun cleaner~~	~~1111/7090~~	~~77732087~~										~~5~~	
Insignificant	291	Storage Tank											Oil	Steel Drum	55	
Insignificant	291	Storage Tank	Valley Pump & Machine Works				1997						Used Oil	Mild Steel	1,000	Fixed
Insignificant	291	Storage Tank	Nogales Highway Iron & Steel										Oil	Steel Drum	480	Fixed
Insignificant	291	Storage Tank											Hydraulic Fluid	Mild Steel	240	Fixed
Insignificant	291	Storage Tank											Premix Antifreeze	Mild Steel	275	Fixed
Insignificant	291	Storage Tank											Waste Antifreeze	Mild Steel	275	Fixed
Insignificant	291	Storage Tank											Transmission Fluid	Mild Steel	240	Fixed
Significant	300	Boiler	Camus Dyno Max	DFNH-1101-MGI-HV	61113313				3			1.1				
Significant	308	Solvent Cleaner	Safety Kleen	30.3R	30246115		Feb 2011								20	
Significant	310	Generator	Onan	3170-0810	BA2275EA	2000	2000	167.6	125	3	120/208		D	CV	500	
Insignificant	310	Storage Tank					1988						Diesel	Mild Steel	500	
Significant	320	Solvent Cleaner	Crystal Clean	1602											30	
Significant	321	Generator	Onan	DFCC-4491142	K000175019	2000		469.7	350				D			
Significant	321	Generator	Onan	1003.0DYC-15R	B850750762	2000		469.4	350	3	277/480		D	CV	500	
Insignificant	321	Storage Tank	Convault				2000						Diesel	Convault	500	Fixed
Significant	~~328~~	~~Boiler~~	~~American Standard~~	~~NA~~	~~NA~~		~~1990~~									
Insignificant	328	Generator	Onan	30.0DL6-15R / 29889D	I860841684	1987		40.2	30	3	120/208		D	CV	250	
Insignificant	328	Storage Tank	Convault				1999						Diesel	Convault	250	Fixed
Insignificant	330	Generator	MEP	MEP 805B	HX39379	2009	April 2011	0.0					D			
Significant	331	Boiler	Lochinvar	CHN1261	107H00201395							1.3				
Insignificant	331	Water Heater	Lochinvar	EWN300PM	107H00201366							0.3				
Significant	335	Storage Tank											Gasoline	Vaulted Underground	15,000	Fixed
Insignificant	335	Storage Tank											Diesel	Vaulted Underground	8,000	Fixed
Insignificant	336	Storage Tank					1995						Rec. Jet Fuel	Mild Steel	250	
Insignificant	336	Storage Tank	Myers Waste Oil Storage Systems / King										Used Oil	Mild Steel	132	Fixed
Insignificant	336	Storage Tank											Oil	Mild Steel	61	Fixed
Insignificant	336	Storage Tank											Antifreeze	Mild Steel	61	Fixed
Insignificant	336	Storage Tank											Tranmission Fluid	Mild Steel	61	Fixed
Insignificant	336	Storage Tank											Oil	Mild Steel	61	Fixed
Insignificant	338	Boiler	Rite Heating Boiler	15X	71-14443		1971					0.2				
Insignificant	338	Storage Tank	Valley Equipment Company										Oil	Mild Steel	65	Fixed
Insignificant	338	Storage Tank	Valley Equipment Company										Oil	Mild Steel	65	Fixed
Insignificant	338	Storage Tank	Beta Systems				1980						Used Oil	Mild Steel	500	Fixed
Insignificant	338	Storage Tank	Valley Equipment Company										Hydraulic Fluid	Mild Steel	65	Fixed
Insignificant	338	Storage Tank	Valley Equipment Company										Oil	Mild Steel	65	Fixed
Insignificant	338	Storage Tank	Valley Equipment Company										Oil	Mild Steel	65	Fixed
Insignificant	338	Storage Tank	Valley Equipment Company										Oil	Mild Steel	65	Fixed
Insignificant	338	Storage Tank	Valley Equipment Company											Mild Steel	65	Fixed
Insignificant	339	20" Drill Press	Wilton	2550	255212			1.5								
Insignificant	339	24" Band Saw	Delta	28-641	HI-01795	1995?		2								
Insignificant	339	24" Disc Sander	Powermatic	D8-203	11020068	2000		3								
Insignificant	339	24" Planer	Invicta	53509626	1571	2002		10								
Significant	339	Boiler	Rite Heating Boiler	76X	7114457							0.8				
Significant	339	Cyclone Dust Collector	Roto Clone Hoppers (Combination Hopper)													
Significant	339	Dust Collector	Cyclone													
Insignificant	339	Jointer	Delta	DJ-20	SH0003644			1.5								
Insignificant	339	Miter Saw 10"	Milwaukee	6497	4070323			0.5								
Significant	339	Paint Booth	Binks	Dyna Precipitor (75509)												
Insignificant	339	Panel Saw 8"	Milwaukee	6411	795A495500056											
Insignificant	339	Radial Arm	Dewalt	96753-00	84870098			5								
Insignificant	339	Router	AXYZ	Camtech SM	3826H3716		2010	3	4.2							
Insignificant	339	Sander	Timesaver	1311-12-1	30774			1								
Insignificant	339	Shaper	Delta	43-791	PI.00779			7.5								
Insignificant	339	Spindle Sander	Jet	JOVS-10	1062070			1								
Insignificant	339	Spindle Shaper	Jet	JWS34L	7060302			2								
Insignificant	339	Table Saw	Sawstop	ICS53230	I100500311		2010	5								
Insignificant	339	Water Heater	Rheem	G91-200-1	URNG1105G00209	2005						0.2				
Significant	343	Boiler	Ajax Boiler & Heater	WG-400D	80-32534		1980					0.4				
Significant	343	Generator	Onan	100.0DYC-15R/28074J	B850748482	1985		134.1	100	3	120/208		D	CV	500	
Insignificant	343	Storage Tank	Convault				1982						Diesel	Convault	500	Fixed
Insignificant	343	Water Heater	Ruud	P30S-30F	RULN0703V01404	2003						0.03				
Significant	350	Storage Tank					1989						Jet Fuel (A/A-1)	Mild Steel	206,219	Fixed
Significant	351	Storage Tank					1953						Jet Fuel (A/A-1)	Mild Steel	413,779	External Floa
Insignificant	355	Generator	Onan	MEP 804B	FZ61597	2009		20.1	15	3	120/208		D		40	
Significant	356	Storage Tank					1954						Jet Fuel (A/A-1)	Mild Steel	1,629,377	External Floa
Significant	359	Storage Tank					1989						Jet Fuel (A/A-1)	Mild Steel	206,219	Fixed
Significant	360	Generator		MEP-806B	MX63365	2003		80.5	60	3	120/208		D		60	
Significant	360	Generator		MEP-806B	HX62705	2002		80.5	60	3	120/208		D		60	
Insignificant	360	Generator	Onan	MEP-804B	61599	2009		20.1	15	3	120/208		D		40	

Permitting	Facility	Equipment Type	Manufacturer	Model #	Serial #	Year Manufactured	Year Installed	HP Rating	kW Rating	Phase	Voltage	Input MMTBU/hr Rating	Fuel Type	Tank Type	Tank Capacity	Tank Roof T
Insignificant	363	Tank (contact water)	Contact Water													
Significant	366	Storage Tank					1996						Jet Fuel (A/A-1)	Mild Steel	26,438	Fixed
Significant	367	Storage Tank					1996						Diesel	Mild Steel	40,000	Fixed
Significant	368	Storage Tank					1996						Gasoline	Mild Steel	35,000	Fixed
Significant	400	Boiler	Ajax Boiler & Heater	WG525D	85-37165		1985					0.4				
~~Significant~~	~~404~~	~~Boiler~~	~~Peerless~~													
Significant	404	Solvent Cleaner	Zep Dyna 680 T2 Super Brute	FB45ZEP	3031852		2003								45	
Insignificant	404	Storage Tank											Used Oil		1,000	Fixed
~~Insignificant~~	~~404~~	~~Water Heater~~	~~Rheem~~	~~G75-75N-1~~	~~RRLN1104D06311~~											
Insignificant	404	Water Heater	Ruud	PR0+G75-75N RU	RULNM301418469	2014						0.075				
Insignificant	405	Storage Tank	Convault				1993						Jet Fuel (A/A-1)	Convault	5,200	Fixed
Insignificant	405	Storage Tank	Convault				1993						Jet Fuel (A/A-1)	Convault	5,200	Fixed
Significant	408	Boiler	Burnham FD/24	R6.2-G-03	34000446				?			1.1				
Insignificant	415	30" Disc Sander	Max Universal		92331			7.5								
Insignificant	415	Band Saw	Du All	2013-V	457-912034	1991		3								
Insignificant	415	Band Saw - 36"	Moake		10426			5								
Significant	415	Boiler	Ajax Boiler & Heater	WG-600	82933		1982					0.6				
Insignificant	415	Chiller	BAC	VTO-78-K	U038440701MAD											
Significant	415	Cyclone - Bead Media	Pauli & Griffin	PRAM # 32	5583											
Significant	415	Cyclone Dust Collector	Cyclomax Dust Collector, (Cyclone)	C3625-H60-24	1810			25								
~~Insignificant~~	~~415~~	~~Joiner~~	~~Yates~~	~~D24864~~				~~5~~								
Significant	415	Paint Booth	CE Fabricated													
~~Insignificant~~	~~415~~	~~Planer~~	~~Northfield~~	~~3720-00-204-4923~~	~~860132-A~~			~~7.5~~								
Insignificant	415	Sand Blaster	Pauli-Griffin	PRAM#431	5583											
Insignificant	415	Sand Blaster	ECONOLINE	RA-48-2	E-88-3682											
~~Insignificant~~	~~415~~	~~Sander~~	~~Sunhill~~	~~SDS 37~~	~~60308~~			~~3.25~~								
Insignificant	415	Sander	Jet	JOVS-10	2042662			1								
~~Insignificant~~	~~415~~	~~Sander - Dual Disk~~	~~Max Universal~~		~~92331~~			~~7.5~~								
~~Significant~~	~~415~~	~~Solvent Cleaner~~	~~Safety-Kleen paint gun cleaner~~	~~1111~~	~~77720000~~		~~2005~~								~~6~~	
Insignificant	415	Table Saw	Sawstop	73480	07066528			7.5								
Significant	416	Boiler	Lochinvar	CHN0991	L05H00181930		2007					0.99				
Insignificant	416	Chiller	EVAPCO	1CT496	5134367											
Insignificant	416	Water Heater	Lochinvar	CNR085-100	CC7454646							0.085				
Significant	417	Boiler	Rite	120WE	30532	2008	2010					1.2				
Significant	417	Boiler	Lochinvar	CHN401	B003048							0.4				
Insignificant	417	Chiller	Marley		$27150-A1 AV61001B 08											
Insignificant	417	Chiller	EVAPCO	AT19-76	99-8964W											
Insignificant	417	Water Heater	A.O. Smith	BT 65 104	MB00-0712681-104							0.06				
Insignificant	417	Water Heater	Ruud	G60-50N-1	URLN1107512107							0.05				
Significant	431	Boiler	Burham	FD/24	34000447							1.1				
Significant	445	Boiler	Ajax Boiler & Heater	WG-350-D	81-34235		1981					0.4				
Insignificant	445	Water Heater	Vanguard	5AV69	VGLN0509415804							0.038				
Insignificant	447	Boiler	Lochinvar	CBN0215	B888608							0.2				
Insignificant	447	Water Heater	A.O. Smith	BTR 154118	AO7M000015							0.154				
Significant	450	Boiler	Lochinvar	EBN300	J03H00159205							0.3				
Significant	450	Generator	Onan	DSGAB-7563823	A090228434	2009		167.6	125				D			
Significant	450	Generator	Onan	0587-63MR3	46971316	2009		167.6	125	3	120/208		D	CV	500	
Insignificant	450	Storage Tank	Convault				1993						Diesel	Convault	500	Fixed
Insignificant	450	Water Heater	Rheem	G91-200	URNG0899G04834							0.2				
Significant	452	Boiler	Rite Heating Boiler	48WG	9022168							0.5				
Significant	453	Boiler	Teledyne Laars Mighty Therm	PH-0250C-N12K	8990606							0.3				
Significant	453	Generator	Onan	250FAC (DFAC-5634576)	L030579229	2004	2010	335.3	250	3	120/208		D	CV	1,000	
Insignificant	453	Storage Tank											Diesel		1,000	Fixed
Insignificant	453	Water Heater	A.O. Smith	BT80110	MH0218S6211-110							0.076				
Insignificant	453	Water Heater	A.O. Smith	BT80110	MH0218S6210-110							0.076				
Significant	460	Boiler	Camus Hydronics	DMNH-0291-MSI-HLS	081317784	2014	2014					0.4				
Significant	460	Boiler	Dynamax	DMNH0391	081317785							0.4				
~~Significant~~	~~461~~	~~Boiler~~	~~Lochinvar~~		~~V888602~~											
Significant	461	Boiler	Dynamax	DMNH0391	HWB103091318008							0.4				
Insignificant	470	Water Heater	Rheem	21V30-30F	RHLN1103V05928	2003						0.03				
Significant	471	Boiler	Camus Hydronics	DMNH-0391-MSI-HLS	091318008	2014	2014					0.4				
Significant	471	Boiler	Camus Hydronics	DMNH-0391-MSI-HLS	081317785	2014	2014					0.4				
Significant	471	Water Heater	Rheem/Ruud	GHD100-300A	133174	2012	2014					0.3			100	
~~Significant~~	~~480~~	~~Alkali Washer~~	~~Magido - Calo 296~~		~~1107S075~~											
Significant	482	Solvent Cleaner	ZEP	Q2011-019	11075075		Aug 2011								149	
~~Significant~~	~~482~~	~~Solvent Cleaner~~	~~Graymills~~	~~TRC3420LP-A~~			~~2014~~								~~42~~	
~~Significant~~	~~482~~	~~Solvent Cleaner~~	~~Graymills~~	~~285584-02~~	~~A42618-A~~											
~~Insignificant~~	~~482~~	~~Solvent Cleaner~~	~~Cuda~~	~~H302413~~	~~C070663055~~										25	
Significant	482	Solvent Cleaner	Magido	L192E	10.192E.60	2010	2012								273	
Significant	485	Boiler	Rite Heating Boiler	76	8720550							0.8				
Insignificant	492	Water Heater	American	MA199-85-1	A087200004							0.2				
Significant	500	Boiler	TeleDyne Laars	HB 560-C-03	7490847							0.6				
Significant	500	Generator	Cummins / CPG	DSFAD-7194941	E110217179	2011	June 2011	80.6	60				D			
~~Significant~~	~~500~~	~~Generator~~	~~Onan~~	~~QSB5 63NR3~~	~~73211390~~	~~2011~~		~~80.5~~	~~60~~	~~3~~	~~277/480~~		~~D~~	~~ST~~	~~145~~	

Permitting	Facility	Equipment Type	Manufacturer	Model #	Serial #	Year Manufactured	Year Installed	HP Rating	kW Rating	Phase	Voltage	Input MMTBU/hr Rating	Fuel Type	Tank Type	Tank Capacity	Tank Roof Ty
	~~600~~	~~Storage Tank~~											~~Diesel~~		~~500~~	~~Fixed~~
Significant	528	Boiler	Lochinvar	CBN0665	D863967							0.7				
Significant	528	Boiler	Lochinvar	CHN501	G09H00220255							0.5				
Significant	528	Boiler	Lochinvar	CFN651-PM	C09H00217606							0.7				
Insignificant	530	Water Heater	PVI	27P250A-G	48657839							0.27				
Insignificant	530	Water Heater	PVI	27G250A-G	48657837							0.27				
Insignificant	533	Water Heater	PVI	27P250A-G	19275068							0.27				
Insignificant	533	Water Heater	PVI	27P250A-G	19275067							0.27				
Significant	542	Boiler	TeleDyne Laars	HH0500 IN 09 K I A C CT	C00C03073							0.5				
Insignificant	542	Water Heater	Vanguard	6E743A	VGN0497G02332							0.2				
Significant	545	Boiler	Bryan Flexible Tube Boilers	CL240 W 125 G	77-472	1995						2.4				
Insignificant	545	Storage Tank											Used Cooking Oil/Grease		300	Fixed
Insignificant	545	Water Heater	A.O. Smith	BTH199100	0833M000768	2008						0.2				
Significant	546	Boiler	Bryan Flexible Tube Boiler	CL90-W-FDG	82965	1998						0.9				
Significant	546	Water Heater	A.O. Smith	BTH 400A 104	1323M001867	2013						0.4				
Insignificant	547	Cooling Tower	NA	NA	NA		1972									
Significant	569	Boiler	Kewanee	M55-KGO	R0514							0.6				
Significant	586	Boiler	Bryan	080369	96929	2008	2009					1.5				
Significant	586	Boiler	Laars	PNCV0750NACKBJN	C08202809	2009	2009					0.8				
Significant	617	Boiler	Lochinvar									1.2				
Significant	617	Boiler	TeleDyne Laars	PH 0500 IN 09 K 1A	C93K08622							0.5				
Insignificant	617	Storage Tank					1996							Mild Steel	200	
Insignificant	617	Storage Tank					1996							Mild Steel	100	
Insignificant	617	Water Heater	Envirotemp	G1F4034T3NV	0231107721							0.034				
Insignificant	617	Water Heater	Ruud	PROG 40-38N RU62	M251514024	2015	2015					0.04				
Significant	618	Boiler	Aero International	BMK3000-GWB	G-13-2110							3				
Significant	618	Boiler	Aero International	BMK3000-GWB	G-13-2111							3				
Significant	635	Boiler	Rite Heating Boiler	450	7114471							4.5				
Significant	635	Boiler	Lochinvar	CFN0991PM	K09H00222768							1				
~~Significant~~	~~636~~	~~Boiler~~	~~Rite Heating Boiler~~	~~375~~	~~14348~~											
~~Significant~~	~~636~~	~~Boiler~~	~~Ajax Boiler & Heater~~	~~WGB-850~~	~~35-AC28432~~		~~1975~~									
Significant	636	Boiler	Lochinvar	CHN0502	L11H00237732							0.425	NG			
Significant	636	Boiler	Lochinvar	CFN0652PM	L11H00237737							0.65	NG			
~~Significant~~	~~637~~	~~Boiler~~	~~Weil-McLain Co~~	~~MGB-18~~												
Significant	637	Boiler	Lochinvar	CFN0652PM	L11H00237738							0.65				
Significant	637	Boiler	Lochinvar	CHN05025	L11H00237731							0.425				
~~Insignificant~~	~~637~~	~~Water Heater~~	~~Rheem~~	~~G91-200-1~~	~~URNG0309G01173~~											
Significant	640	Boiler	Bryan Flexible Tube Boilers	CL120-W-FDG	80312	1997						0.8				
~~Insignificant~~	~~640~~	~~Water Heater~~	~~A.O. Smith~~	~~BTR400A110~~	~~9280763003~~	~~2004~~										
~~Insignificant~~	~~640~~	~~Water Heater~~	~~A.O. Smith~~	~~BTR400A110~~	~~G05M004358~~	~~2005~~										
Significant	640	Water Heater	AO Smith	BTH400A104	1414M001037							0.4				
Significant	663	Boiler	Lochinvar Copper Fin	CBN-0986	L03H00160575	2003						1				
Insignificant	663	Water Heater	Lochinvar	EWN150PW	L03H00160660	2003						0.15				
Insignificant	663	Water Heater	Lochinvar	EWN150PM	L03H00160661	2003						0.15				
Significant	668	Boiler	Bryan Flexible Tube Boilers	CL120-W-FDG	75822	1994	1994					1.2				
Insignificant	668	Chiller	EVAPCO	LSTA 461	94 7393W											
Insignificant	682	Chiller	EVAPCO	ICT4 64	969644W											
Significant	687	Boiler	Bryan Flexible Tube Boilers	CL150-W-FDG	79244	1996						1.5				
Insignificant	687	Water Heater	AO Smith	BTH 250A 100	1403M000242							0.25				
~~Insignificant~~	~~688~~	~~Water Heater~~	~~A.O. Smith~~	~~BTR400A110~~	~~LK03-1970850-110~~											
Significant	700	Boiler	Ajax Boiler & Heater	WG-1500D	83-35489		1983					1.5				
Insignificant	700	Water Heater	Ruud	PR75	RUN0197G01195							0.0755				
Insignificant	~~733~~	~~Water Heater~~	~~A.O. Smith~~	~~BTC154964~~	~~ME97-0653535964~~											
Insignificant	~~733~~	~~Water Heater~~	~~A.O. Smith~~	~~BTC154964~~	~~ME97-0650133064~~											
Significant	750	Boiler	Fulton	PHW-1400LE	95371	2004						1.4	NG			
Insignificant	750	Water Heater	A.O. Smith	BTR197	ML030000266	2003						0.2				
Insignificant	750	Water Heater	A.O. Smith	BTR197	ML030000907	2003						0.2				
Insignificant	793	Storage Tank					1993						Diesel	Convault	500	
Significant	798	Generator	Onan	100.0DVC-15R/3051B	B890841860	1988		134.1	100	3	277/480		D	CV	500	
Significant	799	Boiler	TeleDyne Laars	PH 0500 IN 09 K 1A	C94H07086							0.5				
Insignificant	799	Storage Tank	Convault										Diesel	Convault	500	Fixed
Insignificant	799	Water Heater	Carrier	58PAV055-GC	4893A09883							0.066				
Insignificant	799	Water Heater	Carrier	58PAV055-GC	none							0.066				
Insignificant	799	Water Heater	A.O. Smith	FSG 30 222	GC94-1769484-222							0.032				
Insignificant	799	Water Heater	Bradford White	MI30T6FBN	EH11032937							0.032	NG			
Insignificant	808	Chiller	EVAPCO	AT 19-66	4-113792											
Significant	815	Generator	Power	MEP-009B	RZ00582	1989		268.2	200	3	240/416		D		200	
Significant	820	Boiler	Peerless	TC-11-WP	619686-200906							2.4				
Insignificant	820	Chiller	EVAPCO	AT 19-89	W037867											
Insignificant	820	Chiller	EVAPCO	AT 19-89	W037866											
Insignificant	820	Water Heater	PVI	27 P 250A-G	0409126836							0.27				
Insignificant	820	Water Heater	PVI	27 P 250A-G	0409126837							0.27				
Significant	840	Boiler	Unitux	ZW100W	2009	1995						1				
Insignificant	840	Chiller	EVAPCO	USS1469	9 361476											

Permitting	Facility	Equipment Type	Manufacturer	Model #	Serial #	Year Manufactured	Year Installed	HP Rating	kW Rating	Phase	Voltage	Input MMTBU/hr Rating	Fuel Type	Tank Type	Tank Capacity	Tank Roof Ty
Insignificant	840	Water Heater	Rheem	G91-200-1	URNG0606 G01603							0.2				
Significant	843	Generator	Catapillar	C6.6	E6L01165		2015	234.7	205	3			D	Double Wall Steel	408	NA
Significant	859	Boiler	Trane	YCH180B4LFGA	2311010400	2002						0.3				
Significant	~~859~~	~~Boiler~~	~~Trane~~	~~YCH060C4L0BA~~	~~H381427115~~											
Insignificant	859	Boiler	Carrier	48HCEA06A2A6A0A0A0	3813C81664	2013						0.093				
Significant	859	Generator	Onan	DGHE-5712792	E050778710	2005		67.1	50	3	120/208		D	Attached	75	
Insignificant	859	Storage Tank		159-1463	ODT-32281								Diesel		75	Fixed
Insignificant	~~859~~	~~Water Heater~~	~~American~~	~~403T~~	~~none~~											
Insignificant	859	Water Heater	Vanguard	5AU69	VGLN0611405629	2011						0.038				
Significant	885	Generator	Onan	DGDB-5702801	A050737879	2005		134.1	100	3	120/208		D	S	129	
Insignificant	887	Storage Tank	Nogales Highway Iron & Steel				1996						Used Oil	Mild Steel	1,000	Fixed
Insignificant	888	Storage Tank	Nogales Highway Iron & Steel				1996						Jet Fuel recycled (JP-8)	Mild Steel	6,000	Fixed
Insignificant	897	Generator		MEP-804B	FZ61599	2009		20.1	15	3	120/208		D		40	
Insignificant	897	Storage Tank											Diesel		127	Fixed
Significant	901	Generator	Onan	60DGCB	K920492876	1992		80.5	60	3	240/480		D	S	250	
Insignificant	901	Storage Tank											Diesel	Mild Steel	250	
Significant	904	Boiler	Rite Heating Boiler	42X	12049R4							0.4				
Insignificant	904	Heater - Air Conditioner	Carrier	48TFD008---61--	1209G20659											
Insignificant	904	Water Heater	A.O. Smith	BTC 154 920	MA95-0405102-920							0.154				
Significant	905	Boiler	Trane	YCH301C4LOCA	H371428330 (505101306D)		1993					0.3				
Significant	905	Boiler	Trane	YCH301C4LOCA	H371428320 (505101270D)		1993					0.3				
Insignificant	905	Water Heater	Vanguard	5AU69	VGLN0910421643	2010						0.038				
Insignificant	907	Sand Blaster	Pauli-Griffin													
Insignificant	908	Boiler	Lochinvar	81-286								0.285				
Insignificant	908	Boiler	Lochinvar									0.285				
Insignificant	908	Boiler	Lochinvar	KBN-286	D13H10259392							0.285				
Insignificant	908	Boiler	Lochinvar	KBN-286	D14H10292103							0.285				
Insignificant	908	Water Heater	Lochinvar	AWN151PM	D14H20067819							0.15				
Significant	~~910~~	~~Generator~~	~~Onan~~	~~9587-63NR3~~	~~73113694~~	~~2010~~		~~167.6~~	~~125~~	~~3~~	~~120/208~~		~~D~~	~~CV~~	~~825~~	
Significant	910	Generator	Cummins	DSGAB-5186119	G100142102	2010		167.8	125	3	120/208		D	CV	825	Fixed
Insignificant	910	Storage Tank											Diesel		825	Fixed
Significant	913	Boiler	Ajax Boiler & Heater	WG-1250 9	80-32870		1980					1.25				
Insignificant	913	Water Heater	American	5700	20529							0.14				
Insignificant	913	Water Heater	Ruud	P2-50F1	RULN1211Z09484	2011						0.038				
Significant	914	~~Boiler~~	~~Ajax Boiler & Heater~~	~~WG-1250~~	~~80-33282~~		~~1980~~									
Significant	914	Boiler	Lochinvar	CH1261	L10H00230359							1.25				
Significant	915	Boiler	TeleDyne Laars	HH0600IN09K01	8890137							0.6				
Insignificant	915	Chiller	BAC	VT0-75/K	U041658301MAD											
Significant	917	Boiler	Parker Boiler	T-395	36990	1989	1989					0.4				
Insignificant	917	Water Heater	Ruud	P30-6	0797111662							0.032				
Insignificant	917	Water Heater	Bradford White	MI30T6FBN	HL15800719							0.03				
Insignificant	918	Spent Bullet Collection System	Torit	DFT2-8	IG701796-001		2006	7.5								
Insignificant	918	Spent Bullet Collection System	Torit	DFT2-4	10165544-L1			5								
Insignificant	920	Alkali Washer	ADF System	550	508-4851		2005									
Significant	920	Parts Washer	Stingray Manufacturing	SR5248	8527	2015	2016									
Significant	920	Parts Washer	Mart EQ-1 Processor	(ID#) LYEAGWF01	(on machine) 4940PARC-22											
Insignificant	920	Pressure Washer	Mart Corp Tornado 40 Hi- Profile	C & G Spraydet EL Spray Cabinet Cleaner	7876		2003	180								
Insignificant	~~920~~	~~Sand Blaster~~	~~SNAP-ON~~	~~YA4826P~~	~~DB021473~~		~~2005~~									
Insignificant	920	Sand Blaster		YA3625A	ID: LYEAGCBC1		2005									
Significant	922	Boiler	Ajax Boiler	WNG5000W	54435		1998					5.0				
Significant	922	Boiler	Ajax Boiler	WNG5000W	54436		1998					5.0				
Significant	922	Paint Booth	JBI Inc.													
Significant	922	Paint Booth	JBI Inc.													
Significant	~~927~~	~~Boiler~~	~~Peerless~~	~~75-10-W~~	~~75-2641~~											
Significant	~~927~~	~~Generator~~	~~John Deere~~	~~DMT 505002(4039TF)~~	~~95-7316-1 (CD4039T318193)~~	~~1995~~		~~67.1~~	~~50~~	~~3~~	~~120/208~~		~~D~~	~~S~~	~~90~~	
Insignificant	~~927~~	~~Storage Tank~~											~~Diesel~~	~~Mild Steel~~	90	
Significant	928	Boiler	Lochinvar	CHN-501	K04H00170683	2004						0.425				
Insignificant	928	Chiller	EVAPCO	AT19-56	4-113797											
Insignificant	930	Alkali Washer	Better Engineering													
Significant	930	Boiler	Ajax Boiler & Heater	WG-1375	86-38524		1986					1.375				
Significant	930	Boiler	Weil McLain Co	J-5								0.63				
Insignificant	930	Cleaner	Biocircle													
Insignificant	930	Sand Blaster	Abrasive Blast Systems Inc.		2L1002											
Significant	930	Solvent Cleaner	Zep	Dyna 100 FB	3097150		2003								100	
~~Significant~~	~~930~~	~~Solvent Cleaner~~	~~Zep Dyna 650 T2 Super Brute~~	~~964101~~	~~2222~~										~~45~~	
Significant	930	Spray Ring Tester	Bauer	F100	31743										110	
Insignificant	930	Storage Tank					1984						Jet Fuel (JP-8)	Mild Steel	3,095	Fixed
Insignificant	930	Storage Tank					1984						Jet Fuel (JP-8)	Mild Steel	3,138	Fixed
Insignificant	930	Storage Tank					1984						Diesel	Mild Steel	1,580	Fixed
Insignificant	930	Storage Tank					1984						Used Oil	Mild Steel	250	Fixed
Insignificant	930	Storage Tank	Convault				1998						Used Oil	Convault	1,000	Fixed
Insignificant	930	Water Heater	State Select	GS60YOCTG300	1122J001083							0.04				
Insignificant	930	Water Heater	Ruud	G75-75N-2	RELN 0208108162	2008						0.075				
Significant	931	Boiler	Lochinvar	KBN400	T14H10318105							0.4				

Permitting	Facility	Equipment Type	Manufacturer	Model #	Serial #	Year Manufactured	Year Installed	HP Rating	kW Rating	Phase	Voltage	Input MMTBU/hr Rating	Fuel Type	Tank Type	Tank Capacity	Tank Roof Typ
Significant	931	Boiler	Lochinvar	KBN400	K4H10329383							0.4				
Insignificant	931	Chiller	BAC	DTQ-41-J	U0144775O1MHD											
~~Significant~~	~~931~~	~~Solvent Cleaner~~	~~Zep Dyna 680 T2 Super Brute~~	~~964101~~	~~3086086~~		~~2003~~								~~45~~	
Significant	931	Solvent Cleaner	Zep Dyna	Dyna-100FB											100	
Significant	931	Solvent Cleaner	Zep Dyna 680 T2 Super Brute	FB46ZEP	3031892		2003								45	
Significant	931	Solvent Cleaner	Graymills Corrosion Preventive Finger Print Remover				1999								15	
Significant	931	Solvent Cleaner	Graymills TURCO 6321 Carbon Remover	2R	K-87		1999								15	
Insignificant	931	Water Heater	Ruud	G75-75N-2	0210100981	2010						0.075				
Significant	936	Boiler	TeleDyne Laars	HH0400CN12KBACX	9090792 (D02CK0007)							0.4				
Insignificant	936	Chiller	EVAPCO	USS1499	14697616											
Insignificant	936	Chiller	EVAPCO	AI 19 56	14-113777											
Insignificant	936	Water Heater	A.O. Smith	FCG 75 300	09053005623	2009						0.0751				
Insignificant	937	Boiler	Grieve Oven	HY 1000	760013							0.175				
Significant	937	Boiler	Grieve Oven	HC 1250	540026							0.7				
Significant	938	Boiler	Bryan Flexible Tube Boilers	F350-W-GT	67H70	1987						0.35				
Insignificant	938	Chiller	EVAPCO	ICT 496	4 112084											
Insignificant	938	Water Heater	A.O. Smith	PGC 100 910	MD89-0026617-910							0.08				
Significant	942	Boiler	Lochinvar	CBN355	I864862	1986						0.355				
Insignificant	942	Chiller	EVAPCO	AT1496	10401372											
~~Insignificant~~	~~942~~	~~Water Heater~~	~~GE~~	~~GG40D68~~	~~GENG0701420250~~											
Insignificant	942	Water Heater	Ruud	PROG40-38N RU59	RULNM291412944	2014						0.038				
Insignificant	943	Sand Blaster	Pauli Abrasive Blast Systems	RAM35	011315		2003									
Significant	945	Boiler	Lochinvar	CBN1795	F001079							1.795				
Insignificant	945	Chiller	EVAPCO	ATW68A2	W006961											
Insignificant	945	Water Heater	Bradford-White	MI403T6EN12	WE9590876							0.04				
Insignificant	945	Water Heater	Vanguard	5AU69	VGLN0501211939	2012						0.38				
~~Insignificant~~	~~948~~	~~20" Band Saw~~	~~Rockwell~~	~~28-3XO~~	~~1816936~~			~~3~~								
~~Insignificant~~	~~948~~	~~20" Drill press~~	~~Rockwell~~	~~20377~~	~~1775731~~			~~1.5~~								
Insignificant	948	Bandsaw	Grizzly	G0513ANV	13071482	2013		2.0								
Insignificant	948	Dust Collector	JET R.C.	DC-650	60111123			1								
Insignificant	948	Dust Collector	JET R.C.	DC-650	30111133			1								
Insignificant	948	Dust Collector	Delta	1680P50-900	CFV-901458			5								
Insignificant	948	Panel Saw	Milwaukee	3.22001E+12				2.5								
Insignificant	948	Radial Arm Saw	Rockwell	43572 (438-02-314-0509)	KN56T34F193F			5								
Insignificant	948	Table Saw	Rockwell	34-762	LG-7634	1980		1.5								
Insignificant	948	Water Heater	Rheem	21V30-30F	RHLN 1003506015	2003						0.03				
Insignificant	952	Storage Tank											Convault		2,000	
Insignificant	954	Storage Tank											Used Cooking Oil/Grease		300	Fixed
~~Insignificant~~	~~955~~	~~Storage Tank~~					~~1995~~						~~Diesel~~	~~Convault~~	~~1,000~~	
~~Insignificant~~	~~957~~	~~Generator~~		~~MEP-805B~~	~~HDJ30379~~	~~2009~~		~~40.2~~	~~30~~	~~3~~	~~120/208~~		~~D~~		~~50~~	
Significant	959	Boiler	Ajax Boiler	WNG-1250	61958		2007					1.25				
Insignificant	959	Cooling Tower	BAC	15201 W	U025498701MAD											
Significant	961	Boiler	Ajax Boiler & Heater	WG-150	87-3960 2		1987					1.5				
Significant	961	Generator	Onan	50DGCAL30547A	A890201224	1988		67.1	50	3	120/208		D	CV	250	
Insignificant	961	Storage Tank					1993						Diesel	Convault	250	
Insignificant	961	Water Heater	Rheem	21V40-38	1202Z08539	2002						0.038				
Significant	962	Boiler	Weil McLain Co	J-6								0.75				
Insignificant	962	Water Heater	Vanguard	5AU69	VGLN0501211937	2012						0.038				
Significant	966	Water Heater	A.O. Smith	BT 80 202	MH93-0283631-202							0.751				
Insignificant	968	Storage Tank											Jet Fuel (Jet A/A-1)		600	Fixed
Significant	969	Generator	Onan	60DGCB	A980686970	1998		80.5	60	3	120/208		D	CV	350	
Insignificant	969	Storage Tank											Diesel		100	Fixed
Insignificant	969	Storage Tank	Convaultt										Diesel	Convault	250	Fixed
Significant	979	Generator	Onan	DQDAA-1922047	L090071381	2009	2010	335.3	250	3	120/208		D	CV	2,000	
Insignificant	979	Storage Tank	Convault				1993						Diesel	Convault	2,000	Fixed
Significant	983	Boiler	Inland Heater	GIM 40	63 924							0.5				
Significant	983	Boiler	Inland Heater	GIM 40	63 925							0.5				
Insignificant	983	Cooling Tower	Trane	YCH120C3MOAB	L12101886D	1996										
Insignificant	983	Water Heater	Ruud	P30-6	0697112682							0.032				
Insignificant	983	Water Heater	Vanguard	6E760	VGNG0699164403							0.034				
Significant	984	Boiler	Bryan	F450-W-GI	79919	1997						0.45				
Significant	984	Water Heater	Ruud	P30-6	RUNG1298130276	1996						0.32				
Significant	985	Boiler	Inland Heater	GDM40	63926							0.5				
Significant	985	Boiler	Inland Heater	GDM40	63929							0.5				
Significant	985	Boiler	Inland Heater	GDM40	63928							0.5				
Significant	985	Boiler	Inland Heater	GDM40	63927							0.5				
Insignificant	985	Storage Tank	Myers Waste Oil Storage Systems	MVW500 SD E2	B-176078	2004	1995						Used Oil/Hydraulic Fluid	Mild Steel	132	Fixed
Insignificant	985	Water Heater	American	GBF75-4TN	54658							0.0575				
Insignificant	985	Water Heater	Rheem	41V50	RHNG0700108515							0.04				
Insignificant	985	Water Heater	A.O. Smith	GCR 50 400	1527J003677	2015						0.05				
Insignificant	986	Sand Blaster	Skat Blast		(SA) 43492											
Significant	986	Solvent Cleaner	Graymills	TRC3626L-A	274641		2014								84	
Significant	988	Boiler	Ajax Boiler & Heater	WG-300 D	83-36077							0.3				
Significant	988	Generator	Cummins	DGBC-5956055	L070136371	2007		67.1	50	3	120/208		D	CV	1,000	Fixed

Permitting	Facility	Equipment Type	Manufacturer	Model #	Serial #	Year Manufactured	Year Installed	HP Rating	kW Rating	Phase	Voltage	Input MMTBU/hr Rating	Fuel Type	Tank Type	Tank Capacity	Tank Roof Ty
Significant	~~988~~	~~Generator~~	~~ONAN~~	~~4BTA3.9~~	~~31811081~~	~~2008~~		~~67.1~~	~~50~~	~~3~~	~~120/208~~		~~D~~	~~CV~~	~~1,000~~	
Insignificant	988	Storage Tank	Convault	RN 1000 35F	R147264								Diesel	Convault	1,000	Fixed
Insignificant	988	Water Heater	A.O. Smith	BTR 154 110	MC040000606	2004						0.154				
Significant	993	Boiler	Rite	W180WGE	30686	2008						1.8				
Insignificant	993	Chiller	EVAPCO	USS1896	8340122											
Insignificant	993	Water Heater	Ruud	G91-200-1	URNG1106G00131	2006						0.2				
Significant	997	Boiler	TeleDyne Laars		8890415							0.325				
Insignificant	998	Chiller	EVAPCO	1CT393	W006638											
Insignificant	998	Chiller	EVAPCO	1CT393	W006639											
Significant	998	Generator	Onan	DFCC-4493870	A010198172	2000		469.4	350	3	277/480		D	ST	1,750	
Insignificant	998	Storage Tank	BN Manufacturing										Diesel		1,750	Fixed
Insignificant	999	Boiler	Lochinvar	CNA 251-100-DF9	SH0840119		2007					0.25				
Insignificant	999	Boiler	State Industries	SBD100250NEA 118	1103M001996	2011			9			0.25				
Insignificant	999	Chiller	BAC	15146L	U016230801NAD											
Significant	999	Generator														
Significant	1000	Generator	Cummins	DEFEH-1333681	G130534832	2013	Aug 2014	536.4	400	3	277/480		D	CV	2,000	
Insignificant	1000	Storage Tank	Convault										Diesel	Convault	2,000	Fixed
Insignificant	1001	Storage Tank					1996						Diesel	Convault	500	
Insignificant	1002	Generator	Onan	15.0RDJC-3R/1483AD	K860852588	1986		20.1	15	1	120/240		D	CV	250	
Insignificant	1002	Storage Tank	Convault										Diesel	Convault	250	Fixed
Insignificant	1006	Storage Tank	Westernman Company										Recovered Jet Fuel (JP-8)	Mild Steel	300	Fixed
Insignificant	1006	Storage Tank											1010 Wt. Oil (Turbine Oil)	Mild Steel	400	Fixed
Insignificant	1006	Storage Tank	Westernman Company										Used Oil	Mild Steel	300	Fixed
Insignificant	1006	Storage Tank											Jet Fuel A	Mild Steel	5,000	
Insignificant	1008	Storage Tank											Hydrazine		10,000	Fixed
Significant	1013	Generator	Onan	Q529-G3NR3	A034394	2011	April 2011	335.3	250				D			
Significant	1013	Generator	Onan	QSL9-G3-NR3	A03486694	2011		335.3	250	3	277/480		D	CV	1,000	
Significant	1013	Generator	Onan	DQDAA-6337643	A110184665	2011										
Insignificant	1013	Storage Tank	Convault	WRN 1000 35F	R 748072		1996						Diesel	Convault	1,000	Fixed
Insignificant	1016	Storage Tank					1995						Jet Fuel	Cement/R-12 refueler	5,000	
Insignificant	1016	Storage Tank	Westernman Company										Recovered Jet Fuel (JP-8)	Mild Steel	250	Fixed
Insignificant	1016	Storage Tank					1985						1010 Wt. Oil	Mild Steel	320	Fixed
Insignificant	1016	Storage Tank	Westernman Company				1998						Used Oil	Mild Steel	250	Fixed
Significant	~~1018~~	~~Boiler~~	~~Ajax~~	~~WNG-450~~	~~52466~~		~~1998~~									
Insignificant	1018	Boiler	Laars	NTH210NXN3	G15348036	2015	2015					0.21				
Significant	1018	Paint Booth	Not Available													
Insignificant	1018	Sand Blaster	Abrasive Blast Systems				2003									
Insignificant	1018	Storage Tank					2001						Gasoline	Mild Steel	200	
Insignificant	1018	Storage Tank					1995						Jet Fuel	Convault	1,000	
Insignificant	1018	Storage Tank					1995						Diesel	Mild Steel	1,000	
Insignificant	1018	Water Heater	Ruud	PH50	RUNG 0699123839	1996						0.04				
Significant	1019	Boiler	TeleDyne Laars	IW1670IN09H01	88-90889		1988					1.67				
Significant	1019	Boiler	Rite Engineering	S3	88-21260		1988					0.63				
Insignificant	1019	Boiler	Bradford	MI5036FBN2	ZL3924351		2007					0.04				
Significant	1019	Paint Booth	Binks	Hangar												
Significant	1022	Boiler	Rite Heating Boiler	150	8720549		1987					1.5				
Insignificant	1022	Water Heater	Rheem-Ruud	G100-200	URNG 1002G00889							0.2				
Insignificant	1026	Storage Tank	Nogales Highway Iron & Steel										Waste Oil	Mild Steel	200	Fixed
Significant	1032	Generator	Onan	135ROZJ	RG6081T143545	2003		181.0	135	3	120/208		D	CV	500	
Insignificant	1032	Storage Tank	Convault										Diesel	Convault	1,000	Fixed
Significant	1034	Generator	Power	MEP-806B	MX63365	2003	2005	80.5	60				D			
Significant	1040	Generator	Onan	50.0DGCA-L/30547A	H870917499	1987		67.1	50	3	120/208		D	CV	1,000	
Insignificant	1040	Storage Tank	Convault				1996						Diesel	Convault	1,000	Fixed
Insignificant	1047	Storage Tank					1982						Diesel	Mild Steel	350	
Insignificant	1049	Generator	Onan	30.0DL6-15R	I850777162	1985		40.2	30	3	120/208		D	CV	500	
Insignificant	1049	Storage Tank	Convault				1995						Diesel	Convault	500	Fixed
Insignificant	1056	Generator	Onan	15DKAZ	C960601768	1996		0.0					D			
Insignificant	1056	Generator	Onan	15DKAC	C960601767	1996		20.1	15	1	120/240		D	CV	250	
Insignificant	1056	Storage Tank	Convault				1995						Diesel	Convault	250	Fixed
Insignificant	1057	Generator	Kubota / Cummins	D1708 / DSKAB-1213591	7CS6963 / J120403290	2012	Nov 2011	0.0					D			
Insignificant	1057	Storage Tank	Convault				1995						Diesel	Convault	100	Fixed
Insignificant	1065	Generator	Onan	D1703-M-BGET01	7CS6963	2012		20.1	15	1	120/240		D	CV	100	
Significant	1074	Generator	Power	MEP-806B	HX62705	2002		80.5	60				D			
Insignificant	1076	Storage Tank					1995						Diesel	Convault	250	
Insignificant	1086	Storage Tank					1982						Diesel	Mild Steel	350	
Significant	1119	Boiler	Buderus	GE315/6	05178842-00-3175-0030							0.454				
Insignificant	1119	Cooling Tower	EVAPCO	ICT 4 86	11 413628											
Insignificant	1119	~~Water Heater~~	~~Ruud~~	~~G100-75~~	~~0104G02924~~	~~2004~~										
Insignificant	1119	Water Heater	Ruud	PR0G50-38N-RU58	M131515140	2015						0.038				
Significant	1132	Boiler	Fulton Boiler	PHW-2000	95904	2004	2005					2				
Significant	1132	Boiler	Fulton Boiler	PHW-2000	95901	2004	2005					2				
Significant	1132	Boiler	Fulton Boiler	PHW-2000	95902	2004	2005					2				
Significant	1132	Boiler	Fulton Boiler	PHW-2000	95903	2004	2005					2				
Insignificant	1132	Cooling Tower	Marley	NC4221GS-00	166591-001											

Permitting	Facility	Equipment Type	Manufacturer	Model #	Serial #	Year Manufactured	Year Installed	HP Rating	kW Rating	Phase	Voltage	Input MMTBU/hr Rating	Fuel Type	Tank Type	Tank Capacity	Tank Roof Type
Insignificant	1132	Cooling Tower	Marley	NC4221GS-00	166591-002											
Insignificant	1132	Cooling Tower	Marley	NC7031GS	070293-001-94											
Significant	1132	Generator	Onan	800DFJB	A920445339	1992		1072.8	800	3	277/480		D	CV	6,000	
Significant	1132	Generator	Onan	800DFJB	A920444213	1992		1072.8	800	3	277/480		D	CV	6,000	
Insignificant	1132	Storage Tank	Convault				1993						Diesel	Convault	6,000	Fixed
Insignificant	1132	Storage Tank	Convault				1993						Diesel	Convault	6,000	Fixed
Significant	1132	Water Heater	Fulton	ICX30	96022	2004						1.26				
Significant	1132	Water Heater	Fulton	ICX30	96013	2004						1.26				
Significant	1143	Boiler	Fulton Fuel Fired Steam Boiler	PHW-1000	1402	1996	1997					1				
Insignificant	1143	Cooling Tower	BAC	VT0-155N	U038500401MAD											
Insignificant	1143	Water Heater	Rheem-Ruud	G75-75N-2	RRLN0109100033	2009						0.0751				
Significant	1150	Boiler	Parker Boiler	T-2970	36198	1988	1988					2.97				
Significant	1150	Generator							3							
Insignificant	1150	Storage Tank	Convault										Diesel	Convault	2,000	Fixed
Significant	1150	Water Heater	A.O. Smith	BTR 400 A106	LG000951698							0.399				
Significant	1153	Generator	Onan	DGDB-5702801	A050737878	2005		134.1	100	3	120/208		D	S	127	
Insignificant	1153	Storage Tank	Convault										Diesel	S	127	Fixed
Significant	1216	Generator	Onan	D6FB-4482037	E000108652	2000	1999	234.7	175	3	120/208		D	CV	500	
Insignificant	1219	Storage Tank	Convault				1999						Diesel	Convault	500	Fixed
Insignificant	1223	Storage Tank	Convault										Diesel	Convault	250	Fixed
Insignificant	1233	Storage Tank	Convault				1995						Diesel	Mild Steel	500	Fixed
Significant	1236	Boiler	Ray Pac Inc.	H0133A JDA UBCSX	74294							0.136				
Significant	~~1236~~	~~Boiler~~	~~Ajax Boiler & Heater~~	~~WG-150~~	~~24-27574~~		~~1974~~									
Insignificant	1236	Boiler	Ajax Boiler & Heater	WG 150	86-39134		1986					0.15				
Significant	1239	Generator	Onan	C060893241	DFEH 5750419	2006		536.8	400				D			
Significant	1239	Generator	Onan	QSX15-69 NR2	79160964	1993		536.4	400	3	277/480		D	CV	4,000	
Insignificant	1239	Storage Tank											Diesel		4,000	Fixed
Significant	1240	Solvent Cleaner	Clarius Technology	PCS-25	LYEQQE835		2009								25	
Significant	1240	Solvent Cleaner	Safety Kleen		90200743											
Significant	1240	Solvent Cleaner	Safety Kleen		90199685											
Insignificant	1250	Storage Tank					1993						Diesel	Convault	500	Fixed
Significant	1365	Boiler	Ajax Boiler & Heater	WG-200	76-29616	1976	1976					0.2				
Insignificant	1365	Generator	Onan	20.0DL4-3R/26933D	J870932786	1988		26.8	20	1	120/240		D	CV	250	
Insignificant	1365	Generator	WHISPER QUIET		8100157	2004		19.4	14.5	3	120/208		D		50	
Insignificant	1365	Storage Tank	Convault				2000						Diesel	Convault	250	Fixed
Insignificant	1375	Generator	Onan	D1703-M-BGET01	7CU0982	2012		20.1	15	1	120/240		D	CV	100	
Insignificant	1375	Storage Tank	Convault										Diesel	Convault	100	Fixed
Insignificant	1381	Generator	Kubota / Cummins	D1708 / DSKAB-1213591	7CU0982 / J120403291	2012	Nov 2012	0.0					D			
Insignificant	1381	Storage Tank					1993						Diesel	Convault	100	Fixed
Significant	1387	Generator	Power	MEP-009B	RZ00770	1989		268.2	200	3	240/416		D		200	
Insignificant	~~1392~~	~~Storage Tank~~											~~Water~~	~~Mild Steel~~	~~250~~	
Significant	1515	Boiler	Rite Heating Boiler	55	74-15744		1974					0.55				
Significant	1525	Boiler	Laars	560-D	73-84940M		1973					0.56				
Significant	1540	Boiler	Rite Heating Boiler	400	24087	1994						4				
Significant	1540	Boiler	Rite Heating Boiler	400	24088	1994						4				
Significant	1550	Boiler	PVI	40N90A-G	39378400							0.399				
Significant	1550	Generator	John Deere	4024HF285B	PE4024L061741	2011	Jan 2011	80.5	60				D			
Insignificant	1550	Storage Tank	Sauk Technologies										Diesel		165	Fixed
~~Significant~~	~~3201~~	~~Boiler~~	~~Bryan Flexible Tube Water Heater~~													
~~Significant~~	~~3201~~	~~Solvent Cleaner~~	~~Safety Kleen~~	~~Model 33 (Cold)~~	~~Remote~~										20	
Significant	2201	Storage Tank	Convault				1998						Gasoline	Convault	1,000	Fixed
Insignificant	2201	Storage Tank	Convault				1998						Diesel	Convault	1,000	Fixed
Insignificant	2201	Storage Tank					1998						Used Oil	Mild Steel	300	Fixed
Insignificant	2201	Water Heater	Lochinvar (Knight Heating Boiler)				2014						Propane			
Insignificant	5102	Generator	Onan	30DLGB36102E	L890285851	1989		40.2	30	3	120/208		D	CV	250	
Significant	5106	Generator	Onan	60-DGCB-42244N	A990851692	1999		80.5	60	3	120/208		D	CV	250	
Significant	8226	Generator	Onan	DGHE-5737877	570282	2005		67.1	50	3	120/208		D	S	75	
Significant	8226	Storage Tank											Diesel		72	Fixed
Significant		Generator	ONAN	450D560		1994		603.5	450	3	277/480		D			
Insignificant		Generator	onan	15ORDJC-3R		1987		20.1	15	1	120 240		D			
Insignificant		Generator	ONAN	15DKAZ		1996		20.1	15	1	120 240		D			

5.0 APPLICABLE REQUIREMENTS AND SCHEDULE FOR COMPLIANCE

5.0 APPLICABLE REQUIREMENTS AND SCHEDULE FOR COMPLIANCE

This section lists the applicable Federal Regulations, the applicable Arizona State Regulations, and the Maricopa County Air Pollution Rules. Each listed applicable regulation also includes the method of compliance with the Rule if appropriate.

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General Requirements

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
Maricopa County Air Pollution Control Requirements			
MCAPCR Rule 100 - General Provisions and Definitions			
MCAPCR Rule 100 §§301	AIR POLLUTION PROHIBITED: No person shall discharge from any source whatever into the atmosphere regulated air pollutants which exceed in quantity or concentration that specified and allowed in these rules, the Arizona Administrative Code or A.R.S., or which cause damage to property, or unreasonably interfere with the comfortable enjoyment of life or property of a substantial part of a community, or obscure visibility, or which in any way degrade the quality of the ambient air below the standards established by the Board Of Supervisors or the Director.	Yes	Luke AFB will not emit pollutants in amouts that exceed any required limits or cause damage to property, interfere with life, obcure visibility, or degrade the quality of the ambient air.
MCAPCR Rule 100 §§302	APPLICABILITY OF MULTIPLE RULES: Whenever more than one standard in this rule applies to any source or whenever a standard in this rule and a standard in the Maricopa County Air Pollution Control Regulations Regulation III-Control Of Air Contaminants applies to any source, the rule or combination of rules resulting in the lowest rate or lowest concentration of regulated air pollutants released to the atmosphere shall apply, unless otherwise specifically exempted or designated.	Yes	Luke AFB will comply with all MCAPCR rules as applicable.
MCAPCR Rule 100 §§501	REPORTING REQUIREMENTS: The owner and/or operator of any air pollution source shall maintain records of all emissions testing and monitoring, records detailing all malfunctions which may cause any applicable emission limitation to be exceeded, records detailing the implementation of approved control plans and compliance schedules, records required as a condition of any permit, records of materials used or produced, and any other records relating to the emission of air contaminants which may be requested by the Control Officer.	Yes	Luke AFB will retain all records specified in MCAPCR Rule 100 §§501 as applicable.
MCAPCR Rule 100 §§502	DATA REPORTING: When requested by the Control Officer, a person shall furnish to the Department information to locate and classify air contaminant sources according to type, level, duration, frequency, and other characteristics of emissions and such other information as may be necessary. This information shall be sufficient to evaluate the effect on air quality and compliance with these rules. The owner and/or operator of a source requested to submit information under Section 501 of this rule may subsequently be required to submit annually, or at such intervals specified by the Control Officer, reports detailing any changes in the nature of the source since the previous report and the total annual quantities of materials used or air contaminants emitted.	Yes	Luke AFB will provide all information as requested by the Control Officer in accordance with MCAPCR Rule 100 §§502.
MCAPCR Rule 100 §§503	EMISSION STATEMENTS REQUIRED AS STATED IN THE ACT: Upon request of the Control Officer and as directed by the Control Officer, the owner and/or operator of any source which emits or may emit oxides of nitrogen (NOX) or volatile organic compounds (VOC) shall provide the Control Officer with an emission statement, in such form as the Control Officer prescribes, showing measured actual emissions or estimated actual emissions of NOX and VOC from that source. At a minimum, the emission statement shall contain all information required by the Consolidated Emissions Reporting Rule in 40 CFR 51, Subpart A, Appendix A, Table 2A, which is incorporated by reference in Appendix G of these rules. The statement shall contain emissions for the time period specified by the Control Officer. The statement shall also contain a certification by a responsible official of the company that the information contained in the statement is accurate to the best knowledge of the individual certifying the statement. Statements shall be submitted annually to the Department. The Control Officer may waive this requirement for the owner and/or operator of any source which emits less than 25 tons per year of oxides of nitrogen or volatile organic compounds with an approved emission inventory for sources based on AP-42 or other methodologies approved by the Administrator.	Yes	Luke AFB will submit an emission statement as requested by the Control Officer.
MCAPCR Rule 100 §§504	RETENTION OF RECORDS: Information and records required by applicable requirements and copies of summarizing reports recorded by the owner and/or operator and submitted to the Control Officer shall be retained by the owner and/or operator for five years after the date on which the information is recorded or the report is submitted. Non-Title V sources may retain such information, records, and reports for less than five years, if otherwise allowed by these rules.	Yes	Records will be retained for no less than five years.
MCAPCR Rule 100 §§505	ANNUAL EMISSIONS INVENTORY REPORT:	Yes	Luke AFB will submit an annual emissions inventory report as required by the Control Officer.
MCAPCR Rule 100 §§505.1	Upon request of the Control Officer and as directed by the Control Officer, the owner and/or operator of a business shall complete and shall submit to the Control Officer an annual emissions inventory report. The report is due by April 30, or 90 days after the Control Officer makes the inventory form(s) available, whichever occurs later. These requirements apply whether or not a permit has been issued and whether or not a permit application has been filed.		
MCAPCR Rule 100 §§505.2	The annual emissions inventory report shall be in the format provided by the Control Officer.		
MCAPCR Rule 100 §§505.3	The Control Officer may require submittal of supplemental emissions inventory information forms for air contaminants under A.R.S. §49-476.01, A.R.S. §49-480.03, and Rule 372-Maricopa County Hazardous Air Pollutants (HAPs) Program of these rules.		

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General Requirements

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 300 - Visible Emissions			
MCAPCR Rule 300 §§301	LIMITATIONS: No person shall discharge into the ambient air from any single source of emissions any air contaminant, other than uncombined water, in excess of 20% opacity for a period aggregating more than three minutes in any 60-minute period.	Yes	Luke AFB will perform periodic observations for visible emissions to the ambient air during a time period that the smoke-generating equipment is being operated. Also see regulatory analyses for: abrasive blasting and stationary internal combustion.
MCAPCR Rule 300 §§302	EXCEPTIONS:	N/A	See responses below.
MCAPCR Rule 300 §§302.1	Charging Electric Arc Furnaces: When charging or back-charging any electric arc furnace for which construction commenced prior to February 2, 1963, a person may discharge air contaminants, other than uncombined water, in excess of the applicable opacity limit in Section 301 of this rule for no more than an aggregate of 3 minutes in any 45 minute period; however, visible emissions resulting from such discharge of air contaminants shall not exceed 40% opacity.	N/A	Luke AFB does not operate any charging electric arc furnaces.
MCAPCR Rule 300 §§302.2	Emergency Diesel Generators (EDGs) And Equipment: When emergency diesel generators (EDGs) and equipment must run for safety reasons and/or for safety and operational tests to meet the requirements legally imposed by the Nuclear Regulatory Commission, a person may discharge air contaminants, other than uncombined water, in excess of the applicable opacity limit in Section 301 of this rule. Any discharge of air contaminants, other than uncombined water, in excess of the opacity limit in Section 301 of this rule should not contribute to a violation of the national ambient air quality standard.	N/A	Luke AFB does not operate any emergency diesel generators subject to the requirements of the Nuclear Regulatory Commission.
MCAPCR Rule 300 §§302.3	Firing of Ordnance at Test Facilities: Visible emissions exceeding the opacity standards for short periods of time resulting from firing test rounds in enclosed bunkers at ordnance test facilities which do not exceed 6 minutes in length shall not constitute a violation of Section 301 of this rule.	N/A	The Luke AFB firing range will comply with this requirement.
MCAPCR Rule 300 §§302.4	Opacity Training: Equipment or processes used to train individuals in opacity observations shall be exempt from opacity standards during the preparation for and/or during the actual training session(s).	N/A	Luke AFB does not perform opacity training.
MCAPCR Rule MCAPCR Rule 300 §§501	COMPLIANCE DETERMINATION - OPACITY: Opacity shall be determined by observations of visible emissions conducted in accordance with EPA Reference Method 9 as modified by EPA Reference Method 203B.	Yes	Luke AFB will use observers trained in accordance with EPA Reference Method 9.
MCAPCR Rule 320 - Odors and Gaseous Air Contaminants			
MCAPCR Rule 320 §§300	STANDARDS: No person shall emit gaseous or odorous air contaminants from equipment, operations or premises under his control in such quantities or concentrations as to cause air pollution.	Yes	Luke AFB shall not emit gaseous or odorous air contaminants from equipment, operations or premises under its control in such quantities or concentrations as to cause air pollution.
MCAPCR Rule 320 §§301	ANIMAL AND VEGETABLE MATTER REDUCTION: No person shall operate or use any machine, equipment or other contrivance for the reduction of animal or vegetable matter, separately or in combination, unless all gases, vapors and gas-entrained effluents have been incinerated to destruction at a temperature of not less than 1,300 degrees fahrenheit or processed in a manner determined by the Control Officer to be equally or more effective for the control of air pollution.	N/A	Luke AFB does not operate or use any machine, equipment or other contrivance for the reduction of animal or vegetable matter.
MCAPCR Rule 320 §§302	MATERIAL CONTAINMENT REQUIRED: Materials including, but not limited to, solvents or other volatile compounds, paints, acids, alkalies, pesticides, fertilizer and manure shall be processed, stored, used and transported in such a manner and by such means that they will not unreasonably evaporate, leak, escape or be otherwise discharged into the ambient air so as to cause or contribute to air pollution. Where means are available to reduce effectively the contribution to air pollution from evaporation, leakage or discharge, the installation and use of such control methods, devices or equipment shall be mandatory.	Yes	Luke AFB will process, store, use and transport materials in such a manner and by such means that they will not unreasonably evaporate, leak, escape or be otherwise discharged into the ambient air so as to cause or contribute to air pollution. Also see regulatory analyses for: miscellaneous chemical usage, surface coating, solvent cleaning (degreasing).
MCAPCR Rule 320 §§303	REASONABLE STACK HEIGHT REQUIRED: Where a stack, vent or other outlet is at such a level that air contaminants are discharged to adjoining property, the Control Officer may require the installation of abatement equipment or the alteration of such stack, vent, or other outlet to a degree that will adequately dilute, reduce or eliminate the discharge of air contaminants to adjoining property.	Yes	Luke AFB will install or adjust stacks at the direction of the Control Officer, as required.
MCAPCR Rule 320 §§304	LIMITATION - HYDROGEN SULFIDE: No person shall emit hydrogen sulfide from any location in such a manner or amount that the concentration of such emissions into the ambient air at any occupied place beyond the premises on which the source is located exceeds 0.03 parts per million by volume for any averaging period of 30 minutes or more.	N/A	Luke AFB does not have any sources which emit H2S.
MCAPCR Rule 320 §§305	PERMIT CONDITIONS - HIGH SULFUR OIL: Any permit issued for the operation of an existing source, or any renewal or modification of such a permit, shall include a condition prohibiting the use of high sulfur oil by the permittee. The applicant must demonstrate to the Control Officer that sufficient quantities of low sulfur oil are not available for use by the source and that it has adequate facilities and contingency plans to insure that the sulfur dioxide ambient air quality standards set forth in Rule 510 of these Regulations will not be violated. The terms of the permit may authorize the use of high sulfur oil under such conditions as are justified. In cases where the permittee is authorized to use high sulfur oil, it shall submit to the Control Officer monthly reports detailing its efforts to obtain low sulfur oil. When the conditions justifying the use of high sulfur oil no longer exist, the permit shall be modified accordingly.	N/A	All combustion equipment at Luke AFB uses low sulfur oil.

Regulatory Review
Luke Air Force Base
Air Quality Operating Permit No. V97-017

General Requirements

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 320 §§306	LIMITATION - SULFUR FROM OTHER INDUSTRIES: No person shall discharge into the atmosphere from any industry, reduced sulfur, which includes sulfur equivalent from all sulfur emissions including but not limited to sulfur dioxide, sulfur trioxide and sulfuric acid, in excess of ten percent of the sulfur entering the process as feed.	N/A	Luke AFB does not have any sources which emit reduced sulfur.
MCAPCR Rule 320 §§307	OPERATING REQUIREMENTS - ASPHALT KETTLES AND DIP TANKS:	N/A	Luke AFB does not operate any asphalt kettles or dip tanks.
MCAPCR Rule 320 §§307.1	No person shall operate an asphalt kettle or dip tank unless the owner or operator controls air contaminant emissions by good modern practices, including but not limited to:		
a	Maintenance of temperature below both the asphalt flash point and the maximum temperature recommended by the asphalt manufacturer through the use of automatic temperature controls.		
b	Operation of the kettle or dip tank with the lid closed except when charging.		
c	Pumping or drawing the asphalt through cocks without dipping.		
d	Firing of the kettle or dip tank with a clean burning fuel.		
e	Maintaining the kettle or dip tank in clean, properly adjusted and good operating condition.		
MCAPCR Rule 320 §§307.2	The visible emissions from the operation of an asphalt kettle or dip tank shall comply with the provisions of Rule 300.		
Other MCAPCR Rules			
MCAPCR Rule 310	Fugitive Dust from Dust-Generating Operations	Yes	Luke AFB will comply with the requirements for all dust-generating operations except those listed in MCAPCR Rule 310 Section 103 as applicable.
MCAPCR Rule 310.01	Fugitive Dust from Non-Traditional Sources of Fugitive Dust	Yes	Luke AFB will comply with the requirements for all dust-generating operations except those listed in MCAPCR Rule 310.01 Section 103 as applicable.
MCAPCR Rule 360	New Source Performance Standards	Yes	Luke AFB will comply with all NSPS as applicable. See source specific NSPS.
MCAPCR Rule 370	Federal Hazardous Air Pollutant Program	Yes	Luke AFB will comply with all NESHAPs and MACT Standards as applicable. See source specific NESHAPs/MACT Standards.
MCAPCR Rule 372	Maricopa County Hazardous Air Pollutants (HAPs) Program	N/A	Luke AFB does not have an SIC shown in Table 1-Maricopa County HAPs Minor Source Categories, and is not a major source of HAPs.
MCAPCR Rule 600	Emergency Episodes	Yes	If an air pollution alert, warning, or emergency has been declared, Luke AFB shall comply with any applicable requirements of Rule 600 §302.
	U.S. EPA Requirements		
40 CFR 68	Chemical Accident Prevention Provisions	N/A	Luke AFB does not currently store any regulated materials above the applicability threshold in §68.115, but will comply with all subsections of 40 CFR 68 if this rule becomes applicable.
40 CFR 82	Protection of Stratospheric Ozone	Yes	Luke AFB services motor vehicle air conditioning units, and will comply with all subsections of 40 CFR 82 as applicable.
40 CFR 87	Control of Air Pollution from Aircraft and Aircraft Engines	N/A	Luke AFB does not manufacture or sell aircraft engines or aircraft.
40 CFR 98	Mandatory Greenhouse Gas Reporting	Yes	Luke AFB will comply with the requirements of 40 CFR 98 as applicable.

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Abrasive Blasting
Applies to EPN ABCL907-01, Walk In Abrasive Blasting Booth

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
Maricopa County Air Pollution Control Requirements			
MCAPCR Rule 312 - Abrasive Blasting			
MCAPCR Rule 312 §§301	LIMITATIONS FOR BLASTING: All abrasive blasting operations shall be performed in a confined enclosure, unless one of the following conditions are met, in which case unconfined blasting according to Section 302 of this rule may be performed:	Yes	Emissions from abrasive blasting operations are performed within an enclosed booth and emissions are routed through a collection device.
MCAPCR Rule 312 §§301.1	The item to be blasted exceeds 8 ft. in any one dimension, or		
MCAPCR Rule 312 §§301.2	The surface being blasted is fixed in a permanent location, cannot easily be moved into a confined enclosure, and the surface is not normally dismantled or moved prior to abrasive blasting.		
MCAPCR Rule 312 §§302	REQUIREMENTS FOR UNCONFINED BLASTING: At least one of the following control measures shall be used:	N/A	Emissions from abrasive blasting operations are performed within an enclosed booth.
MCAPCR Rule 312 §§302.1	Wet abrasive blasting,		
MCAPCR Rule 312 §§302.2	Vacuum blasting, or		
MCAPCR Rule 312 §§302.3	Dry abrasive blasting, provided that all of the following conditions are met:		
a	Perform only on a metal substrate.		
b	Use only certified abrasive for dry unconfined blasting.		
c	Blast only paint that is lead free (i.e. the lead content is less than 0.1 percent).		
d	Perform the abrasive blasting operation directed away from unpaved surfaces.		
e	Use the certified abrasive not more than once unless contaminants are separated from the abrasive through filtration and the abrasive conforms to its original size.		
MCAPCR Rule 312 §§303	REQUIREMENTS FOR CONFINED BLASTING: Dry abrasive blasting in a confined enclosure with a forced air exhaust shall be conducted by implementing either of the following:	Yes	Emissions from abrasive blasting operations are performed within an enclosed booth and emissions are routed through a collection device.
a	Using a certified abrasive, or		
b	Venting to an ECS.		
MCAPCR Rule 312 §§304	REQUIREMENTS FOR ECS AND MONITORING DEVICES: The following requirements apply to blasting equipment that vents through a required ECS and requires a Maricopa County permit under Rule 200 of these rules. Buildings and/or enclosures are not considered control equipment. Equipment that meets the following two criteria and is operated and maintained in accordance with manufacturer's specifications, is exempt from the requirements of this section:	Yes	See Response to MCAPCR Rule 312 §§304.1 and 304.2
a	Is self-contained and the total internal volume of the blast section is 50 cubic feet or less, and		
b	Is vented to an ECS.		
MCAPCR Rule 312 §§304.1	Operation and Maintenance (O&M) Plan Required for Emission Control System (ECS)-	Yes	Plans have been and will be written and approved as required. Luke AFB will comply with all actions and schedules provided in in the plan.
a	An owner or operator shall provide and maintain, readily available at all times, an O&M Plan for any ECS, other emission processing equipment, and ECS monitoring devices that are used pursuant to this rule or to an air pollution control permit.		
b	The owner or operator shall submit to the Control Officer for approval the O&M Plans of each ECS and each ECS monitoring device that is used pursuant to this rule. If the O&M plan has not been filed, any owner or operator employing an approved existing ECS on the effective date of this rule shall by December 18, 2003 have an O&M plan filed with the Control Officer.		
c	The owner or operator shall comply with all the identified actions and schedules provided in each O&M Plan.		
MCAPCR Rule 312 §§304.2	Installing And Maintaining ECS Monitoring Devices – An owner or operator operating an ECS pursuant to this rule shall properly install and maintain in calibration, in good working order and in operation, devices described in the facility's O&M Plan that indicate temperatures, pressures, rates of flow, or other operating conditions necessary to determine if air pollution control equipment is functioning properly.	Yes	Devices described in the plan have been installed and are maintained in calibration, in good working order and in operation.

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MCAPCR Rule 312 §§305	OPACITY LIMITATION: No owner or operator shall discharge into the atmosphere from any abrasive blasting operation any air contaminant for an observation period or periods aggregating more than three minutes in any sixty minute period an opacity equal to or greater than 20 percent. An indicated excess will be considered to have occurred if any cumulative period of 15-second increments totaling more than three minutes within any sixty minute period was in excess of the opacity standard.	Yes	Weekly observations are made for visible emissions to the ambient air during a time period that the abrasive blasting equipment is being operated.
MCAPCR Rule 312 §§306	WIND EVENT – No dry unconfined abrasive blasting operation shall be conducted during a wind event.	N/A	Emissions from abrasive blasting operations are performed within an enclosed booth.
MCAPCR Rule 312 §§307	TRAFFIC MARKERS – Surface preparation for raised traffic delineating markers and pavement marking removal using abrasive blasting operations shall be performed by wet blasting, hydroblasting or vacuum blasting. Dry blasting may be performed using only certified abrasives when:	N/A	Emissions from abrasive blasting operations are performed within an enclosed booth.
MCAPCR Rule 312 §§307.1	Removing pavement markings of less than 1,000 square feet		
MCAPCR Rule 312 §§307.2	Performing surface preparation for raised traffic delineating markers of less than 1,000 square feet.		
MCAPCR Rule 312 §§308.1	Unconfined Blasting: The owner or operator shall clean up spent abrasive material with a potential to be transported during a wind event and, until removal occurs, shall, at a minimum, meet the provisions of Rule 310 of these rules regarding work practices.	N/A	Emissions from abrasive blasting operations are performed within an enclosed booth.
MCAPCR Rule 312 §§308.2	Confined Blasting: At the end of the work shift the owner or operator shall clean up spillage, carry-out, and/or trackout of any spent abrasive material with a potential to be transported during a wind event.	Yes	Spillage is cleaned and carry-out and/or trackout of any spent abrasive material are performed at the end of the work shift.
MCAPCR Rule 312 §§501	RECORDKEEPING AND REPORTING: At a minimum, an owner or operator subject to this rule shall keep the following records onsite, that are applicable to all abrasive blasting operations. Additional reporting may be required by an air quality permit:	Yes	See Response to MCAPCR Rule 312 §§3501.1 through 501.4.
MCAPCR Rule 312 §§501.1	If blasting operations occur daily or are a part of a facility's primary work activity, then the following shall be kept as a record:	Yes	The information identified under MCAPCR Rule 312 §§501.1 is maintained as a part of the O&M Plan.
a	A list of the blasting equipment,		
b	The description of the type of blasting as confined, unconfined, sand, wet, or other,		
c	The locations of the blasting equipment or specify if the equipment is portable,		
d	A description of the ECS associated with the blasting operations,		
e	The days of the week blasting occurs, and		
f	The normal hours of operation		
MCAPCR Rule 312 §§501.2	If blasting operations occur periodically, then the following shall be kept as a record:	N/A	Blasting is a part of facility's primary work activity. See response to MCAPCR Rule 312 §§501.1.
a	The date the blasting occurs,		
b	The blasting equipment that is operating,		
c	A description of the type of blasting, and		
d	A description of the ECS associated with the blasting operations.		
MCAPCR Rule 312 §§501.3	The type and amount of solid abrasive material consumed on a monthly basis. Include name of certified abrasive used, as applicable.	Yes	The amount of solid abrasive material consumed is recorded.
MCAPCR Rule 312 §§501.4	Material Safety Data Sheets (MSDS) or results of any lead testing that was performed on paint that is to be removed via unconfined blasting, as applicable.	N/A	If there is a reason to suspect that the surface that is to be abraded is covered in lead paint and Luke AFB intends to use CARB certified abrasive blasting media as the control device, Luke AFB shall conduct testing to determine if the lead content of the paint is less than 0.1 percent, in accordance with MCAPCR Rule 210 §302.1c(2).
MCAPCR Rule 312 §§502	RECORDS RETENTION: Copies of reports, logs, and supporting documentation required by this rule shall be retained for at least 5 years at permitted Title V sources and for at least 2 years at Non-Title V sources.	Yes	All documentation listed in MCAPCR Rule 312 §§502 is maintained for at least 5 years.
MCAPCR Rule 312 §§503.1	Control Device Efficiency – Manufacturer's specifications, testing results, or engineering data that demonstrate control efficiency shall be submitted upon request of the Control Officer.	Yes	All documentation listed in MCAPCR Rule 312 §§503.1 shall be submitted upon request of the Control Officer.
MCAPCR Rule 312 §§503.2	Paint Lead Level – Prior to unconfined blasting of paint, the owner or operator must be the generator with firsthand knowledge of lead content in the paint, or retain evidence of the lead level from the material MSDS or from a lead test performed in accordance with Section 506 of the rule. Unconfined blasting is prohibited if the lead content of the material is >0.1percent.	N/A	Emissions from abrasive blasting operations are performed within an enclosed booth.

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MCAPCR Rule 312 §§504	CERTIFIED ABRASIVES LIST ADOPTED BY REFERENCE: The list of abrasives certified for permissible dry unconfined blasting is found in Executive Order G-00-066 in accordance with the California Code of Regulations, Subchapter 6, Title 17, Section 92530, Exhibit A effective as of December 26, 2000 and is adopted by reference. A copy of the list of currently certified abrasives can also be obtained at Maricopa County Environmental Services, 1001 North Central Avenue, Phoenix, AZ 85004-1942.	N/A	Emissions from abrasive blasting operations are performed within an enclosed booth.
MCAPCR Rule 312 §§505	OPACITY OBSERVATIONS: Opacity shall be determined by observations of visible emissions conducted in accordance with EPA Reference Method 9 and with the following provisions:	Yes	See Response to MCAPCR Rule 312 §§505.3
MCAPCR Rule 312 §§505.1	Emissions from unconfined blasting shall be observed at the densest point of the emission from the closest point of discharge, after a major portion of the spent abrasives has fallen out.	N/A	Emissions from abrasive blasting operations are performed within an enclosed booth.
MCAPCR Rule 312 §§505.2	Emissions from unconfined blasting employing multiple nozzles shall be considered a single source unless it can be demonstrated by the owner or operator that each nozzle, evaluated separately, meets the emission standards of this rule.	N/A	Emissions from abrasive blasting operations are performed within an enclosed booth.
MCAPCR Rule 312 §§505.3	Emissions from confined blasting shall be observed at the densest point after the air contaminant leaves the enclosure or associated ECS.	Yes	When opacity testing is necessary, emissions will be observed at the densest point.
U.S. EPA Requirements			
40 CFR 63, Subpart GG	National Emission Standards for Hazardous Air Pollutants for Aerospace Manufacturing and Rework Facilities	N/A	The facility is not a major source [of HAPs], as defined in 40 CFR 63.2; therefore, this regulation does not apply.

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External Combustion

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
Maricopa County Air Pollution Control Requirements			
MCAPCR Rule 313	Incinerators, Burn-Off Ovens, and Crematories	N/A	Jet engine spray rings are pre-cleaned prior to placement in burn off ovens. Any debris remaining is invisible to the naked eye. The burn-off ovens are exempted from the requirements of MCAPCR Rule 313 per email "RE: Rule 313" from Patty Nelson -- ENVX (PNelson@mail.maricopa.gov) to Newell Yvonne I Civilian 56 CES/CEVC, Thursday May 06, 2004 1:55 PM.
MCAPCR Rule 323	Fuel Burning Equipment from Industrial/Commercial/Institutional (ICI) Sources	N/A	All external combustion units at Luke AFB are less than 10 MMBtu/hr, and none of the external combustion units are turbines; therefore, this rule does not apply.
U.S. EPA Requirements			
40 CFR 60, Subpart D	Standards of Performance for Fossil-Fuel-Fired Steam Generators	N/A	External combustion units at Luke AFB are each less than 250 MMBtu/hr so this rule does not apply.
40 CFR 60, Subpart Da	Standards of Performance for Electric Utility Steam Generating Units	N/A	External combustion units at Luke AFB are each less than 250 MMBtu/hr so this rule does not apply.
40 CFR 60, Subpart Db	Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units	N/A	External combustion units at Luke AFB are each less than 100 MMBtu/hr so this rule does not apply.
40 CFR 60, Subpart Dc	Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units	N/A	External combustion units at Luke AFB are each less than 10 MMBtu/hr so this rule does not apply.
40 CFR 63, Subpart DDDDD	National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters	N/A	The facility is not a major source of HAPs, therefore, this regulation does not apply.
40 CFR 63, Subpart JJJJJJ	National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources	N/A	The facility utilizes only hot water heaters or gas fired boilers, therefore, this regulation does not apply.

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Fire Fighter Training

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
Maricopa County Air Pollution Control Requirements			
MCAPCR Rule 314 - Open Outdoor Fires and Indoor Fireplaces at Commercial and Institutional Establishments			
MCAPCR Rule 314 §§301	PROHIBITION - OPEN OUTDOOR FIRES: It shall be unlawful for any person to ignite, cause or permit to be ignited, allow, maintain any open outdoor fire within the limits of Maricopa County, except as provided in Sections 302, 303, 304, 305 and in the Appendix of this rule.	Yes	Luke AFB will comply with MCAPCR Rule 314 as applicable.
MCAPCR Rule 314 §§302	OPEN OUTDOOR FIRES REQUIRED TO OBTAIN A BURN PERMIT: The types of fires described in Sections 302.1 and 302.2 of this rule require a burn permit that is obtained from the Control Officer prior to initiating the burn. Even after the Control Officer issues the burn permit, the person conducting the fire shall call both the fire department and the Control Officer to obtain permission to burn for each day. The Control Officer shall base his decision to approve or deny permission to burn on National Weather Service forecasts or other meteorological analyses that are indicative of a Restricted-Burn Period. See Section 402 of this rule for additional requirements regarding burn permits.	Yes	Luke AFB wishes to include fire fighter training operations under Air Quality Operating Permit No. V97-017 so it will not be necessary to apply for separate open outdoor burning permits. Luke AFB will separately apply for a burn permit for any other outdoor fires.
MCAPCR Rule 314 §§302.1	Fires Prohibited During Restricted-Burn Periods in Maricopa County, but Allowed From May 1 through September 30 Each Year in Area A:	Yes	All open outdoor fires at Luke AFB will be for fire fighter training at a designated fire fighter training area, as allowed from May 1 through September 30 each year.
a	Open outdoor fires that are declared necessary by the County Agricultural Agent, when such fires have been determined as essential for the purposes of disease and/or pest prevention and certified by actual investigations by the County Agricultural Agent.		
b	Open outdoor fires for the control of weeds for the prevention of fire hazards, when such fires are declared necessary by a public officer in the performance of his official duties.		
c	Open outdoor fires for fire fighting training and fire fighting training areas and structures. See Section 303.2 (b) of this rule for an exemption to this requirement.		
d	Open outdoor fires for the burning of agricultural ditchbanks and fence rows where other reasonable mechanical, chemical, or other methods of removal are not available. In addition:		
1	A high-temperature mechanical burner must be used to burn ditchbanks, canal laterals, and/or fence rows.		
2	Burning ditchbanks and/or fence rows is not allowed during a restricted-burn period from October 1 through February 29, unless such fires are required in the performance of an official duty of any public office, or such fires are necessary to thwart or prevent a hazard that cannot be properly managed by any other means, or are necessary for the protection of public health.		
3	An on-site inspection by the Control Officer must be conducted to verify that only vegetative materials will be burned.		
4	After an initial on-site inspection by the Control Officer has been completed, a Burn Permit may be issued for the same location(s) without having to conduct additional initial on-site inspections. However, periodic unscheduled, on-site inspections may be conducted by the Control Officer on days when such burning has been authorized by the Burn Permit.		
e	Open outdoor fires declared necessary by the federal government or any of its departments, agencies, or agents, or the state or any of its agencies, departments, or subdivisions for the purpose of watershed rehabilitation or control through vegetative manipulation.		
MCAPCR Rule 314 §§302.2	Fires Prohibited During Restricted-Burn Periods in Maricopa County and Also Prohibited from May 1 to September 30 Each Year in Area A:	N/A	All open outdoor fires at Luke AFB will be for fire fighter training at a designated fire fighter training area.
a	Open outdoor fires for the destruction of tumbleweeds for the prevention of fire hazards in cases where other reasonable methods are not available.		
1	Tumbleweeds must be cut, piled, and dried before burning.		
2	A high temperature mechanical burner may be used to burn undried tumbleweeds in situations where it is not feasible to allow natural drying.		
3	A high temperature mechanical burner must be used to burn tumbleweeds growing along canal laterals and fence rows.		
b	Open outdoor fires for the burning of indigenous scrub vegetation cleared for the purpose of agricultural operations in non-urban areas of low population where other reasonable methods are not available.		
1	The Control Officer shall issue such Burn Permit only once per geographical location.		
2	An on-site inspection must be conducted to determine removal of all other materials (e.g. wood, rubber, tires, dirt and metal) before the issuance of the Burn Permit.		

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Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 314 §§303	OPEN OUTDOOR FIRES NOT REQUIRED TO OBTAIN A BURN PERMIT: The person conducting any type of fire listed in Section 303 of this rule does not need to obtain a burn permit. However, the person conducting the fire may be required to contact the Control Officer for permission to burn prior to igniting the fire when specified below in Subsections 303.1 through 303.4.	Yes	See Response to MCAPCR Rule 312 §§304.1 and 304.2.
MCAPCR Rule 314 §§303.1	Fires Allowed at Any Time of the Year in Maricopa County or Area A:	N/A	All open outdoor fires at Luke AFB will be for fire fighter training at a designated fire fighter training area.
a	Cooking for immediate human consumption.		
b	Orchard heaters for frost protection in farming or nursery operations.		
c	Proper disposal of flags under 4 U.S.C. § 8.		
d	The display of fireworks for recreational purposes or pyrotechnics for musical or cinematic/theatrical functions.		
MCAPCR Rule 314 §§303.2	Fires Prohibited During Restricted-Burn Periods in Maricopa County: The person conducting any type of fire listed in Section 303.2 of this rule shall first call the County Air Quality Updates Hotline to hear the recorded message or check local government web sites to determine whether a Restricted-Burn Period has been declared each day. If that is the case, then open outdoor burning is prohibited.	Yes	Fire fighter training is conducted using LPG as a fuel, and has a heat input rating of less than 2 MMBtu/hr.
a	Fire extinguisher training. This exemption from needing a burn permit applies only when the training is limited to using a small amount of flammable liquid and a small container (i.e. a wastepaper basket or a flat pan).		
b	Fire fighting training, training areas and training structures are exempt from needing a permit if the sole source of flame is a burner fueled by either liquefied petroleum gas or natural gas, with a British Thermal Unit (BTU) input per hour rating of less than 2,000,000 BTUs.		
c	Disposal of dangerous material must be conducted in compliance the Arizona Department of Environmental Quality's (ADEQ's) regulations.		
MCAPCR Rule 314 §§303.3	Fires Prohibited During Restricted-Burn Periods in Maricopa County and Also Prohibited from May 1 to September 30 Each Year in Area A: The person conducting any type of fire listed in Section 303.3 of this rule shall first call the County Air Quality Updates Hotline to hear the recorded message or check local government web sites to determine whether a restricted-burn period has been declared. If that is the case, then open outdoor burning is prohibited.	N/A	All open outdoor fires at Luke AFB will be for fire fighter training at a designated fire fighter training area.
a	Warmth for human beings.		
b	Recreational purposes.		
c	Wood-burning chimineas and outdoor pits.		
d	Branding of animals.		
MCAPCR Rule 314 §§303.4	Fires for testing of potentially explosive-containing products during restricted-burn periods: The person conducting any type of fire listed in Section 303.4 of this rule shall keep and submit records as specified in Section 501 of this rule and call the County Air Quality Updates Hotline prior to burning to hear the recorded message or check local government web sites to determine whether a restricted-burn period has been declared. If a restricted-burn period has been declared, the person conducting the fire is required to contact the Control Officer for permission to burn prior to igniting the fire. Particulate emissions from the fires for testing of potentially explosive-containing products must not exceed two pounds per day for this permission to burn to be granted. The amount of particulate emissions are to be calculated using emission factors referenced in AP-42 or using other means of quantification that have been approved by the Control Officer and the Administrator.	N/A	All open outdoor fires at Luke AFB will be for fire fighter training at a designated fire fighter training area.
a	Testing of potentially explosive-containing, flammable, or combustible products (e.g., automotive airbags, rocket motors, gas generators, and vehicular assemblies) in accordance with Department of Transportation (DOT) or Department of Defense guidelines. This exemption from needing a burn permit refers to testing of hazard classification, packaging performance, propagation, and/or mass fire, but only when the testing area is controlled, is relatively small, and when the testing is not considered to be nor is associated with the disposal of dangerous material.		
b	Testing of potentially explosive-containing products for commercial, military, or law enforcement use. This exemption from the requirement to obtain a burn permit applies only when the testing area is controlled, is relatively small, and when the testing is not considered to be nor is associated with the disposal of dangerous material.		

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MCAPCR Rule 314 §§304	OPEN OUTDOOR FIRES IN AN AIR CURTAIN DESTRUCTOR: Prior to conducting an open outdoor fire in an air curtain destructor shall obtain a Title V permit from ADEQ and a site-specific Burn Plan approved by the Control Officer. See the Appendix to Rule 314 for further requirements for the use of air curtain destructors. See Section 406 of this rule for Burn Plan Applications and Conditions.	N/A	All open outdoor fires at Luke AFB will be for fire fighter training at a designated fire fighter training area.
MCAPCR Rule 314 §§305	ADDITIONAL REQUIREMENTS FOR OPEN OUTDOOR FIRES ALLOWED PER SECTIONS 302, 303, AND 304:	Yes	All open outdoor fires at Luke AFB will be for fire fighter training at a designated fire fighter training area, during normal operating hours.
MCAPCR Rule 314 §§305.1	Prohibited materials cannot be burned in open outdoor fires except as provided in Sections 303.2 and 303.4.		
MCAPCR Rule 314 §§305.2	Open outdoor fires cannot be conducted before the hour of 10 a.m. and after 5 p.m. from October 1 to March 31 and before the hour of 6 a.m. and after 6 p.m. from April 1 to September 30 except as provided in Sections 302.1(c), 303.2(b), and 303.3.		
MCAPCR Rule 314 §§305.3	Open outdoor fires cannot be conducted during any weekends or holidays except as provided in Sections 302.1(c), 303.1, 303.2(b), and 303.3.		
MCAPCR Rule 314 §§305.4	Fire extinguishing equipment shall be available at all times during open outdoor fires.		
MCAPCR Rule 314 §§305.5	An attendant shall be present at all times during open outdoor fires for the duration of the burn.		
MCAPCR Rule 314 §§305.6	Open outdoor fires shall never be initiated with items that cause the production of black smoke.		
MCAPCR Rule 314 §§305.7	An air curtain destructor must be used for the burning of certain vegetative materials greater than 6 inches in diameter and an on-site inspection must be conducted before burning.		
MCAPCR Rule 314 §§306	PROHIBITION - BURNING IN INDOOR FIREPLACES: Burning in indoor fireplaces that use any fuels other than gaseous fuels, including gas logs, at commercial and institutional establishments is prohibited during Restricted-Burn Periods in Maricopa County. The owner or operator of a commercial or institutional fireplace shall first call the County Air Quality Updates Hotline to hear the recorded message or check local government web sites to determine whether a Restricted-Burn Period has been declared. If that is the case, then burning is prohibited except if using gaseous fuels.	N/A	All open outdoor fires at Luke AFB will be for fire fighter training at a designated fire fighter training area.
MCAPCR Rule 314 §§501.1	The following information shall be provided to the Control Officer for each time that open burning occurs for persons and operations subject to Sections 302, 303.2(c), or 304. This information shall be provided on a daily basis either by writing, fax, or electronically and shall include:	Yes	Records are maintained as required MCAPCR Rule 314 §§501.1.
a	The date of the burn; and		
b	The type and quantity of fuel burned for each date open outdoor burning occurs; and		
c	The fire type such as a pile or windrow for each date that open outdoor burning occurs; and		
d	The legal location, to the nearest township, range and section, or latitude and longitude, to the nearest degree minute, street address, or parcel number.		
MCAPCR Rule 314 §§501.2	For persons and operations subject to Sections 303.4 the following information shall be provided to the Control Officer for each day that such testing is conducted. This information shall be provided on a daily basis either by writing, fax, or electronically and shall include:	N/A	All open outdoor fires at Luke AFB will be for fire fighter training at a designated fire fighter training area, and are not subject to Section 303.4.
a	The date of the testing;		
b	The time of day of testing;		
c	The legal location of such testing, to the nearest township, range and section, or latitude and longitude, to the nearest degree minute, street address, or parcel number;		
d	The unit designation (if applicable) (e.g. part number and test item description);		
e	The quantity of units tested;		
f	The type and quantity of material burned;		
g	The total charge weight per unit tested;		
h	The total weight of airborne particulate matter and gaseous pollutant effluents produced per test unit;		
i	The test procedure used;		
j	The duration of burn of each test unit;		
k	The estimated emissions resulting from the testing.		

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Fire Fighter Training

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 314 §§502.1	Maricopa County shall retain permits issued for open burning available for inspection by the ADEQ for five years.	Yes	Luke AFB wishes to include fire fighter training operations under Air Quality Operating Permit No. V97-017 so it will not be necessary to apply for separate open outdoor burning permits. Luke AFB will separately apply for a burn permit for any other outdoor fires; records will be kept as required.
MCAPCR Rule 314 §§502.2	For each permit issued, Maricopa County shall have a means of contacting the person authorized by the permit to set an open fire, if an order to extinguish open burning is issued by either the County or ADEQ. Therefore the permit application must contain the name of a contact person and shall list a means of contacting that person.	Yes	Luke AFB wishes to include fire fighter training operations under Air Quality Operating Permit No. V97-017 so it will not be necessary to apply for separate open outdoor burning permits. Luke AFB will separately apply for a burn permit for any other outdoor fires; contact information will be provided as requested.
U.S. EPA Requirements			

There are no regulations promulgated by the U.S. EPA which are potentially applicable to this source category.

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Fuel Cell Maintenance

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
Maricopa County Air Pollution Control Requirements			
There are no regulations promulgated by Maricopa County which are potentially applicable to this source category.			
U.S. EPA Requirements			
There are no regulations promulgated by the U.S. EPA which are potentially applicable to this source category.			

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Fuel Dispensing & Fuel Loading
Applies to Loading of Gasoline

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
Maricopa County Air Pollution Control Requirements			
MCAPCR Rule 351 - Loading of Organic Liquids			
MCAPCR Rule 351 §§301	GENERAL REQUIREMENTS FOR LOADING FACILITIES: All bulk terminals and plants must have submerged fill pipes in all tanks over 250 gallons (946 l) storing organic liquids, observe designated procedures and be equipped with applicable equipment as follows:	Yes	All loading at Luke AFB is performed using submerged fill.
MCAPCR Rule 351 §§301.1	Bulk Terminals: No person shall load organic liquids having a TVP of 1.5 psia (77.5 mm Hg) or greater into any delivery vessel from a stationary storage tank at a bulk terminal unless the vessel bears a current pressure-test decal issued by the Control Officer and the terminal uses a vapor collection/processing system which reduces the emissions of volatile organic compounds to not more than .08 pounds per 1000 gallons of such liquids transferred (10 grams per 1000 liters). Switch loading shall be subject to this standard. The terminal owner or operator and the operator of the receiving vessel shall act to ensure that the vapor line is connected before such liquids are transferred.	N/A	Luke AFB does not meet the definition of a bulk terminal in MCAPCR Rule 351 §§203.
MCAPCR Rule 351 §§301.2	Bulk Plant Tanks Over 250 Gallons (>946 L):	Yes	See responses below.
a	Transfer To Bulk Plant Tanks: No person shall transfer gasoline from a delivery vessel into a bulk plant tank exceeding 250 gallons (946 l) capacity unless the delivery vessel bears a current county pressure-test decal and uses a vapor balance system equipped with fittings which are vapor tight; or, alternatively, a vapor loss control system is used which emits to atmosphere less than 0.6 pound of volatile organic compounds per 1000 gallons transferred (72 grams per 1000 liters).	Yes	The delivery vessels used at Luke AFB are pressure tested by an offsite contractor, and bear current county pressure-test decals. Stage I vapor balance systems are used for loading of materials having a TVP of 1.5 psia (77.5 mm Hg) or greater.
b	Loading From Bulk Plant Tanks: No person shall transfer gasoline from a bulk plant tank exceeding 250 gallons (946 l) into a delivery vessel unless both the loading rack and delivery vessel use a vapor balance system equipped with fittings which are vapor tight; or, alternatively, a vapor loss control system is used which emits to atmosphere less than 0.6 pounds of volatile organic compounds per 1000 gallons loaded (72 grams per 1000 liters).	Yes	Stage I vapor balance systems are used for loading of materials having a TVP of 1.5 psia (77.5 mm Hg) or greater.
MCAPCR Rule 351 §§302	OPERATING REQUIREMENTS FOR VAPOR LOSS CONTROL DEVICES: The owner or operator of a vapor loss control device subject to this rule shall operate the device and organic liquid transfer equipment as follows:	Yes	See responses below.
MCAPCR Rule 351 §§302.1	Loading shall be accomplished in a manner that prevents gauge pressure from exceeding 18 inches of water (33.6 mm Hg) and vacuum from exceeding six inches of water (11.2 mm Hg) in the tank truck. Each owner or operator of a facility shall act to ensure that any vapor recovery system required by this Rule 351 is connected between the delivery vessel and the storage tank during all organic liquid transfers.	Yes	Loading operations will not be performed unless the vapor recovery system required by Rule 351 is connected between the delivery vessel and the storage tank during all organic liquid transfers.
MCAPCR Rule 351 §§302.2	Loading shall be accomplished in a manner that prevents overfills, fugitive liquid leaks or excess organic liquid drainage. Owners or operators of bulk plants or operators of delivery vessels shall observe all parts of the transfer and shall discontinue transfer if any leaks are observed. Measures shall be taken to prevent liquid leaks from the loading device when it is not in use, and to complete drainage before the loading device is disconnected. During loading or unloading operations, potential leak sources shall be vapor tight as demonstrated by the test procedure described in Section 501 of this rule.	Yes	All parts of the transfer shall be observed, and the transfer shall be discontinued if any leaks are observed. Periodic checks will be performed to ensure that there are no liquid leaks when the loading device is not connected.
MCAPCR Rule 351 §§302.3	Loading operations which use vapor collection/processing equipment shall be accomplished in such a manner that the displaced vapor and air will be vented only to the vapor collection/processing system, which shall be operated gas-tight and in a manner such that the vapor processing capacity is not exceeded. Diaphragms used in vapor storage tanks shall be maintained gas-tight.	Yes	Loading will not commence unless all displaced vapor and air is vented to the vapor collection system.
MCAPCR Rule 351 §§302.4	Vapor transfer lines shall be equipped with fittings that are vapor tight and that automatically and immediately close upon disconnection. Vapor balance systems shall be designed to prevent any vapors collected at one loading rack from passing to another loading rack.	Yes	All vapor transfer lines will be vapor tight and autimatically and immediately closed upon disconnection.

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Fuel Dispensing & Fuel Loading
Applies to Loading of Gasoline

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 351 §§303	REPAIR AND RETESTING REQUIREMENT: Except as superseded by Division actions pursuant to the procedures of Rule 100, Section 501 ("Malfunctions"), the owner/operator of a vapor loss control device that exceeds the standards of this rule shall notify the Control Officer and observe the following time schedule in ending such exceedances:	Yes	Luke AFB performs daily inspections of all equipment associated with delivery and loading operations to ensure operation is leak free, vapor tight, and in good working order. If equipment is found to be leaking or otherwise not in good working order, loading operations will cease until all necessary repairs are made.
MCAPCR Rule 351 §§303.1	Concentrations at or above the lower explosive limit must be brought into compliance within 24 hours of detection.		
MCAPCR Rule 351 §§303.2	Leak concentrations exceeding 10,000 ppm but less than 50,000 ppm as methane for vapor collection/processing equipment subject to gas-tight standard shall be brought into compliance within 5 days of detection.		
MCAPCR Rule 351 §§303.3	Except as the Control Officer otherwise specifies, a leak source subject to Sections 303.1 or 303.2 must be tested after presumed leak-correction within 15 minutes of recommencing use; if leak standards are exceeded in this test, the use of the faulty equipment shall be discontinued within 15 minutes until correction is verified by retesting.		
MCAPCR Rule 351 §§304	EQUIPMENT MAINTENANCE AND OPERATING PRACTICES: All equipment associated with delivery and loading operations shall be maintained to be leak free, vapor tight and in good working order. Gasoline shall not be spilled, discarded in sewers, stored in open containers, or handled in any other manner that would result in evaporation to the atmosphere. Purging of gasoline vapors and of JP-4 (jet petrol) vapors is prohibited.		
MCAPCR Rule 351 §§305	EXEMPTIONS:	Yes	See responses below.
MCAPCR Rule 351 §§305.1	Less Than 120,000 Gallons Per 30-Day Period: At bulk plants built before October 2, 1978, vapor loss control specified in Section 301.2b is not required at the outloading rack when all of the following are complied with:	N/A	This exemption is not applicable.
a	After April 6, 1992, the bulk plant loads less than 120,000 gallons (454,800 l) of gasoline into delivery vessels in any consecutive 30-day period. Any plant that becomes subject to all of the provisions of Section 301.2b by exceeding this threshold will remain subject to these provisions even if its output later falls below the threshold.		
b	Keep current records of amount of gasoline loaded and keep them readily accessible to the Division upon request for at least three (3) years.		
c	Load outgoing gasoline using submerged fill only.		
d	The owners or operators of the bulk plant or the owners or operators of the delivery vessel shall observe all parts of the transfer and shall discontinue the transfer if any leaks are observed.		
MCAPCR Rule 351 §§305.2	Opening Hatches: When VOC vapors from organic liquids are present within a non-exempt delivery vessel, authorized government agents as well as owners/operators and their contractors may open vapor containment equipment while performing operations required by Division rules or by other statutory entities, but shall be restricted as follows unless approved in advance by the Control Officer:	Yes	If vapor containment equipment hatches need to be opened as required to perform operations required by Division rules or other statutory entities, they will be opened in accordance with the requirements of MCAPCR Rule 351 §§305.2.
a	Wait at least 3 minutes after onloading is complete or delivery vessel has stopped before opening hatch or other vapor seal.		
b	Reclose hatch or other sealing device within 3 minutes of opening.		
c	Limit windspeed at opened hatch or other opened sealing device to not more than 3 mph (1.34 m/sec).		

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Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 351 §§501	LEAK DETECTION - TEST PROCEDURE: During loading into or unloading out of delivery vessels, the peripheries of all potential sources of leakage at the loading facility are checked with a combustible gas detector or organic vapor analyzer (OVA) as follows:	Yes	Luke AFB used the applicable test methods under this section to determine whether a leak exisits.
MCAPCR Rule 351 §§501.1	Pressure: A pressure tap shall be placed in the loading facility's vapor control system, as close as possible to the delivery vessel's tank. The pressure shall be recorded periodically during testing, at least once every minute. Instantaneous maximum pressure shall be recorded either automatically or by visual observation. A pressure measurement device capable of measuring 20 inches (50.8 cm) of water pressure with a precision of 0.1 (2.5 mm) inch of water shall be calibrated. This device shall fit the tap and shall either be permanently installed or shall be kept available at all times at the facility.		
MCAPCR Rule 351 §§501.2	Calibration: Within 4 hours prior to monitoring the combustible gas detector or OVA shall be calibrated with 10,600 ppm propane by volume in air for a 50 percent lower explosive limit (LEL) response.		
MCAPCR Rule 351 §§501.3	Probe Distance: The probe inlet shall be one inch (2.5 cm) or less from the potential leak source when searching for leaks. The probe inlet shall be one inch (2.5 cm) from the leak source when the highest detector reading is being determined for a discovered leak. When the probe is obstructed from moving within one inch (2.5 cm) of an actual or potential leak source, the closest practicable probe distance shall be used.		
MCAPCR Rule 351 §§501.4	Probe Movement: The probe shall be moved slowly, not faster than 1.6 inches per second (4 centimeters per second). If there is any meter deflection at a potential or actual leak source, the probe shall be positioned to locate the point of highest meter response.		
MCAPCR Rule 351 §§501.5	Probe Position: The probe inlet shall be positioned in the path of the vapor flow from a leak such that the central axis of the probe-tube inlet shall be positioned coaxial with the path of the most concentrated vapors.		
MCAPCR Rule 351 §§501.6	Wind: Wind shall be blocked as much as possible from the space being monitored. The annual leak detection test required by Section 401 shall be valid only when wind speed in the space being monitored is 5 mph or less.		
MCAPCR Rule 351 §§501.7	Data Recording: The highest detector reading and location for each incidence of leakage shall be recorded along with the date and time.		
MCAPCR Rule 351 §§502	COMPLIANCE INSPECTIONS: The Control Officer, at any time, may monitor a delivery vessel vapor collection system, a loading rack's vapor loss control devices, a loading facility or a vapor collection/processing system for vapor leaks by the methods described in Section 501 of this rule or by applicable EPA Reference Methods specified in Section 504.	Yes	The Control Officer may perform inspections at Luke AFB in accordance with MCAPCR Rule 351 §§502.
MCAPCR Rule 351 §§503	RECORDS RETENTION: Records and information required by this rule shall be retained for at least three years.	Yes	Records will be retained for at least three years.
MCAPCR Rule 352 - Gasoline Delivery Vessel Testing and Use			
MCAPCR Rule 352 §§301	PREVENT LEAKS AND SPILLS:	Yes	See responses below.
MCAPCR Rule 352 §§301.1	Vessel Integrity: In Maricopa County, no person shall store or transport gasoline in or otherwise use or operate any gasoline delivery vessel unless such vessel is designed and maintained to be vapor tight and leak free.	Yes	The gasoline delivery vessels are designed and maintained to be vapor tight and leak free.
MCAPCR Rule 352 §§301.2	Onloading Measures:	Yes	Onloading will follow the procedures outlined in MCAPCR Rule 352 §§301.2.
a	At any bulk loading rack, connect a vapor return hose before connecting any loading hose.		
b	At a bulk plant, connect an additional vapor hose before connecting any additional loading hose, unless an assisted vapor return system is serving the vapor hose that is already connected.		
c	Use a bucket or other effective capture device to catch any liquid dripping during the connection or disconnection of both the loading hose from the truck and the vapor hose from the loading dock's vapor receiving pipe.		
1	Either dispose of the captured liquid in a tank designated for that purpose, or use a receptacle or a material designed to absorb the liquid.		
2	Any gasoline that escapes or spills must be collected and contained.		

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Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 352 §§301.3	Prevent Spills and Excess Drainage: A driver/operator of a gasoline delivery vessel shall:	Yes	Spills and excess drainage will be prevented in accordance with the procedures outlined in MCAPCR Rule 352 §§301.3.
a	Thoroughly drain a fill hose and a vapor recovery hose into the dispensing tank before disconnecting it from the tank's fittings.		
b	Connect and disconnect fill hoses and vapor recovery hoses in such a way as to prevent excess gasoline drainage (more than 2 teaspoonsful) from escaping from the hose in one connect/disconnect cycle.		
c	Spills and any gasoline that is deposited in or on an area other than within the dispensing tank shall be collected and contained. This can include, but is not limited to, the correct use of buckets and/or absorbent material designed for the purpose, and the correct disposal of the collected gasoline.		
MCAPCR Rule 352 §§301.4	Vapor Hose use Required at Retail Gas Stations:	Yes	The gasoline tanks at Luke AFB are equipped with vapor hoses, vapor returns, locked caps that can be removed, and are maintained such that fittings allow connection of the vapor hose. Deliveries of gasoline are performed after a vapor hose is connected from the vessel to a vapor return-line serving the tank. All contractors are required to meet these requirements.
a	A driver/operator shall not deliver gasoline to a dispensing tank at a retail gas station unless a vapor hose is first connected from the vessel to a vapor return-line serving the tank.		
b	No delivery shall be made to a retail tank if:		
1	it is not served by a vapor return, or		
2	if it has a locked cap that cannot be removed, or		
3	if broken fittings prevent correct connection of the vapor hose.		
MCAPCR Rule 352 §§301.5	Prevent Vapor Escape During Deliveries: For gasoline dispensing tanks that are equipped with a Stage 1 vapor recovery system (VR System):	Yes	Deliveries to tanks equipped with Stage 1 vapor recovery systems will follow the procedures outlined in MCAPCR Rule 352 §§301.5. All contractors are required to meet these requirements.
a	During delivery, the vessel operator shall not remove the lid of a fill tube unless every other fill tube either has a lid fastened in place or a delivery hose connecting it to the delivery vessel.		
b	Connect a vapor recovery hose before connecting any gasoline delivery hose.		
c	Disconnect a delivery hose from a tank before disconnecting the vapor recovery hose.		
d	Restriction on Multiple Connection: A delivery vessel shall not simultaneously have more than one gasoline delivery hose connected, unless each delivery hose is connected to a dispensing tank's 2-point system that already has a vapor hose connecting it to the vessel.		
MCAPCR Rule 352 §§301.6	Vapor Recovery Systems Having Remote Vapor Return Lines: If a delivery vessel's vapor hose is connected to a vapor return line that is not part of a 2-point system, then there shall not be more than one gasoline delivery hose connected to the vessel, and no other hoses connected to a fill tube; viz., no more than one compartment of the delivery vessel shall be emptied at a time.	Yes	Deliveries to tanks not equipped with Stage 1 vapor recovery system will follow the procedures outlined in MCAPCR Rule 352 §§301.6. All contractors are required to meet these requirements.

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Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 352 §§302	GASOLINE DELIVERY VESSEL LEAK TEST REQUIRED: A gasoline delivery vessel shall first pass the MC Pressure Test before delivering or onloading gasoline within Maricopa County, and to continue, must pass the MC Pressure Test each year thereafter. This does not apply to loads that originate solely in another state, nor to loads originating in Maricopa County that are not delivered in Maricopa County.	Yes	These gasoline delivery vehicles are tested annually by an off-base contractor to ensure the vessels are vapor tight and leak free, in accordance with the requirements of MCAPCR Rule 352 §§302.
MCAPCR Rule 352 §§302.1	Testing: The MC Pressure Test shall be performed according to subsection 302.2.		
a	Scheduling and notification of an initial test or annual retest shall be done in accordance with subsection 401.1 and subsection 401.3.		
b	A tester shall record the results of a Pressure Test according to the format in subsection 501.2.		
c	A valid Maricopa County Air Quality Department decal shall be affixed to the vessel consequent to passing the MC Pressure Test before the vessel may deliver or onload gasoline.		
d	An owner or operator of a delivery vessel shall comply with subsection 401.2 registration requirements to obtain a valid Maricopa County Air Quality Department decal after a successful MC Pressure Test.		
MCAPCR Rule 352 §§302.2	MC Pressure Test: A vessel that is being MC Pressure Tested shall pass all 3 of the following pressure subtests, in the following order, and use the same vapor hose during the test as will be used for deliveries by that same unit:		
a	Positive Pressure Subtest: Lose no more than 1.0 inch (25.4 mm) of water column in 5.0 minutes, when pressurized to a gauge pressure of 18 inches (45.7 cm) of water in 2 consecutive runs according to procedures in subsections 5.1.1 through 5.2.7 of EPA Method 27, as incorporated by reference in Section 504 of this rule; and		
b	Vapor Valve Subtest: Lose no more than 5.0 inches (127 mm) of water column in 5.0 minutes, measured in the vapor system after the vessel compartments are first collectively pressurized to a gauge pressure of 18 inches (45.7 cm) of water and then the vapor valves are closed, per subsection 503.2 of this Rule 352; and		
c	Partial Vacuum Subtest: Gain no more than 1.0 inch (25.4 mm) of water column in 5.0 minutes, when initially evacuated to a gauge pressure of 6 inches (15.2 cm) of water, in 2 consecutive runs, per subsections 5.3.1 through 5.3.7 of EPA Method 27, as incorporated by reference in Section 504 of this rule.		
d	Pressure Instability: A subtest is invalidated if during either of the pressure subtests, more than 1/2 inch water pressure is gained, or if during the vacuum test the vacuum is increased by more than minus ½ inch.		
MCAPCR Rule 352 §§302.3	A vessel shall be repaired, retested, and pass all 3 subtests in the same testing period within 15 days of testing if it does not pass all 3 subtests of subsection 302.2 of this rule.		
MCAPCR Rule 352 §§303	DISPLAY A VALID DECAL: Each gasoline delivery vessel shall clearly display a valid Maricopa County Air Quality Department decal that is permanently mounted near the front on the right (passenger) side of the vessel.	Yes	Gasoline delivery vessels display a current decal near the front right (passenger) side of the vessel.
MCAPCR Rule 352 §§304	PURGING PROHIBITED:	N/A	Luke AFB does not purge the gasoline delivery vessels.
MCAPCR Rule 352 §§304.1	No person shall purge gasoline vapors into the atmosphere from a delivery vessel unless the following conditions are met:		
a	VOC emissions shall be reduced at least 90% by weight, including capture and processing, by a control device having a Maricopa County Air Pollution Permit; and		
b	Such purging shall be done only after all delivery valves are opened and any liquid gasoline outflow is captured in a container having an attached lid which is kept closed when not receiving or pouring gasoline.		
MCAPCR Rule 352 §§304.2	An operator of a delivery vessel shall not purge gasoline vapors from such vessel as a passive result of switch loading, except for vessels exempted by subsection 305.1.		

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Applies to Loading of Gasoline

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 352 §§305	EXEMPTIONS:	Yes	See responses below.
MCAPCR Rule 352 §§305.1	A delivery vessel is exempt from pressure test requirements of Section 302 if all of the following conditions are met:	N/A	None of the exemptions in MCAPCR Rule 352 §§305.1 apply to the gasoline delivery vehicles Luke AFB.
a	The vessel was placed in operation before July 13, 1988; and		
b	The vessel transported gasoline within Maricopa County before January 1, 1998; and		
c	The vessel never loads at a gasoline terminal; and		
d	The vessel serves only farm tanks and/or those non-resale dispensing operations having a yearly throughput not exceeding 120,000 gallons of gasoline, verified by monthly records pursuant to subsection 501.1a; and		
e	The vessel either has a sticker affixed to it that indicates to a bulk plant operator that the vessel may be loaded in Maricopa County, or has an affidavit signed by an owner or officer of the operating company filed with the Maricopa County Air Quality Department, with a complete copy of the signed affidavit available in the vehicle for inspection by a bulk plant operator or the Control Officer.		
MCAPCR Rule 352 §§305.2	An operator of a delivery vessel exempted by subsection 305.1 is allowed to incidentally purge gasoline vapors from such vessel as a passive result of loading, or briefly when lids/ports must be open for inspection.		
MCAPCR Rule 352 §§305.3	Opening Hatches on Non-Exempt Vessels:	Yes	If vapor containment equipment hatches need to be opened as required to perform operations required governmental agencies, they will be opened in accordance with the requirements of MCAPCR Rule 352 §§305.3.
a	Required by Rule: Owners/operators, their contractors, and authorized government agents may open vapor containment equipment on a nonexempt gasoline delivery vessel while performing operations required by governmental agencies, but shall be restricted as follows, unless approved in advance by the Control Officer:		
1	Wait at least 3 minutes after onloading is complete and after a delivery vessel has stopped before opening its hatch or other vapor seal.		
2	Reclose hatch or other sealing device within 3 minutes of completing the required procedures.		
3	Limit windspeed at opened hatch or other opened sealing device to not more than 3 mph (1.34 m/sec), using a barrier if necessary.		
b	Defueling: Hatches of a delivery vessel may be open for monitoring to prevent overflow during the period that the vessel is receiving gasoline from a tank or other source, if so required by a local fire code or other ordinance.		
c	Connecting Coaxial Fittings: Requirements for first connecting a vapor hose before a gasoline delivery hose do not apply to coaxial VR connection fittings.		
MCAPCR Rule 352 §§501	RECORDKEEPING AND REPORTING REQUIREMENTS:	Yes	See responses below.
MCAPCR Rule 352 §§501.1	The owner or operator of a gasoline delivery vessel subject to this rule shall maintain records of all certification, testing, and repairs.	Yes	Records will be retained for at least five years, and provided to the Control Officer upon request.
a	Such records must be maintained in a legible, readily available condition for at least 5 years after the date the testing and repair is completed.		
b	Upon verbal or written request by the Control Officer, or a designee of the Control Officer, records shall be provided within a reasonable time. If the Control Officer is at the site where requested records are kept, records shall be provided without delay.		

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Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 352 §§501.2	The records of the certification testing required by Section 302 must be recorded in both of the following documents: the "Application for Air Pollution Vapor Recovery Certification" and the "Tank Truck Leak Certification Check List". Pressure and vacuum shall be recorded to no less than the nearest quarter inch or half-centimeter of water column. The minimum requirements for each of these 2 documents follow:	Yes	Tank truck leak checks are performed by an offsite contractor. The "Application for Air Pollution Vapor Recovery Certification" and the "Tank Truck Leak Certification Check List" are completed by the offsite contractor.
a	For the "Application for Air Pollution Vapor Recovery Certification":		
1	Owner's name and address.		
2	Tank ID number, the location of the test, the time of the test, and the date of the test.		
3	For the pressure subtest, 2 readings: the change in pressure (in inches H2O) for Run 1 and the change in pressure for Run 2.		
4	For the vapor-valve subtest (subsection 302.2b), 1 reading: the total change in pressure during the test.		
5	For the vacuum test, 2 readings: the total change in vacuum during Run 1 and the same for Run 2.		
b	The "Tank Truck Leak Certification Check List" (or its successor document) shall contain at least the following information:		
1	The same information required in subsections a(1) and a(2) of this subsection 501.2; and		
2	The time the subtest began, the initial pressure of the subtest, the finish time, the final pressure of the subtest, and the pressure change between the start and end of the subtest; the vessel's unit number, manufacturer's serial number, the tank capacity, whether the tank was purged of gasoline vapors, and the date of the next leakage test if the set of 3 subtests are not all passed.		
3	If the initial pressure test was not passed, one set of readings in the row "Initial Test", also giving the elapsed time if the pressure reached zero before 5 minutes. For example, the row marked "Initial Test" will normally contain the results of the initial failed subtest if any repairs were made subsequent to any pressurization or evacuation of the tank.		
MCAPCR Rule 352 §§502	MONITORING FOR LEAKS: The Control Officer may at any time monitor a delivery vessel, including the vapor collection system, for vapor and liquid leaks to ascertain if it is vapor tight and leak free. Leakage of vapor exceeding 1/5 of the lower explosive limit, or 10,000 ppm as methane, when performed according to subsection 504.4, shall be an exceedance of the vapor-tight standard of subsection 301.1.	Yes	The Control Officer may monitor for vapor and liquid leaks in accordance with MCAPCR Rule 352 §§502.
MCAPCR Rule 352 §§503	COMPLIANCE DETERMINATION: When more than one test method is permitted for a determination, an exceedance of the limits established in the rule determined by any of the applicable test methods constitutes a violation of this rule.	Yes	Tank truck leak checks are performed by an offsite contractor, in accordance with the requirements of MCAPCR Rule 352 §§503.
MCAPCR Rule 352 §§503.1	Pressure and Vacuum Tests: The subtests to determine compliance with subsection 302.2a and subsection 302.2c of this rule shall be performed according to EPA Method 27, except that the definition of gasoline shall be according to this Rule 352.		
MCAPCR Rule 352 §§503.2	Test of Internal Vapor Valves: The test to determine compliance with subsection 302.2b shall be performed immediately after successfully passing the pressure subtest (pursuant to subsection 302.2a), without performing any intervening maintenance or repair on the vapor valves.		
MCAPCR Rule 352 §§503.3	Confirmation of a vapor leak detected on a vessel during onloading shall be determined by properly deploying a pressure tap adapter that conforms to Method 27 provisions, and demonstrating the leak according to subsection 504.4, while the pressure is less than 20 inches of water column.		
MCAPCR Rule 352 §§503.4	Pursuant to Section 203, Reid vapor pressure shall be determined using American Society for Testing and Materials (ASTM) Method D 323-90.		

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Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 353 - Gasoline in Stationary Dispensing Tanks			
MCAPCR Rule 353 §§300	STANDARDS–VAPOR LOSS CONTROL MEASURES REQUIRED: No person shall transfer or permit the transfer of gasoline from any delivery vessel into any stationary dispensing tank located above or below ground with a capacity of more than 250 gallons (946 l) unless the following conditions are met:	Yes	Luke AFB will operate all gasoline fuel dispensing stations in accordance with the requirements of this rule.
MCAPCR Rule 353 §§301	BASIC TANK INTEGRITY: No vapor or liquid escapes are allowed through a dispensing tank's outer surfaces, nor from any of the joints where the tank is connected to pipe(s), wires, or other system.	Yes	Luke AFB will operate in manner to minimize any leaks. All parts of the transfer shall be observed, and the transfer shall be discontinued if any leaks are observed. Periodic checks will be performed to ensure that there are no liquid leaks when the loading device is not connected. All seals and fittings will be periodically observed for integrity.
MCAPCR Rule 353 §§301.1	VOC Emission Standard:	Yes	
a	Gasoline delivery operations shall be vapor-tight, as defined in Section 218, except for tanks exempted by Section 305 from Stage 1 vapor recovery requirements.	Yes	
b	Tanks and their fittings shall be vapor-tight except for the outlet of a pressure/vacuum relief valve on a dispensing tank's vent pipe. Specifically, this means that at a probe tip distance of 1 inch (2.5 cm) from a surface, no vapor escape shall exceed 1/5 of the lower explosive limit. This applies to tanks containing gasoline regardless of whether they are currently being filled, and to caps and other tank fittings.	Yes	
MCAPCR Rule 353 §§301.2	Leakage Limits–Liquid Leaks and Spills:	Yes	
a	Gasoline storage and receiving operations shall be leak-free. Specifically, no liquid gasoline escape of more than 3 drops per minute is allowed. This includes leaks through the walls of piping, fittings, fill hose(s), and vapor hose(s).		
b	There shall be no excess gasoline drainage from the end of a fill hose or a vapor hose. Specifically, not more than 2 teaspoonsful of gasoline shall be lost in the course of a connect or disconnect process.		
MCAPCR Rule 353 §§301.3	Spill Containment Equipment: The entire spill containment system including gaskets shall be kept vapor-tight.	Yes	
a	The Spill Containment Receptacle:		
1	The outer surface of the spill containment receptacle shall have no holes or cracks and shall allow no vapors to pass from the dispensing tank through it to the atmosphere.		
2	Spill containment receptacles shall be kept clean and free of foreign material at all times.		
3	Spill containment receptacles shall be inspected at least weekly. Records of inspection and cleaning shall be kept according to subsection 502.2.		
b	If the spill containment is equipped with a passageway to allow material trapped by the containment system to flow into the interior of the dispensing tank:		
1	The passageway shall be kept vapor-tight at all times, except during the short period when a person opens the passageway to immediately drain material trapped by the containment system into the tank.		
2	The bottom of the receptacle shall be designed and kept such that no puddles of gasoline are left after draining through the passageway has ceased.		
c	The dispensing tank owner/operator is responsible for assuring that before a delivery vessel leaves the premises after a delivery:		
1	Any gasoline in a dispensing tank's spill containment receptacle has been removed.		
2	Any gasoline that a person has taken out of a spill receptacle, as a free liquid or as absorbed into/onto other material removed from the receptacle, shall be contained in such a way that VOC emission is prevented; disposal in conformance with applicable hazardous waste rules is sufficient to meet this requirement.		
3	Any plunger/stopper assembly is unimpeded and sealing correctly.		
d	Criteria Of Violation/Exceedance for Spill-Containment Receptacles: A reading on a CGD or OVA exceeding 1/5 LEL (10,000 ppm as methane) is an exceedance. The procedure for performing a determination is set forth in subsection 504.3.		

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Fuel Dispensing & Fuel Loading
Applies to Loading of Gasoline

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 353 §§302	FILL PIPE REQUIREMENTS:	Yes	All tanks at Luke AFB are designed to meet the fill pipe requirements of this rule and not allow for vapor or liquid leakage at the joints.
MCAPCR Rule 353 §§302.1	Each fill-line into a stationary dispensing tank shall be equipped with a permanent submerged fill pipe that has a discharge opening which is completely submerged when the liquid level is 6 inches above the tank bottom.		
a	Threads, gaskets, and mating surfaces of the fill pipe assembly shall be designed and maintained tight. There shall be no liquid or vapor leakage at the joints of the assembly.		
b	An owner/operator is responsible to assure that external fittings of a fill pipe assembly shall be inspected weekly to assure that cap, gasket, and piping are intact and are not loose.		
1	A record of the inspection shall be made according to subsection 502.2.		
2	An owner/operator shall act to prevent driver/deliverers from connecting the delivery hose coupling to a fill pipe coupling with so much twisting force that the fill pipe assembly is loosened. One method of complying is to have a CARB-certified swivel coupling as part of the fill pipe assembly (reference subsection 503.4 for CARB).		
MCAPCR Rule 353 §§302.2	Fill Pipe Caps:	Yes	The fill pipe cap and gaskey will only be used if functioning properly.
a	The cap shall have a securely attached, intact gasket.		
b	The cap and its gasket shall always function properly, latch completely so that it cannot then be easily twisted by hand, and have no structural defects.		
c	The cap of a gasoline fill pipe shall always be fastened securely on the fill pipe except immediately before, during, and immediately after:		
1	"Sticking" the tank to measure gasoline depth.		
2	Delivering gasoline into the tank.		
3	Doing testing, maintenance or inspection on the gasoline/vapor system.		
d	Do not unfasten or remove a fill pipe cap unless every other fill pipe is either securely capped or connected to a delivery hose, except as otherwise needed for testing, maintenance, or inspection.		
MCAPCR Rule 353 §§302.3	Restrictions on Multiple Fill Pipes:	N/A	None of the storage tanks have more than one fill pipe.
a	A tank installed after December 31, 1998, shall not be equipped with more than one fill pipe unless more than one fill pipe is specifically allowed in the Air Pollution Permit and there is a 2-point system having a properly installed vapor return pipe close to each fill pipe.		
b	Restriction on Concurrent Delivery: An owner/operator of a dispensing tank fitted with more than 1 fill pipe shall prevent concurrent delivery of gasoline by a gasoline delivery vessel to more than 1 fill pipe of the tank by locking additional fill pipes shut or by using other permanent means, unless:		
1	Concurrent delivery is specifically allowed in the facility's Air Pollution Permit; and		
2	All fill pipes in use are part of a 2-point vapor recovery system; and		
3	Before making a concurrent delivery through a tank's second fill pipe, an additional vapor return hose from the delivery vessel must first be attached to the vapor return line associated with the second fill pipe.		
MCAPCR Rule 353 §§302.4	Fill Pipe Obstructions:	N/A	There are no screens and/or other obstructions in the fill pipe assemblies at Luke AFB.
a	Any type of screen and/or other obstructions in fill pipe assemblies shall be permanently removed by November 1, 1999, unless it is specifically allowed by an Air Pollution Permit or is CARB-certified, as referenced in subsection 503.4.		
b	A screen or other obstruction, allowed by Air Pollution Permit or CARB, shall be temporarily removed by the owner/operator of a dispensing tank prior to inspection by the Control Officer to allow measurements pursuant to this rule.		
MCAPCR Rule 353 §§302.5	Overfill Protection Equipment: Overfill prevention equipment shall be vapor-tight to the atmosphere. Any device mounted within the fill pipe shall be so designed and maintained that no vapor from the vapor space above the gasoline within the tank can penetrate into the fill pipe or through any of the fill pipe assembly into the atmosphere.	Yes	Overfill protection will be vapor-tight to the atmosphere.
MCAPCR Rule 353 §§303	VAPOR RECOVERY SYSTEM:	Yes	See responses below.
MCAPCR Rule 353 §§303.1	Gasoline vapors displaced from a dispensing tank by gasoline being delivered shall be handled by a Stage Vapor Recovery System, unless the tank is exempted by Section 305.	Yes	Gasoline storage tanks subject to MCAPCR Rule 353 are equipped with Stage I Vapor Recovery Systems.

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Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 353 §§303.2	Stage 1 Vapor-Recovery System Configuration (Reference subsection 503.4 for identification of CARB-certified components):	Yes	Luke AFB's vapor recover systems meet the Stage I and Stage II vapor recover system requirements.
a	Replacement: After June 16, 1999, no part of a vapor recovery system for which there is a CARB specification shall be replaced with anything but CARB-certified components.		
b	Vapor Valves:		
1	All vapor return lines from dispensing tanks shall be equipped with CARB-certified, spring-loaded, vapor-tight, poppetted dry break valves.		
2	Vapor valves shall be inspected weekly to determine if closure is complete and gaskets are intact; a record shall be made pursuant to subsection 502.2.		
c	Above Ground Systems: After June 16, 1999, an above ground dispensing tank shall have CARB-certified fittings wherever CARB so specifies.		
d	New Systems: Each new gasoline tank installation shall use CARB-certified fittings exclusively wherever CARB so specifies, and:		
1	Shall have its own separate, functioning 2-point vapor return line;		
2	Is allowed to have a combination vapor recovery system that in addition to having a separate 2-point Stage 1 vapor return line, also has stage 1 vapor piping/fittings linking it to one or more (other) gasoline dispensing tanks.		
e	New Coaxial Prohibited:		
1	No coaxial fill pipes shall be installed after June 16, 1999, in new installations; and		
2	No coaxial fill pipes shall be reinstalled after June 16, 1999, in major modifications in which the top of the tank is exposed and the vapor port bung is pre-configured to accept vapor recovery piping.		
MCAPCR Rule 353 §§304	EQUIPMENT MAINTENANCE AND USE REQUIRED: All vapor loss control equipment shall be installed as required, operated as recommended by the manufacturer, and maintained leak-free, vapor-tight and in good working order.	Yes	All equipment is maintained as recommended by the manufacturer, and maintiained leak free, vapor tight, and in good working order.
MCAPCR Rule 353 §§304.1	Both the owner/operator of a dispensing tank and the driver/operator of a delivery vessel delivering gasoline to the fuel dispensing tank equipped with vapor recovery shall have responsibility to assure that vapor recovery equipment (if required by this rule) is properly connected and in use at all times while gasoline is actively being dropped/delivered.	Yes	
MCAPCR Rule 353 §§304.2	The owner/operator of a fuel dispensing tank not exempted by Section 305 shall refuse delivery of gasoline from a delivery vessel which does not bear a current pressure test certification decal issued by the Control Officer. This provision does not apply during times when the facility is unattended or there is only one person under control of the dispensing facility present.	Yes	
MCAPCR Rule 353 §§304.3	Coaxial Systems: Both spring-loaded and fixed coaxial fill tubes shall be maintained according to the standards of their manufacturer(s) and be operated so that there is no obstruction of vapor passage from the tank to the delivery vessel.	Yes	
MCAPCR Rule 353 §§305	EXEMPTIONS:	Yes	See responses below.
MCAPCR Rule 353 §§305.1	Dispensing Tanks for Farm Operations: Any stationary gasoline dispensing tank used exclusively for the fueling of implements of normal farm operations is exempt from this rule, except for cap, spills, and liquid leak-age provisions in Section 301.	N/A	Luke AFB does not dispense gasoline for farm operations.
MCAPCR Rule 353 §§305.2	The Vapor Recovery Provisions of Section 303 of this Rule Shall Not Apply to the Following Stationary Gasoline Dispensing Tanks:	N/A	All gasoline storage tanks were installed after October 2, 1978.
a	Non-Resale Dispensing Operations From Non-Farm Tanks: Any stationary gasoline dispensing operation receiving less than 120,000 gallons of gasoline in any 12 consecutive calendar months, dispensing no resold gasoline, and having each gasoline dispensing tank equipped with a permanent submerged fill pipe pursuant to subsection 302.1, is exempt from Section 303. However, any operation shall become subject to the provisions of Section 303 of this rule by exceeding the 120,000 gallon threshold or not abiding by the restrictions, and shall remain subject to such provisions even if annual emissions later fall below this threshold.	N/A	
b	Dispensing Tanks Of 1000 Gallons Or Less: Any stationary dispensing tank having a capacity of 1000 gallons (3785 l) or less which was installed prior to October 2, 1978, provided that such tank is equipped with a permanent submerged fill pipe. Where, because of government regulation including, but not limited to, Fire Department codes, such a fill pipe cannot be installed, the gasoline shall be delivered into the tank using a nozzle extension that reaches within 6 inches of the tank bottom.	N/A	
c	Dispensing Tanks with Offset Fill Lines: Any stationary dispensing tank installed prior to October 2, 1978, where the fill line between the fill connection and tank is offset.	N/A	

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Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 353 §§501	COMPLIANCE INSPECTIONS: Any dispensing tank required by this rule to be equipped with vapor loss control devices may be subject to monitoring for vapor tightness and leak tightness during any working hours. Such a tank may be opened for gauging or inspection when loading operations are not in progress, provided that such tank is part of an open system or is served by a positive-pressure relief valve with a relief setting not exceeding +1/2 lb psig.	Yes	Luke AFB performs compliance inspections as required by this section.
MCAPCR Rule 353 §§502	RECORDKEEPING: The owner or operator of each gasoline dispensing facility in Maricopa County shall maintain records as follows:	Yes	All fuel storage records at Luke AFB required under MCAPCR Rule 353 §§502 are maintained for a period of 5 years.
MCAPCR Rule 353 §§502.1	The total amount of gasoline received each month shall be recorded by the end of the following month.		
MCAPCR Rule 353 §§502.2	The owner or operator of a gasoline dispensing facility shall cause weekly records of fill tube, vapor valve and spill containment inspection to be kept. The findings of such weekly inspections shall be permanently entered in a record or log book by the end of Saturday of the following week.		
MCAPCR Rule 353 §§502.3	These records and any reports or supporting information required by this rule or by the Control Officer shall be retained for at least 5 years.		
MCAPCR Rule 353 §§502.4	Records of the past 12 months shall be in a readily accessible location and must be made available to the Control Officer without delay upon verbal or written request.		
MCAPCR Rule 353 §§503	COMPLIANCE DETERMINATION: The test methods referenced in Section 504 shall be used in the ways given in the subsections that immediately follow. When more than one test method is permitted for a determination, an exceedance of the limits established in this rule determined by any of the applicable test methods constitutes a violation of this rule. For routine information collection, the Control Officer may accept a manufacturer's data sheet (MSDS), data certified by an officer of the supplying company, or test data for the product of inquiry.	Yes	See responses below.
MCAPCR Rule 353 §§503.1	Control efficiency of [emission control device] vapor recovery systems and vapor collection/ processing systems shall be determined according to EPA Method 2A and either EPA Method 25A or 25B (Section 504 and subsection 504.1), or by CARB-approved test methods (Section 504 and subsection 504.4). EPA Method 2B shall be used for vapor incineration devices.	Yes	Control efficiency of the vapor recovery systems is determined according to one of the methods listed in MCAPCR Rule 353 §§503.1.
MCAPCR Rule 353 §§503.2	Vapor pressure of gasoline (reference Section 204) shall be determined using American Society for Testing and Materials (ASTM) Method D323-94 or ASTM Method D4953-93. Method D323-94 shall be used for gasoline either containing no oxygenates or MTBE (methyl tertiary butyl ether) as the sole oxygenate. Method D4953-93 shall be used for oxygenated gasoline.	N/A	Vapor pressure of gasoline is provided by the supplier.
MCAPCR Rule 353 §§503.3	Vapor Leaks:	Yes	Luke AFB will comply with the vapor leak-tight status determinations as outlined in MCAPCR Rule 353 §§503.3, as performed by the Control Officer, as applicable.
a	If a determination of leak-tight status is to be made on Stage 1 or spill containment equipment at a gasoline dispensing facility or on a delivery vessel at the station, the method in subsection 504.3 shall be used.		
b	Subsection 504.3 probe distance and movement parameters not with-standing, if it has been established that there are no other interfering vapor escapes, it is an exceedance if a reading by the Control Officer from an established vapor escape above 1/5 LEL (or 10,000 ppm as methane) is sustained for at least 5 seconds, and the probe is either consistently further than 1 inch from the source and/or the probe is consistently being moved faster than 4 cm per second.		
c	The Control Officer may count it as a failure to perform weekly inspections pursuant to subsection 301.3 if foreign material is found in a spill containment receptacle and there is no record of an inspection's being performed in the preceding 10 days.		

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Applies to Loading of Gasoline

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
	U.S. EPA Requirements		
40 CFR 60, Subpart XX	Standards of Performance for Bulk Gasoline Terminals	N/A	The facility is not a bulk gasoline terminal, as defined in 40 CFR 60.501; therefore, this regulation does not apply.
40 CFR 63, Subpart R	National Emission Standards for Gasoline Distribution Facilities (Bulk Gasoline Terminals and Pipeline Breakout Stations)	N/A	The facility is not a bulk gasoline terminal, as defined in 40 CFR 63.421; therefore, this regulation does not apply.
40 CFR 63, Subpart EEEE	National Emission Standard for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline)	N/A	The facility is not a major source of HAPs, therefore, this regulation does not apply.
40 CFR 63, Subpart BBBBBB	National Emission Standards for Hazardous Air Pollutants: Gasoline Distribution Bulk Terminals, Bulk Plants, and Pipeline Facilities	N/A	Gasoline storage tanks at Luke AFB are used only for dispensing gasoline in a manner consistent with tanks located at a gasoline dispensing facility as defined in §63.11132, are not subject to any of the requirements in this subpart. These tanks must comply with subpart CCCCCC of this part.
40 CFR 63, Subpart CCCCCC	National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities	Yes	All gasoline fuel dispensing facilities will meet the applicable requirements of this NSPS.

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Fuel Storage Tanks

Applies to Gasoline Storage Tanks

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
Maricopa County Air Pollution Control Requirements			
MCAPCR Rule 350 - Storage of Organic Liquids at Bulk Plants and Terminals			
MCAPCR Rule 350 §§301	ALL STORAGE TANKS GREATER THAN 250 GALLONS (946 L): No person shall install or use a stationary storage tank with a capacity greater than 250 gallons (946 l) for storing organic liquids with a true vapor pressure of 1.5 psia (77.5 mm Hg) or more unless such a tank meets the following requirements:	Yes	See responses below.
MCAPCR Rule 350 §§301.1	The tank has a submerged fill pipe; and	Yes	All storage tanks greater than 250 gallons used to store organic liquids with a true vapor pressure of 1.5 psia (77.5 mm Hg) or more are submerged fill.
MCAPCR Rule 350 §§301.2	The tank has a pressure/vacuum valve which is set within ten percent of the tank's maximum, safe working-pressure.	Yes	All fixed roof storage tanks greater than 250 gallons used to store organic liquids with a true vapor pressure of 1.5 psia (77.5 mm Hg) or more have a pressure/vacuum valve which is ses within ten percent of the tank's maximum safe working-pressure.
MCAPCR Rule 350 §§302	GASOLINE STORAGE TANKS BETWEEN 250 AND 40,000 GALLONS (946 -151,400 L): No person shall store gasoline in a stationary storage tank with a capacity less than 40,000 gallons (151,400 l) but greater than 250 gallons (946 l) unless the tank is equipped with a vapor recovery system which collects and returns displaced vapors to the delivery vessel using vapor-tight fittings and lines; or such tank uses at least one of the vapor loss control methods in Sections 306, 307, or 308 of this rule.	Yes	All gasoline storage tanks between 250 and 40,000 gal at Luke AFB are equipped with Stage I vapor recovery systems.
MCAPCR Rule 350 §§303	ORGANIC LIQUID STORAGE TANKS OF 20,000 THROUGH 39,999 GALLONS CAPACITY (75,700 - 151,396 L): No person shall store organic liquids with a true vapor pressure (TVP) of 1.5 through 11.0 psia (77.5 - 569 mm Hg) in a stationary tank with a capacity from 20,000 through 39,999 gallons (75,700 - 151,396 l) unless the tank is equipped with a vapor recovery system which collects and returns displaced vapors to the delivery vessel using vapor-tight fittings and lines; or such tank uses at least one of the vapor loss control methods specified in Sections 306, 307, or 308 of this rule.	Yes	This only applies to the gasoline storage tank at Bldg. 368, which is equipped with a Stage I vapor recovery system.
MCAPCR Rule 350 §§304	STORAGE TANKS OF 40,000 GALLONS (151,400 L) OR MORE: No person shall place, store or hold in any stationary storage tank having a capacity of 40,000 gallons (151,400 L) or more, any gasoline or organic liquid having a true vapor pressure of 1.5 psia (77.5 mm Hg) or greater under actual storage conditions, unless such storage tank is equipped with at least one of the vapor loss control devices specified in Sections 306, 307, or 308 of this rule.	N/A	Luke AFB does not have any storage tanks with a capacity of 40,000 gallons or more which store gasoline or organic liquids having a true vapor pressure of 1.5 psia (77.5 mm Hg) or greater.
MCAPCR Rule 350 §§305	TANKS STORING LIQUIDS HAVING VAPOR PRESSURES EXCEEDING 11 PSIA: No person shall place, store, or hold in a stationary tank having a capacity over 250 gallons (946 l) organic liquid(s) with a true vapor pressure above 11.0 psia (569 mm Hg) unless such a tank is either a pressure tank maintaining working pressure sufficient at all times to prevent organic vapor/gas loss to the atmosphere or is equipped with a vapor collection/processing system specified in Section 308 of this rule.	N/A	Luke AFB does not have any storage tanks which store organic liquid(s) with a true vapor pressure above 11.0 psia (569 mm Hg).
MCAPCR Rule 350 §§306	EXTERNAL FLOATING ROOF STORAGE TANKS: This vapor loss control device is an uncovered floating roof consisting of either a pontoon type or a doubledeck type roof. It must rest on and be supported by the surface of the liquid contents, be equipped with a continuous primary seal to close the space between the roof eave and tank wall, except as provided in subsection 309.1 and have a continuous secondary seal which is of a design that is in accordance with accepted standards of the petroleum industry. The secondary seal shall meet the following requirements:	Yes	Luke AFB has JP-8 storage tanks with external floating roof tanks and complies with the provisions set forth in this section.
MCAPCR Rule 350 §§306.1	The secondary seal is to be installed above the primary seal so that it completely covers the space between the roof edge or primary seal and the tank wall, except as provided in subsection 306.2 of this rule. Storage tanks constructed after July 13, 1988, shall have a secondary seal that is rimmounted. Except for tanks having metallic shoe primary seals onto which secondary seals were installed prior to July 13, 1988, by October 6, 1993 no person shall operate an external floating roof tank subject to the provisions of this rule unless a secondary seal extends from the roof to the tank shell (a rim-mounted seal) and is not attached to the primary seal.		
MCAPCR Rule 350 §§306.2	The accumulated area of gaps between the tank wall and the secondary seal shall not exceed 1.0 square inch per foot (21.2 cm2 per meter) of tank diameter. Determinations of gap area shall only be made at the point(s) where the gaps exceed 1/8 inch (3 mm). The width of any portion of any gap shall not exceed 1/2 inch (1.27 cm).		

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Fuel Storage Tanks
Applies to Gasoline Storage Tanks

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 350 §§306.3	The owner or operator is exempted from the requirements for secondary seals and the secondary seal gap criteria when performing gap measurements or inspections of the primary seal.		
MCAPCR Rule 350 §§307	INTERNAL FLOATING ROOF TANKS WITH FIXED COVERING: This vapor loss control device is a covered tank with an internal floating roof resting on the contained liquid. This tank and its appurtenances shall meet the applicable requirements as follows:	N/A	Luke AFB does not have any internal floating roof tanks used to store gasoline or organic liquids with a true vapor pressure of 1.5 psia (77.5 mm Hg) or more.
MCAPCR Rule 350 §§307.1	Bulk terminal tanks for which construction, reconstruction or modification commenced after July 23, 1984, must comply with all applicable requirements of the EPA New Source Performance Standard (NSPS), 40 CFR Part 60, Subpart Kb.		
MCAPCR Rule 350 §§307.2	All tanks not subject to subsection 307.1 must comply with one of the following:		
a	Comply with 40 CFR Part 60, Subpart Kb, notwithstanding the type of facility and the date of tank construction, reconstruction or modification; or		
b	Have at least one continuous seal which completely covers the space between the roof edge and tank wall, except as provided in subsection 309.1, and meet at least one of the following requirements:		
1	Have a contact-type roof resting completely on the liquid surface.		
2	Have a liquid mounted seal.		
3	Have two seals, a primary and a secondary.		
MCAPCR Rule 350 §§308	VAPOR COLLECTION/PROCESSING SYSTEM: This vapor loss control device consists of a vapor gathering subsystem capable of collecting the organic vapors and organic gases plus a second subsystem capable of processing such vapors and gases, preventing at least 95 percent by weight of the volatile organic compounds entering it from escaping to the atmosphere.	N/A	All gasoline storage tanks between 250 and 40,000 gal at Luke AFB are equipped with Stage I vapor recovery systems, as required by MCAPCR Rule 350 §§302; therefore, a vapor collection/processing system is not required.
MCAPCR Rule 350 §§308.1	The vapor processing subsystem shall be gas-tight except for the designated exhaust.		
MCAPCR Rule 350 §§308.2	Any tank gauging or sampling device on a tank, vented to such a vapor collection/processing system, shall be equipped with a gas-tight cover which shall be closed at all times except during gauging or sampling procedures.		
MCAPCR Rule 350 §§308.3	All pressure-vacuum valves shall be constructed and maintained in a gas tight condition except when the operating pressure exceeds the valve release setting.		
MCAPCR Rule 350 §§309	ADDITIONAL REQUIREMENTS:	Yes	See responses below.
MCAPCR Rule 350 §§309.1	Prohibition - Floating Roof Openings: Floating roof tanks subject to the provisions of Section 306 or 307 of this rule shall have no visible holes, tears or other openings in the seal or in any seal fabric. The accumulated area of gaps between a tank's wall and primary seal shall not exceed 10 square inches per foot of tank diameter (212 cm2 per meter) and the width of any portion of any gap shall not exceed 1½ inches (3.8 cm). Where applicable, all openings except drains shall be equipped with a cover seal or lid. The cover seal or lid shall be in a closed position at all times, except when the device is in actual use. Automatic bleeder vents shall be closed at all times, except when the roof is floated off or landed on the roof leg supports. Rim vents, if provided, shall be set to open only when the roof is being floated off the roof leg supports or at the manufacturer's recommended setting.	N/A	Luke AFB does not have any floating roof tanks used to store gasoline or organic liquids with a true vapor pressure of 1.5 psia (77.5 mm Hg) or more.
MCAPCR Rule 350 §§309.2	Tanks and all required emission control equipment shall be properly installed, properly maintained and be properly operating.	Yes	All tanks are installed according to manufacturer's specifications.
MCAPCR Rule 350 §§310	EXEMPTIONS:	N/A	See responses below.
MCAPCR Rule 350 §§310.1	A pressure tank maintaining working pressure sufficient at all times to prevent organic vapor or gas loss to the atmosphere is exempt from Sections 301, 302, 303, and 304 of this rule.	N/A	Luke AFB does not have any pressure tanks used to store gasoline or organic liquids with a true vapor pressure of 1.5 psia (77.5 mm Hg) or more.
MCAPCR Rule 350 §§310.2	During the following periods a floating roof is exempt from the requirement that its roof be floating: when the tank is being drained completely and when it is being filled, as long as both processes are accomplished continuously and as rapidly as practicable.	N/A	Luke AFB does not have any floating roof tanks used to store gasoline or organic liquids with a true vapor pressure of 1.5 psia (77.5 mm Hg) or more.
MCAPCR Rule 350 §§310.3	A horizontal filling nozzle at its highest point within a floating roof tank exceeding 2,000,000 gallons (7,580,000 l) capacity may be up to 39.4 inches (1 meter) above the tank bottom if: except when the tank is emptied completely, the nozzle is kept completely submerged, including when the roof rests on its legs.	N/A	Luke AFB does not have any floating roof tanks used to store gasoline or organic liquids with a true vapor pressure of 1.5 psia (77.5 mm Hg) or more.

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Fuel Storage Tanks

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Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 350 §§501	VAPOR PRESSURE RECORDS: A person whose tanks are subject to the provisions of this rule shall keep accurate records of liquids stored in such tanks including either the true or the Reid vapor pressure ranges of each such liquid. The temperature of the contents of each affected tank located at bulk terminals shall be recorded at least weekly and the true vapor pressure of each shall be recorded at least once each month. These records shall be kept a minimum of three years.	Yes	All fuel storage records at Luke AFB are maintained by POL. [Note: Luke AFB is not a bulk terminal, in accordance with MCAPCR Rule 350 §§202.]
	U.S. EPA Requirements		
40 CFR 60, Subpart K	Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978.	N/A	All storage tanks at Luke AFB greater than 40,000 gallons were constructed either prior to 1973 or after 1978, therefore this subpart does not apply.
40 CFR 60, Subpart Ka	Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July 23, 1984.	N/A	All storage tanks at Luke AFB greater than 40,000 gallons were constructed prior to 1978 or after 1984, therefore this subpart does not apply.
40 CFR 60, Subpart Kb	Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984	N/A	Storage tanks at Luke AFB which were constructed, reconstructed, or modified after July 23, 1984 which are used to store JET-A or diesel are not subject to the requirements of 40 CFR 60, Subpart Kb, in accordance with §60.110b(b), as the vapor pressures of JET-A and diesel are less than 3.5 kilopascals (kPa). The storage tank at Luke AFB which was constructed, reconstructed, or modified after July 23, 1984 which is used to store gasoline and which has a capacity greater than or equal to 75 cubic meters (m3) [19,812 gal] (i.e., the gasoline storage tank at Bldg 368) is not subject to the requirements of 40 CFR 60, Subpart Kb, in accordance with §60.110b(d)(6), as it is located at a gasoline service station.
40 CFR 63, Subpart OO	National Emission Standards for Tanks - Level 1	N/A	Luke AFB is not subject to another subpart of 40 CFR parts 60, 61, or 63 which references the use of this subpart for such air emission control.
40 CFR 63, Subpart WW	National Emission Standards for Storage Vessels (Tanks) - Control Level 2	N/A	Luke AFB is not subject to another subpart references the use of this subpart for such air emission control.

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Jet Engine Testing

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
Maricopa County Air Pollution Control Requirements			
There are no regulations promulgated by Maricopa County which are potentially applicable to this source category.			
U.S. EPA Requirements			
40 CFR 63, Subpart PPPPP	National Emission Standard for Hazardous Air Pollutants for Engine Test Cells/Stands	N/A	The facility is not a major source of HAPs, therefore, this regulation does not apply.

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Miscellaneous Chemical Usage

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
Maricopa County Air Pollution Control Requirements			
MCAPCR Rule 330 - Volatile Organic Compounds			
MCAPCR Rule 330 §§301	LIMITATIONS–OPERATIONS INVOLVING HEAT: No person shall discharge more than 15 pounds (6.8 kg) of volatile organic compounds into the atmosphere in any one day from any machine, equipment, device, or other article in which any volatile organic compound or any material containing a volatile organic compound comes into contact with flame or is evaporated at temperatures exceeding 200°F (93.3°C), in the presence of oxygen, unless the entire amount of such discharge has been reduced in accordance with Section 304 of this rule.	N/A	Luke AFB's miscellaneous chemical usage operations do not involve heat.
MCAPCR Rule 330 §§302	LIMITATIONS–NON-COMPLYING SOLVENTS: Excluding emissions subject to Section 301 above, no person shall discharge more than 40 pounds (18 kg) of volatile organic compounds into the atmosphere in any one day from any machine, equipment, device or other article for employing, applying, evaporating or drying any non-complying solvent (as defined in Section 202 of this rule) or material containing such non-complying solvent, unless the entire amount of such discharge has been reduced in accordance with Section 304 of this rule.	N/A	Luke AFB does not use non-complying solvents.
MCAPCR Rule 330 §§303	LIMITATIONS–PROCESS LINES: Emissions of VOCs from any series of machines, equipment, devices or other articles which are designed for processing any item including but not limited to continuous web(s), strip(s), or wire(s) and which use operations described in Sections 301 and/or 302 of this rule shall be collectively subject to the limitations of and compliance with those sections.	N/A	Luke AFB's miscellaneous chemical usage operations do not involve process lines.
MCAPCR Rule 330 §§304	REDUCTIONS REQUIRED: Emission to the atmosphere of volatile organic compounds requiring control pursuant to Section 301 or 302 of this rule shall be reduced by at least one of the following methods:	N/A	Controls are not required. See responses above.
MCAPCR Rule 330 §§304.1	Incineration, provided that 90 percent or more of the carbon in the volatile organic compounds entering the incineration device is oxidized to carbon dioxide and overall control efficiency (capture plus processing) is at least 85 percent by weight; or		
MCAPCR Rule 330 §§304.2	Adsorption, provided that overall control efficiency (capture plus processing) is at least 85 percent by weight; or		
MCAPCR Rule 330 §§304.3	Using low VOC material containing no more than 20 percent VOC by volume (as determined by the applicable test method(s) and excluding non-precursor organic compounds and water), provided that no VOC from the material comes into contact with flame; or		
MCAPCR Rule 330 §§304.4	Processing in a manner not less effective than in subsection 304.1 or 304.2 of this rule and verified by test methods of this rule.		
MCAPCR Rule 330 §§304.5	The owner or operator using an emissions control device to reduce emissions in accordance with this section shall provide the Control Officer with an Operation and Maintenance (O&M) Plan. This plan shall specify key system operating parameters, such as temperatures, pressures and/or flow rates, necessary to determine compliance with this rule and describe in detail procedures to maintain the approved emission control system. The Control Officer's written approval of this plan shall be required for compliance with this rule to be achieved.		
MCAPCR Rule 330 §§305	EQUIPMENT CLEANUP: A person shall not use any liquid materials containing more than 10 percent volatile organic compounds for the cleanup of equipment unless:	Yes	Luke AFB collects all solvents and stores them in closed containers pursuant to this seciton.
MCAPCR Rule 330 §§305.1	The used cleaning liquids are collected in a container which is closed when not in use and is disposed of in a manner such that volatile organic compounds are not emitted into the atmosphere, or		
MCAPCR Rule 330 §§305.2	The equipment is disassembled and cleaned in a solvent vat which is closed when not in use, or cleaning is done by other methods, approved in writing by the Control Officer, which limit evaporation.		

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Miscellaneous Chemical Usage

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 330 §§306	VOC CONTAINMENT AND DISPOSAL: No person shall store, discard, or dispose of VOC or VOC-containing material in a way intended to cause or to allow the evaporation of VOC to the atmosphere. Reasonable measures shall be taken to prevent such evaporation which include but are not limited to the following:	Yes	VOC-containing material and all materials from which VOC can evaporate are stored in designated areas when not in use, are collected in designated HAZMAT containers, and disposed of accordingly.
MCAPCR Rule 330 §§306.1	All materials from which VOC can evaporate, including fresh solvent, waste solvent and solvent-soaked rags and residues, shall be stored in closed containers when not in use; and		
MCAPCR Rule 330 §§306.2	Such containers one gallon and larger shall be legibly labeled with their contents; and		
MCAPCR Rule 330 §§306.3	Records of the disposal/recovery of such materials shall be kept. Records of hazardous waste disposal shall be kept in accordance with hazardous waste disposal statutes.		
MCAPCR Rule 330 §§307	EXEMPTIONS: The provisions of this rule shall not apply to:	Yes	See responses below.
MCAPCR Rule 330 §§307.1	Organic solvent manufacturing facilities and the overland transport of organic solvents and materials containing VOC.	N/A	Luke AFB is not an organic solvent manufacturing facility and does not overland transport organic solvents and materials.
MCAPCR Rule 330 §§307.2	The use of equipment, materials, and/or substances which meet applicable requirements and standards specified by other rules of Regulation III.	Yes	The standards in MCAPCR Rule 330 will not be applied to other operations which are addressed in the other sections of this regulatory analysis (e.g., for surface coating).
MCAPCR Rule 330 §§307.3	The spraying or other employment of insecticides, pesticides or herbicides.	Yes	Luke AFB's use of insecticides, pesticides or herbicides are not considered in this regulatory analysis.
MCAPCR Rule 330 §§307.4	Foundries; smelters; melting or roasting of metal, ore, or dross; all operations included under Standard Industrial Classification codes 3312, 3313, 332, 333, 334, 336, and 3398; and all on-site mold making activities at such operations and industries.	N/A	Luke AFB is not one of the operations listed in MCAPCR Rule 330 §§307.4.
MCAPCR Rule 330 §§501	PROVIDING AND MAINTAINING MONITORING DEVICES: Any person incinerating, adsorbing, or otherwise processing organic materials pursuant to this rule shall provide, properly install and maintain in calibration, in good working order and in operation, devices specified in the Operation and Maintenance Plan as well as in either the Permit to Operate or the Installation Permit for indicating temperatures, pressures, rates of flow, or other operating conditions necessary to determine if air pollution control equipment is functioning properly and is properly maintained.	N/A	Luke AFB does not process organic materials.
MCAPCR Rule 330 §§502	DETERMINATION OF COMPLIANCE: Determination of the organic solvent content and composition of a solvent or material shall be made as of the time that the solvent or material is in its final form for application or employment, notwithstanding any prior blending, reducing, thinning or other preparation for application or employment. Emissions resulting from air or heat drying of products for the first 12 hours after the removal from any machine, equipment, device or other article shall be included in determining compliance with this rule.	Yes	Organic solvent content and composition is taken from the material Safety Data Sheet.
MCAPCR Rule 330 §§503	RECORDKEEPING AND REPORTING: Any person subject to this rule shall comply with the following requirements. Records shall be retained for five years and shall be made available to the Control Officer upon request.	Yes	Records are maintained as required per MCAPCR Rule 330 §§503.
MCAPCR Rule 330 §§503.1	Current List: Maintain a current list of coatings, adhesives, makeup solvents, and any other VOC-containing materials; state the VOC content of each in pounds per gallon or grams per liter. VOC content shall be expressed less water and non-precursor compounds for materials which are not used for cleaning or cleanup.	Yes	Luke AFB uses the Environmental Management Information System (EMIS); a comprehensive database tracking system for all material authorization and issues.
MCAPCR Rule 330 §§503.2	Monthly Usage Records: Maintain monthly records of the amount of each coating; adhesive; makeup solvent; solvent used for surface preparation, for cleanup, and for the removal of materials; and any other VOC-containing material used. Identify any materials subject to the emission limits in Section 301 or Section 302 and keep separate totals for these materials.	Yes	All records are maintained in EMIS.
MCAPCR Rule 330 §§503.3	Operation and Maintenance: Maintain a continuous record of the times an approved emission control device is used to comply with this rule. Maintain daily records of the O&M Plan's key system operating parameters. Account for any periods of operation when the control device was not operating. Maintain records of all maintenance performed according to the O&M Plan.	N/A	An emission control device is not used for compliance with MCAPCR Rule 330.

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MCAPCR Rule 330 §§503.4	Discarded Materials: Maintain records of the type, amount, and method of disposing of VOC-containing materials on each day of disposal.	Yes	All materials are assumed to be 100% consumed. Materials are disposed of in accordance with applicable HAZMAT requirements.
Other MCAPCR Rules			
MCAPCR Rule 342	Coating Wood Furniture and Fixtures	N/A	Luke AFB does not fall under Standard Industrial Classification (SIC) numbers 2434, 2511, 2512, 2517, 2519, 2521, 2531, 2541, 2599, or 2515, and does not coat wood furniture or fixtures on a routine basis.
MCAPCR Rule 346	Coating Wood Millwork	N/A	Luke AFB does not construct, repair, or otherwise work with wood millwork.
U.S. EPA Requirements			
40 CFR 63, Subpart HHHHHH	National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources	N/A	The facility is owned and operated by the Armed Forces of the United States, therefore, this regulation does not apply.

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Solvent Cleaning Equipment (Degreasers)

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
Maricopa County Air Pollution Control Requirements			
MCAPCR Rule 331 - Solvent Cleaning			
MCAPCR Rule 331 §§301	SOLVENT HANDLING REQUIREMENTS: Any person to whom this rule applies must comply with all of the following:	Yes	See responses below.
MCAPCR Rule 331 §§301.1	All cleaning-solvent, including solvent soaked materials, shall be kept in closed, leak free, impervious containers that are opened only when adding or removing material.	Yes	All degreasing and parts washing units are equipped with lids, which are closed when the units are not in use. Equipment is serviced by an outside contractor to minimize emissions.
a	Porous or absorbent materials used for wipe cleaning shall be stored in closed containers when not in use.		
b	Each container shall be clearly labeled with its contents.		
MCAPCR Rule 331 §§301.2	If any cleaning-solvent escapes from a container:	Yes	Any spills are cleaned immediately or as soon as reasonably possible.
a	Wipe up or otherwise remove immediately if in accessible areas.		
b	For areas where access is not feasible during normal production, remove as soon as reasonably possible.		
MCAPCR Rule 331 §§301.3	Unless records show that VOC-containing cleaning material was sent offsite for legal disposal, it will be assumed that it evaporated on site.	Yes	Logs of solvent added to the equipment are maintained by companies servicing the equipment.
MCAPCR Rule 331 §§302	EQUIPMENT REQUIREMENTS FOR ALL CLEANING MACHINES: Any person operating a cleaning machine to which this rule applies must comply with all of the following:	Yes	See responses below.
MCAPCR Rule 331 §§302.1	Provide a leak free, impervious container (degreaser) for the solvents and the articles being cleaned.	Yes	All degreasing and parts washing units are equipped with lids, which are closed when the units are not in use. Equipment is serviced by an outside contractor to minimize emissions.
a	The VOC-containment portion shall be impervious to VOC-containing liquid and vapors.		
b	No surface of any freeboard required by this rule shall have an opening or duct through which VOC can escape to the atmosphere, except as controlled by an ECS, or as required by OSHA.		
MCAPCR Rule 331 §§302.2	Properly maintain and operate all cleaning machine equipment required by this rule and any of its emission controls required by this rule.	Yes	All degreasing and parts washing units are equipped with lids, which are closed when the units are not in use. Equipment is serviced by an outside contractor to minimize emissions.
MCAPCR Rule 331 §§303	SPECIFIC OPERATING & SIGNAGE REQUIREMENTS FOR CLEANING MACHINES: Any person who cleans with cleaning-solvent other than a Low-VOC Cleaner must conform to all of the following operating requirements:	Yes	See responses below.
MCAPCR Rule 331 §§303.1	Operating Requirements:	Yes	See responses below.
a	Fans: Do not locate nor position comfort fans in such a way as to direct airflow across the opening of any cleaning machine.	Yes	Comfort fans are not in use in the shops which utilize the degreasers or if present are not used while degreasers are in use.
b	Cover: Do not remove any device designed to cover the solvent unless processing work in the cleaning machine or maintaining the machine.	Yes	All degreasing and parts washing units are equipped with lids, which are closed when the units are not in use.
c	Draining: Drain cleaned parts for at least 15 seconds after cleaning or until dripping ceases, whichever is later.	Yes	Parts are left in the degreasing units at least 15 seconds or until dripping ceases.
d	Spraying: If using a cleaning-solvent spray system,	Yes	All spray streams will be a solid stream, otherwise the degreaser will be shutdown for repair.
1	Use only a continuous, undivided stream (not a fine, atomized, or shower type spray).		
2	Pressure at the orifice from which the solvent emerges shall not exceed 10 psig and shall not cause liquid solvent to splash outside of the solvent container.		
3	In an in-line cleaning machine, a shower-type spray is allowed, provided that the spraying is conducted in a totally confined space that is separated from the environment.		
4	Exceptions to foregoing Sections 303.1d(1), (2), and (3) are provided for in Section 307 of this rule.		
e	Agitation: No person shall cause agitation of a cleaning-solvent in a cleaning machine by sparging with air or other gas. Covers shall be placed over ultrasonic cleaners when the cleaning cycle exceeds 15 seconds.	N/A	Sparging with air or other gas is not performed at Luke AFB. Ultrasonic cleaners are not used at Luke AFB.

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f	No Porous Material:	Yes	Porous or other absorbent materials are not used to clean parts or products in a cleaning machine.
1	Do not clean nor use porous or absorbent materials to clean parts or products in a cleaning machine. For the purpose of this rule, porous or absorbent materials include, but are not limited to, cloth, leather, wood, and rope.		
2	Do not place an object with a sealed wood handle, including a brush, in or on a cleaning machine.		
3	Do not place porous or absorbent materials, including, but not limited to, cloth, leather, wood, and rope on a cleaning machine.		
g	Vent Rates: The ventilation rate at the cleaning machine shall not exceed 65 cfm per square foot of evaporative surface (20 m^3 /min./m^2), unless that rate must be changed to meet a standard specified and certified by a Certified Safety Professional, a Certified Industrial Hygienist, or a licensed professional engineer experienced in ventilation, to meet health and safety requirements.	Yes	All cleaning machines at Luke AFB are designed to applicable meet health and safety requirements.
h	Hoist Speed: Limit the vertical speed of mechanical hoists moving parts in and out of the cleaning machine to a maximum of 2.2 inches per second and 11 ft/min. (3.3 m/min.).	N/A	Mechanical hoists are not used to move parts in and out of the cleaning machine.
i	Contamination Prevention: Prevent cross contamination of solvents regulated by Section 304 of this rule with solvents that are not so regulated. Use signs, separated work-areas, or other effective means for this purpose. This includes those spray gun cleaning solvents that are regulated by another rule of these rules.	Yes	Solvent cleaning units (degreasers) are designated use only.
j	Filtration Devices: If a filtration device (e.g., to remove oils, greases, sludge, and fine carbon from cleaning solvent) is inherent in the design of the cleaning machine, then such filtration device shall be operated in accordance with manufacturer's specifications and in accordance with the following requirements:	Yes	Equipment is maintained in accordance with manufacturer's specifications by an outside contractor.
1	The filtration device shall be fully submerged in cleaning solvent at all times during filtration.		
2	When the filtration device is completely saturated and must be removed from the cleaning machine, the filtration device shall be drained until no liquid can flow from the filtration device. Draining and drying such filtration device shall be conducted in a sealed container with no exhaust to the atmosphere or work area.		
3	After the filtration device is dry, the filtration device shall be stored in a closed, leak free, impervious container that is legibly labeled with its contents and that remains covered when not in use. Disposal of the filtration device shall be done in a manner that inhibits VOC evaporation and that is in compliance with appropriate/legal methods of disposal.		
MCAPCR Rule 331 §§303.2	Signage Requirements: Any person who uses cleaning-solvent, other than Low-VOC Cleaner, in any solvent cleaning machine (degreaser) or dip tank shall provide on the machine, or within 3¼ feet (1 meter) of the machine, a permanent, conspicuous label or placard which includes, at a minimum, each of the following applicable instructions, or its equivalent:	Yes	Sings indicating the requirements of MCAPCR Rule 331 §§303.2 are placed on the machines or within $3^1/_4$ feet (1 meter) of the machine, in accordance with MCAPCR Rule 331 §§303.2.
a	"Keep cover closed when parts are not being handled." (This is not required for remote reservoir cleaners.)		
b	"Drain parts until they can be removed without dripping."		
c	"Do not blow off parts before they have stopped dripping."		
d	"Wipe up spills and drips as soon as possible; store used spill rags [or 'wiping material'] in covered container."		
e	"Don't leave cloth or any absorbent materials in or on this tank."		
f	For cleaning machines with moving parts such as hoists, pumps, or conveyors, post: "Operating instructions can be obtained from _____," listing a person or place where the instructions are available.		
MCAPCR Rule 331 §§304	SOLVENT SPECIFICATIONS FOR NON-VAPOR CLEANING AND DEGREASING: [Operating requirements specifically for vapor cleaning machines are in the Appendix.] All cleaning solvents, except Low-VOC Cleaners, used in non- boiling cleaning machines shall comply with Section 304.1 or Section 304.2 or Section 304.3, as follows:	Yes	See responses below.
MCAPCR Rule 331 §§304.1	Use a cleaning-solvent having a total VOC vapor pressure at 68°F (20°C) not exceeding 1 millimeter of mercury column, as determined by the standards described in Section 500 of this rule.	N/A	Solvent cleaning units at Luke AFB comply with MCAPCR Rule 331 §§304.3.
MCAPCR Rule 331 §§304.2	ECS: Use an ECS to capture and process VOC emissions in accordance with Section IV of the Appendix within this rule; or	N/A	Solvent cleaning units at Luke AFB comply with MCAPCR Rule 331 §§304.3.
MCAPCR Rule 331 §§304.3	Sealed System: Use a Sealed System that is an Air-tight or Airless Cleaning System which is operated according to the manufacturer's specifications and, unless otherwise indicated by the manufacturer, meets all of the following requirements:	Yes	All degreasing units are sealed systems that are air-tight or airless. Lids are closed when the units are not in service.
a	Has a door or other pressure-sealing apparatus that is shut during each cleaning and drying cycle; and		

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b	Has a differential pressure gauge that always indicates the pressure in the sealed chamber when occupied or in active use; and		
c	Any associated pressure relief device(s) shall be so designed and operated as to prevent liquid cleaning-solvents from draining out.		
MCAPCR Rule 331 §§305	NON-VAPOR BATCH CLEANING MACHINES: Equipment requirements for non-vapor batch cleaning machines with remote reservoirs are set forth in Section 305.1 of this rule. Equipment standards applicable to non-vapor batch cleaning machines with internal reservoirs (non-remote) are set forth in Section 305.2 of this rule. Non-vapor batch cleaning machines with either remote or internal reservoirs that use cleaning-solvents that are either heated, agitated or non-conforming are subject to additional provisions set forth in Section 305.3 of this rule. Low-VOC Cleaners are exempt from this section.	Yes	See responses below.
MCAPCR Rule 331 §§305.1	With Remote Reservoir: A batch cleaning machine with remote reservoir, including cabinet type(s), shall be equipped with the following:	Yes	All remote reservoir solvent cleaning machines are designed such that the solvent drains from the part and is collected and recycled through the sump, allowing no solvent to pool in the work or cleaning area.
a	A sink-like work area or basin which is sloped sufficiently towards the drain so as to prevent pooling of cleaning-solvent.		
b	A single, unimpeded drain opening or cluster of openings served by a single drain for the cleaning-solvent to flow from the sink into the enclosed reservoir. Such opening(s) shall be contained within a contiguous area not larger than 15.5 square inches (100 cm^2).		
c	Solvent Return: Provide a means for drainage of cleaned parts such that the drained solvent is returned to the cleaning machine.		
MCAPCR Rule 331 §§305.2	With Internal Reservoir (Non-Remote): A batch cleaning machine without a remote reservoir shall be equipped with all of the following:	Yes	All internal reservoir solvent cleaning machines are designed with an internal drainage rack or other assembly which drains from the part and returns solvent to the hold of the cleaning machine. All degreasing units are sealed systems that are air-tight or airless. Lids are closed when the units are not in service. ECSs are not used.
a	Have and use an internal drainage rack or other assembly that confines within the freeboard all cleaning-solvent dripping from parts and returns it to the hold of the cleaning machine (degreaser); and		
b	Have an impervious cover which when closed prevents cleaning-solvent vapors in the cleaning machine from escaping into the air/atmosphere when not processing work in the cleaning machine.		
1	A cover shall be fitted so that in its closed position the cover is between the cleaning-solvent and any lip exhaust or other safety vent, except that such position of cover and venting may be altered by an operator for valid concerns of flammability established in writing and certified to by a Certified Safety Professional or a Certified Industrial Hygienist to meet health and safety requirements.		
2	A cover is not required when an ECS is used in accordance with Section IV of the Appendix within this rule.		
c	In the absence of additional applicable freeboard standards, freeboard height shall be not less than 6 inches (15.2 cm); and		
d	The freeboard zone shall have a permanent, conspicuous mark that locates the maximum allowable solvent level which conforms to the applicable freeboard requirements.		
MCAPCR Rule 331 §§305.3	Using Cleaning-Solvent that is Heated, Agitated, or is Non- Conforming: If a cleaning machine uses a cleaning-solvent at a temperature above 120°F (49°C), uses non-conforming solvent if allowed by Section 305.3(d) of this rule, or agitates the solvent, then comply with one of the following:	Yes	See responses below.
a	Remote Reservoir Cleaning Machines: For a remote reservoir cleaning machine, comply with Section 305.1 of this rule and one of the following:	Yes	Lids are closed when the units are not in service.
1	Use a stopper in the drain whenever the sink or cabinet is empty of solvent and nothing is being handled in the sink; or		
2	Cover the sink or cabinet whenever the sink or cabinet is empty of solvent and nothing is being handled in the sink.		

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b	Internal Reservoir Cleaning Machines: For an internal reservoir cleaning machine, comply with Section 305.2 of this rule and either Section (1) or (2) that follow:	Yes	All internal reservoir cleaning machines use a freeboard and cover in accordance with MCAPCR Rule 331 §§305.3(b)(2). Luke AFB does not use non-conforming solvents.
1	A Water Cover: A floating layer of water (insoluble in the solvent) at least 1 inch thick, and a freeboard at least 6 inches above the top of the solvent shall be present; or		
2	Freeboard and Cover:		
a	The basin shall have a freeboard ratio of 0.75 or greater and an impervious cover shall cover the basin whenever work is not being processed; and		
b	If a non-conforming solvent is used, the cover shall be of a sliding or rolling type which is designed to easily open and close in a horizontal plane without disturbing the vapor zone.		
c	Cabinet Style: Keep a cabinet-style cleaning machine closed at all times that it contains cleaning-solvent, except when introducing or removing work from the machine. If blasting or misting with cleaning-solvent, also conform to the applicable requirements of Section 307 of this rule.	Yes	Lids are closed when the units are not in service. Luke AFB does not blast/mist with solvent.
d	Non-Conforming Solvent: A non-conforming solvent may be used in operations to which this rule applies, if at least one of the following is met:	N/A	Luke AFB does not use non-conforming solvents.
1	The emissions from the operation shall be controlled by an ECS per Section 304.2 of this rule or by a Sealed System per Section 304.3 of this rule; or		
2	The operation is exempted per Section 308.2 of this rule; or		
3	The operation is both exempted per Section 308.3 of this rule and complies with Section 305.3 of this rule, or for in-line machines, complies with all of Section 306 of this rule except Section 306.4 of this rule.		
MCAPCR Rule 331 §§305.4	ECS Alternative: An owner and/or operator is allowed to meet the requirements of any one or combination of the requirements of Sections 305.1, 305.2 and/or 305.3 of this rule by operating an ECS in accordance with Section IV of the Appendix within this rule whenever any requirement of Sections 305.1, 305.2 and/or 305.3 of this rule is not met.	N/A	Luke AFB meets the requirements of Sections 305.1 and 305.2 without the use of an ECS.
MCAPCR Rule 331 §§306	NON-VAPOR IN-LINE CLEANING MACHINES: No person shall operate a non-vapor in-line cleaning machine using cleaning-solvent unless it complies with Sections 306.1, 306.2, and 306.3 of this rule:	N/A	Luke AFB does not use in-line cleaning machines.
MCAPCR Rule 331 §§306.1	Features:		
a	Carry-Out Prevention: Equip the cleaning machine with either a drying tunnel or another means, such as a rotating basket, sufficient to prevent cleaned parts from carrying out cleaning-solvent liquid or vapor.		
b	Enclosed Design: An in-line cleaning machine shall be fully enclosed except for entrance and exit portals.		
c	Cover: During shutdown hours or if the cleaning machine is idle for more than 30 minutes, a cover shall be used to close the entrance and exit and any opening greater than 16 square inches (104 cm^2).		
MCAPCR Rule 331 §§306.2	Minimized Openings: Entrances and exits should silhouette workloads so that the average clearance between parts and the edge of the cleaning machine opening is either less than four inches (10 cm), or less than 10% of the width of the opening.		
MCAPCR Rule 331 §§306.3	The machine shall have a freeboard ratio greater than or equal to 0.75.		
MCAPCR Rule 331 §§306.4	ECS Alternative: An owner and/or operator is allowed to meet the requirements of any one or combination of Sections 306.1(b), 306.1(c), 306.2, and/or 306.3 of this rule by operating an ECS that controls VOC vapor from processes addressed by the requirement(s). Such ECS shall be operated in accordance with Section IV of the Appendix within this rule.		

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Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 331 §§307	SPECIAL NON-VAPOR CLEANING SITUATIONS:	Yes	See responses below.
MCAPCR Rule 331 §§307.1	Blasting/Misting with Conforming Solvent: Any person blasting or misting with conforming solvent shall operate and equip the device(s) as follows:	Yes	All solvent degreasing units at Luke AFB are designed so as to prevent any perceptible liquid from emerging from the device, and are operated such that there is no perceptible leakage from the device except for incidental drops from drained, removed parts.
a	Equipment: The device shall have internal drainage, a reservoir or sump, and a completely enclosed cleaning chamber, designed so as to prevent any perceptible liquid from emerging from the device; and		
b	Operation: The device shall be operated such that there is no perceptible leakage from the device except for incidental drops from drained, removed parts.		
MCAPCR Rule 331 §§307.2	Blasting/Misting with Non-Conforming Solvent: Any person shall use a Sealed System pursuant to Section 304.3 of this rule for all blasting or misting with a non-conforming solvent.	N/A	Luke AFB does not blast/mist with non-conforming solvent.
MCAPCR Rule 331 §§307.3	High Pressure Flushing: Cleaning systems using cleaning-solvent that emerges from an object undergoing flushing with a visible mist or at a pressure exceeding 10 psig, shall comply as follows:	N/A	Equipment used for degreasing does not have a high pressure flushing operation.
a	Conforming Solvent: For conforming solvent, use a containment system that is designed to prevent any perceptible cleaning-solvent liquid from becoming airborne outside the containment system, such as a completely enclosed chamber.		
b	Non-Conforming Solvent: Use a Sealed System for non-conforming solvent.		
MCAPCR Rule 331 §§307.4	ECS Alternative: An owner and/or operator is allowed to meet the requirement(s) of Section 307.1 and/or Section 307.2 of this rule by operating an ECS that controls VOC vapor from processes addressed by the requirement(s). The ECS shall be operated pursuant to Section IV of the Appendix within this rule.	N/A	Luke AFB is not subject to the requirements of MCAPCR Rule 331 §§307.1 or §§307.2 (see responses above).
MCAPCR Rule 331 §§308.1	Categorical Exemptions:	Yes	See responses below.
a	Industries and cleaning operations that are not regulated by this rule include, but are not limited to, the following EPA approved versions of the VOC rules in Regulation III of these rules:	Yes	See responses below.
1	Dry cleaning with petroleum solvents (Rule 333);	NA	Luke AFB does not have these activities.
2	Printing and graphic arts coating (Rule 337);		
3	Semiconductor manufacturing (Rule 338);		
4	Automotive windshield washer fluid (Rule 344); and		
5	Architectural Coating (Rule 335).	Yes	See regulatory review for Miscellaneous Chemical Usage.
b	All operations regulated by the following NESHAPs are exempt from Rule 331:	NA	Luke AFB is not subject to the requirements of these NESHAPs.
1	National Emission Standards for Halogenated Solvent Cleaning (40 CFR 63, subpart T). This includes the de minimis amounts of solvent VOCs that are exempted by subpart T.		
2	National Emission Standards for Perchloroethylene for Dry Cleaning Facilities, (40 CFR 63, subpart M).		
c	Exemptions for Qualified Operations:		
1	Cleanup of Coating-Application Equipment: Operations involving the cleanup of coating-application equipment that are subject to or specifically exempted by an EPA approved version of another rule in Regulation III of these rules are exempt from Rule 331. Examples include Rule 336 (Surface Coating Operations), Rule 342 (Coating Wood Furniture and Fixtures), and Rule 346 (Coating Wood Millwork).	Yes	See regulatory review for Surface Coating and Miscellaneous Chemical Usage.
2	Aerospace: Wipe cleaning of aerospace components is subject to Rule 348 of these rules, whereas the cleaning of aerospace components in a dip tank or a cleaning machine is subject to Rule 331.		
MCAPCR Rule 331 §§308.2	Partial Exemption from Section 300: The following are exempt from sections of Section 300 of this rule as noted:	Yes	See responses below.
a	Wipe Cleaning: The provisions of Sections 302 through 307 of this rule do not apply to wipe cleaning. Recordkeeping provisions in Section 500 of this rule do apply to wipe cleaning.	Yes	Wipe cleaning at Luke AFB will following the requirements of MCAPCR Rule 331 §§301, but not of MCAPCR Rule 331 §§302-307 or Section 500.

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Solvent Cleaning Equipment (Degreasers)

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
b	Small Cleaners: The provisions of Sections 303 through 307 of this rule shall not apply to any non-vapor cleaning machine (degreaser) or diptank fitting either of the following descriptions, except that these shall be covered when work is not being processed:	Yes	Non-vapor cleaning machines and diptanks at Luke AFB will following the requirements of MCAPCR Rule 331 §§301 and 302, but not of MCAPCR Rule 331 §§303-307.
1	A small cleaner having a liquid surface area of 1 square foot (0.09 square meters) or less, or		
2	A small cleaner having a maximum capacity of one gallon (3.79 liters) or less.		
MCAPCR Rule 331 §§308.3	Exemptions from Section 304: The U.S. Government Printing Office "Standard Industrial Classification Manual, 1987" (and no future editions) is incorporated by reference and is on file at the Maricopa County Air Quality Department, 1001 N. Central Ave., Phoenix, Arizona 85004. The following are exempt from Section 304 of this rule:	N/A	Luke AFB does not have these activities.
a	Non-furniture medical devices included in Standard Industrial Classification (SIC) codes 3841, 3843, 3844, or 3845, and products for internal use in 3842;		
b	Electronic products for space vehicles and communications equipment in SIC codes 3661, 3663, 3669, 3677, 3678, 3679, and 3769; and		
c	Production processes having clean-room standards equal to or more stringent than class 100,000 (particles/m^3); and		
d	Low viscosity solvent used to clean an aerospace component if the Federal Aviation Authority, the US Department of Defense, or a US Military specification designates that the cleanliness of the component is critical to the flight safety of a complete aerospace vehicle. By January 1, 2001, any such solvents shall be listed in a Maricopa County air pollution permit, conditioned upon a sufficient demonstration by the user that no compliant substitute exists.	Yes	Luke AFB will provide necessary information sould a solvent be needed to be used through thiis exemption.
MCAPCR Rule 331 §§308.4	Comfort Fans: The Section 303.1(a) prohibition against fans and fan-drafts being close to cleaning machines does not apply to a totally enclosed cleaning machine that cannot be penetrated by drafts.	Yes	Comfort fans are not in use in the shops which utilize the degreasers or if present are not used while degreasers are in use.
MCAPCR Rule 331 §§308.5	Vehicle Refinishing: Dip cleaning of vehicle or mobile equipment surfaces is subject to this rule.	Yes	See responses below.
MCAPCR Rule 331 §§308.6	Aerosol cans, squirt bottles, and other solvent containers intended for handheld use shall meet the requirements in Sections 301 and 500 of this rule.	Yes	Luke AFB will comply with the requirements in Sections 301 and 500 of this rule for aerosol cans, squirt bottles, and other solvent containers intended for handheld use.
MCAPCR Rule 331 §§308.7	A Low-VOC Cleaner is subject only to Sections 301, 302, 307.1, 501.1(a), and 501.2 of this rule.	Yes	Luke AFB will comply with Sections 301, 302, 307.1, 501.1(a), and 501.2 of this rule for low-VOC cleaners.

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Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 331 §§309	REQUIREMENTS FOR AIR POLLUTION CONTROL EQUIPMENT AND ECS MONITORING EQUIPMENT: For the purpose of this rule, an ECS shall be approved in writing by the Control Officer and shall be designed and operated in accordance with good engineering practices.	N/A	Luke AFB is not required to use an ECS.
MCAPCR Rule 331 §§309.1	Operation and Maintenance (O&M) Plan Required for ECS:		
a	General Requirements: An owner and/or operator shall provide and maintain (an) O&M Plan(s) for any ECS, any other emission processing equipment, and any ECS monitoring devices that are used pursuant to this rule or pursuant to an air pollution control permit. An owner and/or operator shall comply with all the identified actions and schedules provided in each O&M Plan.		
b	Approval by Control Officer of Initial O&M Plan(s): An owner and/or operator shall submit to the Control Officer for written approval the O&M Plan(s) of each ECS and each ECS monitoring device that is used pursuant to this rule. While the Control Officer is reviewing for approval the O&M Plan(s), an owner and/or operator shall comply with all the identified actions and schedules provided in each O&M Plan submitted for approval, unless notified otherwise by the Control Officer. After the Control Officer has issued written approval of the O&M Plan(s), an owner and/or operator shall continue to comply with all the identified actions and schedules provided in each O&M Plan.		
c	Owner and/or Operator Revisions to Initial O&M Plan(s): If an owner and/or operator submits to the Control Officer revisions to the initial O&M Plan(s) and if such revisions have been approved in writing by the Control Officer, an owner and/or operator shall comply with the revisions to the initial O&M Plan(s).		
d	Control Officer Modifications to Initial O&M Plan(s): After discussion with the owner and/or operator, the Control Officer may modify the O&M Plan(s) in writing prior to approval of the initial O&M Plan(s). An owner and/or operator shall then comply with the O&M Plan(s) that has been modified by the Control Officer.		
MCAPCR Rule 331 §§309.2	Providing and Maintaining ECS Monitoring Devices: An owner and/or operator incinerating, adsorbing, or otherwise processing VOC emissions pursuant to this rule shall provide, properly install and maintain in calibration, in good working order and in operation, devices described in the facility's O&M Plan that indicate temperatures, pressures, rates of flow, or other operating conditions necessary to determine if air pollution control equipment is functioning properly and is properly maintained.		
MCAPCR Rule 331 §§501	RECORDKEEPING AND REPORTING: Any person subject to this rule shall comply with the following requirements. Records shall be retained for five years and shall be made available to the Control Officer upon request.	Yes	See response below.

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Solvent Cleaning Equipment (Degreasers)

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 331 §§501.1	Current List:	Yes	Luke AFB uses the Environmental Management Information System (EMIS); a comprehensive database tracking system for all material authorization and issues. Organic solvent content and composition is taken from the material Safety Data Sheet.
a	Maintain a current list of cleaning-solvents; state the VOC-content of each in pounds VOC per gallon of material or grams per liter of material.		
b	A facility using any cleaning-solvent subject to the vapor-pressure limits of Section 304.1 of this rule shall have on site the written value of the total VOC vapor-pressure of each such solvent, in one of the following forms:		
1	A manufacturer's technical data sheet,		
2	A manufacturer's safety data sheet (MSDS), or		
3	Actual test results.		
MCAPCR Rule 331 §§501.2	Usage Records:		
a	Monthly: Records of the amount of cleaning-solvent used shall be updated by the end of month for the previous month. Show the type and amount of each make-up and all other cleaning-solvent to which this rule is applicable.		
b	Annually:		
1	Certain Concentrates: Use of concentrate that is used only in the formulation of Low VOC Cleaner shall be updated at least annually.		
2	Low-VOC Cleaner: An owner and/or operator need not keep a record of a cleaning substance that is made by diluting a concentrate with water or non-precursor compound(s) to a level that qualifies as a Low VOC Cleaner if records of the concentrate usage are kept in accordance with this rule.		
c	Grouping by VOC Content: For purposes of recording usage, an operator may give cleaning-solvents of similar VOC content a single group-name, distinct from any product names in the group. The total usage of all the products in that group is then recorded under just one name. (In such a case, the operator must also keep a separate list that identifies the product names of the particular solvents included under the group name). To the group name shall be assigned the highest VOC content among the members of that group, rounded to the nearest 10th of a pound of VOC per gallon of material, or to the nearest gram VOC per liter of material.		
	U.S. EPA Requirements		
40 CFR 63, Subpart M	National Perchloroethylene Air Emission Standards for Dry Cleaning Facilities	N/A	Luke AFB does not utilize solvent cleaning for a dry cleaning facility; therefore, this regulation is not applicable.
40 CFR 63, Subpart T	National Emission Standards for Halogenated Solvent Cleaning	N/A	Luke AFB does not use halogenated HAP solvents; therefore, this regulation is not applicable.

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Stationary Internal Combustion Engines

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
Maricopa County Air Pollution Control Requirements			
MCAPCR Rule 324 - Stationary Internal Combustion (IC) Engines			
MCAPCR Rule 324 §§301	LIMITATIONS FOR NEW AND EXISTING STATIONARY IC ENGINES: An owner or operator of any engine that meets the criteria listed in Section 102 shall comply with either of the following:	Yes	See responses below.
MCAPCR Rule 324 §§301.1	Use any fuel that contains no more than 0.05% sulfur by weight, alone or in combination with other fuels.	Yes	The engines at Luke AFB combust diesel fuel containing no more than 0.05% sulfur by weight.
MCAPCR Rule 324 §§301.2	Use any waste derived fuel gas that contains no more than 0.08% sulfur by weight, alone or in combination with other fuels.	N/A	The engines at Luke AFB do not combust waste derived fuel gas.
MCAPCR Rule 324 §§302	GOOD COMBUSTION PRACTICES / TUNING PROCEDURE: An owner or operator shall conduct preventative maintenance or tuning procedures recommended by the engine manufacturer to ensure good combustion practices to minimize NOx emissions. A handheld monitor may be used if so desired by the owner or operator for measurement of NOx, CO, and concentrations in the effluent stream after each adjustment is made. This may assist in determining that the proper adjustment has been made to ensure NOx and CO minimization. In lieu of a manufacturer's procedure, a different procedure specified by any other maintenance guideline may be used as a default procedure. The tuning procedure shall include all of the following, if so equipped, and appropriate to the type of engine:	Yes	Luke AFB operates and maintains all internal combustion engines to meet the requirements for good combustion practices.
MCAPCR Rule 324 §§302.1	Lubricating Oil and Filter: change once every three months or after no more than 300 hours of operation, whichever occurs last.		
MCAPCR Rule 324 §§302.2	Inlet Air Filter: clean once every three months or after no more than 300 hours of operation and replace every 1,000 hours of operation or every year, whichever occurs last;		
MCAPCR Rule 324 §§302.3	Fuel Filter: clean once every year or replace (if cartridge type) once every 1,000 hours of operation, whichever occurs last.		
MCAPCR Rule 324 §§302.4	Check and adjust the following once every year or after no more than 1,000 hours of operation, whichever occurs last:		
a	intake and exhaust valves		
b	spark plugs (if so equipped)		
c	spark timing and dwell or fuel injection timing (if adjustable), and		
d	carburetor mixture (if adjustable).		
MCAPCR Rule 324 §§302.5	Spark Plugs and Ignition Points: replace after 3,000 hours of operation or every year whichever occurs last		
MCAPCR Rule 324 §§302.6	Coolant: change after 3,000 hours of operation or every year whichever occurs last.		
MCAPCR Rule 324 §§302.7	Exhaust System: check for leaks and/or restrictions after 3,000 hours of operation or every year whichever occurs last.		
MCAPCR Rule 324 §§303	LIMITATIONS – OPACITY: No owner or operator shall discharge into the ambient air from any single source of emissions any air contaminant, other than uncombined water, in excess of 20% opacity.	Yes	Periodic visual inspections will be performed to ensure smoke will not be emitted in excess of 20% opacity.
MCAPCR Rule 324 §§304	ADDITIONAL LIMITATIONS FOR PRIME ENGINES > 250 RATED bhp: In addition to meeting the standards in Sections 301, 302, and 303, each existing or new prime engine greater than 250 rated bhp that is not listed in Sections 103, 104, or 105, shall comply with the emission limits or control technology requirements listed in Section 304, Table 1, 2, or 3, dependent upon the type of engine.	Yes	Luke AFB operates and maintains all internal combustion engines to meet the requirements for good combustion practices.
MCAPCR Rule 324 §§305	EFFICIENCY ALLOWANCE: Each emission limit expressed in Tables 1, 2 or 3 may be multiplied by X, where X equals the engine efficiency (E) divided by a reference efficiency of 30 percent. Engine efficiency shall be determined by one of the following methods whichever is higher:	Yes	Luke AFB maintains all applicable IC engines to meet the 30% efficiency minimum set forth by this section.
a	E = (Engine Output) X (100) ÷ (Energy Input) where energy input is determined by a fuel measuring device accurate to +/- 5 % and is based upon the higher heating value (HHV) of the fuel. Percent efficiency (E) shall be averaged over 15 consecutive minutes and measured at peak load for the applicable engine.	Yes	
b	E = (Manufacturers Rated Efficiency [Continuous] at (LHV) X (LHV) ÷(HHV) where LHV = the lower heating value of the fuel Engine efficiency (E) shall not be less than 30 percent; an engine with an efficiency lower than 30 percent shall be assigned an efficiency of 30 percent for the purposes of this rule.	Yes	
MCAPCR Rule 324 §§306	EQUIVALENT OR IDENTICAL ENGINE REPLACEMENT: An equivalent or identical replacement engine that replaces an existing engine shall be treated as an existing engine for the purposes of compliance with this rule, unless the engine commenced operation or was constructed or modified after October 22, 2003, including the contractual obligation to undertake and complete an order for an engine and then it will be considered a new engine for purposes of meeting the standards for a new engine in this rule.	Yes	All replacement of internal combustion engines will meet the requirements of this section.
MCAPCR Rule 324 §§501	COMPLIANCE DETERMINATION:	Yes	

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MCAPCR Rule 324 §§501.1	Existing Engines: Existing IC engines or engine families shall demonstrate compliance with Section 300 by recordkeeping according to Section 502. Emission testing using the applicable test methods listed in Section 503 shall be performed if the Control Officer requests.	Yes	At the direction of the Compliance Officer, Luke AFB will perform all testing on internal combustion engines in accordance with this section.
MCAPCR Rule 324 §§501.2	Existing Engine Families at a Source: When testing an engine family at one source, the number of engines tested should be the greater of either one engine or one third of all identical engines in the group. If any of the representative engines exceed the emission limits, each engine in the group shall demonstrate compliance by emissions testing.	Yes	
MCAPCR Rule 324 §§501.3	New Engines / New Engine Families: Compliance with the limitations listed in Section 304, Table 3 shall be demonstrated by either:	Yes	
a	A statement from the manufacturer that the engine meets the most stringent emissions standards found in 40 CFR Part 89 or 90 applicable to the engine and its model year at the time of manufacture or	Yes	
b	Performance of emission testing using the test methods listed in Section 503.	Yes	
MCAPCR Rule 324 §§501.4	Low Sulfur Oil Verification: If the Control Officer requests proof of the sulfur content, the owner or operator shall submit fuel receipts, contract specifications, pipeline meter tickets, Material Safety Data Sheets (MSDS), fuel supplier information or purchase records, if applicable, from the fuel supplier, indicating the sulfur content of the fuel oil. In lieu of these, testing of the fuel oil for sulfur content to meet the 0.05% limit shall be permitted if so desired by the owner or operator for evidence of compliance.	Yes	Records are maintained documenting the fuel sulfur content requirements specified in MCAPCR Rule 324 §§501.4.
MCAPCR Rule 324 §§501.5	Waste - Derived Fuel Sulfur Verification: The owner or operator shall submit documentation of the concentration of the sulfur level of the waste- derived fuel to the Control Officer.	N/A	The engines at Luke AFB do not combust waste derived fuel gas.
MCAPCR Rule 324 §§501.6	Test Method Conditions: The owner or operator shall use the test methods listed in Section 503 to determine compliance with the limitations in Section 304, Tables 1-3. Testing for stationary IC engines shall be completed under steady state conditions at either the maximum operating load or no less than 80% of the rated brake horsepower rating. If the owner or operator of an engine demonstrates to the Control Officer that the engine cannot operate at these conditions, then emissions source testing shall be performed at the highest achievable continuous brake horsepower rating or under the typical duty cycle or typical operational mode of the engine.	Yes	The general purpose generator meets the requirements shown in Table 1, according to manufacturer specifications.

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Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 324 §§502	RECORDKEEPING / RECORDS RETENTION: The owner or operator of any stationary IC engine subject to this rule shall comply with the following requirements and keep records for a period of 5 years:	Yes	Records are maintained as required per MCAPCR Rule 324 §§502 for a period of five years.
MCAPCR Rule 324 §§502.1	An owner or operator of any IC engine, including emergency engines, prime engines and low usage engines, shall keep a record that includes an initial one time entry that lists the particular engine combustion type (compression or spark-ignition or rich or lean burn); manufacturer; model designation, rated brake horsepower, serial number and where the engine is located on the site.		
MCAPCR Rule 324 §§502.2	An owner or operator of a prime engine shall maintain a monthly record for prime engines which shall include:		
1	Hours of operation;		
2	Type of fuel used, and		
3	Documentation verifying compliance with sulfur fuel content according to subsection 301.1.		
MCAPCR Rule 324 §§502.3	An owner or operator of a prime engine shall maintain an annual record of good combustion procedures according to Section 302.		
MCAPCR Rule 324 §§502.4	An owner or operator of an emergency engine and a non- emergency low-usage engine that meets the exemptions listed in Sections 104 and 105 shall keep an engine record that includes:		
1	Monthly rolling twelve month total of hours of operation, including hours of operation for testing, reliability and maintenance;		
2	Fuel type and sulfur content of fuel; and		
3	Explanation for the use of the engine if it is used as an emergency engine.		
U.S. EPA Requirements			
40 CFR 60, Subpart IIII	Standards of Performance for Stationary Compression Ignition Internal Combustion Engines	Yes	All generators at the facility that have been modified/constructed after 07/11/2005 will meet the applicable requirements of this NSPS.
40 CFR 60, Subpart JJJJ	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines	N/A	None of the generators at the installation are spark ignition internal combustion engines.
40 CFR 63, Subpart ZZZZ	National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines	N/A	The facility is not a major source for HAPs, therefore, this regulation does not apply.

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Surface Coating

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
Maricopa County Air Pollution Control Requirements			
MCAPCR Rule 315 - Spray Coating Operations ***Applies to EPNs: SURF339-01, SURF415-01***			
MCAPCR Rule 315 §§301	CONTROLS REQUIRED: No person shall use or operate any spray painting or spray coating equipment unless one of the following conditions is met:	Yes	See responses below.
MCAPCR Rule 315 §§301.1	Equipment Operated In Enclosures Located Outside a Building: Spray coating equipment shall be operated inside an enclosure which has at least three sides a minimum of eight feet in height and able to contain any object or objects being coated.	N/A	Spray coating equipment is operated in a designated area inside a building (paint booth).
a	Three-Sided Enclosures: Spray shall be directed in a horizontal or downward pointing manner so that overspray is directed at the walls or floor of the enclosure. No spraying shall be conducted within three feet of any open end and/or within two feet of the top of the enclosure.		
b	More Complete Enclosures: For enclosures with three sides and a roof or complete enclosures, spray shall be directed into the enclosure so that the overspray is directed away from any opening in the enclosure. No spraying shall be conducted within three feet of any open end and/or within two feet of any open top of the enclosure.		
MCAPCR Rule 315 §§301.2	Equipment Operated With Forced Air Exhaust Vented Directly Outside: Any spray booth or enclosure with forced air exhaust must have a filtering system with an average overspray removal efficiency of at least 92% by weight for the type of material being sprayed. No gaps, sags or holes shall be present in the filters and all exhaust must be discharged into the atmosphere. Spray Booths or enclosures utilizing a water curtain, waterfall or other means to capture particulates in a liquid medium shall effectively remove at least 92% of the overspray and be operated in a manner consistent with the manufacturer's specifications to achieve such efficiency for the type of material being sprayed.	Yes	The spray booths exhaust through fabric filters and have an overspray removal efficiency of at least 92%.
MCAPCR Rule 315 §§302	EXEMPTIONS: The controls required in Section 301 of this rule shall not apply:	Yes	See responses below.
MCAPCR Rule 315 §§302.1	To the spray coating of buildings or dwellings, including appurtenances and any other ornamental objects that are not normally removed prior to coating	N/A	Luke AFB does not spray coat buildings or dwellings.
MCAPCR Rule 315 §§302.2	To the spray coating of facility equipment or structures which are fixed in a permanent location and cannot easily be moved into an enclosure or spray booth and which are not normally dismantled or moved prior to coating.	N/A	Luke AFB does not spray coat facility equipment or structures which are fixed in a permanent location and cannot easily be moved into an enclosure or spray booth and which are not normally dismantled or moved prior to coating.
MCAPCR Rule 315 §§302.3	To the spray coating of objects which cannot fit inside of an enclosure with internal dimensions of 10'W X 25'L X 8'H.	N/A	Luke AFB does not spray coat objects which cannot fit inside of an enclosure with internal dimensions of 10'W X 25'L X 8'H.
MCAPCR Rule 315 §§302.4	To enclosures and spray booths and exhausts located entirely in a completely enclosed building, providing that any vents or openings do not allow overspray to be emitted into the outside air.	N/A	The spray booths exhaust through fabric filters.
MCAPCR Rule 315 §§302.5	To any coating operations utilizing only hand-held aerosol cans.	Yes	Luke AFB performs spray coating using hand-held aerosol cans in and outside of the designated paint booths; the requirements of MCAPCR Rule 315 are not applicable to these operations in accordance with MCAPCR Rule 315 §§302.5.
MCAPCR Rule 335 - Architectural Coatings			
MCAPCR Rule 335 §§301	PROHIBITION–BITUMINOUS PAVEMENT SEALERS: No person shall apply, sell, offer for sale or manufacture for sale within Maricopa County any architectural coating manufactured after July 13, 1988, which is recommended for use as a bituminous pavement sealer unless it is an emulsion type coating.	N/A	Luke AFB does not apply, sell, offer or manufacture for sale bituminous pavement sealers.
MCAPCR Rule 335 §§302	INTERIM LIMITS–NON-FLAT ARCHITECTURAL COATINGS: No person shall apply, sell, offer for sale or manufacture for sale within Maricopa County any non-flat architectural coating manufactured after July 13, 1989, which contains more than 3.2 lbs (380 g/l) of volatile organic compounds per gallon of coating, excluding water and any colorant added to tint bases. These limits do not apply to specialty coatings listed in Section 305 of this rule.	N/A	Luke AFB does not apply, sell, offer or manufacture for sale non-flat architectural coating manufactured after July 13, 1989, which contains more than 3.2 lbs (380 g/l) of volatile organic compounds per gallon of coating, excluding water and any colorant added to tint bases.
MCAPCR Rule 335 §§303	FINAL LIMITS–NON-FLAT ARCHITECTURAL COATINGS: No person shall apply, sell, offer for sale or manufacture for sale within Maricopa County any non-flat architectural coating manufactured after July 13, 1990, which contains more than 2.1 lbs (250 g/l) of volatile organic compounds per gallon of coating, excluding water and any colorant added to tint bases. These limits do not apply to specialty coatings listed in Section 305 of this rule.	Yes	Luke AFB uses compliant coatings fro any architectural coating processes.
MCAPCR Rule 335 §§304	LIMITS–FLAT ARCHITECTURAL COATINGS: No person shall apply, sell, offer for sale or manufacture for sale within Maricopa County any flat architectural coating manufactured after July 13, 1989, which contains more than 2.1 lbs (250 g/l) of volatile organic compounds per gallon of coating, excluding water and any colorant added to tint bases. These limits do not apply to specialty coatings listed in Section 305 of this rule.	Yes	Luke AFB uses compliant coatings fro any architectural coating processes.

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Surface Coating

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 335 §§305	LIMITS: SPECIALTY COATINGS: No person shall apply, sell, offer for sale or manufacture for sale within Maricopa County any architectural coating that exceeds the following limits manufactured after the date listed below. Limits are expressed in pounds of VOC per gallon of coating as applied, excluding water and any colorant added to tint bases.	Yes	Luke AFB complies with the limits set forth in this section.
MCAPCR Rule 335 §§306	EXEMPTIONS–SPECIFIC USE COATINGS: This rule shall not apply to architectural coatings recommended by the manufacturer for use solely as one or more of the following:	Yes	If Luke AFB performs coating operations using any of the architectural coatings identified in MCAPCR Rule 335 §§306.1 through MCAPCR Rule 335 §§306.11, the requirements of MCAPCR Rule 335 are not applicable to these operations in accordance with MCAPCR Rule 335 §§306.
MCAPCR Rule 335 §§306.1	Below ground wood preservative coatings.		
MCAPCR Rule 335 §§306.2	Bond breakers.		
MCAPCR Rule 335 §§306.3	Fire retardant coatings.		
MCAPCR Rule 335 §§306.4	Graphic arts coatings (sign paints).		
MCAPCR Rule 335 §§306.5	Mastic texture coatings.		
MCAPCR Rule 335 §§306.6	Metallic pigmented coatings.		
MCAPCR Rule 335 §§306.7	Multi-colored paints.		
MCAPCR Rule 335 §§306.8	Quick-dry primers, sealers and undercoaters.		
MCAPCR Rule 335 §§306.9	Shellacs.		
MCAPCR Rule 335 §§306.10	Swimming pool paints.		
MCAPCR Rule 335 §§306.11	Tile-like glaze coatings.		
MCAPCR Rule 335 §§307	EXCEPTION–SMALL CONTAINERS: The provisions of this rule shall not apply to architectural coatings supplied in containers having capacities of one quart or less.		If Luke AFB performs coating operations using architectural coatings supplied in containers having capacities of one quart or less, the requirements of MCAPCR Rule 335 are not applicable to these operations in accordance with MCAPCR Rule 335 §§307.
MCAPCR Rule 336 - Surface Coating Operations			
MCAPCR Rule 336 §§301	SURFACE COATINGS: A person shall comply with one of the following for all applications of surface coatings:	Yes	See responses below.
MCAPCR Rule 336 §§301.1	Meet the limits in Table 1.	Yes	Luke AFB meets the applicable surface coating emission limits specified in MCAPCR Rule 336 Table 1.
MCAPCR Rule 336 §§301.2	Operate an ECS in accordance with subsection 306.1 when applying a coating that exceeds the VOC limits in Table 1.	N/A	The coating operations at Luke AFB subject to MCAPCR Rule 336 are not required to use an ECS, as the VOC limits in Table 1 are met. [Note that the paint booth in Bldg 922 (EPN SURF922-01) has an ECS, but is regulated under MCAPCR Rule 348, and is therefore not subject to the requirements of this rule per MCAPCR Rule 336 §§102.]
MCAPCR Rule 336 §§301.3	Qualify for an exemption under Section 305.	Yes	See response to MCAPCR Rule 336 §§305.1.
MCAPCR Rule 336 §§302	APPLICATION METHODS FOR SURFACE COATINGS: A person shall employ one of the following for all applications of surface coating containing more than 2 pounds of VOC per gallon (240 g/L) minus exempt compounds:	Yes	See responses below.
MCAPCR Rule 336 §§302.1	A low pressure spray gun; or	Yes	Non-exempt surface coating operations at Luke AFB subject to MCAPCR Rule 336 involve the use of HVLP spray guns or non-atomizing non-spraying application methods.
MCAPCR Rule 336 §§302.2	An electrostatic system; or	N/A	Luke AFB does not use an electrostatic system.
MCAPCR Rule 336 §§302.3	A system that atomizes principally by hydraulic pressure, including "airless" and "air assisted airless"; or	N/A	Luke AFB does not use "airless" or "air assisted airless" systems.
MCAPCR Rule 336 §§302.4	Non-atomizing or non-spraying application methods, such as but not limited to dipping, rolling, or brushing; or	Yes	Non-exempt surface coating operations at Luke AFB subject to MCAPCR Rule 336 involve the use of HVLP spray guns or non-atomizing non-spraying application methods.
MCAPCR Rule 336 §§302.5	Any method which is approved by the Administrator of the Federal EPA and the Control Officer as having a transfer efficiency of 65% or greater.	N/A	Luke AFB does not use surface coating methods separately approved by the Administrator of the Federal EPA and the Control Officer.
MCAPCR Rule 336 §§303	CLEANUP OF APPLICATION EQUIPMENT: A person shall comply with the following when using VOC-containing material to clean application equipment:	Yes	See responses below.

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Surface Coating

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
MCAPCR Rule 336 §§303.1	Disassemble any spray gun and other application equipment and clean it in:	Yes	Luke AFB utilizes commercially-sold gun cleaning machines to clean all spray guns, which are maintained as a part of the O&M Plan.
a	A container which remains covered at all times, except when the application equipment is being handled in the container, or transferred into or out of the container; or		
b	A commercially-sold gun cleaning machine which shall be operated and maintained as stipulated in the Air Pollution Permit's Operation and Maintenance (O&M) Plan, or in the absence of its mention in the O&M Plan, according to manufacturer's or distributor's instructions.		
MCAPCR Rule 336 §§303.2	Vapor Pressure Limits: Any person subject to this rule using VOC-solvent to clean coating application equipment shall use only solvent which, as used, has a VOC-vapor pressure below 35 mm Hg at 20° C (68° F), except for sprayless equipment exempted pursuant to subsection 305.6.	Yes	All cleaning solvents used by Luke AFB meet the requirements of this section.
MCAPCR Rule 336 §§304	HANDLING AND DISPOSAL OF VOC:	Yes	See responses below.
MCAPCR Rule 336 §§304.1	Use And Storage: A person shall cover and keep covered each VOC containing material which is not currently in use. A person shall store finishing and cleaning materials in closed or covered leak-free containers.	Yes	VOC-containing material and all materials from which VOC can evaporate are stored in designated areas when not in use.
MCAPCR Rule 336 §§304.2	Disposal Of VOC And VOC-Containing Material: A person shall store all VOC-containing materials intended for disposal including, but not limited to, rags, waste coatings, waste brushes, waste rollers, waste applicators, waste solvents, and their residues, in closed, leakfree containers which are legibly labeled with their contents and which remain covered when not in use.		
MCAPCR Rule 336 §§305	EXEMPTIONS:	Yes	Luke AFB meets the exemptions for the following operations: aerosol can appplications, touch-up or repair-coating operations, and tactical military-equipment coating.
MCAPCR Rule 336 §§306	REQUIREMENTS FOR AIR POLLUTION CONTROL EQUIPMENT AND ECS MONITORING EQUIPMENT:	N/A	The coating operations at Luke AFB subject to MCAPCR Rule 336 are not required to use an ECS, as the VOC limits in Table 1 are met. [Note that the paint booth in Bldg 922 (EPN SURF922-01) has an ECS, but is regulated under MCAPCR Rule 348, and is therefore not subject to the requirements of this rule per MCAPCR Rule 336 §§102.]
MCAPCR Rule 336 §§306.1	ECS Control Efficiencies: To meet the requirements pursuant to subsection 301.2, subsection 305.3, or subsection 305.7, an ECS shall be operated as follows:		
a	Overall ECS Efficiency: Overall, the ECS shall prevent at least 85% of the mass of the VOC emitted by each coating or process so controlled from entering the atmosphere except as successfully controlled pursuant to the alternative in subsection 306.1c(2).		
b	Capture Efficiencies:		
1	For an ECS used pursuant to subsection 301.2 and/or subsection 305.7, capture shall be at least 87%.		
2	For an ECS used pursuant to subsection 305.3, capture shall be at least 90%.		
c	Control Efficiency Of The Emissions Processing Subsystem:		
1	The emissions-processing subsystem of the ECS shall reduce the mass of VOC entering it by at least 90 percent; or		
2	Alternative for Very Dilute Input: For VOC input-concentrations of less than 100 ppm (as carbon) at the inlet of the ECS emissions processing subsystem, an ECS' VOC processing subsystem also satisfies the processor efficiency requirements of this rule if:		
a	The VOC output is consistently less than 20 mg VOC/M3 (as carbon) adjusted to standard conditions; and		
b	The ECS consistently shows an overall control efficiency of at least 85% when tested pursuant to subsection 503.3 at VOC input-concentrations exceeding 100 ppm (as carbon).		
d	Coating that exceeds the applicable VOC-limits in Table 1 shall be clearly identified such that coating-operators are informed an ECS must be used.		
MCAPCR Rule 336 §§306.2	Operation And Maintenance (O&M) Plan Required for ECS:		
a	An owner or operator shall provide and maintain (an) O&M Plan(s) for any ECS, any other emission processing equipment, and any ECS monitoring devices that are used pursuant to this Rule 336 or to an air pollution control permit.		
b	The owner or operator shall submit to the Control Officer for approval the O&M Plans of each ECS and each ECS monitoring device that is used pursuant to this Rule 336.		
c	The owner or operator shall comply with all the identified actions and schedules provided in each O&M Plan.		
MCAPCR Rule 336 §§306.3	Providing And Maintaining ECS Monitoring Devices: Any person incinerating, adsorbing, or otherwise processing VOC emissions pursuant to this rule shall provide, properly install and maintain in calibration, in good working order and in operation, devices described in the facility's O&M Plan that indicate temperatures, pressures, rates of flow, or other operating conditions necessary to determine if air pollution control equipment is functioning properly and is properly maintained. Records shall be kept pursuant to Section 502 which demonstrate that the ECS meets the overall control standard required by subsection 306.1.		

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MCAPCR Rule 336 §§306.4	O&M Plan Responsibility: An owner or operator of a facility that is required to have an O&M Plan pursuant to subsection 306.2 must fully comply with all O&M Plans that the owner or operator has submitted for approval, but which have not yet been approved, unless notified otherwise by the Control Officer in writing.		
MCAPCR Rule 336 §§501	RECORDKEEPING AND REPORTING: Any person subject to this rule shall comply with the following requirements of subsections 501.1 and 501.2 that apply to materials regulated by this Rule 336. Records shall be retained for 5 years and shall be made available to the Control Officer upon request.	Yes	Records are maintained as required per MCAPCR Rule 336 §§501.
MCAPCR Rule 336 §§501.1	Current Lists:	Yes	Luke AFB uses the Environmental Management Information System (EMIS); a comprehensive database tracking system for all material authorization and issues. Organic material content and composition is taken from the material Safety Data Sheet.
a	Maintain a current list of coatings, adhesives, reducers, thinners, gun-cleaning materials, additives, and any other VOC-containing materials regulated by this rule; give the VOC content of material for each as received (before thinning). A complete, neat assemblage of this data meets the requirements for a list. Express VOC content in 1 of 3 forms: pounds VOC per gallon, grams VOC per liter, or the percent VOC by weight along with the specific gravity or density, (2 numbers are required).		
b	Less Stringent Recordkeeping for Consistently Low Users: An operator of a facility that always uses less than 2 gallons per day total of thinner and coating (listed in Table 1), meets the listing and recording requirements of subsections 501.1a, 501.1c, and 501.2 if:		
1	All purchase receipts/invoices of VOC-containing material that is regulated by this rule for the most recent 12 months are kept together; and		
2	Current data sheets show the VOC content of material for every VOC containing substance currently used that is regulated by this rule.		
c	Facilities That Are Not Small Surface-Coating Sources: Facilities that are not small surface-coating sources shall do the following:		
1	Coatings: For all coatings (except those recorded under the subsection 305.4c low usage allowance), make the following listings for coatings and adhesives that have VOC limits in Table 1:		
a	VOC Before Reducing: The VOC content of each coating as received, minus exempt compounds. (This figure is sometimes called the "EPA Method 24" VOC content on manufacturer's data sheets). If the coating is a multi-part coating, list the VOC content which the manufacturer states the coating will have once you have mixed all the necessary parts together in the proportions specified by the manufacturer.		
b	List Maximum VOC Content Of Coating As Applied: For each coating that you thin/reduce or add any additive to, record in a permanent log either of the following:		
i	The maximum number of fluid ounces thinner/reducer that you ever add to a gallon of unreduced coating (or maximum g/liter), and the maximum fluid ounces of every other additive you mix into a gallon of the coating; or		
ii	The VOC content of the coating, after adding the maximum amount of thinner/reducer and other additives that you would ever add, as determined by the formula in subsection 255.1.		
2	Applicator Cleanup Solvent: Have a hardcopy of the VOC vapor pressure (VP) at 20°C (68°F) of solvent(s) used to clean spray guns, hoses, reservoirs, and any other coating application equipment. Any one of the following ways of providing the VP data is sufficient:		
a	A current manufacturer's technical data sheet;		
b	A current manufacturer's safety data sheet (MSDS);		
c	Actual test results; or		
d	A letter signed by an official or lab manager of the supplying facility.		
MCAPCR Rule 336 §§501.2	Frequency Of Updating Usage Records: Update your records, showing the type and amount used of each VOC-containing coating or adhesive which is regulated by name or type in Table 1, and update each VOC-containing material, related to surface coating, that is not addressed by Table 1. This includes, but is not limited to, thinners, surfacers, and diluents. Maintain records according to the following schedule:		
a	Small Surface-Coating Sources: Small surface-coating sources shall update each month's records of coating use by the end of the following month.		
b	All Other Sources: For a source that does not meet the definition of small surface-coating source:		
1	Monthly: Monthly update records of each coating used that complies with the VOC limits in Table 1. Complete a month's update by the end of the following month.		
2	Daily: Daily update the usage of each coating that exceeds its limits in Table 1, including coating exempted by subsection 305.4c.		

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MCAPCR Rule 336 §§501.3	Grouping By VOC Content: For purposes of recording usage, coatings and adhesives that are in the same category in Table 1, and have similar VOC content, may be recorded under a name that includes the category name. The highest VOC content among the members of that grouping shall be assigned to that grouping, rounded to the nearest 10th of a pound. To identify what products belong within each group, after each group name and the group's VOC content of material must appear the name of each product in the group and its VOC content of material. For example: For flexible plastic parts, you use 20 gallons of primer that has 3.04 lb VOC/gal., 30 gallons of primer having 3.14 lb VOC/gal., and 40 gallons of primer having 2.89 lb VOC/gal. You may record usage as 90 gallons of flexible plastic primer containing 3.1 lb VOC/gal. If grams VOC per liter is used to record VOC content, round off to the nearest whole number of grams.		
MCAPCR Rule 336 §§502	ECS RECORDING REQUIREMENTS:	N/A	The coating operations at Luke AFB subject to MCAPCR Rule 336 are not required to use an ECS, as the VOC limits in Table 1 are met. [Note that the paint booth in Bldg 922 (EPN SURF922-01) has an ECS, but is regulated under MCAPCR Rule 348, and is therefore not subject to the requirements of this rule per MCAPCR Rule 336 §§102.]
MCAPCR Rule 336 §§502.1	On each day an ECS is used at a facility pursuant to this rule, an owner or operator of the facility shall:		
a	Record the amount and VOC content of coating, the amount of catalyst/hardener, and the amounts of solvent, reducer, and diluent used that were subject to ECS control pursuant to this Rule 336; and		
b	Make a permanent record of the operating parameters of the key systems as required by the O&M Plan; and		
c	Make a permanent record of the maintenance actions taken, within 24 hours of the action's completion, for each day or period in which the O&M Plan requires that maintenance be done.		
MCAPCR Rule 336 §§502.2	An explanation shall be entered for scheduled maintenance that is not performed during the period designated for it in the O&M Plan.		
MCAPCR Rule 336 §§503	COMPLIANCE DETERMINATION AND TEST METHODS: When more than one test method is permitted for a determination, an exceedance of the limits established in the rule determined by any of the applicable test methods constitutes a violation of this rule.	Yes	See responses below.
MCAPCR Rule 336 §§503.1	Compliance Determination: The following means shall be used to determine compliance with this rule:	Yes	See responses below.
a	Measurement of VOC content of materials subject to Section 301 or Section 302 of this rule shall be conducted and reported using one of the following means:	N/A	Luke AFB obtains VOC content from the applicable material Safety Data Sheet.
1	VOC content of coatings, solvents, and other substances having less than 5% solids will be determined by the test method in subsection 503.2f (BAAQMD Method 31 [April 15, 1992]) or 503.2g (SCAQMD Method 313-91 [April 1997]).		
2	The VOC content of coatings or other materials having 5% or more solids will be determined by the test method in subsection 503.2c (EPA Method 24), 503.2f (BAAQMD Method 31 [April 15, 1992]) or 503.2g (SCAQMD Method 313-91 [April 1997]).		
a	Plastisols, powder coatings, and radiation-cured coatings shall be cured according to the procedures actually used in the coating process being tested before final VOC-emission determinations are made.		
b	In the case of multi-component, polymerizing coatings tested according to 503.1a, Method 24 shall be modified to eliminate the post-mixing dilution-step (that employs toluene or other solvent). Instead, the mixture shall be spread by appropriate technique to form a thin layer, occupying the entire bottom of the foil pan. Techniques included in the method referenced in 503.1b can be used as a guide for such spreading.		
b	The VOC content of gaseous emissions entering and exiting an ECS shall be determined by either EPA Method 18 referred to in subsection 503.2b, or EPA Method 25 and its submethod, referred to in subsection 503.2d.	N/A	The coating operations at Luke AFB subject to MCAPCR Rule 336 are not required to use an ECS, as the VOC limits in Table 1 are met. [Note that the paint booth in Bldg 922 (EPN SURF922-01) has an ECS, but is regulated under MCAPCR Rule 348, and is therefore not subject to the requirements of this rule per MCAPCR Rule 336 §§102.]
c	Capture efficiency of an ECS shall be determined either by the methods in 503.2e (EPA Method 204 and its submethods), or by using mass balance calculation methods in concert with the methods in 503.2a (EPA Methods 2, 2a, 2c, and 2d).		
d	Measurement of air pressure at the center of the spray gun tip and air horns of an air-atomizing spray gun (reference subsection 302.1 and Section 225) shall be performed using an attachable device in proper working order supplied by the gun's manufacturer for performing such a measurement.	Yes	When required,. Measurements will be completed in accordance with this requirement.
e	Temperature measurements shall be done with an instrument with an accuracy and precision of less than one-half degree Fahrenheit (0.25°C) for temperatures up to 480°F (250°C).	Yes	When required,. Measurements will be completed in accordance with this requirement.
MCAPCR Rule 345 - Vehicle and Mobile Equipment Coating			
MCAPCR Rule 345 §§301	LIMITATIONS: VOC CONTENT OF REFINISH COATINGS FOR LIGHT DUTY VEHICLES:	Yes	See responses below.
MCAPCR Rule 345 §§301.1	No person shall sell for use, supply for use, or apply, coating on a previously finished automobile/light-duty vehicle in Maricopa County unless the coating's VOC content complies with the applicable limits in Table 1.	Yes	Luke AFB meets the applicable surface coating emission limits specified in MCAPCR Rule 345 Table 1 for refinishing of light duty vehicles.

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a	VOC content is determined according to Sections 502, 503.2, and 505.	Yes	Luke AFB obtains VOC content from the applicable material Safety Data Sheet.
b	Compliance will be determined based on the VOC content limit, as expressed in metric units. (English units (lbs VOC/gal) are provided for information only.)		
MCAPCR Rule 345 §§301.2	Refinishing Surfaces that are Not Part of Body/Chassis: The recoating of a section of a light-duty vehicle that is not part of its body/chassis, its body's appurtenances, nor its wheels, shall comply with the VOC limits of Table 3. This includes drive-train, steering gear, suspension, etc.	Yes	Luke AFB meets the applicable surface coating emission limits specified in MCAPCR Rule 345 Table 3 for recoating of a section of a light-duty vehicle that is not part of its body/chassis, its body's appurtenances, nor its wheels.
MCAPCR Rule 345 §§301.3	Refinishing Replacement Appurtenances on the Vehicle Body: Vehicle-body appurtenances such as mirrors, trim strips, license-plate frames, etc., used to replace or supplement existing appurtenances on an automobile/light-duty vehicle bodies may be coated with coatings that meet the applicable VOC limits in Table 1, even if the item has never been coated or used.	Yes	Luke AFB meets the applicable surface coating emission limits specified in MCAPCR Rule 345 Table 1 for recoating of vehicle-body appurtenances such as mirrors, trim strips, license-plate frames, etc., used to replace or supplement existing appurtenances on an automobile/light-duty vehicle bodies.
MCAPCR Rule 345 §§302	REFINISHING HEAVY DUTY TRUCKS AND TRUCK-TRAILERS:	Yes	See responses below.
MCAPCR Rule 345 §§302.1	Refinish VOC Limits: No person shall apply refinish coating to any section or appurtenance of the body or chassis of a heavy truck unless that coating complies with the VOC limits in Table 2.	Yes	Luke AFB meets the applicable surface coating emission limits specified in MCAPCR Rule 345 Table 2 for refinishing of heavy duty trucks and truck-trailers.
a	VOC content is determined according to Sections 502, 503.2, and 505.	Yes	Luke AFB obtains VOC content from the applicable material Safety Data Sheet.
b	Compliance will be determined based on the VOC content limit, as expressed in metric units. (English units (lbs VOC/gal) are provided for information only.)		
MCAPCR Rule 348 - Aerospace Manufacturing and Rework Operations			
MCAPCR Rule 348 §§301	LIMITATIONS: VOC EMISSIONS: No person shall apply any surface coating including any VOC-containing materials added to the original coating supplied by the manufacturer, which contain VOC in excess of the limits in Tables 1a and 1b, unless the emissions are controlled in accordance with the provisions of Section 302 of this rule.	Yes	With the exception of the paint booth in Bldg 922 (EPN SURF922-01), the coating operations at Luke AFB subject to MCAPCR Rule 348 are not required to use an ECS, as the VOC limits in Tables 1a and 1b are met. The paint booth in Bldg 922 (EPN SURF922-01) has an ECS.
MCAPCR Rule 348 §§302	EMISSION CONTROL SYSTEM: As an alternative to meeting the applicable coating VOC limits set forth in Section 301, an operator can comply with this rule by operating an Emission Control System (ECS) approved by the Control Officer, provided that the control system has a combined VOC emissions capture and control equipment efficiency of at least 81 percent by weight.	Yes	The paint booth in Bldg 922 (EPN SURF922-01) has an ECS which achieves a control efficiency of at least 81% by weight. All other coating operations at Luke AFB subject to MCAPCR Rule 348 are not required to use an ECS, as the VOC limits in Tables 1a and 1b are met.
MCAPCR Rule 348 §§303	REQUIREMENTS FOR AIR POLLUTION CONTROL EQUIPMENT:	Yes	See responses below. All responses are for EPN SURF922-01 only, as all other coating operations at Luke AFB subject to MCAPCR Rule 348 are not required to use an ECS, as the VOC limits in Tables 1a and 1b are met.
MCAPCR Rule 348 §§303.1	Operation and Maintenance (O&M) Plan Required for ECS:	Yes	Plans have been and will be written and approved as required. Luke AFB will comply with all actions and schedules provided in in the plan.
a	An owner or operator shall provide and maintain (an) O&M Plan(s) for any ECS, any other emission processing equipment, and any ECS monitoring devices that are used pursuant to this rule or to an air pollution control permit.		
b	The owner or operator shall submit to the Control Officer for approval the O&M Plans of each ECS and each ECS monitoring device that is used pursuant to this rule.		
c	An owner or operator of a facility that is required to have an O&M Plan pursuant to this subsection must fully comply with all O&M Plans that the owner or operator has submitted for approval, but which have not yet been approved, unless notified otherwise by the Control Officer in writing.		
MCAPCR Rule 348 §§304	APPLICATION EQUIPMENT: A person shall use one or more of the following application techniques in applying any primer or topcoat to aerospace vehicles or components: flow/curtain coat; dip coat; roll coating; brush coating; cotton-tipped swab application; electrodeposition (DIP) coating; high volume low pressure (HVLP) spraying; electrostatic spray; or other coating application methods that can demonstrate and be approved by the Control Officer as having at least a 65% transfer efficiency, which is equivalent to the transfer efficiency of HVLP or electrostatic spray application methods.	Yes	Luke AFB utilizes HVLP spraying or other coating application methods that achieve at least a 65% transfer efficiency.
MCAPCR Rule 348 §§305	SOLVENT CLEANING: The following requirements apply to solvent cleaning operations:	Yes	Luke AFB complies with the provisions of this section. Cleaning solvents and wastes are stored in closed containers in order to prevent evaporation of vapors into the atmosphere.
MCAPCR Rule 348 §§305.1	Hand-Wipe Cleaning: Cleaning solvents used in hand-wipe cleaning operations shall utilize an aqueous cleaning solvent, or have a VOC composite vapor pressure less than or equal to 45 millimeters of mercury (mm Hg) at 20°C.		
MCAPCR Rule 348 §§305.2	Flush Cleaning: For cleaning solvents used in the flush cleaning of parts, assemblies, and coating unit components, the used cleaning solvent (except for semi-aqueous cleaning solvents) must be emptied into an enclosed container or collection system that is kept closed when not in use or captured with wipers, provided they comply with the VOC handling requirements of Section 307 of this rule.		

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MCAPCR Rule 348 §§305.3	Dip Cleaning: Dip cleaning using solvents is subject to the requirements of Rule 331.		
MCAPCR Rule 348 §§306	SPRAY GUN CLEANING: All spray guns must be cleaned by one or more of the following methods:	Yes	Luke AFB complies with this section by using one or more of the recommended options mentioned in this section.
MCAPCR Rule 348 §§306.1	Enclosed spray gun cleaning system, provided that it is kept closed when not in use and leaks are repaired within 14 days from when the leak is first discovered. If the leak is not repaired by the 15th day after detection, the solvent shall be removed and the enclosed cleaner shall be shut down until the leak is repaired or its use is permanently discontinued;		
MCAPCR Rule 348 §§306.2	Unatomized discharge of solvent into a waste container that is kept closed when not in use;		
MCAPCR Rule 348 §§306.3	Disassembly of the spray gun and cleaning in a vat that is kept closed when not in use; or		
MCAPCR Rule 348 §§306.4	Atomized spray into a waste container that is fitted with a device designed to capture atomized solvent emissions.		
MCAPCR Rule 348 §§307	VOC CONTAINMENT AND DISPOSAL: All fresh and used VOC containing material, including but not limited to cleaning solvents, coatings, thinners, rags, and their residues, shall be stored in closed, leak free, legibly labeled containers when not in use. In addition, the owner or operator must implement handling and transfer procedures to minimize spills during filling and transferring the cleaning solvent to or from enclosed systems, vats, waste containers, and other cleaning operation equipment that hold or store fresh or used cleaning solvents.	Yes	VOC-containing material and all materials from which VOC can evaporate are stored in designated areas when not in use.
MCAPCR Rule 348 §§308	EXEMPTIONS:	Yes	See responses below.
MCAPCR Rule 348 §§308.1	Coatings: The following coatings types are exempted from the VOC limits set forth in Tables 1a and 1b in Section 301 of this rule:	Yes	If Luke AFB uses any of the coating types outlined in MCAPCR Rule 348 §§308.1, they will be exempt from the VOC limits set forth in MCAPCR Rule 348 §§301 Tables 1a and 1b.
a	Touchup coatings;		
b	Hand-held aerosol can operations;		
c	DOD "classified" coatings;		
d	Coating of space vehicles; and		
e	Low usage coatings used in separate formulations in volumes of less than 50 gallons per year with a maximum exemption of 200 gallons total for such formulations applied annually.		
MCAPCR Rule 348 §§308.2	Application Equipment: The following operations are exempt from the requirements of Section 304 of this rule:	Yes	If Luke AFB requires the use of coating operations outlined in MCAPCR Rule 348 §§308.2, they will be exempt from the requirements set forth in MCAPCR Rule 348 §§304 [achievement of at least 65% transfer efficiency].
a	Any situation that normally requires the use of an airbrush or an extension on the spray gun to properly reach limited access spaces;		
b	The application of specialty coatings;		
c	The application of coatings that contain fillers that adversely affect atomization with HVLP spray guns and that the permitting agency has determined cannot be applied by any of the application methods;		
d	The application of coatings that normally have a dried film thickness of less than 0.0013 centimeter (0.0005 in.) and that the permitting agency has determined cannot be applied by any of the application methods;		
e	The use of airbrush application methods for stenciling, lettering, and other identification markings; and		
f	Touch-up and repair operations.		
MCAPCR Rule 348 §§308.3	Solvent Cleaning Operations: The following are exempt from the requirements of Section 305 of this rule:	Yes	If Luke AFB requires the use of solvent cleaning operations outlined in MCAPCR Rule 348 §§308.3, they will be exempt from the requirements set forth in MCAPCR Rule 348 §§305 [for hand wipe cleaning, flush cleaning, or dip cleaning].
a	Cleaning during the manufacture, assembly, installation, maintenance, or testing of components of breathing oxygen systems that are exposed to the breathing oxygen;		
b	Cleaning during the manufacture, assembly, installation, maintenance, or testing of parts, subassemblies, or assemblies that are exposed to strong oxidizers or reducers (e.g., nitrogen tetroxide, liquid oxygen, hydrazine);		
c	Cleaning and surface activation prior to adhesive bonding;		
d	Cleaning of electronics parts and assemblies containing electronics parts;		
e	Cleaning of aircraft and ground support equipment fluid systems that are exposed to the fluid, including air-to-air heat exchangers and hydraulic fluid systems;		
f	Cleaning of fuel cells, fuel tanks, and confined spaces;		
g	Surface cleaning of solar cells, coated optics, and thermal control surfaces;		
h	Cleaning during fabrication, assembly, installation, and maintenance of upholstery, curtains, carpet, and other textile materials used on the interior of the aircraft;		
i	Cleaning of metallic and nonmetallic materials used in honeycomb cores during the manufacture or maintenance of these cores, and cleaning of the completed cores used in the manufacture of aerospace vehicles or components;		
j	Cleaning of aircraft transparencies, polycarbonate, or glass substrates;		
k	Cleaning and solvent usage associated with research and development, quality control, or laboratory testing;		

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l	Cleaning operations using nonflammable liquids conducted within 5 feet of energized electrical systems. Energized electrical systems means any AC or DC electrical circuit on an assembled aircraft once electrical power is connected, including interior passenger and cargo areas, wheel wells and tail sections; and		
m	Cleaning operations identified in an Essential Use Waiver which has been reviewed and approved by the U.S. EPA and the voting parties of the International Montreal Protocol Committee [sections 604(d)(1) and (g)(2) of the Act].		
MCAPCR Rule 348 §§308.4	General Exemptions: Cotton-tipped swabs used for very small cleaning operations and aqueous cleaning solvents are exempt from the requirements of Section 307 of this rule.	Yes	If Luke AFB uses cotton-tipped swabs for very small cleaning operations or aqueous cleaning solvents, they will be exempt from the requirements of MCAPCR Rule 348 §§307 [VOC containment and disposal].
MCAPCR Rule 348 §§308.5	Small Sources: Sections 301 and 302 of this rule shall not apply to any one facility from which the total VOC emissions from all operations subject to this rule emit less than 15 pounds (6.8 kg) per day and less than two tons (1814 kg) per year of VOCs prior to any controls.	N/A	Aerospace surface coating operations at Luke AFB emit more than 15 pounds per day or two tons per year of VOCs prior to any controls.
MCAPCR Rule 348 §§501	RECORDKEEPING AND REPORTING: Any person subject to this rule shall comply with the following requirements. Records shall be retained for five years and shall be made available to the Control Officer upon request.	Yes	Records will be retained for at least five years, and provided to the Control Officer upon request.
MCAPCR Rule 348 §§501.1	Coatings: Each owner or operator using coatings listed in Section 301 of this rule shall maintain a current list of coatings in use, VOC content as applied and records of the monthly usage of such materials in pounds per gallon or grams per liter.	Yes	Luke AFB uses the Environmental Management Information System (EMIS); a comprehensive database tracking system for all material authorization and issues. VOC content is taken from the applicable material Safety Data Sheet.
MCAPCR Rule 348 §§501.2	Cleaning Solvents: Each owner or operator shall:	Yes	See responses below.
a	Maintain a current list of all aqueous and semi-aqueous hand-wipe cleaning solvents used with corresponding water contents.	Yes	All information will be maintained in the base EMIS.
b	Maintain a current list of all vapor pressure compliant hand-wipe cleaning solvents in use with their respective vapor pressures or, for blended solvents, VOC composite vapor pressures and records of the monthly usage of such cleaning solvents.	Yes	
c	Maintain a current list of all hand-wipe cleaning processes using cleaning solvents with a vapor pressure greater than 45 mm Hg and records of the monthly usage of such cleaning solvents.	Yes	
MCAPCR Rule 348 §§501.3	Enclosed Spray Gun Cleaners: Any person using an enclosed spray gun cleaner shall visually inspect the seals and all other potential sources of leaks at least once per month while the spray gun cleaner is in operation. Records of these inspections shall be kept and made available upon request by the Control Officer.	Yes	All spray guns are inspected prior to use.
	U.S. EPA Requirements		
40 CFR 60, Subpart MM	Standards of Performance for Automobile and Light Duty Truck Surface Coating Operations	N/A	The facility is not an automobile or light-duty truck assembly plant; therefore, this regulation does not apply.
40 CFR 63, Subpart GG	National Emission Standards for Hazardous Air Pollutants for Aerospace Manufacturing and Rework Facilities	N/A	The facility is not a major source [of HAPs], as defined in 40 CFR 63.2; therefore, this regulation does not apply.
40 CFR 63, Subpart IIII	National Emission Standard for Hazardous Air Pollutants: Surface Coating of Automobiles and Light-Duty Trucks	N/A	The facility is not a major source of HAPs, therefore, this regulation does not apply.
40 CFR 63, Subpart MMMM	National Emission Standard for Hazardous Air Pollutants for Surface Coating of Miscellaneous Metal Parts and Products	N/A	The facility is not a major source of HAPs and is owned and operated by the Armed Forces of the United States, therefore, this regulation does not apply.
40 CFR 63, Subpart PPPP	National Emission Standards for Hazardous Air Pollutants for Surface Coating of Plastic Parts and Products	N/A	The facility is not a major source of HAPs and is owned and operated by the Armed Forces of the United States, therefore, this regulation does not apply.
40 CFR 63, Subpart QQQQ	National Emission Standard for Hazardous Air Pollutants: Surface Coating of Wood Building Products	N/A	The facility is not a major source of HAPs, and woodworking is not used for parts used for construction, either interior or exterior, of a residential, commercial buildings; therefore, this regulation does not apply.
40 CFR 63, Subpart HHHHHH	National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources	N/A	The facility is owned and operated by the Armed Forces of the United States, therefore, this regulation does not apply.

Regulatory Review
Luke Air Force Base
Air Quality Operating Permit No. V97-017

Wastewater Treatment Plant

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
Maricopa County Air Pollution Control Requirements			
There are no regulations promulgated by Maricopa County which are potentially applicable to this source category.			
U.S. EPA Requirements			
40 CFR 60, Subpart O	Standards of Performance for Sewage Treatment Plants	N/A	The facility does not have an incinerator to combust the waste; therefore, this rule does not apply.
40 CFR 63, Subpart DD	National Emission Standards for Hazardous Air Pollutants from Off-Site Waste and Recovery Operations	N/A	The facility is not a major source of HAPs, therefore, this regulation does not apply.
40 CFR 63, Subpart VVV	National Emission Standard for Hazardous Air Pollutants: Publicly Owned Treatment Works	N/A	The facility is not publicly owned, therefore, this regulation does not apply.

Regulatory Review
Luke Air Force Base
Air Quality Operating Permit No. V97-017

Woodworking

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
Maricopa County Air Pollution Control Requirements			
MCAPCR Rule 342	Coating Wood Furniture and Fixtures	N/A	See regulatory review for Miscellaneous Chemical Usage.
MCAPCR Rule 346	Coating Wood Millwork	N/A	Luke AFB does not construct, repair, or otherwise work with wood millwork.
U.S. EPA Requirements			

There are no regulations promulgated by the U.S. EPA which are potentially applicable to this source category.

Regulatory Review
Luke Air Force Base
Air Quality Operating Permit No. V97-017

Other Source Types

Regulatory Citation	Requirement	In Compliance (Yes/No)	Compliance Method
	U.S. EPA Requirements		
40 CFR 61, Subpart M	National Emission Standards for Asbestos	Yes	Luke AFB has old buildings which contain asbestos, and will comply with 40 CFR §61.145: Standard for demolition and renovation, as applicable.
40 CFR 63, Subpart Q	National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers	N/A	The facility is not a major source of HAPs, and the cooling towers are not operated chromium-based water treatment chemicals; therefore, this regulation does not apply.
40 CFR 63, Subpart VV	National Emission Standards for Oil-Water Separators and Organic-Water Separators	N/A	The facility is not subject to a subpart of 40 CFR Part 60, 61, or 63 which references the use of this subpart, therefore, this regulation does not apply.

6.0 EMISSIONS SOURCE DESCRIPTIONS AND CALCULATIONS

6.0 EMISSIONS SOURCE DESCRIPTIONS AND CALCULATIONS

6.1 Abrasive Blasting

6.1.1 Emissions Source Description

Abrasive blasting operations involve the use of a hard material such as sand, plastic beads, or glass beads to remove old paint and/or corrosion from equipment. A high pressure gun is used to blast the abrasive material at the equipment being stripped/cleaned. Depending on the size of the equipment, blasting is performed in either a small enclosed cabinet (i.e., glove box), inside a booth, or outdoors. For indoor blasting, the exhaust from blasting operations are ventilated to a control system consisting of a fabric filter. The primary pollutants of interest are PM_{10}, $PM_{2.5}$, and HAPs within the particulate. A process flow diagram is shown in Figure 6-1.

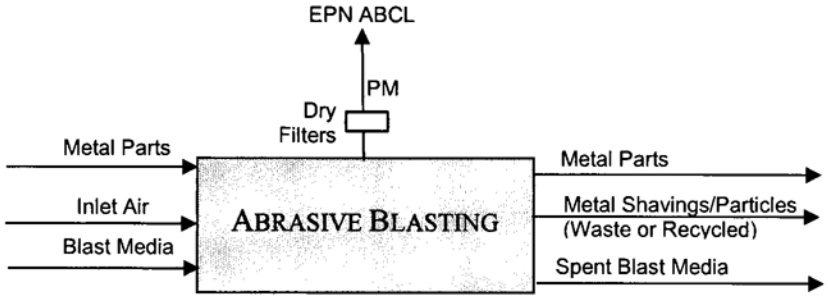

Figure 6-1. Abrasive Blasting Process Flow Diagram

Luke AFB has one walk-in abrasive blasting booth in Building 907 which vents to atmosphere. The remaining units are small glove-box blasters (modular, self-contained, abrasive blasting cabinets) that exhaust into the work space, and are considered an insignificant source in accordance with MCAPCR Appendix D ["Hand-held or manually operated equipment used for buffing, polishing, carving, cutting, drilling, machining, routing, sanding, sawing, surface grinding, or turning of ceramic art work, precision parts, leather, metals, plastics, fiberboard, masonry, carbon, glass, or wood."]. Refer to Section 7.0 for additional information on insignificant sources.

6.1.2 Emissions Calculations

Maximum emissions from abrasive blasting have been estimated by multiplying the amount of blast media consumed by the appropriate emission factor, as shown in the equation below.

$$E_{Pol} = Q \times 1/1{,}000 \times EF_{Pol}$$

where,

E_{POL} = Emissions of a particular pollutant (lb/yr);
Q = Annual blast media consumed (lb/yr); and
EF_{POL} = Emissions factor (lb/10^3 lb of blast media used).

Maximum particulate matter with an aerodynamic diameter less than 10 microns (PM_{10}) emissions were estimated based on the maximum blasting material which could be used and the emission factor for controlled garnet blasting obtained Table 2-1 of the Air Emissions Guide for Stationary Sources, AFCEC, October 2014 (AEI Guide) (0.59 pounds (lb) per thousand pounds (10^3 lb) of PM_{10} of abrasive material used). PM and $PM_{2.5}$ emission were assumed to be equal to PM_{10} emissions.

HAP emissions were conservatively assumed to be 100% of particulate matter (PM) emissions. HAP emissions from abrasive blasting are a much smaller percentage of PM emissions and should a more accurate speciation be desired, a chemical analysis of the waste material collected would be required.

Maximum media usage for the unit were determined by taking the media usage in 2007, which Luke AFB has set as the baseline year based on knowledge of usual operations, and scaling this number up by 4.21. The factor of 4.21 is the ratio of the maximum number of hours per year (8,760) to current average actual site operating hours of eight hours per day, five days per week, 52 weeks per year (2,080 hours per year), which conservatively assumes that abrasive blasting at Luke AFB would increase proportionately to base operations.

Detailed emissions calculations, and equipment information are summarized in Appendix A.

6.2 External Combustion

6.2.1 Emissions Source Description

The majority of external combustion sources at Luke AFB include boilers, furnaces, and heaters used for comfort heating and potable water. Luke AFB also has three spray paint booth dryers which are used in association with the civilian and government vehicle paint booths to provide heated air to dry painted parts, and two bake-off ovens which are used for the removal of baked-on particulate matter from jet engine fuel spray rings.

Emissions from external combustion units occur as a result of the combustion of the fuel burned and include criteria pollutants and a variety of HAPs. Emissions depend on a variety of factors including the size/type of the combustor, firing configuration, fuel type, control devices used, operating capacity, and whether the system is properly operated/maintained. A process flow diagram is shown in Figure 6-2.

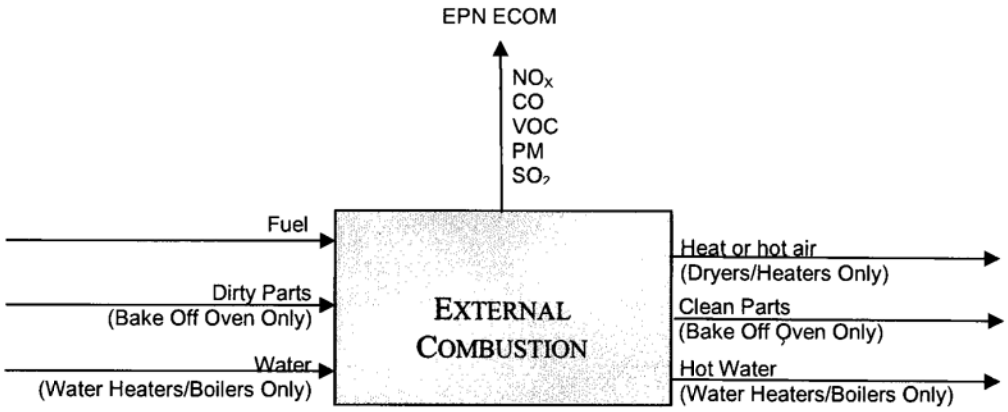

Figure 6-2. External Combustion Process Flow Diagram

The external combustion units at Luke AFB primarily utilize natural gas for fuel, although some units use either propane or LPG for fuel.

Emissions from the burn-off ovens are considered to be solely due to the combustion of natural gas used to fuel the oven, as the jet engine spray rings are pre-cleaned prior to placement in the burn off ovens and the combustion of any debris remaining can be considered negligible per MCAQD guidance (refer to Section 7.0 for additional information on excluded sources and the guidance provided by MCAQD).

Certain external combustion sources (e.g., water heaters <300,000 MMBTU/hr) at Luke AFB are considered an insignificant source in accordance with MCAPCR Appendix D ["All natural gas and/or liquefied petroleum gas-fired pieces of equipment over 300,000 BTU per hour, only if the input capacities added together are less than 2,000,000 BTU per hour, the emissions come from fuel burning, and the equipment is used solely for heating buildings for personal comfort or for producing hot water for personal use."]. Refer to Section 7.0 for additional information on insignificant sources. All external combustion units, including those that may be insignificant, have been included in maximum emissions calculations to allow for a conservative estimate.

6.2.2 Emissions Calculations

Emissions from external combustion units were estimated by multiplying the amount of fuel combusted by the appropriate emission factor, as shown in the equation below.

$$E_{POL} = FC \times EF$$

where,

E_{POL} = Emissions of a particular pollutant (lb/yr);
FC = Quantity of fuel consumed per year (MMBtu/yr for natural gas); and
EF = Emission factor (lb/MMBtu for natural gas).

Calculations were completed using emission factors from AP-42, Section 1.4, Natural Gas Combustion (July 1998). Emission factors were converted from $lb/10^6$ ft3 to

lb/MMBtu using a heating value of 1,020 Btu/ft^3, taken from AP-42, Section 1.4, Natural Gas Combustion (July 1998). Emissions for propane and LPG combustion were estimated using emission factors for natural gas combustion. Luke AFB is not taking credit for any boilers installed with Low NOx burners and has based all emissions on standard AP-42 emission factors.

The make, model, and heat input rating for each of the external combustion units was obtained from the boiler plate or specification sheet of each unit. Potential natural gas usage for each of the units was calculated using the maximum hours of operation per year (8,760 hr/yr). Detailed emissions calculations, and equipment information are summarized in Appendix A.

6.3 Fire Fighter Training

6.3.1 Emissions Source Description

Luke AFB has a small scale fire fighter training facility used for periodic refresher training. The training is performed in a live fire training pit including a mock-up aircraft structure. The fire is simulated through the use of a controlled propane burner. Emissions from fire fighter training occur as a result of the combustion of the fuel burned and include criteria pollutants and a variety of HAPs (both organic and inorganic). A process flow diagram is shown in Figure 6-3.

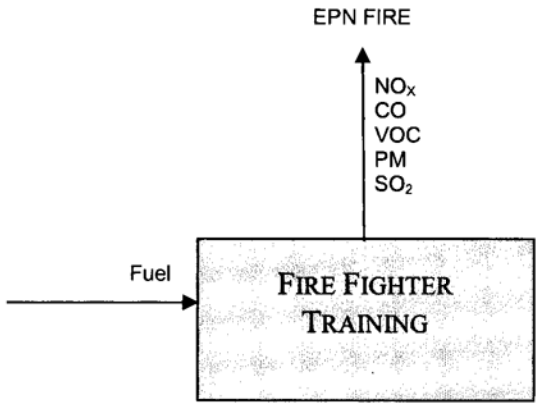

Figure 6-3. Fire Fighter Training Process Flow Diagram

MCAPCR Rule 314 §§303 defines fire fighter training as a trivial source ["Fire fighting training, training areas and training structures are exempt from needing a permit if the sole source of flame is a burner fueled by either liquefied petroleum gas or natural gas, with a British Thermal Unit (BTU) input per hour rating of less than 2,000,000 BTUs."] However, Luke AFB wishes to include these operations under Air Quality Operating Permit No. V97-017 so it will not be necessary to apply for separate open outdoor burning permits.

6.3.2 Emissions Calculations

Emissions from fire fighter training were estimated by multiplying the amount of fuel combusted by the appropriate emission factor, as shown in the equation below.

$$E_{POL} = Q \times EF$$

where,

E_{POL} = Emissions of a particular pollutant (lb/yr);
Q = Quantity of fuel consumed per year (10^3 gal/yr for propane); and
EF = Emission factor (lb/10^3 gal for propane).

Calculations were completed using emission factors from *Air Emissions Guide for Air Force Stationary Sources* (AFCEC, October 2014). Emissions from fire fighter training were determined by taking the average of the fuel consumed during 2012 to 2014 (used as the 3-year baseline average), and scaling this number up by 4.21. The factor of 4.21 is the ratio of the maximum number of hours per year (8,760) to current average actual site operating hours of eight hours per day, five days per week, 52 weeks per year (2,080 hours per year), which conservatively assumes that fire fighter training at Luke AFB would increase proportionately to base operations. Detailed emissions calculations, and equipment information are summarized in Appendix A.

6.4 Fuel Cell Maintenance

6.4.1 Emissions Source Description

Luke AFB performs maintenance, repair, and routine inspection of the F-16 fuel cells, which are the fuel storage tanks on the aircraft. Although fuel cell maintenance while the fuel cells remain on the aircraft is considered to be a mobile source of emissions by the Air Force, the F-16 has two external fuel cells which may be removed and maintained in a dedicated facility at Luke AFB. For this reason, fuel cell maintenance is included under Air Quality Operating Permit No. V97-017.

Fuel remaining in the fuel cell and fuel foam are removed prior to inspection and maintenance of the fuel cell. Fuel cell maintenance is a source of VOC and HAP emissions from both the removal of fuel from the fuel cell into bowsers and from subsequently purging the fuel cell with clean air until the cell may be entered by maintenance personnel.[1] Fuel cell defueling emissions are the result of vapors displaced from the bowser tank by fuel from the fuel cell (and back again). The emissions from the loading of fuel to and from the bowsers (during the defueling process) are addressed in Section 6.6, Fuel Loading. Refueling of the fuel cell occurs

[1] Emissions from the evaporation of fuel from any explosion suppression foam removed from the cell is assumed to be negligible due to the strict Air Force Technical Order requirements that all removed foam must be immediately sealed to prevent fuel vaporization.

on the flightline once the cells have been put back on the aircraft and is considered a mobile source. A process flow diagram is shown in Figure 6-4.

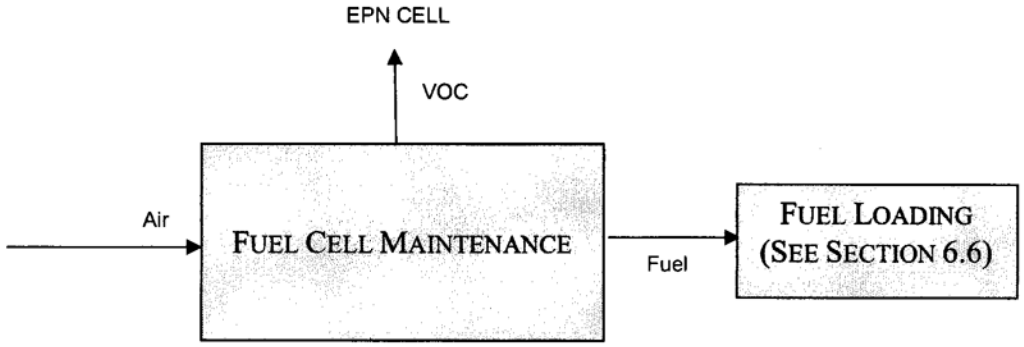

Figure 6-4. Fuel Cell Maintenance Process Flow Diagram

6.4.2 Emissions Calculations

Calculations were completed in accordance with the methodology shown in Section 13 of the *Air Emissions Guide for Air Force Stationary Sources* (AFCEC, October 2014). Emissions from the purging and ventilation of the fuel cell is related to the vapor concentration of the fuel in the fuel cell and the amount of residual fuel clinging to the interior surfaces of the cell that remains after removing the fuel from the fuel cell. However, these parameters can be difficult to determine, so emissions are conservatively estimated to be equal to the product of the saturation concentration of the vapor in the fuel cell and twice the fuel cell volume, as shown in the equation below.

$$E_{VOC} = C_{VOC} \times 0.13368 \times 2 \times \sum(V \times N)$$

where,

E_{VOC} = Annual emissions of VOC (lb/yr);
2 = Factor used for the conservative estimate of emissions representing twice the fuel cell volume;
C_{VOC} = VOC concentration in the fuel cell (lb/ft^3);
0.13368 = Factor for converting cubic feet to gallons (ft^3/gal);
V = Fuel cell volume (gal/unit); and
N = Number of fuel cells purged/ventilated in a year (units/yr).

The vapor saturation concentration (CVOC) was first estimated using the vapor molecular weight, vapor pressure and temperature of JET-A, as shown in the equation below.

$$C_{VOC} = (M_V \times P_{VA}) / (R \times T_{LA})$$

where,

M_V = Vapor molecular weight (lb/lb-mol);
P_{VA} = Vapor pressure at the daily average liquid surface temperature (psia);
R = Ideal gas constant (10.732 $psia \cdot ft^3/°R \cdot lb\text{-}mol$); and
T_{LA} = Daily average liquid surface temperature (°R).

The properties of JET-A were taken from Table 13-1 of the *Air Emissions Guide for Air Force Stationary Sources* (AFCEC, October 2014).
Speciated HAP emissions were calculated by multiplying the VOC emissions with the JET-A vapor-phase weight fraction of a particular HAP.

Maximum emissions from fuel cell maintenance were estimated using the maximum number of fuel cells purged in a year. The maximum number of fuel cells purged in a year was determined by taking the number of fuel cells purged in 2007 (used as baseline year), and scaling this number up by 4.21. The factor of 4.21 is the ratio of the maximum number of hours per year (8,760) to current average actual site operating hours of eight hours per day, five days per week, 52 weeks per year (2,080 hours per year), which conservatively assumes that fuel cell maintenance at Luke AFB would increase proportionately to base operations.

Detailed emissions calculations, and equipment information are summarized in Appendix A.

6.5 Fuel Dispensing

6.5.1 Emissions Source Description

Luke AFB has one gasoline dispensing location used primarily to refuel government vehicles (Building 335). Fuel dispensing is a source of VOC and HAP emissions. Vehicle refueling emissions are the result of vapors displaced from the vehicle tank by dispensed fuel, from spillage of fuels from pre-fill and post-fill nozzle drip, and from "spit-back" and overflow from the fuel tank filler neck on the vehicle during filling. Breathing and working emissions from the storage tanks are addressed with Fuel Storage (Section 6.7). A process flow diagram is shown in Figure 6-5.

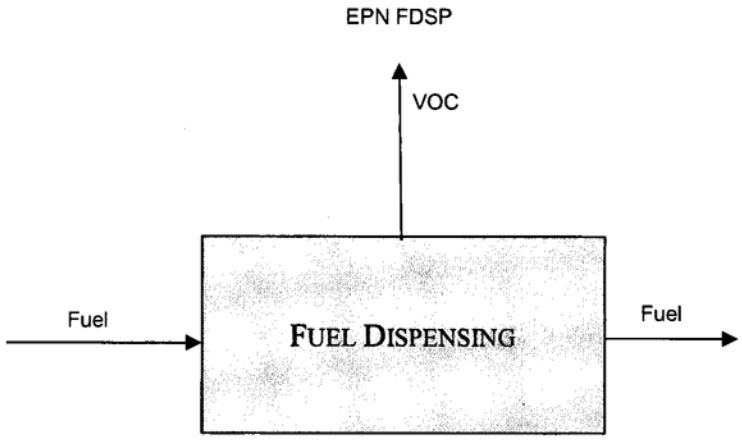

Figure 6-5. Fuel Dispensing Process Flow Diagram

At Luke AFB, gasoline dispensing currently involves the use of Stage II Vapor Recovery. However, in accordance with EPA policy, Luke AFB plans to phase out Stage II systems pending instruction from Maricopa County. For this reason, a control efficiency is not claimed for the use of Stage II Vapor Recovery in conjunction with emission calculations for gasoline dispensing.

At Building 335, gasoline is transferred into gasoline delivery vehicles for distribution to other gasoline storage tanks on base. These gasoline delivery vehicles are tested annually by an off-base contractor to ensure the vessels are vapor tight and leak free, in accordance with the requirements of MCAPCR Rule 352. Emissions from the transfer of fuel into these vessels is accounted for as a part of the fuel dispensing calculations; emissions from the transfer of fuel from these vessels to other storage tanks is considered a part of storage tank working losses, as discussed in Section 6.7.

6.5.2 Emissions Calculations

The VOC emission factors for gasoline are 11 lb/10^3 gal for uncontrolled displacement emissions per AP 42, Section 5.2, Table 5.2-7 (EPA, June 2008). VOC emissions were calculated using the equation shown below.

$$EVOC = Q \times 1/1{,}000 \times EF$$

where,

EVOC = Emissions of VOC (lb/yr);
Q = Annual quantity of fuel transferred (gal/yr);
1/1,000 = Factor for converting gallons to 1,000-gallons (gal/10^3 gal); and
EF = Emission factor (lb/10^3 gal).

Speciated HAP emissions were calculated by multiplying the VOC displacement emissions with the vapor-phase weight fraction of a particular HAP.

Maximum VOC and HAP emissions from fuel dispensing operations were estimated using fuel usage quantities previously submitted to the MCAQD during the last renewal. The calculated emissions are lower than the applicability threshold for the Subpart CCCCCC, of the National Emission Standards for Hazardous Air Pollutants for Source Categories: Gasoline Dispensing Stations", codified at 40 CFR §63.11110 through §63.11132. Therefore, that federal regulation does not apply to the gasoline dispensing operations at Luke AFB.

Detailed emissions calculations, operational limits, and equipment information are summarized in Appendix A.

6.6 Fuel Loading

6.6.1 Emissions Source Description

Luke AFB has loading racks where diesel and JET-A are dispensed from large tanks into tank trucks (meet the definition of delivery vessel in the regulations). Fuel loading is a source of VOC and HAP emissions. Loading losses are the result of vapors displaced from the fuel tank during loading of the fuel. A process flow diagram is shown in Figure 6-6.

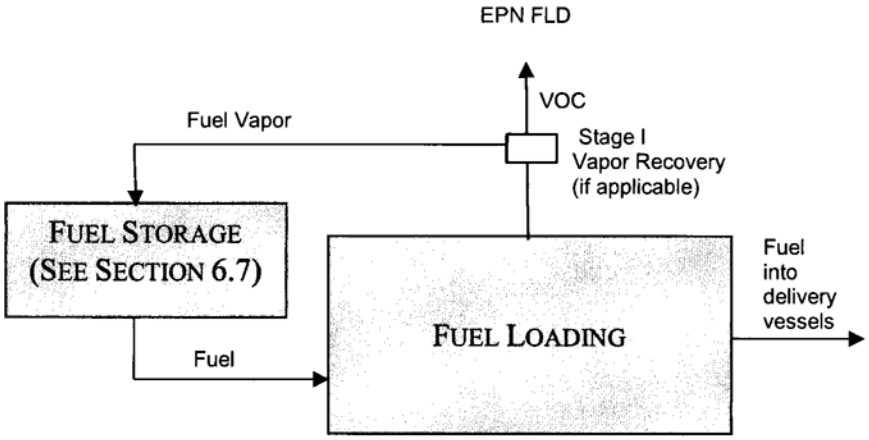

Figure 6-6. Fuel Loading Process Flow Diagram

Fuel is transferred from Tanks 350 and 359 to five aboveground fuel loading racks through a pipeline within the base.[2] From the loading racks, the fuel is loaded into base tank trucks and distributed to aircraft on the flight line or to the smaller storage tanks located throughout the base for use in equipment and vehicles. All loading is submerged, dedicated service.

Aircraft defueling (unloading of JET-A into a bowser) as a part of fuel cell maintenance activities (as described in Section 6.4) is also included under fuel loading. However, other aircraft defueling and refueling on the flightline is considered a mobile source and is not addressed in this renewal. Refer to Section 7.0 for additional information on excluded sources.

6.6.2 Emissions Calculations

[2] Fuel can also be piped directly from Tanks 351 and 356 to the loading racks.

VOC emissions from fuel loading operations are calculated in accordance with the loading loss equation provided in AP-42, Section 5.2 (EPA, June 2008). VOC emissions were calculated using the equation shown below.

$E_{VOC} = Q \times 1/1000 \times 12.46 \times S \times P \times M / T \times [1-(CAP_{eff}/100 \times CON_{eff}/100)]$

where,

E_{VOC} = Annual emissions of VOCs (lb/yr);
Q = Annual quantity of fuel transferred into the tanks (gal/yr);
1/1000 = Factor for converting gallons to 1,000-gallons (gal/10^3 gal);
12.46 = Equation constant (°R lb-mol/psia 10^3 gal);
S = Saturation factor;
P = True vapor pressure of fuel (psia);
M = Vapor molecular weight of the fuel (lb/lb-mol);
T = Temperature of bulk liquid loaded (°R);
CAP_{eff} = Capture efficiency of the loading terminal (%);
CON_{eff} = Efficiency of the control device (%); and
100 = Factor for converting a percent to a fraction (%).

Speciated HAP emissions were calculated by multiplying the total VOC displacement emissions against the vapor phase weight fraction of each HAP in the fuel. Capture and control efficiency were set at 0% to allow for a conservative estimate of emissions.

The maximum amount of fuel loaded in a year was determined by taking the usage in 2007 (used as baseline year), and scaling this number up by 4.21. The factor of 4.21 is the ratio of the maximum number of hours per year (8,760) to current average actual site operating hours of eight hours per day, five days per week, 52 weeks per year (2,080 hours per year), which conservatively assumes that fuel loading at Luke AFB would increase proportionately to base operations.

Detailed emissions calculations, and equipment information are summarized in Appendix A.

6.7 Fuel Storage

6.7.1 Emissions Source Description

Luke AFB stores fuel in multiple storage tanks. All fuel tanks contain one of three fuel types: jet fuel (JET-A), gasoline, or diesel/biodiesel. Evaporative regulated air pollutants from fuel storage tanks include VOCs and organic HAPs which occur as a result of working losses when the tanks are filled and breathing losses while the tanks are storing fuel. A process flow diagram is shown in Figure 6-7.1.

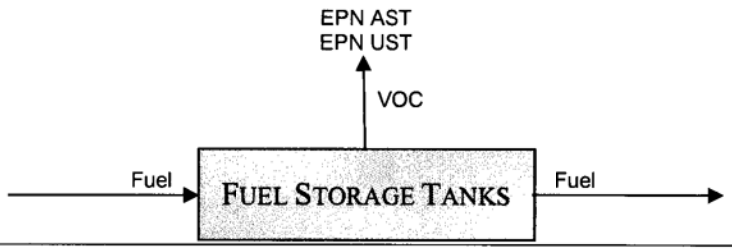

Figure 6-7.1. Fuel Storage Process Flow Diagram

6.7.1.1 JET-A Storage Tanks

JET-A fuel is received through an interstate pipeline that transfers fuel to Tanks 351 and 356. Tanks 351 and 356 are external floating roof tanks with capacities of 420,000 and 1,680,000 gallons, respectively. Fuel is then transferred from Tanks 351 and 356 into Tanks 350 and 359. Tanks 350 and 359 are fixed roof tanks, each with a capacity of 210,000 gallons. Fuel is transferred from Tanks 350 and 359 to five aboveground fuel loading racks through an internal pipeline. Loading rack operation is discussed in Section 6.4.

Tank 366 contains up to 25,000 gallons JP-8. Tank 366 receives JET-A from aircraft de-fueling or excess fuel when cleaning tanker trucks. Fuel from Tank 366 is then transferred into either Tank 351 or 356.

Figure 6-7.2 outlines the flow of JET-A at Luke AFB.

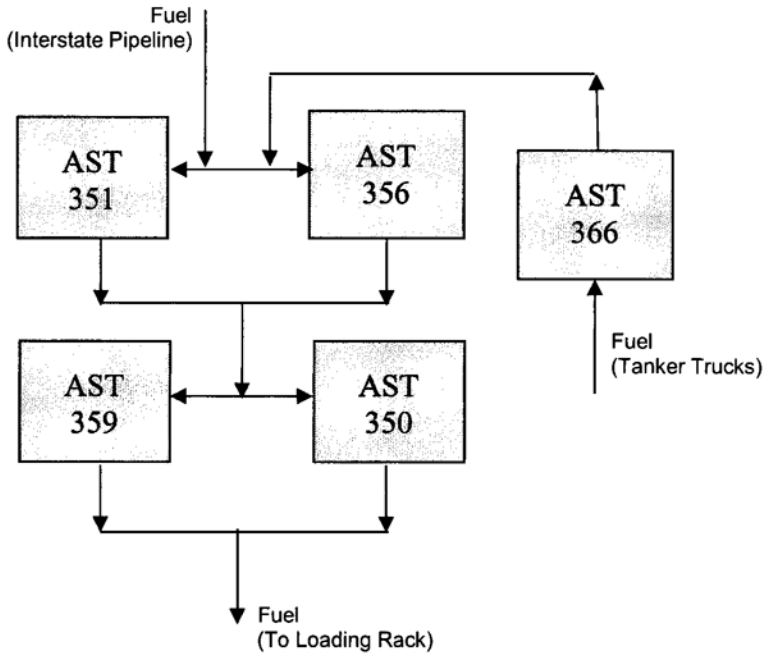

Figure 6-7.2. JET-A Process Flow Diagram

6.7.1.2 Gasoline and Diesel Storage Tanks

Tanks 367 and 368 contain up to 50,000 gallons diesel and 25,000 gallons gasoline, respectively. Tanks 367 and 368 receive fuel from an outside contractor.

Building 2201 has a 1,000-gallon gasoline convault AST. This tank receives gasoline from an outside contractor.

Building 335 is a service station, which provides gasoline and diesel fuel to military vehicles for base operations. Fuel is delivered to the government service station by a contractor, and fuel delivery pumps are essentially identical to retail gas station units, meeting weights and measure standards. Figure 6-5 outlines the flow of gasoline at Luke AFB.

6.7.1.3 Insignificant Tanks

Smaller diesel and gasoline fuel storage tanks at Luke AFB (e.g., built in generator fuel storage tanks) are considered an insignificant source in accordance with MCAPCR Appendix D ["Chemical or petroleum storage tanks or containers that hold 250 gallons or less and would have emissions of a regulated air pollutant."].

Luke AFB also has tanks storing liquids considered to have a low vapor pressure (virgin oil, flush oil, hydraulic oil, antifreeze, etc.). These tanks are also considered an insignificant source in accordance with MCAPCR Appendix D ["Any emissions unit, operation, or activity that handles or stores no more than 12,000 gallons of a liquid with a vapor pressure less than 1.5 psia."].

Refer to Section 7.0 for additional information on insignificant sources.

6.7.2 Emissions Calculations

Maximum emissions from fuel storage tanks were estimated using previously permitted maximum fuel usage limits and individual tank characteristics (tank diameter, shell length/height, etc.). VOC emissions from fuel storage tanks were estimated using methods outlined in Section 7.1.4 of AP-42. Calculations were completed within the Air Program Information Management System (APIMS) by inputting the tank properties and fuel throughputs. HAP emissions were calculated by multiplying total VOC emissions by the vapor weight fraction of each HAP in the fuel.

Detailed emissions calculations, and equipment information are summarized in Appendix A.

6.8 Jet Engine Test Cells

6.8.1 Emissions Source Description

Two F-16 aircraft engines are tested at Luke AFB: F100-PW-220 and F100-PW-229. This renewal addresses emissions from engines that have been removed from aircraft and are tested in dedicated test cells. These cells are permanent fixtures with noise-

reducing enclosures, sometimes referred to as hush houses. Testing conducted on engines that are still attached to the aircraft are considered mobile and are not included in this application. Testing usually involves combustion of JET-A[3] fuel in various simulated aircraft operating scenarios (such as idle or approach modes). Emissions from aircraft engine testing occur as a result of the combustion of the fuel burned and include criteria pollutants and a variety of HAPs (both organic and inorganic). A process flow diagram is shown in Figure 6-8.

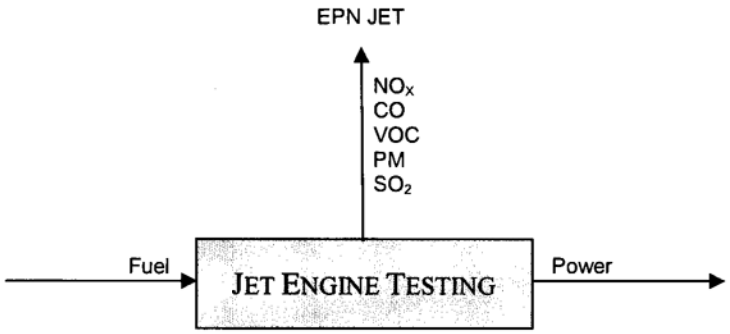

Figure 6-8. Jet Engine Testing Process Flow Diagram

6.8.2 Emissions Calculations

Emissions from jet engine testing were estimated by multiplying the number of tests per year per mode by the appropriate emission factor, as shown in the equation below.

$$E_{Pol} = FFR \times 1/1{,}000 \times T_{Test} \times EF_{Pol}$$

where,

E_{Pol} = Emissions (lb/yr);
FFR = Fuel flow rate per mode (lb/hr);
1/1,000 = Factor for converting gallons to 1,000-gallons (gal/10^3 gal);
T_{Test} = Total annual time engine testing occurred while operating at the applicable fuel flow rate (hr/yr); and
EF_{Pol} = Emissions factor (lb/10^3 lb).

Maximum times in mode were taken from the test cell technical operating procedures. The maximum number of tests in a year was determined by taking the usage in 2007 (used as baseline year), and scaling this number up by 4.21. The factor of 4.21 is the ratio of the maximum number of hours per year (8,760) to current average actual site operating hours of eight hours per day, five days per week, 52 weeks per year (2,080 hours per year), which conservatively assumes that jet engine testing at Luke AFB would increase proportionately to base operations.

[3] JP-8 fuel was historically used as a fuel for jet engine testing; JET-A is chemically identical to JP-8.

Fuel flow rates and emission factors for each mode were taken from *Air Emissions Guide for Air Force Mobile Sources* (AFCEC, October 2014). Emission factors in units of lb/gal for sulfur dioxide (SO_2) were derived by assuming all the sulfur in the fuel is converted to sulfur oxides (SOx) during combustion. As described in the *Air Emissions Guide for Air Force Stationary Sources* (AFCEC, October 2014), the emission factor for SOx is obtained using the following equation: EFSOx = 20S; where S is the weight percent of sulfur in the fuel.

Detailed emissions calculations, and equipment information are summarized in Appendix A.

6.9 Miscellaneous Chemical Use

6.9.1 Emissions Source Description

Miscellaneous chemical usage at Luke AFB includes cleaners, solvents, light lubricants, oils, adhesives, sealants and other materials. These are chemicals which are used up in process and emissions are uncontrolled. The primary regulated air pollutants associated with miscellaneous chemical usage are VOCs and organic HAPs. Emissions of these pollutants are a result of product evaporation. A majority of the chemicals used contain no inorganic HAP or solids, and spray application is minimal. Therefore, PM emissions from general chemical use is considered to be negligible. A process flow diagram is shown in Figure 6-9.

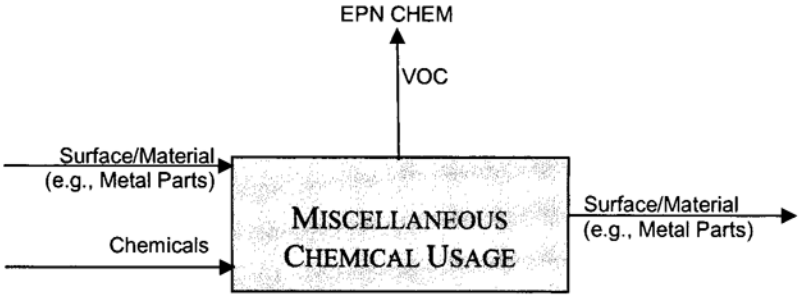

Figure 6-9. Miscellaneous Chemical Use Process Flow Diagram

6.9.2 Emissions Calculations

Emissions from miscellaneous chemical use are calculated based on a material balance. The emissions of each pollutant are calculated by multiplying the volume of chemical product used by the density of the chemical product and then by the weight fraction (weight percent divided by 100) of the pollutant in the chemical product, as shown in the equation below.

$$E_{POL} = QC \times D \times (WP/100)$$

where,

E_{POL} = Emissions of a particular pollutant (lb/yr);
QC = Quantity of chemical product used (gal/yr);
D = Density of the chemical product (lb/gal);
WP = Weight percent of the pollutant in the chemical product (%); and
100 = Factor for converting weight percent to weight fraction.

Luke AFB uses the Environmental Management Information System (EMIS); a comprehensive database tracking system for all material authorization and issues. When a material is authorized by base personnel, it is entered into the database, including health and safety information, physical and chemical properties and constituent breakdown from the material Safety Data Sheet (SDS). Many National Stock Numbers (NSN) are repeated since facilities are authorized to purchase any one specific cage (manufacturer) listed. Emissions are overstated by having duplicate NSN calculations, but each manufacturer usually has different constituents. In order to accurately report what is used, all possible products are accounted for.

Emissions from miscellaneous chemical use were determined by taking the emissions from 2007 EMIS data (used as the baseline average for this source), and scaling this number up by 4.21. The factor of 4.21 is the ratio of the maximum number of hours per year (8,760) to current average actual site operating hours of eight hours per day, five days per week, 52 weeks per year (2,080 hours per year), which conservatively assumes that miscellaneous chemical use at Luke AFB would increase proportionately to base operations.

Detailed emissions calculations are summarized in Appendix A.

6.10 Solvent Cleaning (Degreasing)

6.10.1 Emissions Source Description

Luke AFB operates multiple degreasing units which are commonly used by maintenance shops to clean (or degrease) parts associated with a variety of vehicles and equipment.

In a maintenance cleaner, dirty parts cleaned in remote reservoir tanks are manually sprayed with solvent, possibly brushed, and allowed to dry before being removed from the cleaner. The waste solvents are drained to a remote reservoir that captures drainage from the sink and acts as a pump sump for the spray. The cover is closed whenever parts are not being processed or allowed to drip dry in the cleaner.

The regulated air pollutants from solvent cleaning machines include VOCs and HAPs from product evaporation; however, the solvents used at Luke AFB do not contain HAPs. Therefore, only VOC emissions are being authorized from solvent cleaning units operated at Luke AFB. A process flow diagram is shown in Figure 6-10.

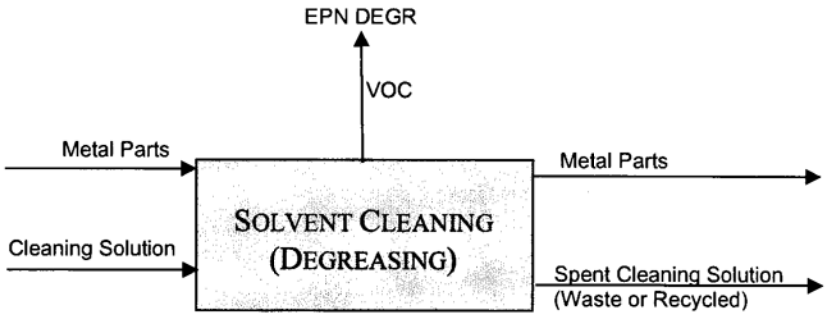

Figure 6-10. Solvent Cleaning (Degreasing) Process Flow Diagram

Some facilities use aqueous parts washers where the detergent used does not contain VOC's. These units are considered a trivial source in accordance with MCAPCR Appendix E ["Storage tanks, vessels, containers holding or storing liquid substances that will not emit any VOC or HAPs. Exemptions for storage tanks containing petroleum liquids or other VOCs should be based on size limits and vapor pressure of liquids stored and are not appropriate for this list."]. Refer to Section 7.0 for additional information on insignificant and trivial sources.

6.10.2 Emissions Calculations

Maximum VOC emissions were calculated using the equation shown below.

$$E_{VOC} = Q \times D \times (1-R/100)$$

where,

E_{VOC} = Emissions of VOC (lb/yr);
Q = Solvent Used (gal/yr);
D = Solvent Density (lb/gal); and
R = Percent Recovered (%).

The maximum amount of each type of solve used determined by taking the usage in 2007 (used as baseline year for this source), and scaling this number up by 4.21. The factor of 4.21 is the ratio of the maximum number of hours per year (8,760) to current average actual site operating hours of eight hours per day, five days per week, 52 weeks per year (2,080 hours per year), which conservatively assumes that solvent cleaning at Luke AFB would increase proportionately to base operations.
Detailed emissions calculations, and equipment information are summarized in Appendix A.

6.11 Stationary Internal Combustion

6.11.1 Emissions Source Description

Luke AFB has two types of stationary internal combustion engines. The majority of the engines are emergency generators which are used to provide emergency backup power to facilities/systems when the primary electrical power is not available; however, Luke AFB also has one general purpose generator which is used to provide electricity for the base as required.

Emissions from internal combustion occur as a result of the combustion of the fuel burned and include criteria pollutants and a variety of HAPs. The emissions from internal combustion units depend on a variety of factors including the size/type of the combustor, firing configuration, fuel type, control devices used, and operating capacity. A process flow diagram is shown in Figure 6-11.

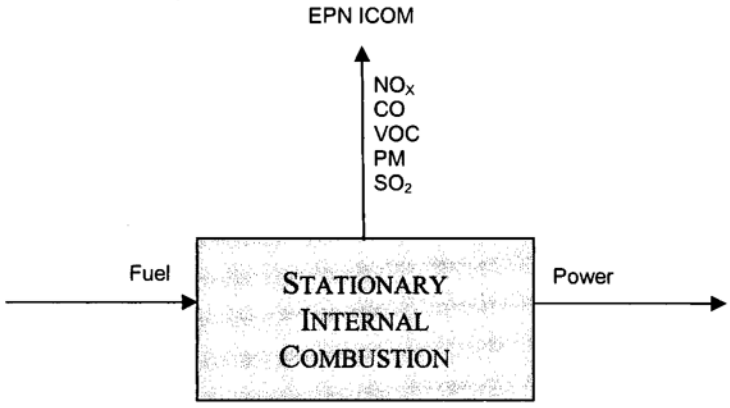

Figure 6-11. Stationary Internal Combustion Process Flow Diagram

Smaller stationary internal combustion engines at Luke AFB with a maximum equipment rating of less than 50hp are considered an insignificant source in accordance with MCAPCR Appendix D ["Any piston-type IC engine with a manufacturer's maximum continuous rating of no more than 50 brake horsepower (bhp)."]. Refer to Section 7.0 for additional information on insignificant sources.

6.12.2 Emissions Calculations

Emissions from stationary internal combustion sources were calculated using the equation below:

$$E_{POL} = OT \times PO \times LF/100 \times EF_{POL}$$

where,

E_{POL} = Emissions of a particular pollutant (lb/yr);
OT = Operating time (hr/yr);
PO = Rated power output of engine (hp);
LF = Engine load factor (%); 74% per AEI Guide, Table 28-2; and
EF_{POL} = Emissions factor (lb/hp-hr).

Power rating for each of the generators was obtained from base records and by visiting as many generators as possible to verify the information. The maximum hours of

operation for each of the engines was set based on the EPA memorandum "Calculating Potential to Emit (PTE) for Emergency Generators", which states that an engine cannot operate for more than 500 hours per year and be considered an emergency generator (EPA, September 1995). Emissions factors were taken from Table 28-3 and 28-4 of the AEI Guide.

Detailed emissions calculations, operational limits, and equipment information are summarized in Appendix A.

6.12 Surface Coating

6.12.1 Emissions Source Description

Surface coating operations are performed by a variety of shops on an Air Force installation, including corrosion control shops, structural maintenance shops, munitions maintenance shops, vehicle maintenance shops, hobby shops, etc. Surface coating operations involve the application of primers, paints (e.g., enamels, lacquers, polyurethanes), thinners, stains, varnishes, shellacs, glazes, etc., for decorative and protective purposes. The types of regulated air pollutants from surface coating include VOCs, organic HAPs, PM, and inorganic HAPs. The type and quantity of emissions are dependent on the composition of the surface coating material, the application technique, and whether or not a control device is used. A process flow diagram is shown in Figure 6-12.

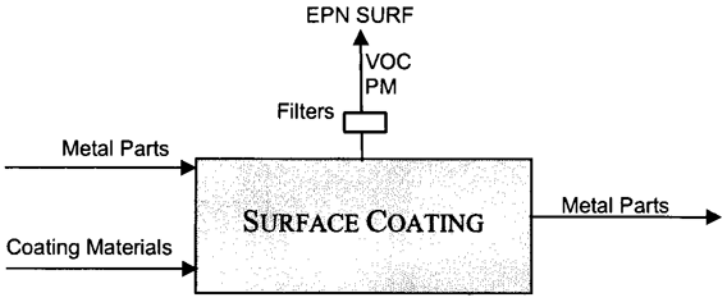

Figure 6-12. Surface Coating Process Flow Diagram

Surface coating operations at Luke AFB are categorized under Operating Permit No. V97-017 as: "Aerospace Manufacturing and Rework", "Vehicle and Mobile Equipment Coating", "Spray Coating Operations", "Architectural Coatings", and "Surface Coating Operations", as determined by MCAPCR Rules 348, 345, 315, 335, and 336, respectively. Aerospace coating operations at Luke AFB include coating of F-16 aircraft, aerospace ground equipment and rework at Buildings 922, 1018 and 1019. Vehicle refinishing operations at Luke AFB include coating of government vehicles operated by the federal government at Building 291. Spray Surface and spray coating operations at Luke AFB include coating of furniture, appliances, plastic products, and

signs at Buildings 339 and 415. In addition, the booth in Bldg. 339 is occasionally used for architectural coatings.

All surface coating operations at Luke AFB except for those performed at Building 247 are enclosed coating operations utilizing high-volume low-pressure (HVLP) spray equipment to apply the coatings. Information on the types of controls used at each surface coating location are provided in Appendix A.

Manual (touch-up) and aerosol can application of coatings inside the spray booth at Building 247 is considered insignificant ["Any equipment or activity using no more than one gallon per day of surface coating or any combination of surface coating and solvent, which contains either VOC or hazardous air pollutants (HAPs) or both."]. Refer to Section 7.0 for additional information on insignificant sources. Additional general exemptions are specified by MCAPCR Rules 348, 345, 315, 335, and 336, and are not listed in this application (e.g., MCAPCR Rule 348 §§308.4: Cotton-tipped swabs used for very small cleaning operations and aqueous cleaning solvents are exempt from the requirements of Section 307 of this rule.).

6.12.2 Emissions Calculations

Air emissions are calculated using Safety Data Sheet (SDS) information and a material balance. VOC and organic HAP emissions from surface coating are estimated in the same manner as described in Section 6.9 for Miscellaneous Chemical Use. Particulate matter emissions from surface coating operations are also calculated based on a material balance, and take into account the transfer efficiency of the application method and control efficiency of the control device. Emissions of particulate matter are calculated as shown in the equation below.

$$E_{POL} = QC \times D \times (WP/100) \times [1 - (TE/100)] \times [1 - (CE/100)] \times Cpol$$

where,

E_{POL} = Emissions of a particular pollutant (lb/yr);
QC = Quantity of chemical product used (gal/yr);
D = Density of the chemical product (lb/gal);
WP = Weight percent of the pollutant in the chemical product (%);
TE = Transfer efficiency (%):
CE = Control efficiency (%);
C_{Pol} = Fractional percentage of PM_{10} or $PM_{2.5}$ to total PM; and
100 = Factor for converting weight percent to weight fraction.

Similar to miscellaneous chemical use, surface coating usage and SDS information is tracked using EMIS. To allow for a conservative estimate, it was assumed that 100% of particulate sprayed would not be transferred and either emitted directly to the atmosphere or to a filter system if conducted within a booth. Booth filter efficiency was conservatively set low at 95%.

Emissions from surface coating were determined by taking the emissions from 2007 (used as the baseline average for this source), and scaling this number up by 4.21. The

factor of 4.21 is the ratio of the maximum number of hours per year (8,760) to current average actual site operating hours of eight hours per day, five days per week, 52 weeks per year (2,080 hours per year), which conservatively assumes that surface coating at Luke AFB would increase proportionately to base operations.

Detailed emissions calculations, and equipment information are summarized in Appendix A.

6.13 Woodworking

6.13.1 Emissions Source Description

Most Air Force installations have a few organizations that operate woodworking equipment (e.g., saws, sanders, etc.). The use of woodworking equipment generates airborne PM in the form of small wood waste particles (shavings, sander dust, sawdust, etc.). In most cases, the airborne particulate is captured by a ventilation system and control device. The control device used is either a cyclone, a baghouse (fabric filter), or both in series. The sawdust captured by the control device is then collected in a bin or other container that is emptied when full. All processes at Luke AFB are manually operated. A process flow diagram is shown in Figure 6-13.

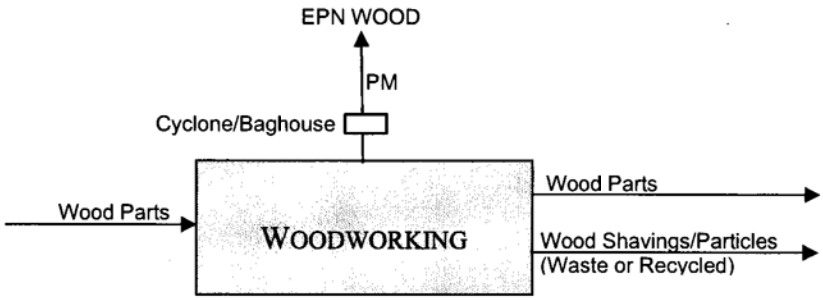

Figure 6-13. Woodworking Process Flow Diagram

Luke AFB currently operates a baghouse to control air emissions at Building 247, two cyclones to control air emissions at Buildings 339 and 415, and a Roto Clone Hopper to control air emissions at Building 339[4]. All other woodworking activities utilize hand held or manually operated equipment that exhaust into the work space and are considered an insignificant source in accordance with MCAPCR Appendix D ["Hand-held or manually operated equipment used for buffing, polishing, carving, cutting, drilling, machining, routing, sanding, sawing, surface grinding, or turning of ceramic art work, precision parts, leather, metals, plastics, fiberboard, masonry, carbon, glass, or wood."]. Refer to Section 7.0 for additional information on insignificant sources.

[4] For the purposes of emission estimations, the Roto Clone Hopper is treated as equivalent to a cyclone.

6.13.2 Emissions Calculations

Emissions from woodworking were calculated by multiplying the amount of waste collected time the appropriate emissions factor per the equation below:

$$E_{POL} = Q \times EF_{Pol} \times 1 - (CAP_{eff}/100 \times CON_{eff}/100)$$

where,

E_{POL} = Emissions of a particular pollutant (lb/yr);
Q = Annual quantity of wood waste hauled away (ton/yr);
EF_{Pol} = Emissions factor (lb/ton wood waste hauled away);
CAP_{eff} = Capture efficiency (%);
CON_{eff} = Control efficiency (%); and
100 = Factor for converting percent to fraction.

Emission factors for PM_{10} were taken from the Maricopa County Emissions Inventory Help Sheet for the Woodworking Industry (2014). The capture and control efficiencies for the cyclones and baghouses were assumed to be 100% and 85%, respectively, in accordance with the Maricopa County Emissions Inventory Help Sheet for the Woodworking Industry (2014) for cyclones.

The maximum amount of sawdust collected at each location was determined by taking the usage in 2007 (used as baseline year for this source), and scaling this number up by 4.21. The factor of 4.21 is the ratio of the maximum number of hours per year (8,760) to current average actual site operating hours of eight hours per day, five days per week, 52 weeks per year (2,080 hours per year) which it is conservatively assumes that woodworking operations at Luke AFB would increase proportionately to base operations.

Detailed emissions calculations, and equipment information are summarized in Appendix A.

7.0 INSIGNIFICANT AND TRIVIAL ACTIVITIES

7.0 INSIGNIFICANT AND TRIVIAL ACTIVITIES

Per MCAPCR Rule 100 §§200.58 and Appendix D, emissions do not need to be calculated for insignificant activities, however, the sources must be listed or generally grouped in the application. The table below summarizes the sources at Luke AFB that meet the definition of insignificant.

Source Type	EPN	Description	Exclusion Rationale
Boilers/Heaters/ Water Heaters	Multiple – See Source List	Boilers/Heaters/ Water heaters <300,000 Btu/hr	Appendix D: General Combustion Activities establishes a threshold for these sources as greater than 300,000 Btu/hr. All natural gas and/or liquefied petroleum gas-fired pieces of equipment over 300,000 BTU per hour, only if the input capacities added together are less than 2,000,000 BTU per hour, the emissions come from fuel burning, and the equipment is used solely for heating buildings for personal comfort or for producing hot water for personal use. It is implied that water heaters <300,000 Btu/hr are insignificant.
Cooling Towers	Multiple – See Source List	Cooling Towers with circulation rate of 3,900 gallons per minute or less	Appendix D: Miscellaneous Activities. Cooling towers: Any water cooling tower which: (1) has a circulation rate of less than 10,000 gallons per minute; and (2) is not used to cool process water, water from barometric jets, or water from barometric condensers.
Stationary Internal Combustion	Multiple – See Source List	Emergency generators <50hp	Appendix D: Internal Combustion (IC) Equipment. Any piston-type IC engine with a manufacturer's maximum continuous rating of no more than 50 brake horsepower (bhp).
Woodworking	Multiple – See Source List	Hand held or manually operated equipment that exhaust into the work space	Appendix D: Miscellaneous Activities. Hand-held or manually operated equipment used for buffing, polishing, carving, cutting, drilling, machining, routing, sanding, sawing, surface grinding, or turning of ceramic art work, precision parts, leather, metals, plastics, fiberboard, masonry, carbon, glass, or wood.
Abrasive Blasting	Multiple – See Source List	Small Glove Box Blaster	

Source Type	EPN	Description	Exclusion Rationale
Storage Tanks	Multiple – See Source List	Gasoline, Diesel and JET-A Storage Tanks <250 gal cap.	Appendix D: Storage And Distribution. Chemical or petroleum storage tanks or containers that hold 250 gallons or less and would have emissions of a regulated air pollutant. Any emissions unit, operation, or activity that handles or stores no more than 12,000 gallons of a liquid with a vapor pressure less than 1.5 psia.
	Multiple – See Source List	Generator fuel storage tanks (Diesel) - various capacities	
	Multiple – See Source List	Tanks storing liquids considered to have a low vapor pressure (virgin oil, flush oil, hydraulic oil, antifreeze, etc.)	
Surface Coating	Multiple	Paint booth [in a designated (clean) shop area] in which manual application of materials is the sole method of application.	Appendix D: Surface Coating And Printing Equipment. Any equipment or activity using no more than one gallon per day of surface coating or any combination of surface coating and solvent, which contains either VOC or hazardous air pollutants (HAPs) or both.

Per MCAPCR Rule 100 §§200.111 and Appendix E, "Trivial activities" means activities, process, or emissions units, such as the following, that may be omitted from a Title V permit application. The table below summarizes the sources at Luke AFB that meet the definition of trivial.

Description	Exclusion Rationale
Welding	Appendix E: Repair And Maintenance. Plant maintenance and upkeep activities (e.g., grounds keeping, general repairs, cleaning, painting, welding, plumbing, re-tarring roofs, installing insulation, and paving parking lots), provided these activities are not conducted as part of a manufacturing process, are not related to the source's primary business activity, and not otherwise triggering a permit modification. Cleaning and painting activities qualify, if they are not subject to VOC or HAP control requirements. Asphalt batch plant owners and/or operators must still get a permit, if otherwise required.
Miscellaneous Chemical Use[1]	Appendix E: Repair and Maintenance. Plant maintenance and upkeep activities (e.g., grounds keeping, general repairs, cleaning, painting, welding, plumbing, re-tarring roofs, installing insulation, and paving parking lots), provided these activities are not conducted as part of a manufacturing process, are not related to the source's primary business activity, and not otherwise triggering a permit modification. Cleaning and painting activities qualify, if they are not subject to VOC or HAP control requirements. Asphalt batch plant owners and/or operators must still get a permit, if otherwise required. And Repair or maintenance shop activities not related to the source's primary business activity (excluding emissions from surface coating or degreasing (solvent metal cleaning) activities) and not otherwise triggering a permit modification.
Solvent Cleaning (Degreasing) Using	Appendix E: Storage And Distribution. Storage tanks, vessels, containers

Description	Exclusion Rationale
Aqueous Solvents	holding or storing liquid substances that will not emit any VOC or HAPs. Exemptions for storage tanks containing petroleum liquids or other VOCs should be based on size limits and vapor pressure of liquids stored and are not appropriate for this list.
Fire Suppression Systems (e.g., AFFF)	Appendix E: Emergency Equipment. Fire suppression systems.

[1]Miscellaneous chemical emissions estimates may include emissions from activities that would be considered insignificant to allow for a conservative estimate.

Additionally, the table below summarizes sources that are not defined insignificant or trivial per MCAPCR, but can be justifiably excluded from permitting.

Description	Exclusion Rationale
Aircraft Defueling	Both pieces of equipment are mobile; not a stationary source.
Jet Engine Spray Ring Matter Burn Off	Jet engine spray rings are pre-cleaned prior to placement in burn off ovens. Any debris remaining is invisible to the naked eye. The burn-off ovens are exempted from the requirements of MCAPCR Rule 313 per email "RE: Rule 313" from Patty Nelson – ENVX (PNelson@mail.maricopa.gov) to Newell Yvonne I Civilian 56 CES/CEVC, Thursday May 06, 2004 1:55 PM.
Oil water separators	Generally used only for JET-A, oils, and other heavy materials mixed with water. Units are constant level, underground units (i.e., no working or breathing losses) and assumed to have no evaporative emissions.
Portable Jet Engine Test Stand	Considered a mobile source.
Portable Fuel Storage Tanks	Not a stationary source.
Outdoor Firing Range	Shooters are mobile; not a stationary source.

APPENDIX A – CALCULATION SPREADSHEETS

6.13.2 Emissions Calculations

Emissions from woodworking were calculated by multiplying the amount of waste collected time the appropriate emissions factor per the equation below:

$$E_{POL} = Q \times EF_{Pol} \times 1 - (CAP_{eff}/100 \times CON_{eff}/100)$$

where,

E_{POL} = Emissions of a particular pollutant (lb/yr);
Q = Annual quantity of wood waste hauled away (ton/yr);
EF_{Pol} = Emissions factor (lb/ton wood waste hauled away);
CAP_{eff} = Capture efficiency (%);
CON_{eff} = Control efficiency (%); and
100 = Factor for converting percent to fraction.

Emission factors for PM_{10} were taken from the Maricopa County Emissions Inventory Help Sheet for the Woodworking Industry (2014). The capture and control efficiencies for the cyclones and baghouses were assumed to be 100% and 85%, respectively, in accordance with the Maricopa County Emissions Inventory Help Sheet for the Woodworking Industry (2014) for cyclones.

The maximum amount of sawdust collected at each location was determined by taking the usage in 2007 (used as baseline year for this source), and scaling this number up by 4.21. The factor of 4.21 is the ratio of the maximum number of hours per year (8,760) to current average actual site operating hours of eight hours per day, five days per week, 52 weeks per year (2,080 hours per year) which it is conservatively assumes that woodworking operations at Luke AFB would increase proportionately to base operations.

Detailed emissions calculations, and equipment information are summarized in Appendix A.

7.0 INSIGNIFICANT AND TRIVIAL ACTIVITIES

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Per MCAPCR Rule 100 §§200.58 and Appendix D, emissions do not need to be calculated for insignificant activities, however, the sources must be listed or generally grouped in the application. The table below summarizes the sources at Luke AFB that meet the definition of insignificant.

Source Type	EPN	Description	Exclusion Rationale
Boilers/Heaters/ Water Heaters	Multiple – See Source List	Boilers/Heaters/ Water heaters <300,000 Btu/hr	Appendix D: General Combustion Activities establishes a threshold for these sources as greater than 300,000 Btu/hr. All natural gas and/or liquefied petroleum gas-fired pieces of equipment over 300,000 BTU per hour, only if the input capacities added together are less than 2,000,000 BTU per hour, the emissions come from fuel burning, and the equipment is used solely for heating buildings for personal comfort or for producing hot water for personal use. It is implied that water heaters <300,000 Btu/hr are insignificant.
Cooling Towers	Multiple – See Source List	Cooling Towers with circulation rate of 3,900 gallons per minute or less	Appendix D: Miscellaneous Activities. Cooling towers: Any water cooling tower which: (1) has a circulation rate of less than 10,000 gallons per minute; and (2) is not used to cool process water, water from barometric jets, or water from barometric condensers.
Stationary Internal Combustion	Multiple – See Source List	Emergency generators <50hp	Appendix D: Internal Combustion (IC) Equipment. Any piston-type IC engine with a manufacturer's maximum continuous rating of no more than 50 brake horsepower (bhp).
Woodworking	Multiple – See Source List	Hand held or manually operated equipment that exhaust into the work space	Appendix D: Miscellaneous Activities. Hand-held or manually operated equipment used for buffing, polishing, carving, cutting, drilling, machining, routing, sanding, sawing, surface grinding, or turning of ceramic art work, precision parts, leather, metals, plastics, fiberboard, masonry, carbon, glass, or wood.
Abrasive Blasting	Multiple – See Source List	Small Glove Box Blaster	

Source Type	EPN	Description	Exclusion Rationale
Storage Tanks	Multiple – See Source List	Gasoline, Diesel and JET-A Storage Tanks <250 gal cap.	Appendix D: Storage And Distribution. Chemical or petroleum storage tanks or containers that hold 250 gallons or less and would have emissions of a regulated air pollutant. Any emissions unit, operation, or activity that handles or stores no more than 12,000 gallons of a liquid with a vapor pressure less than 1.5 psia.
	Multiple – See Source List	Generator fuel storage tanks (Diesel) - various capacities	
	Multiple – See Source List	Tanks storing liquids considered to have a low vapor pressure (virgin oil, flush oil, hydraulic oil, antifreeze, etc.)	
Surface Coating	Multiple	Paint booth [in a designated (clean) shop area] in which manual application of materials is the sole method of application.	Appendix D: Surface Coating And Printing Equipment. Any equipment or activity using no more than one gallon per day of surface coating or any combination of surface coating and solvent, which contains either VOC or hazardous air pollutants (HAPs) or both.

Per MCAPCR Rule 100 §§200.111 and Appendix E, "Trivial activities" means activities, process, or emissions units, such as the following, that may be omitted from a Title V permit application. The table below summarizes the sources at Luke AFB that meet the definition of trivial.

Description	Exclusion Rationale
Welding	Appendix E: Repair And Maintenance. Plant maintenance and upkeep activities (e.g., grounds keeping, general repairs, cleaning, painting, welding, plumbing, re-tarring roofs, installing insulation, and paving parking lots), provided these activities are not conducted as part of a manufacturing process, are not related to the source's primary business activity, and not otherwise triggering a permit modification. Cleaning and painting activities qualify, if they are not subject to VOC or HAP control requirements. Asphalt batch plant owners and/or operators must still get a permit, if otherwise required.
Miscellaneous Chemical Use[1]	Appendix E: Repair and Maintenance. Plant maintenance and upkeep activities (e.g., grounds keeping, general repairs, cleaning, painting, welding, plumbing, re-tarring roofs, installing insulation, and paving parking lots), provided these activities are not conducted as part of a manufacturing process, are not related to the source's primary business activity, and not otherwise triggering a permit modification. Cleaning and painting activities qualify, if they are not subject to VOC or HAP control requirements. Asphalt batch plant owners and/or operators must still get a permit, if otherwise required. And Repair or maintenance shop activities not related to the source's primary business activity (excluding emissions from surface coating or degreasing (solvent metal cleaning) activities) and not otherwise triggering a permit modification.
Solvent Cleaning (Degreasing) Using	Appendix E: Storage And Distribution. Storage tanks, vessels, containers

Description	Exclusion Rationale
Aqueous Solvents	holding or storing liquid substances that will not emit any VOC or HAPs. Exemptions for storage tanks containing petroleum liquids or other VOCs should be based on size limits and vapor pressure of liquids stored and are not appropriate for this list.
Fire Suppression Systems (e.g., AFFF)	Appendix E: Emergency Equipment. Fire suppression systems.

[1]Miscellaneous chemical emissions estimates may include emissions from activities that would be considered insignificant to allow for a conservative estimate.

Additionally, the table below summarizes sources that are not defined insignificant or trivial per MCAPCR, but can be justifiably excluded from permitting.

Description	Exclusion Rationale
Aircraft Defueling	Both pieces of equipment are mobile; not a stationary source.
Jet Engine Spray Ring Matter Burn Off	Jet engine spray rings are pre-cleaned prior to placement in burn off ovens. Any debris remaining is invisible to the naked eye. The burn-off ovens are exempted from the requirements of MCAPCR Rule 313 per email "RE: Rule 313" from Patty Nelson – ENVX (PNelson@mail.maricopa.gov) to Newell Yvonne I Civilian 56 CES/CEVC, Thursday May 06, 2004 1:55 PM.
Oil water separators	Generally used only for JET-A, oils, and other heavy materials mixed with water. Units are constant level, underground units (i.e., no working or breathing losses) and assumed to have no evaporative emissions.
Portable Jet Engine Test Stand	Considered a mobile source.
Portable Fuel Storage Tanks	Not a stationary source.
Outdoor Firing Range	Shooters are mobile; not a stationary source.

APPENDIX A – CALCULATION SPREADSHEETS

Maricopa County
Air Quality Department

Maricopa County Air Quality Department
1001 N Central Ave, Suite 125, Phoenix, AZ 85004
Phone (602) 506-6010 Fax (602) 372-0587
AQPermits@mail.maricopa.gov

Company Name & Location: Luke Air Force Base

EMISSION SOURCES

Estimated Potential to Emit as per Rule 100.

Review of applications and issuance of permits will be expedited by supplying all necessary information on this table.

REGULATED AIR POLLUTANT DATA					EMISSION POINT DISCHARGE PARAMETERS										
Emission Point (1)		Chemical Composition of Total Stream	R. Air Pollutant Emission Rate		UTM Coordinates of Emissions Pt. (5)			Stack Sources (6)					Non Point Sources (7)	
Number	Name	Regulated Air Pollution Name (2)	#/ HR. (3)	Tons/ Year (4)	Zone	East (Mtrs)	North (Mtrs)	Height Above Ground/ Feet	Height Above Structure/ Feet	Exit Data DIA. (ft)	Exit Data VEL. (fps)	Exit Data Temp (°F)	Length (ft.)	Width (ft.)
001	External Combustion Sources - Natural Gas	CO	10.97	48.05	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		NOx	13.06	57.20										
		SOx	0.08	0.34										
		PM	0.99	4.35										
		PM_{10}	0.99	4.35										
		$PM_{2.5}$	0.99	4.35										
		VOC	0.72	3.15										
		Total HAPs	0.02	0.09										
002	External Combustion Sources - Propane	CO	0.08	0.36	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		NOx	0.14	0.62										
		SOx	<0.01	<0.01										
		PM	0.01	0.03										
		PM_{10}	0.01	0.03										
		$PM_{2.5}$	0.01	0.03										
		VOC	0.01	0.05										
		Total HAPs	<0.01	<0.01										
003	Fire Fighter Training - Building 7213	CO	0.24	0.25	12	371529	3710102						TBD	TBD
		NOx	0.88	0.91										
		SOx	<0.01	<0.01										
		PM	0.15	0.16										
		PM_{10}	0.15	0.16										
		$PM_{2.5}$	0.15	0.16										
		VOC	0.38	0.39										
		Total HAPs	0.01	0.01										
300	Stationary Internal Combustion, Small Emergency Generators, All Under 600 hp	CO	51.15	12.79	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		NOx	237.76	59.44										
		SOx	15.65	3.91										
		PM	17.06	4.26										
		PM_{10}	16.72	4.18										
		$PM_{2.5}$	16.72	4.18										
		VOC	18.58	4.65										
		Total HAPs	0.21	0.05										

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Company Name & Location: Luke Air Force Base

EMISSION SOURCES

Estimated Potential to Emit as per Rule 100.

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REGULATED AIR POLLUTANT DATA					EMISSION POINT DISCHARGE PARAMETERS										
Emission Point (1)		Chemical Composition of Total Stream	R. Air Pollutant Emission Rate		UTM Coordinates of Emissions Pt. (5)			Stack Sources (6)					Non Point Sources (7)	
Number	Name	Regulated Air Pollution Name (2)	#/ HR. (3)	Tons/ Year (4)	Zone	East (Mtrs)	North (Mtrs)	Height Above Ground/ Feet	Height Above Structure/ Feet	Exit Data DIA. (ft)	Exit Data VEL. (fps)	Exit Data Temp (°F)	Length (ft.)	Width (ft.)
330	Aircraft Engine Testing - Bldg 1006, 1012, & 1016 - F-100-PW-220	CO	551.32	12.76	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		NOx	765.64	29.13										
		SOx	34.93	0.84										
		PM	74.93	2.09										
		PM_{10}	74.93	2.09										
		$PM_{2.5}$	67.64	1.88										
		VOC	106.38	4.17										
		Total HAPs	4.09	0.38										
332	Aircraft Engine Testing - Bldg 1006 - F-100-PW-229	CO	462.98	0.41	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		NOx	740.41	2.40										
		SOx	23.52	0.06										
		PM	53.46	0.16										
		PM_{10}	53.46	0.16										
		$PM_{2.5}$	48.22	0.15										
		VOC	115.47	0.08										
		Total HAPs	3.08	0.03										
360	Stationary Internal Combustion, Large Emergency Generators, All 600 hp +	CO	14.26	3.56	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		NOx	53.66	13.42										
		SOx	0.03	0.01										
		PM	1.68	0.42										
		PM_{10}	1.68	0.42										
		$PM_{2.5}$	1.68	0.42										
		VOC	1.48	0.37										
		Total HAPs	0.03	0.01										
502	Woodworking - Waste Bin Emptying - Bldg 247, 339, 415, and 948	PM	0.01	0.01	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		PM_{10}	0.01	0.01										
		$PM_{2.5}$	0.01	0.01										
503	Woodworking - Bin Vents - Bldg 247, 339, 415, and 948	PM	<0.01	<0.01	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		PM_{10}	<0.01	<0.01										
		$PM_{2.5}$	<0.01	<0.01										
516	Woodworking - Dust Collection Systems - 247, 339, and 415	PM	0.07	0.07	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		PM_{10}	0.07	0.07										
		$PM_{2.5}$	0.07	0.07										

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Emission Point (1)		Chemical Composition of Total Stream	R. Air Pollutant Emission Rate		UTM Coordinates of Emissions Pt. (5)			Stack Sources (6)					Non Point Sources (7)	
Number	Name	Regulated Air Pollution Name (2)	#/ HR. (3)	Tons/ Year (4)	Zone	East (Mtrs)	North (Mtrs)	Height Above Ground/ Feet	Height Above Structure/ Feet	Exit Data DIA. (ft)	Exit Data VEL. (fps)	Exit Data Temp (°F)	Length (ft.)	Width (ft.)
515	Walk-In Abrasive Blasting Booth	PM	<0.01	<0.01	12	371529	3710102	TBD	TBD	TBD	TBD	TBD		
		PM_{10}	<0.01	<0.01										
		$PM_{2.5}$	<0.01	<0.01										
		Total HAPs	<0.01	<0.01										
520	Fuel Cell Maintenance - Internal Tank	VOC	0.62	0.65	12	371529	3710102						Varies	Varies
		Total HAPs	0.01	0.01										
521	Fuel Cell Maintenance - External Tank	VOC	0.19	0.20	12	371529	3710102						Varies	Varies
		Total HAPs	<0.01	<0.01										
522	Fuel Cell Maintenance - External Tank	VOC	0.09	0.10	12	371529	3710102						Varies	Varies
		Total HAPs	<0.01	<0.01										
523	Aircraft Defueling Prior to Fuel Cell Maintenance	VOC	0.01	0.01	12	371529	3710102						Varies	Varies
		Total HAPs	<0.01	<0.01										
620	Fuel Storage Tank - B351, STANDING	VOC	0.02	0.10	12									
		Total HAPs	<0.01	<0.01										
621	Fuel Storage Tank - B351, WORKING	VOC	0.18	0.18	12									
		Total HAPs	<0.01	<0.01										
622	Fuel Storage Tank - B356, STANDING	VOC	0.03	0.12	12									
		Total HAPs	<0.01	<0.01										
623	Fuel Storage Tank - B356, WORKING	VOC	0.13	0.13	12									
		Total HAPs	<0.01	<0.01										
624	Fuel Storage Tank - B350, STANDING	VOC	0.01	0.04	12									
		Total HAPs	<0.01	<0.01										
625	Fuel Storage Tank - B350, WORKING	VOC	0.03	0.03	12									
		Total HAPs	<0.01	<0.01										
626	Fuel Storage Tank - B359, STANDING	VOC	0.01	0.04	12									
		Total HAPs	<0.01	<0.01										
627	Fuel Storage Tank - B359, WORKING	VOC	0.06	0.06	12									
		Total HAPs	<0.01	<0.01										
632	Fuel Storage Tank - B366, STANDING	VOC	0.01	0.05	12									
		Total HAPs	<0.01	<0.01										
633	Fuel Storage Tank - B366, WORKING	VOC	0.01	0.01	12									
		Total HAPs	<0.01	<0.01										

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Emission Point (1)		Chemical Composition of Total Stream	R. Air Pollutant Emission Rate		UTM Coordinates of Emissions Pt. (5)			Stack Sources (6)					Non Point Sources (7)	
Number	Name	Regulated Air Pollution Name (2)	#/ HR. (3)	Tons/ Year (4)	Zone	East (Mtrs)	North (Mtrs)	Height Above Ground/ Feet	Height Above Structure/ Feet	Exit Data DIA. (ft)	Exit Data VEL. (fps)	Exit Data Temp (°F)	Length (ft.)	Width (ft.)
642	Fuel Loading (Dispensing) - JET-A to Trucks, Tank 351, 356	VOC	13.72	14.27	12	371529	3710102						TBD	TBD
		Total HAPs	0.13	0.13										
643	Fuel Loading (Dispensing) - JET-A to Aircraft, Tank 351, 356	VOC	13.72	14.27	12	371529	3710102						TBD	TBD
		Total HAPs	0.13	0.13										
644	Fuel Loading (Dispensing) - Diesel to Trucks, Bldg 405	VOC	<0.01	<0.01	12	371529	3710102						TBD	TBD
		Total HAPs	<0.01	<0.01										
653	Fuel Dispensing - Gasoline - Military Service Station	VOC	6.35	6.60	12	371529	3710102						TBD	TBD
		Total HAPs	0.19	0.20										
662	B2201, STANDING	VOC	0.13	0.59	12									
		Total HAPs	<0.01	0.02										
663	B2201, WORKING	VOC	0.07	0.07	12									
		Total HAPs	<0.01	<0.01										
666	Fuel Storage Tank - B368, STANDING	VOC	1.59	6.98	12									
		Total HAPs	0.05	0.21										
669	B368, WORKING	VOC	0.35	0.37	12									
		Total HAPs	0.01	0.01										
701	Solvent Cleaning - Safety Kleen	VOC	1.21	1.26	12	371529	3710102						Varies	Varies
706	Solvent Cleaning - ZEP Dyna 680, Type II	VOC	0.26	0.27	12	371529	3710102						Varies	Varies
707	Solvent Cleaning - Formula 724	VOC	0.31	0.33	12	371529	3710102						Varies	Varies
708	Solvent Cleaning - Penetone 724	VOC	0.31	0.33	12	371529	3710102						Varies	Varies
709	Solvent Cleaning - Penetone 725	VOC	0.32	0.33	12	371529	3710102						Varies	Varies
710	Solvent Cleaning - PD 680, TYPE III	VOC	0.31	0.32	12	371529	3710102						Varies	Varies
711	Solvent Cleaning - Calla 296	VOC	0.05	0.05	12	371529	3710102						Varies	Varies
712	Solvent Cleaning - Super Agitene 141	VOC	0.32	0.33	12	371529	3710102						Varies	Varies

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Emission Point (1)		Chemical Composition of Total Stream	R. Air Pollutant Emission Rate		UTM Coordinates of Emissions Pt. (5)			Stack Sources (6)					Non Point Sources (7)	
Number	Name	Regulated Air Pollution Name (2)	#/ HR. (3)	Tons/ Year (4)	Zone	East (Mtrs)	North (Mtrs)	Height Above Ground/ Feet	Height Above Structure/ Feet	Exit Data			Length (ft.)	Width (ft.)
										DIA. (ft)	VEL. (fps)	Temp (°F)		
713	Solvent Cleaning - Tectyl 275 (Finger Print Remover)	VOC	0.25	0.26	12	371529	3710102						Varies	Varies
751	Surface Coating - Paint - General Maintenance Materials, Multiple Bldgs	PM	0.46	0.48	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		PM_{10}	0.46	0.48										
		$PM_{2.5}$	0.46	0.48										
		VOC	1.15	1.20										
		Total HAPs	0.12	0.12										
752	Chemical and Solvent Use - Primer - General Maintenance Materials, Multiple Bldgs	PM	0.30	0.31	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		PM_{10}	0.30	0.31										
		$PM_{2.5}$	0.30	0.31										
		VOC	0.75	0.78										
		Total HAPs	0.08	0.08										
753	Chemical and Solvent Use - Thinner - General Maintenance Materials, Multiple Bldgs	VOC	0.11	0.11	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		Total HAPs	0.11	0.11										
757	Chemical and Solvent Use - Adhesive - General Maintenance Materials, Multiple Bldgs	VOC	0.73	0.76	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		Total HAPs	0.07	0.08										
760	Chemical and Solvent Use - Sealer - General Maintenance Materials, Multiple Bldgs	VOC	4.94	5.14	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		Total HAPs	0.49	0.51										
762	Chemical and Solvent Use - Alcohol - General Maintenance Materials, Multiple Bldgs	VOC	3.10	3.23	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		Total HAPs	0.31	0.32										
770	Chemical and Solvent Use - Misc. Cleaners, Corrosion Prev., Hardeners, etc. - General	VOC	35.51	36.93	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		Total HAPs	3.55	3.69										

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Emission Point (1)		Chemical Composition of Total Stream	R. Air Pollutant Emission Rate		UTM Coordinates of Emissions Pt. (5)			Stack Sources (6)					Non Point Sources (7)	
Number	Name	Regulated Air Pollution Name (2)	#/ HR. (3)	Tons/ Year (4)	Zone	East (Mtrs)	North (Mtrs)	Height Above Ground/ Feet	Height Above Structure/ Feet	Exit Data DIA. (ft)	Exit Data VEL. (fps)	Exit Data Temp (°F)	Length (ft.)	Width (ft.)
775	Surface Coating - Paint - Corrosion Control Bld 922, Controlled by Carbon Filters & F	PM	0.05	0.05	12	372960	3711288	30		3	0.2	80		
		PM_{10}	0.05	0.05										
		$PM_{2.5}$	0.05	0.05										
		VOC	2.42	2.52										
		Total HAPs	0.24	0.25										
776	Surface Coating - Primer - Corrosion Control Bld 922, Controlled by Carbon Filters &	PM	0.02	0.02	12	372960	3711288	30		3	0.2	80		
		PM_{10}	0.02	0.02										
		$PM_{2.5}$	0.02	0.02										
		VOC	1.04	1.08										
		Total HAPs	0.10	0.11										
777	Surface Coating - Thinner - Corrosion Control Bld 922, Controlled by Carbon Filters &	VOC	1.37	1.42	12	372960	3711288	30		3	0.2	80		
		Total HAPs	1.37	1.42									-	
779	Surface Coating - Alcohol - Corrosion Control Bld 922, Controlled by Carbon Filters &	VOC	0.05	0.06	12	372960	3711288	30		3	0.2	80		
		Total HAPs	0.01	0.01										
780	Surface Coating - Adhesive - Corrosion Control Bld 922, Controlled by Carbon Filters	VOC	0.02	0.02	12	372960	3711288	30		3	0.2	80		
		Total HAPs	<0.01	<0.01										
781	Surface Coating - Sealant - Corrosion Control Bld 922, Controlled by Carbon Filters &	VOC	0.03	0.03	12	372960	3711288	30		3	0.2	80		
		Total HAPs	<0.01	<0.01										

Ground Elevation of Facility Above Mean Sea Level (ft.) : 1,100 feet
ADEQ Standard Conditions are 293K and 101.3 Kilopascals (A.A.C. R18-2-101)

General Instructions:

(1) Identify each emission point with a unique number for this plant site, consistent with emission point identification used on plot plan, previous permits, and Emissions Inventory Questionnaire. Include fugitive emissions. Limit emission point number to eight (8) character spaces. For each emission point use as many lines as necessary to list regulated air pollutant data. Typical emission point names are: heater, vent, boiler, tank, reactor, separator, baghouse, fugitive, etc. Abbreviations are O.K.

(2) Comonents to be listed include regulated air pollutants as defined in R18-2-101. Examples of typical component names are: Carbon Monoxide (CO), Nitrogen Oxides (NOx) , Sulfur Dioxide (SO2), Volatile Organic Compounds (VOC) , particulate matter (PM) , particulate less than 10 microns (PM 10), etc. Abbreviations are O.K.

(3) Pounds per hour (#/HR) is maximum potential emission rate expected by applicant.

(4) Tons per year is annual maximum potential emission expected by applicant, Which takes into account process operating schedule.

(5) As a minimum applicant shall furnish a facility plot plan as described in the filing instructions. UTM coordinates are required only if the source is a major source or is required to perform refined modeling for the purposes of demonstrating compliance with ambient air quality guidelines.

(6) Supply additional information as follows if appropriate :

(a) Stack exit configuration other than a round vertical stack. Show length and width for a rectangular stack. Indicate if horizontal discharge with a note.

(b) Stack's height above supporting or adjacent structures if structure is within 3 "stack height above the ground" of stack.

(7) Dimensions of non point sources as defined in R18-2-101.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: External Combustion
Process ID: 001, 002

Source List and Usage

Process ID	Equipment Size	Fuel Type	Total Heat Input[1] (MMBTU/hr)	Maximum Operation (hr/yr)	Maximum Fuel Use	Throughput Units
001	<10 MMBtu/hr	Nat. Gas	134	8,760	1,144	MMscf/yr
002	<10 MMBtu/hr	Propane	1	8,760	95	Mgal/yr

1. Total MMBtu/hr includes all external combustion units at Luke AFB. The total number was rounded up to the nearest MMBTU/hr.
2. The following heating values were used for unit conversion (MMBtu to gal):
For Natural Gas: 1,026 MMBtu/MMscf
For Propane: 92 MMBtu/10^3 gal
from Air Emissions Guide for Air Force Stationary Sources, Table 11-2, AFCEC, October 2014.

Emissions Factors

Pollutant	CAS #	Natural Gas (lb/MMscf)[1]	Propane (lb/Mgal)[2]
CO	-	84	7.5
NOx	-	100	13
SOx	-	0.6	0.018
PM	-	7.6	0.7
PM_{10}	-	7.6	0.7
$PM_{2.5}$	-	7.6	0.7
VOC	-	5.5	1
Acenaphthene	83-32-9	1.80E-06	1.65E-07
Acenaphthylene	208-96-8	1.80E-06	1.65E-07
Acetaldehyde	75-07-0	4.30E-03	2.84E-04
Acrolein	107-02-8	2.70E-03	2.47E-04
Anthracene	120-12-7	2.40E-06	2.20E-07
Arsenic	7440-38-2	2.00E-04	1.83E-05
Benz(a)anthracene	56-55-3	1.80E-06	1.65E-07
Benzene	71-43-2	8.00E-03	5.31E-04
Benzo(b)fluoranthene	205-99-2	1.80E-06	1.65E-07
Benzo(k)fluoranthene	207-08-9	1.80E-06	1.65E-07
Benzo(g,h,i)perylene	191-24-2	1.20E-06	1.46E-07
Benzo(a)pyrene	50-32-8	1.20E-06	1.46E-07
Beryllium	7440-41-7	1.20E-05	1.10E-06
Cadmium	7440-43-9	1.10E-03	1.01E-04
Chromium	7440-47-3	1.40E-03	1.28E-04
Chrysene	218-01-9	1.80E-06	1.65E-07
Cobalt Compounds	7440-48-4	8.40E-05	7.69E-06
Dibenzo(a,h)anthracene	53-70-3	1.20E-06	1.46E-07
Dichlorobenzene	25321-22-6	1.20E-03	1.10E-04
7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	1.46E-06
Ethyl Benzene	100-41-4	9.50E-03	6.31E-04
Fluoranthene	206-44-0	3.00E-06	2.75E-07
Fluorene	86-73-7	2.80E-06	2.56E-07
Formaldehyde	50-00-0	7.50E-02	6.86E-03
Hexane	110-54-3	6.30E-03	4.21E-04
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	1.65E-07
Lead	7439-92-1	5.00E-04	4.58E-05
Manganese	7439-96-5	3.80E-04	3.48E-05
Mercury	7439-97-6	2.60E-04	2.38E-05
3-Methylchloranthrene	56-49-5	1.80E-06	1.65E-07
2-Methylnaphthalene	91-57-6	2.40E-05	2.16E-06
Naphthalene	91-20-3	3.00E-04	2.75E-05
Nickel	7440-02-0	2.10E-03	1.92E-04
Phenanathrene	85-01-8	1.70E-05	1.56E-06
Pyrene	129-00-0	5.00E-06	4.58E-07
Selenium Compounds	7782-49-2	2.40E-05	2.20E-06
Toluene	108-88-3	3.66E-02	2.42E-03
Xylenes	1330-20-7	-	1.80E-03

1. Air Emissions Guide for Air Force Stationary Sources, Tables 11-3, 11-4, AFCEC, October 2014. Emission factors are derived from AP-42 and Mohave Desert Air Quality Management District.
2. Air Emissions Guide for Air Force Stationary Sources, Tables 11-13, 11-14, AFCEC, October 2014. Emission factors are derived from AP-42 and Mohave Desert Air Quality Management District.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: External Combustion
Process ID: 001, 002

Emissions

Pollutant	CAS #	Emissions[1]					
		001			002		
		(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
CO	-	10.97	96,103.86	48.05	0.08	714.13	0.36
NOx	-	13.06	114,409.36	57.20	0.14	1,237.83	0.62
SOx	-	0.08	686.46	0.34	1.96E-04	1.71	0.00
PM	-	0.99	8,695.11	4.35	0.01	66.65	0.03
PM_{10}	-	0.99	8,695.11	4.35	0.01	66.65	0.03
$PM_{2.5}$	-	0.99	8,695.11	4.35	0.01	66.65	0.03
VOC	-	0.72	6,292.51	3.15	0.01	95.22	0.05
Total HAPs	-	0.02	171.67	0.09	1.51E-04	1.32	6.61E-04
Acenaphthene	83-32-9	2.35E-07	2.06E-03	1.03E-06	1.79E-09	1.57E-05	7.86E-09
Acenaphthylene	208-96-8	2.35E-07	2.06E-03	1.03E-06	1.79E-09	1.57E-05	7.86E-09
Acetaldehyde	75-07-0	5.62E-04	4.92	2.46E-03	3.09E-06	0.03	1.35E-05
Acrolein	107-02-8	3.53E-04	3.09	1.54E-03	2.68E-06	0.02	1.18E-05
Anthracene	120-12-7	3.13E-07	2.75E-03	1.37E-06	2.39E-09	2.09E-05	1.05E-08
Arsenic	7440-38-2	2.61E-05	0.23	1.14E-04	1.99E-07	1.74E-03	8.71E-07
Benz(a)anthracene	56-55-3	2.35E-07	0.00	1.03E-06	1.79E-09	1.57E-05	7.86E-09
Benzene	71-43-2	1.04E-03	9.15	4.58E-03	5.77E-06	0.05	2.53E-05
Benzo(b)fluoranthene	205-99-2	2.35E-07	2.06E-03	1.03E-06	1.79E-09	1.57E-05	7.86E-09
Benzo(k)fluoranthene	207-08-9	2.35E-07	2.06E-03	1.03E-06	1.79E-09	1.57E-05	7.86E-09
Benzo(g,h,i)perylene	191-24-2	1.57E-07	1.37E-03	6.86E-07	1.59E-09	1.39E-05	6.95E-09
Benzo(a)pyrene	50-32-8	1.57E-07	1.37E-03	6.86E-07	1.59E-09	1.39E-05	6.95E-09
Beryllium	7440-41-7	1.57E-06	0.01	6.86E-06	1.20E-08	1.05E-04	5.24E-08
Cadmium	7440-43-9	1.44E-04	1.26	6.29E-04	1.10E-06	0.01	4.81E-06
Chromium	7440-47-3	1.83E-04	1.60	8.01E-04	1.39E-06	0.01	6.09E-06
Chrysene	218-01-9	2.35E-07	0.00	1.03E-06	1.79E-09	1.57E-05	7.86E-09
Cobalt Compounds	7440-48-4	1.10E-05	0.10	4.81E-05	8.36E-08	7.32E-04	3.66E-07
Dibenzo(a,h)anthracene	53-70-3	1.57E-07	1.37E-03	6.86E-07	1.59E-09	1.39E-05	6.95E-09
Dichlorobenzene	25321-22-6	1.57E-04	1.37	6.86E-04	1.20E-06	0.01	5.24E-06
7,12-Dimethylbenz(a)anthracene	57-97-6	2.09E-06	0.02	9.15E-06	1.59E-08	1.39E-04	6.95E-08
Ethyl Benzene	100-41-4	1.24E-03	10.87	5.43E-03	6.86E-06	0.06	3.00E-05
Fluoranthene	206-44-0	3.92E-07	3.43E-03	1.72E-06	2.99E-09	2.62E-05	1.31E-08
Fluorene	86-73-7	3.66E-07	3.20E-03	1.60E-06	2.78E-09	2.44E-05	1.22E-08
Formaldehyde	50-00-0	9.80E-03	85.81	4.29E-02	7.46E-05	0.65	3.27E-04
Hexane	110-54-3	8.23E-04	7.21	3.60E-03	4.58E-06	0.04	2.00E-05
Indeno(1,2,3-cd)pyrene	193-39-5	2.35E-07	2.06E-03	1.03E-06	1.79E-09	1.57E-05	7.86E-09
Lead	7439-92-1	6.53E-05	0.57	2.86E-04	4.98E-07	4.36E-03	2.18E-06
Manganese	7439-96-5	4.96E-05	0.43	2.17E-04	3.78E-07	3.31E-03	1.66E-06
Mercury	7439-97-6	3.40E-05	0.30	1.49E-04	2.59E-07	2.27E-03	1.13E-06
3-Methylchloranthrene	56-49-5	2.35E-07	2.06E-03	1.03E-06	1.79E-09	1.57E-05	7.86E-09
2-Methylnaphthalene	91-57-6	3.13E-06	0.03	1.37E-05	2.35E-08	2.06E-04	1.03E-07
Naphthalene	91-20-3	3.92E-05	0.34	1.72E-04	2.99E-07	2.62E-03	1.31E-06
Nickel	7440-02-0	2.74E-04	2.40	1.20E-03	2.09E-06	0.02	9.14E-06
Phenanathrene	85-01-8	2.22E-06	0.02	9.72E-06	1.70E-08	1.49E-04	7.43E-08
Pyrene	129-00-0	6.53E-07	0.01	2.86E-06	4.98E-09	4.36E-05	2.18E-08
Selenium Compounds	7782-49-2	3.13E-06	0.03	1.37E-05	2.39E-08	2.09E-04	1.05E-07
Toluene	108-88-3	4.78E-03	41.87	2.09E-02	2.63E-05	0.23	1.15E-04
Xylenes	1330-20-7	-	-	-	1.96E-05	0.17	8.57E-05

2. Calculation Methodology:

E_{POL} = FC * EF

E_{POL} = Emissions of a particular pollutant (lb/yr);

FC = Quantity of fuel consumed per year (units/yr); and

EF = Emission factor (lb/units).

Emission calculation methodology from Section 11 of Air Emissions Guide for Air Force Stationary Sources, AFCEC, October 2014.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: Fire Fighter Training
Process ID: 003

Source List and Usage

Process ID	Facility ID	Fuel Type	Fuel Usage (gal)	
			3-Yr Average [1]	Max [2]
003	7213	Propane	7,800	32,838

1. 3-Yr Average includes usage from 2012-2014 to obtain a baseline actual usage.
2. Baseline usage has been scaled up by a factor of 4.21 to arrive at a maximum usage (i.e., 8,760 hrs / 2,080 hrs).

Emissions Factors

Pollutant	CAS #	Propane ($lb/10^3$ gal) [1]
CO	-	15.4
NOx	-	55.7
SOx	-	0.02
PM	-	9.5
PM_{10}	-	9.5
$PM_{2.5}$	-	9.5
VOC	-	24.0
Formaldehyde	50-00-0	0.7

1. Emission factors taken rom Air Emissions Guide for Air Force Stationary Sources, AFCEC, Table 12-1, October 2014.

Emissions

Pollutant	CAS #	Emissions [1]		
		(lb/hr)	(lb/yr)	(tpy)
CO	-	0.24	505.71	0.25
NOx	-	0.88	1,829.08	0.91
SOx	-	3.16E-04	0.66	3.28E-04
PM	-	0.15	311.96	0.16
PM_{10}	-	0.15	311.96	0.16
$PM_{2.5}$	-	0.15	311.96	0.16
VOC	-	0.38	788.11	0.39
Total HAPs	-	0.01	22.99	0.01
Formaldehyde	50-00-0	0.01	22.99	0.01

1. Calculation Methodology:

$E_{POL} = Q * EF$

E_{POL} = Emissions of a particular pollutant (lb/yr);

Q = Quantity of fuel consumed per year (10^3 gal/yr for propane); and

EF = Emission factor ($lb/10^3$ gal for propane).

Emission calculation methodology from Section 12 of Air Emissions Guide for Air Force Stationary Sources, AFCEC, October 2014.

Hourly emissions were estimated as annual emissions divided by actual operating hours (2,080 hr/yr).

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: Stationary Internal Combustion
Process IDs: 300, 360

Source List and Usage

Process ID	Power Rating[1] (hp)	Maximum Run Time[2] (hr/yr/unit)
Diesel Fired Generators ≤450 kW or 600 hp		
300	9,000	500
Diesel Fired Generators >450 kW or 600 hp		
360	2,800	500

1. Total power rating includes all generators at Luke AFB for that particular rating category. The total number was rounded up to the nearest 100 hp.
2. 500 hours per unit is based on guidance provided in Calculating Potential to Emit for Emergency Generators, EPA, September 1995.

Emissions Factors

Pollutant	CAS #	Diesel[1]	
		Engines < 600 HP	Engines 600 < hp ≤ 3000
		(lb/hp-hr)	(lb/hp-hr)
CO	-	7.68E-03	6.88E-03
NOx	-	3.57E-02	2.59E-02
SOx	-	2.35E-03	1.23E-05
PM	-	2.56E-03	8.09E-04
PM_{10}	-	2.51E-03	8.09E-04
$PM_{2.5}$	-	2.51E-03	8.09E-04
VOC	-	2.79E-03	7.16E-04
1,3-Butadiene	106-99-0	3.16E-07	3.16E-07
Acenaphthene	83-32-9	1.15E-08	3.79E-08
Acenaphthylene	208-96-8	4.09E-08	7.47E-08
Acetaldehyde	75-07-0	6.20E-06	2.04E-07
Acrolein	107-02-8	7.48E-07	6.37E-08
Anthracene	120-12-7	1.51E-08	9.95E-09
Benz(a)anthracene	56-55-3	1.36E-08	5.03E-09
Benzene	71-43-2	7.55E-06	6.28E-06
Benzo(a)pyrene1.52E-	50-32-8	1.52E-09	2.08E-09
Benzo(b)fluoranthene	205-99-2	8.02E-10	8.98E-09
Benzo(g,h,i)perylene	191-24-2	3.96E-09	4.50E-09
Benzo(k)fluoranthene	207-08-9	1.25E-09	1.76E-09
Chrysene	218-01-9	2.86E-09	1.24E-08
Dibenz(a,h)anthracene	53-70-3	4.72E-09	2.80E-09
Fluoranthene	206-44-0	6.16E-08	3.26E-08
Fluorene	86-73-7	2.36E-07	1.04E-07
Formaldehyde	50-00-0	9.55E-06	6.38E-07
Indeno(1,2,3-c,d)pyrene	193-39-5	3.03E-09	3.35E-09
Naphthalene	91-20-3	6.86E-07	1.05E-06
Phenanthrene	85-01-8	2.38E-07	3.30E-07
Pyrene	129-00-0	3.87E-08	3.00E-08
Toluene	108-88-3	3.31E-06	2.27E-06
Xylenes	1330-20-7	2.31E-06	1.56E-06

1. Emissions factors taken from Air Emissions Guide for Air Force Stationary Sources, AFCEC, Tables 28-3 and 28-4, October 2014. Pre-2007 factors were used to provide a conservative estimate.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: Stationary Internal Combustion
Process IDs: 300, 360

Emissions

Pollutant[1]	CAS #	300			360		
		<600hp			600 < hp ≤ 3000		
		(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
CO	-	51.15	25,574.40	12.79	14.26	7,127.68	3.56
NOx	-	237.76	118,881.00	59.44	53.66	26,832.40	13.42
SOx	-	15.65	7,825.50	3.91	0.03	12.74	0.01
PM	-	17.06	8,528.13	4.26	1.68	838.12	0.42
PM_{10}	-	16.72	8,358.30	4.18	1.68	838.12	0.42
$PM_{2.5}$	-	16.72	8,358.30	4.18	1.68	838.12	0.42
VOC	-	18.58	9,290.70	4.65	1.48	741.78	0.37
Total HAPs	-	0.21	104.37	0.05	0.03	13.51	0.01
1,3-Butadiene	106-99-0	2.10E-03	1.05	5.26E-04	6.55E-04	0.33	1.64E-04
Acenaphthene	83-32-9	7.66E-05	0.04	1.91E-05	7.85E-05	0.04	1.96E-05
Acenaphthylene	208-96-8	2.72E-04	0.14	6.81E-05	1.55E-04	0.08	3.87E-05
Acetaldehyde	75-07-0	4.13E-02	20.65	0.01	4.23E-04	0.21	1.06E-04
Acrolein	107-02-8	4.98E-03	2.49	1.25E-03	1.32E-04	0.07	3.30E-05
Anthracene	120-12-7	1.01E-04	0.05	2.51E-05	2.06E-05	0.01	5.15E-06
Benz(a)anthracene	56-55-3	9.06E-05	0.05	2.26E-05	1.04E-05	0.01	2.61E-06
Benzene	71-43-2	5.03E-02	25.14	0.01	1.30E-02	6.51	3.25E-03
Benzo(a)pyrene1.52E-	50-32-8	1.01E-05	0.01	2.53E-06	4.31E-06	2.15E-03	1.08E-06
Benzo(b)fluoranthene	205-99-2	5.34E-06	2.67E-03	1.34E-06	1.86E-05	0.01	4.65E-06
Benzo(g,h,i)perylene	191-24-2	2.64E-05	0.01	6.59E-06	9.32E-06	4.66E-03	2.33E-06
Benzo(k)fluoranthene	207-08-9	8.33E-06	4.16E-03	2.08E-06	3.65E-06	1.82E-03	9.12E-07
Chrysene	218-01-9	1.90E-05	0.01	4.76E-06	2.57E-05	0.01	6.42E-06
Dibenz(a,h)anthracene	53-70-3	3.14E-05	0.02	7.86E-06	5.80E-06	2.90E-03	1.45E-06
Fluoranthene	206-44-0	4.10E-04	0.21	1.03E-04	6.75E-05	0.03	1.69E-05
Fluorene	86-73-7	1.57E-03	0.79	3.93E-04	2.15E-04	0.11	5.39E-05
Formaldehyde	50-00-0	6.36E-02	31.80	0.02	1.32E-03	0.66	3.30E-04
Indeno(1,2,3-c,d)pyrene	193-39-5	2.02E-05	0.01	5.04E-06	6.94E-06	3.47E-03	1.74E-06
Naphthalene	91-20-3	4.57E-03	2.28	1.14E-03	2.18E-03	1.09	5.44E-04
Phenanthrene	85-01-8	1.59E-03	0.79	3.96E-04	6.84E-04	0.34	1.71E-04
Pyrene	129-00-0	2.58E-04	0.13	6.44E-05	6.22E-05	0.03	1.55E-05
Toluene	108-88-3	2.20E-02	11.02	0.01	4.70E-03	2.35	1.18E-03
Xylenes	1330-20-7	1.54E-02	7.69	3.85E-03	3.23E-03	1.62	8.08E-04

1. Calculation Methodology:

$E_{Pol} = OT \times PO \times LF/100 \times EF_{Pol}$

E_{Pol} = Emissions (lb/yr)

OT = Operating Time (hr/yr)

PO = Rated power output of engines (hp)

LF = Engine load factor (%); 74% per Air Emissions Guide for Air Force Stationary Sources, Table 28-8, AFCEC, October 2014.

EF_{Pol} = Emissions factor (lb/hp-hr)

Emission calculation methodology from Air Emissions Guide for Air Force Stationary Sources, Section 28, AFCEC, October 2014.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: Jet Engine Testing
Process ID: 330, 332

Source List and Usage

Process ID	Facility ID	Aircraft	Engine	Numer of Engine Tests	
				2007 [1]	Max [2]
330	1006, 1012, 1016	F-16	F100-PW-220	228	960
332	1006, 1016	F-16	F100-PW-229	17	72

1. Luke AFB determined that 2007 is respresentative of a typical operations year; therefore maximum limits are determined from this baseline year.
2. Baseline usage has been scaled up by a factor of 4.21 to arrive at a maximum usage limit (i.e., 8,760 hrs / 2,080 hrs).

EPN	Maximum Time-In-Mode (mins/test)[1]				
	Idle	Approach	Intermediate	Military	Afterburner
330	30.0	N/A[2]	2.6	10.1	0.7
332	30.0	N/A[2]	2.6	10.1	0.7

1. Maximum Time-In-Modes obtained from interviewing base personnel on operating procedures.
2. Not applicable; engine is not tested in this mode.

Emissions Factors

Fuel Flowrates

Aircraft	Engine	Fuel Flowrate per Mode (lb/hr)[1]				
		Idle	Approach	Intermediate	Military	Afterburner
F-16	F100-PW-220	1,084	3,837	5,770	9,679	41,682
F-16	F100-PW-229	1,087	3,098	5,838	11,490	20,793

1. Fuel flowrates taken from Air Emissions Guide for Air Force Mobile Sources, AFCEC, Table 2-8, October 2014.

F100-PW-220 Engine Emissions Factors

Pollutant	CAS	Emissions Factors per Mode (lb/1000lb)[1,2]				
		Idle	Approach	Intermediate	Military	Afterburner
CO	-	35.30	1.92	0.86	0.86	11.99
NO_X	-	4.61	12.53	22.18	29.32	8.37
SO_X[3]	-	0.60	0.60	0.60	0.60	0.60
PM	-	2.06	2.63	2.06	1.33	1.15
PM_{10}	-	2.06	2.63	2.06	1.33	1.15
$PM_{2.5}$	-	1.85	2.37	1.85	1.20	1.04
VOC	-	7.94	5.12	2.89	1.79	1.53
Total HAPs	-	1.31E+00	8.80E-03	3.11E-02	3.45E-02	5.16E-02
Acenaphthylene	208-96-8	5.38E-04	--	--	--	--
Acetaldehyde	75-07-0	2.41E-01	--	7.00E-03	1.30E-02	1.60E-02
Acrolein	107-02-8	8.40E-02	--	--	--	--
Benzene	71-43-2	4.70E-02	3.87E-04	1.89E-04	4.90E-04	1.82E-04
Carbon Tetrachloride	56-23-5	2.31E-04	3.02E-04	3.09E-04	1.85E-04	2.23E-05
Dibenzofuran	132-64-9	6.49E-04	--	--	--	--
Dibutyl Phthalate	84-74-2	2.23E-04	2.14E-04	1.77E-04	1.47E-04	8.33E-04
1,4-Dichlorobenzene	106-46-7	--	4.90E-05	3.90E-04	1.77E-04	3.16E-06
Di(2-Ethylhexyl) Phthalate (DEHP)	117-81-7	1.35E-03	2.83E-03	2.04E-03	2.35E-03	3.93E-03
Ethylbenzene	100-41-4	2.99E-03	1.93E-04	2.70E-04	3.44E-04	4.01E-05
Fluorene	86-73-7	3.35E-04	--	--	--	8.76E-05
Formaldehyde	50-00-0	7.77E-01	--	--	2.00E-03	2.00E-02
Hexachlorobutadiene	87-68-3	--	4.06E-04	1.40E-03	5.74E-04	--
Methylene Chloride	75-09-2	6.94E-04	1.35E-03	3.06E-03	3.16E-03	1.07E-03
2-Methylnaphthalene	91-57-6	2.59E-02	3.30E-04	2.60E-04	3.53E-04	4.51E-04
Naphthalene	91-20-3	3.42E-02	2.13E-04	3.96E-04	4.01E-04	4.12E-04
2-Nitrophenol	88-75-5	5.91E-03	--	--	--	--
4-Nitrophenol	100-02-7	5.57E-03	--	--	--	--
Phenanthrene	85-01-8	4.48E-04	--	--	--	1.33E-04
Phenol	108-95-2	1.35E-02	--	--	2.68E-04	1.04E-03
Propanal	123-38-6	4.90E-02	--	8.00E-03	6.00E-03	7.00E-03
Pyrene	129-00-0	1.79E-04	--	--	--	--
Styrene	100-42-5	5.02E-04	--	2.78E-04	--	--
1,1,2,2-Tetrachloroethane	79-34-5	--	--	6.96E-04	2.52E-04	--
Tetrachloroethene	127-18-4	--	--	2.40E-03	8.96E-04	--
1,2,4-Trichlorobenzene	120-82-1	--	3.43E-04	2.04E-03	7.29E-04	3.22E-05
1,1,1-Trichloroethane	71-55-6	1.38E-03	5.02E-04	3.36E-04	5.61E-04	7.21E-05
Trichloroethene	79-01-6	--	--	9.17E-05	--	--
m,p-Xylene	1330-20-7	1.47E-02	1.40E-03	1.43E-03	2.11E-03	2.59E-04
o-Xylene	95-47-6	3.61E-03	2.81E-04	3.51E-04	4.73E-04	5.80E-05

1. Emissions factors taken from Air Emissions Guide for Air Force Mobile Sources, AFCEC, Table 2-8 and 2-9, October 2014.
2. HAP emissions factors for engine F100-PW-220 were not available. HAP emission factors for engine F100-PW-200 were used as a surrogate as emissions from this engine.
3. SO_X emission factor calculated as follows:

$EF_{SOx} = SO_X$ emission factor ($lb/10^3$ lb)
S = Weight percent sulfur content of the fuel (%)
20 = Factor for converting units from weight percent to $lb/10^3$ lb (lb/% 10^3 lb)
Note: JET-A maximum sulfur content = 0.03%

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: Jet Engine Testing
Process ID: 330, 332

F100-PW-229 Emissions Factors

Parameter	CAS	Emissions Factors per Mode (lb/1000lb)[1,2]				
		Idle	Approach	Intermediate	Military	Afterburner
CO	-	10.17	1.17	0.15	0.33	21.51
NO_X	-	3.80	15.08	17.54	29.29	14.30
SO_X[3]	-	0.60	0.60	0.60	0.60	0.60
PM	-	2.06	2.63	2.06	1.33	1.15
PM_{10}	-	2.06	2.63	2.06	1.33	1.15
$PM_{2.5}$	-	1.85	2.37	1.85	1.20	1.04
VOC	-	0.45	0.24	0.35	0.31	5.26
Total HAPs	-	1.31E+00	8.80E-03	3.11E-02	3.45E-02	5.16E-02
Acenaphthylene	208-96-8	5.38E-04	--	--	--	--
Acetaldehyde	75-07-0	2.41E-01	--	7.00E-03	1.30E-02	1.60E-02
Acrolein	107-02-8	8.40E-02	--	--	--	--
Benzene	71-43-2	4.70E-02	3.87E-04	1.89E-04	4.90E-04	1.82E-04
Carbon Tetrachloride	56-23-5	2.31E-04	3.02E-04	3.09E-04	1.85E-04	2.23E-05
Dibenzofuran	132-64-9	6.49E-04	--	--	--	--
Dibutyl Phthalate	84-74-2	2.23E-04	2.14E-04	1.77E-04	1.47E-04	8.33E-04
1,4-Dichlorobenzene	106-46-7	--	4.90E-05	3.90E-04	1.77E-04	3.16E-06
Di(2-Ethylhexyl) Phthalate (DEHP)	117-81-7	1.35E-03	2.83E-03	2.04E-03	2.35E-03	3.93E-03
Ethylbenzene	100-41-4	2.99E-03	1.93E-04	2.70E-04	3.44E-04	4.01E-05
Fluorene	86-73-7	3.35E-04	--	--	--	8.76E-05
Formaldehyde	50-00-0	7.77E-01	--	--	2.00E-03	2.00E-02
Hexachlorobutadiene	87-68-3	--	4.06E-04	1.40E-03	5.74E-04	--
Methylene Chloride	75-09-2	6.94E-04	1.35E-03	3.06E-03	3.16E-03	1.07E-03
2-Methylnaphthalene	91-57-6	2.59E-02	3.30E-04	2.60E-04	3.53E-04	4.51E-04
Naphthalene	91-20-3	3.42E-02	2.13E-04	3.96E-04	4.01E-04	4.12E-04
2-Nitrophenol	88-75-5	5.91E-03	--	--	--	--
4-Nitrophenol	100-02-7	5.57E-03	--	--	--	--
Phenanthrene	85-01-8	4.48E-04	--	--	--	1.33E-04
Phenol	108-95-2	1.35E-02	--	--	2.68E-04	1.04E-03
Propanal	123-38-6	4.90E-02	--	8.00E-03	6.00E-03	7.00E-03
Pyrene	129-00-0	1.79E-04	--	--	--	--
Styrene	100-42-5	5.02E-04	--	2.78E-04	--	--
1,1,2,2-Tetrachloroethane	79-34-5	--	--	6.96E-04	2.52E-04	--
Tetrachloroethene	127-18-4	--	--	2.40E-03	8.96E-04	--
1,2,4-Trichlorobenzene	120-82-1	--	3.43E-04	2.04E-03	7.29E-04	3.22E-05
1,1,1-Trichloroethane	71-55-6	1.38E-03	5.02E-04	3.36E-04	5.61E-04	7.21E-05
Trichloroethene	79-01-6	--	--	9.17E-05	--	--
m,p-Xylene	1330-20-7	1.47E-02	1.40E-03	1.43E-03	2.11E-03	2.59E-04
o-Xylene	95-47-6	3.61E-03	2.81E-04	3.51E-04	4.73E-04	5.80E-05

1. Emissions factors taken from Air Emissions Guide for Air Force Mobile Sources, AFCEC, Table 2-8 and 2-9, October 2014.

2. HAP emissions factors for engine F100-PW-220 were not available. HAP emission factors for engine F100-PW-200 were used as a surrogate as emissions from this engine.

3. SO_x emission factor calculated as follows:

EF_{SOx} = SO_x emission factor ($lb/10^3$ lb)

S = Weight percent sulfur content of the fuel (%)

20 = Factor for converting units from weight percent to $lb/10^3$ lb ($lb/\%\ 10^3$ lb)

Note: JET-A maximum sulfur content = 0.03%

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: Jet Engine Testing
Process ID: 330, 332

Emissions
Process ID: 330
F100-PW-220 Emissions

Pollutant	CAS	Emissions per Mode (lb/yr)[1]					Total Emissions		
		Idle	Approach[2]	Intermediate	Military	Afterburner	(lb/hr)	(lb/yr)	(tpy)
CO	-	18,367.30	N/A	206.43	1,345.15	5,597.39	551.32	25,516.26	12.76
NO_X	-	2,398.68	N/A	5,323.91	45,860.19	3,907.44	765.64	58,255.85	29.13
SO_X	-	312.19	N/A	144.02	938.48	280.10	34.93	1,674.79	0.84
PM	-	1,071.86	N/A	494.47	2,080.29	536.86	74.93	4,183.48	2.09
PM_{10}	-	1,071.86	N/A	494.47	2,080.29	536.86	74.93	4,183.48	2.09
$PM_{2.5}$	-	962.59	N/A	444.06	1,876.95	485.51	67.64	3,769.11	1.88
VOC	-	4,131.34	N/A	693.69	2,799.79	714.26	106.38	8,339.08	4.17
Total HAPs	-	682.09	N/A	7.47	53.92	24.10	4.09	767.58	0.38
Acenaphthylene	208-96-8	0.28	N/A	0.0000	0.0000	0.0000	0.0006	0.2799	0.0001
Acetaldehyde	75-07-0	125.40	N/A	1.6802	20.3336	7.4694	1.0944	154.8804	0.0774
Acrolein	107-02-8	43.71	N/A	0.0000	0.0000	0.0000	0.0911	43.7069	0.0219
Benzene	71-43-2	24.46	N/A	0.0454	0.7664	0.0850	0.0644	25.3518	0.0127
Carbon Tetrachloride	56-23-5	0.12	N/A	0.0742	0.2894	0.0104	0.0048	0.4941	0.0002
Dibenzofuran	132-64-9	0.34	N/A	0.0000	0.0000	0.0000	0.0007	0.3377	0.0002
Dibutyl Phthalate	84-74-2	0.12	N/A	0.0425	0.2299	0.3889	0.0374	0.7773	0.0004
1,4-Dichlorobenzene	106-46-7	0.00	N/A	0.0936	0.2769	0.0015	0.0041	0.3719	0.0002
Di(2-Ethylhexyl) Phthalate (DEHP)	117-81-7	0.70	N/A	0.4897	3.6757	1.8347	0.1998	6.7025	0.0034
Ethylbenzene	100-41-4	1.56	N/A	0.0648	0.5381	0.0187	0.0098	2.1773	0.0011
Fluorene	86-73-7	0.17	N/A	0.0000	0.0000	0.0409	0.0040	0.2152	0.0001
Formaldehyde	50-00-0	404.29	N/A	0.0000	3.1283	9.3368	1.6953	416.7537	0.2084
Hexachlorobutadiene	87-68-3	0.00	N/A	0.3360	0.8978	0.0000	0.0136	1.2339	0.0006
Methylene Chloride	75-09-2	0.36	N/A	0.7345	4.9426	0.4995	0.0936	6.5378	0.0033
2-Methylnaphthalene	91-57-6	13.48	N/A	0.0624	0.5521	0.2105	0.0518	14.3014	0.0072
Naphthalene	91-20-3	17.79	N/A	0.0951	0.6272	0.1923	0.0604	18.7095	0.0094
2-Nitrophenol	88-75-5	3.08	N/A	0.0000	0.0000	0.0000	0.0064	3.0751	0.0015
4-Nitrophenol	100-02-7	2.90	N/A	0.0000	0.0000	0.0000	0.0060	2.8982	0.0014
Phenanthrene	85-01-8	0.23	N/A	0.0000	0.0000	0.0621	0.0060	0.2952	0.0001
Phenol	108-95-2	7.02	N/A	0.0000	0.4192	0.4855	0.0606	7.9290	0.0040
Propanal	123-38-6	25.50	N/A	1.9203	9.3848	3.2679	0.4491	40.0686	0.0200
Pyrene	129-00-0	0.09	N/A	0.0000	0.0000	0.0000	0.0002	0.0931	0.0000
Styrene	100-42-5	0.26	N/A	0.0667	0.0000	0.0000	0.0021	0.3279	0.0002
1,1,2,2-Tetrachloroethane	79-34-5	0.00	N/A	0.1671	0.3942	0.0000	0.0065	0.5612	0.0003
Tetrachloroethene	127-18-4	0.00	N/A	0.5761	1.4015	0.0000	0.0225	1.9775	0.0010
1,2,4-Trichlorobenzene	120-82-1	0.00	N/A	0.4897	1.1402	0.0150	0.0202	1.6449	0.0008
1,1,1-Trichloroethane	71-55-6	0.72	N/A	0.0807	0.8775	0.0337	0.0119	1.7098	0.0009
Trichloroethene	79-01-6	0.00	N/A	0.0220	0.0000	0.0000	0.0005	0.0220	0.0000
m,p-Xylene	1330-20-7	7.65	N/A	0.3432	3.3003	0.1209	0.0554	11.4132	0.0057
o-Xylene	95-47-6	1.88	N/A	0.0843	0.7398	0.0271	0.0129	2.7295	0.0014

1. Calculation Methodology:
$E_{Pol} = FFR \times 1/1,000 \times T_{Test} \times EF_{Pol}$
E_{Pol} = Emissions (lb/yr)
FFR = Fuel flow rate (lb/hr)
1,000 = Factor for converting pounds to 10^3 pounds (lb/10^3 lb)
T_{Test} = Total annual time engine testing occurred while operating at the applicable fuel flow rate (hr/yr)
EF_{Pol} = Emissions factor (lb/10^3 lb)
2. Not applicable; engine is not tested in this mode.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: Jet Engine Testing
Process ID: 330, 332

Process ID: 332
F100-PW-229 Emissions

Pollutant	CAS	Emissions per Mode (lb/yr)[1]					Total Emissions		
		Idle	Approach[2]	Intermediate	Military	Afterburner	(lb/hr)	(lb/yr)	(tpy)
CO	-	397.97	N/A	2.73	45.96	375.70	462.98	822.36	0.41
NO_X	-	148.70	N/A	319.48	4,078.89	249.77	740.41	4,796.84	2.40
SO_X	-	23.48	N/A	10.93	83.56	10.48	23.52	128.44	0.06
PM	-	80.61	N/A	37.52	185.21	20.09	53.46	323.43	0.16
PM_{10}	-	80.61	N/A	37.52	185.21	20.09	53.46	323.43	0.16
$PM_{2.5}$	-	72.39	N/A	33.70	167.11	18.16	48.22	291.37	0.15
VOC	-	17.61	N/A	6.38	43.17	91.87	115.47	159.03	0.08
Total HAPs	-	51.30	N/A	0.57	4.80	0.90	3.08	57.57	0.03
Acenaphthylene	208-96-8	0.0211	N/A	0.0000	0.0000	0.0000	0.0006	0.0211	0.0000
Acetaldehyde	75-07-0	9.4308	N/A	0.1275	1.8104	0.2795	0.7849	11.6481	0.0058
Acrolein	107-02-8	3.2871	N/A	0.0000	0.0000	0.0000	0.0913	3.2871	0.0016
Benzene	71-43-2	1.8392	N/A	0.0034	0.0682	0.0032	0.0616	1.9141	0.0010
Carbon Tetrachloride	56-23-5	0.0090	N/A	0.0056	0.0258	0.0004	0.0046	0.0408	0.0000
Dibenzofuran	132-64-9	0.0254	N/A	0.0000	0.0000	0.0000	0.0007	0.0254	0.0000
Dibutyl Phthalate	84-74-2	0.0087	N/A	0.0032	0.0205	0.0145	0.0203	0.0470	0.0000
1,4-Dichlorobenzene	106-46-7	0.0000	N/A	0.0071	0.0246	0.0001	0.0044	0.0318	0.0000
Di(2-Ethylhexyl) Phthalate (DEHP)	117-81-7	0.0528	N/A	0.0372	0.3273	0.0686	0.1221	0.4859	0.0002
Ethylbenzene	100-41-4	0.1170	N/A	0.0049	0.0479	0.0007	0.0096	0.1705	0.0001
Fluorene	86-73-7	0.0131	N/A	0.0000	0.0000	0.0015	0.0022	0.0146	0.0000
Formaldehyde	50-00-0	30.4056	N/A	0.0000	0.2785	0.3493	1.2834	31.0334	0.0155
Hexachlorobutadiene	87-68-3	0.0000	N/A	0.0255	0.0799	0.0000	0.0148	0.1054	0.0001
Methylene Chloride	75-09-2	0.0272	N/A	0.0557	0.4401	0.0187	0.0772	0.5416	0.0003
2-Methylnaphthalene	91-57-6	1.0135	N/A	0.0047	0.0492	0.0079	0.0431	1.0753	0.0005
Naphthalene	91-20-3	1.3383	N/A	0.0072	0.0558	0.0072	0.0527	1.4086	0.0007
2-Nitrophenol	88-75-5	0.2313	N/A	0.0000	0.0000	0.0000	0.0064	0.2313	0.0001
4-Nitrophenol	100-02-7	0.2180	N/A	0.0000	0.0000	0.0000	0.0061	0.2180	0.0001
Phenanthrene	85-01-8	0.0175	N/A	0.0000	0.0000	0.0023	0.0033	0.0199	0.0000
Phenol	108-95-2	0.5283	N/A	0.0000	0.0373	0.0182	0.0394	0.5838	0.0003
Propanal	123-38-6	1.9175	N/A	0.1457	0.8356	0.1223	0.3145	3.0210	0.0015
Pyrene	129-00-0	0.0070	N/A	0.0000	0.0000	0.0000	0.0002	0.0070	0.0000
Styrene	100-42-5	0.0196	N/A	0.0051	0.0000	0.0000	0.0022	0.0247	0.0000
1,1,2,2-Tetrachloroethane	79-34-5	0.0000	N/A	0.0127	0.0351	0.0000	0.0070	0.0478	0.0000
Tetrachloroethene	127-18-4	0.0000	N/A	0.0437	0.1248	0.0000	0.0243	0.1685	0.0001
1,2,4-Trichlorobenzene	120-82-1	0.0000	N/A	0.0372	0.1015	0.0006	0.0210	0.1392	0.0001
1,1,1-Trichloroethane	71-55-6	0.0540	N/A	0.0061	0.0781	0.0013	0.0114	0.1395	0.0001
Trichloroethene	79-01-6	0.0000	N/A	0.0017	0.0000	0.0000	0.0005	0.0017	0.0000
m,p-Xylene	1330-20-7	0.5752	N/A	0.0260	0.2938	0.0045	0.0540	0.8996	0.0004
o-Xylene	95-47-6	0.1413	N/A	0.0064	0.0659	0.0010	0.0126	0.2145	0.0001

1. Calculation Methodology:

$E_{Pol} = FFR \times 1/1{,}000 \times T_{Test} \times EF_{Pol}$

E_{Pol} = Emissions (lb/yr)

FFR = Fuel flow rate (lb/hr)

1,000 = Factor for converting pounds to 10^3 pounds (lb/10^3 lb)

T_{Test} = Total annual time engine testing occurred while operating at the applicable fuel flow rate (hr/yr)

EF_{Pol} = Emissions factor (lb/10^3 lb)

2. The greater of the Intermediate or Military fuel flow rates and emissions factors were used for each pollutant.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: Woodworking
Process ID: 502, 503, 516

Source List and Usage

Process ID	Facility ID	Description	Dust Collection System	Capture Effeciency (%)[1]	Control Effeciency (%)[1]
502	247, 339, 415, 948	Waste Bin Emptying	N/A	0	0
503	247, 339, 415, 948	Cyclone Bin Vents	N/A	0	0
516	247	Hobby Shop	Baghouse (Control ID 500)	100	85
	339	Construction/Refurbishing of Base Signs	Cyclone (Control ID 506)		
	415	Mock-up/model Fabrication	Cyclone (Control ID 502)		

1. Control efficiencies taken from Maricopa County Emissions Inventory Help Sheet for the Woodworking Industry (2014) for cyclones.
The cyclone control efficiency of 85% was used rather than the baghouse control efficiency of 99% for Building 247 to allow for a conservative estimate.

Process ID	Wood Waste Collected (ton/yr)	
	2007 [1]	Max[2]
502	2.34	10
503	2.34	10
516	2.34	10

1. Luke AFB determined that 2007 is respresentative of a typical operations year; therefore maximum operations are determined from this baseline year.
2. Baseline usage has been scaled up by a factor of 4.21 to arrive at a maximum usage (i.e., 8,760 hrs / 2,080 hrs).

Emissions Factors

Pollutant	Emissions Factor (lb/ton wood waste hauled away)[1]		
	Baghouse or Cyclone Operations	Wood Waste Storage Bin Vent	Wood Waste Storage Bin Loadout
$PM/PM_{10}/PM_{2.5}$	100.00	0.58	1.2

1. Emission factors taken from Emission Inventory Help Sheet for the Woodworking Industry, Maricopa County Air Quality Department, 2014.

Emissions

Pollutant	Emissions								
	502			503			516		
	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
$PM/PM_{10}/PM_{2.5}$	0.01	11.82	0.01	2.75E-03	5.71	2.86E-03	0.07	147.77	0.07

1. Calculation Methodology:
$E_{Pol} = Q \times EF_{Pol} \times 1 - (CAP_{eff}/100 \times CON_{eff}/100)$
E_{Pol} = Emissions (lb/yr)
Q = Annual quantity of wood waste hauled away (ton/yr)
EF_{Pol} = Emissions factor (lb/ton wood waste hauled away)
CAP_{eff} = Capture Efficiency (%)
CON_{eff} = Control Efficiency (%)
Emission calculation methodology from Emission Inventory Help Sheet for the Woodworking Industry, Maricopa County Air Quality Department, 2014.
Hourly emissions were estimated as annual emissions divided by actual operating hours (2,080 hr/yr).

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: Abrasive Blasting
Process ID: 515

Source List and Usage

Process ID	Facility ID	Description	Make	Media Type	Control	Media Usage (lb/yr)	
						2007 [1]	Max [2]
515	907	Walk-In Abrasive Blasting Booth	Pauli-Griffin	Garnet	Baghouse (Control ID 522)	700	2,947

1. Luke AFB determined that 2007 is respresentative of a typical operations year; therefore maximum operations are determined from this baseline year.
2. Baseline usage has been scaled up by a factor of 4.21 to arrive at a maximum usage (i.e., 8,760 hrs / 2,080 hrs).

Emissions Factors

Pollutant	Emissions Factor[1, 2] ($lb/10^3 lb$)
PM	0.59
PM_{10}	0.59
$PM_{2.5}$	0.55

1. Emission factors taken from Air Emissions Guide for Air Force Stationary Sources, Table 2-1, AFCEC, October 2014.
2. PM emission factor not available. PM emissions conservatively assumed to equal PM_{10} emissions.

Emissions

Pollutant	Emissions[1]		
	(lb/hr)	(lb/yr)	(tpy)
PM	0.0008	1.74	0.0009
PM_{10}	0.0008	1.74	0.0009
$PM_{2.5}$	0.0008	1.62	0.0008
Total HAPs[2]	0.0008	1.74	0.0009

1. Calculation Methodology:
$E_{Pol} = Q \times 1/1,000 \times EF_{Pol}$
E_{Pol} = Emissions (lb/yr)
Q = Annual blast media consumed (lb/yr)
1,000 = Factor for converting pounds to 10^3 pounds ($lb/10^3$ lb)
EF_{Pol} = Emissions factor ($lb/10^3$ lb of blast media used)
Emission calculation methodology from Section 2 of Air Emissions Guide for Air Force Stationary Sources, AFCEC, October 2014, for uncontrolled abrasive blasting.
Hourly emissions were estimated as annual emissions divided by actual operating hours (2,080 hr/yr).
2. Speciation data not available. Total HAP emissions conservatively assumed to equal PM emissions.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: Fuel Cell Maintenance
Process IDs: 520, 521, 522

Source List and Usage

Process ID	Facility ID	Tank Description	Fuel Tank Volume (gal)	Numer of Cells Purged	
				2007 [1]	Max[2]
520	968	Internal Tank	1,050	532	2,240
521		External Tank	370	467	1,966
522		External Tank	300	279	1,175

1. Luke AFB determined that 2007 is respresentative of a typical operations year; therefore maximum operations are determined from this baseline year.
2. Baseline usage has been scaled up by a factor of 4.21 to arrive at a maximum usage (i.e., 8,760 hrs / 2,080 hrs).

Emissions Factors

JET-A Physical Properties[1]

Property	Description	Value	Units
M_V	Vapor Molecular Weight	130	lb/lb-mol
P_{VA}[2]	Vapor Pressure	9.54E-02	psia
R	Ideal Gas Law	10.732	psia•ft3/°R•lb-mol
T_{LA}	Daily Liquid Average Surface Temperature	560	R
C_{VOC}[3]	Vapor Saturation Concentration	0.00206	lb/ft^3

1.Values taken from Air Emissions Guide for Air Force Stationary Sources, Table 13-1, AFCEC, October 2014.
2. Vapor pressure at daily average liquid surface temperature, conservatively assumed to equal 100 °F.
3. Calculation Methodology:
$C_{VOC} = (M_V \times P_{VA}) / (R \times T_{LA})$
M_V = Vapor molecular weight (lb/lb-mol);
P_{VA} = Vapor pressure at the daily average liquid surface temperature (psia);
R = Ideal gas constant (10.732 psia•ft^3/°R•lb-mol); and
T_{LA} = Daily average liquid surface temperature (°R).

Hazardous Air Pollutant Vapor Speciation (Weight %)

Hazardous Air Pollutant	CAS #	JET-A
Benzene	71-43-2	3.38E-02
Cumene	98-82-8	1.81E-01
Ethyl Benzene	100-41-4	1.59E-01
Fluorene	86-73-7	3.44E-03
Isooctane	540-84-1	1.23E-03
Naphthalene	91-20-3	2.68E-01
Phenylbenzene	92-52-4	6.78E-02
Pyrene	129-00-0	1.00E-05
Toluene	108-88-3	2.19E-01
Xylenes	1330-20-7	1.19E-02

1. Speciation taken from Values taken from Air Emissions Guide for Air Force Stationary Sources, Table 13-2, AFCEC, October 2014.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: Fuel Cell Maintenance
Process IDs: 520, 521, 522

Emissions

Fuel Type	CAS #	Emissions[1]											
		520 Internal Tank - 1050 gal			521 External Tank - 370 gal			522 External Tank - 300 gal			Total		
		(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
VOC	–	0.62	1,297.49	0.65	0.19	401.35	0.20	0.09	194.41	0.10	**0.91**	**1,893.25**	**0.95**
Total HAPs	–	0.01	12.26	0.01	0.00	3.79	1.90E-03	0.00	1.84	9.19E-04	**0.01**	**17.89**	**0.01**
Benzene	71-43-2	0.00	0.44	2.19E-04	0.00	0.14	6.78E-05	0.00	0.07	3.29E-05	**0.00**	**0.64**	**3.20E-04**
Cumene	98-82-8	0.00	2.35	1.17E-03	0.00	0.73	3.63E-04	0.00	0.35	1.76E-04	**0.00**	**3.43**	**1.71E-03**
Ethyl Benzene	100-41-4	0.00	2.06	1.03E-03	0.00	0.64	3.19E-04	0.00	0.31	1.55E-04	**0.00**	**3.01**	**1.51E-03**
Fluorene	86-73-7	2.15E-05	0.04	2.23E-05	6.64E-06	0.01	6.90E-06	3.22E-06	0.01	3.34E-06	**3.13E-05**	**0.07**	**3.26E-05**
Isooctane	540-84-1	7.67E-06	0.02	7.98E-06	2.37E-06	4.94E-03	2.47E-06	1.15E-06	2.39E-03	1.20E-06	**1.12E-05**	**0.02**	**1.16E-05**
Naphthalene	91-20-3	0.00	3.48	1.74E-03	0.00	1.08	5.38E-04	0.00	0.52	2.61E-04	**0.00**	**5.07**	**2.54E-03**
Phenylbenzene	92-52-4	0.00	0.88	4.40E-04	0.00	0.27	1.36E-04	0.00	0.13	6.59E-05	**0.00**	**1.28**	**6.42E-04**
Pyrene	129-00-0	6.24E-08	1.30E-04	6.49E-08	1.93E-08	4.01E-05	2.01E-08	9.35E-09	1.94E-05	9.72E-09	**9.10E-08**	**1.89E-04**	**9.47E-08**
Toluene	108-88-3	0.00	2.84	1.42E-03	0.00	0.88	4.39E-04	0.00	0.43	2.13E-04	**0.00**	**4.15**	**2.07E-03**
Xylenes	1330-20-7	0.00	0.15	7.72E-05	0.00	0.05	2.39E-05	0.00	0.02	1.16E-05	**0.00**	**0.23**	**1.13E-04**

1. Calculation Methodology:

$E_{VOC} = 2 \times C_{VOC} \times 0.13368 \times \sum(V \times N)$

E_{VOC} = Annual emissions of VOC (lb/yr);

2 = Factor used for the conservative estimate of emissions representing twice the fuel cell volume;

C_{VOC} = VOC concentration in the fuel cell (lb/ft^3);

0.13368 = Factor for converting cubic feet to gallons (ft^3/gal);

V = Fuel cell volume (gal/unit); and

N = Number of fuel cells purged/ventilated in a year (units/yr).

Emission calculation methodology from Section 13 of Air Emissions Guide for Air Force Stationary Sources, AFCEC, October 2014.

Hourly emissions were estimated as annual emissions divided by actual operating hours (2,080 hr/yr).

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: Fuel Cell Maintenance - Aircraft Defueling
Process ID: 523

Source List and Maximum Throughput

Process ID	Facility ID	Description	Fuel Type	Throughout (gal/yr)	
				2007 [1]	Max [2]
523	968	Aircraft Defueling Prior to Fuel Cell Maintenance	JET-A	106,400	447,944

1. Luke AFB determined that 2007 is respresentative of a typical operations year; therefore maximum operations are determined from this baseline year.
2. Baseline usage has been scaled up by a factor of 4.21 to arrive at a maximum usage (i.e., 8,760 hrs / 2,080 hrs).

Emissions Factors

Loading Loss Calculation

Loading Loss Equation Parameter		Value
		JET-A
Saturation (S) Factor	S	1.45
True Vapor Pressure (psi)	P	0.0085
Molecular Weight of Vapor (lb/lb-mole)	M	130
Temperature of Bulk Liquid Loaded (°R)	T	520
Capture Efficiency (%)	CAPeff	0
Control Efficiency (%)	CONeff	0
Loading Loss (lb/1000 gal)	L_L	0.0384

1. Loading loss calculated in accordance with Section 5.2-"Transportation and Marketing of Petroleum Liquids," Compilation of Air Pollutant Emission Factors - Volume I: Stationary Point and Area Sources, Fifth Edition, U.S. Environmental Protection Agency, July 2008. The equation used is shown below:

$L_L = 12.46*SPM/T*(1-(CAPeff/100 - CONeff/100))$

12.46 = Equation constant (°R lb-mol/psia 10^3 gal);
S = Saturation factor;
P = True vapor pressure of fuel (psia);
M = Vapor molecular weight of the fuel (lb/lb-mol);
T = Temperature of bulk liquid loaded (°R);
Cap = Capture efficiency of the loading terminal (%);
CE = Efficiency of the control device (%); and
100 = Factor for converting a percent to a fraction (%)

Saturation factor, true vapor pressure, and vapor molecular weight taken from Air Emissions Guide for Air Force Stationary Sources, AFCEC, Table 16-1 and 16-2, October 2014.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: Fuel Cell Maintenance - Aircraft Defueling
Process ID: 523

Hazardous Air Pollutant Vapor Speciation (Weight %)

Hazardous Air Pollutant	CAS #	JET-A
Benzene	71-43-2	3.38E-02
Cumene	98-82-8	1.81E-01
Ethyl Benzene	100-41-4	1.59E-01
Fluorene	86-73-7	3.44E-03
Isooctane	540-84-1	1.23E-03
Naphthalene	91-20-3	2.68E-01
Phenylbenzene	92-52-4	6.78E-02
Pyrene	129-00-0	1.00E-05
Toluene	108-88-3	2.19E-01
Xylenes	1330-20-7	1.19E-02

1. Speciation taken from Values taken from Air Emissions Guide for Air Force Stationary Sources, Table 13-2, AFCEC, October 2014.

Emissions

Pollutant	CAS #	Emissions[1] 523		
		(lb/hr)	(lb/yr)	(ton/yr)
VOCs	-	8.27E-03	17.20	8.60E-03
Total HAPs	-	7.81E-05	1.63E-01	8.13E-05
Benzene	71-43-2	2.79E-06	5.81E-03	2.91E-06
Cumene	98-82-8	1.50E-05	3.11E-02	1.56E-05
Ethyl Benzene	100-41-4	1.31E-05	2.73E-02	1.37E-05
Fluorene	86-73-7	2.84E-07	5.92E-04	2.96E-07
Isooctane	540-84-1	1.02E-07	2.12E-04	1.06E-07
Naphthalene	91-20-3	2.22E-05	4.61E-02	2.30E-05
Phenylbenzene	92-52-4	5.61E-06	1.17E-02	5.83E-06
Pyrene	129-00-0	8.27E-10	1.72E-06	8.60E-10
Toluene	108-88-3	1.81E-05	3.77E-02	1.88E-05
Xylenes	1330-20-7	9.84E-07	2.05E-03	1.02E-06

1. Calculation Methodology:
   $E_{HAP} = E_{VOC} \times (WP_{HAP}/100)$
   E_{HAP} = HAP Emissions (lb/yr)
   E_{VOC} = VOC Emissions (lb/yr)
   WP_{HAP} = Weight percent HAP in the fuel (%)
   100 = Factor for converting weight percent to weight fraction (%)
Emission calculation methodology from Air Emissions Guide for Air Force Stationary Sources, Section 16, AFCEC, October 2014.
Hourly emissions were estimated as annual emissions divided by actual operating hours (2,080 hr/yr).

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: Fuel Storage
Process IDs: Multiple (See Below)

Source List and Maximum Usage

Process ID	Facility ID	Description	Tank Type[1]	Fuel Type	Diameter (ft)	Shell Length (ft)	Shell Color	Capacity (gal)	Maximum Throughput[2] (gal)
620	351	B351, STANDING	EFR	JET-A	45.0	n/a	White	413,779	16,704,220
621	351	B351, WORKING	EFR	JET-A	45.0	n/a	White	413,779	16,704,220
622	356	B356, STANDING	EFR	JET-A		n/a			22,700,454
623	356	B356, WORKING	EFR	JET-A		n/a			22,700,454
624	350	B350, STANDING	VFR	JET-A	30.0	44.0	White	206,219	371,858
625	350	B350, WORKING	VFR	JET-A	30.0	44.0	White	206,219	371,858
626	359	B359, STANDING	VFR	JET-A	30.0	44.0	White	206,219	697,907
627	359	B359, WORKING	VFR	JET-A	30.0	44.0	White	206,219	697,907
632	366	B366, STANDING	VFR	JET-A	21.0	20.0	White	38,864	78,833
633	366	B366, WORKING	VFR	JET-A	21.0	20.0	White	38,864	78,833
666	368	B368, STANDING	VFR	Gasoline	15.0	30.0	White	35,000	16,147
669	368	B368, WORKING	VFR	Gasoline	15.0	30.0	White	35,000	16,147
662	2201	B2201, STANDING	HFR	Gasoline	4.7	11.0	White	1,000	4,392
663	2201	B2201, WORKING	HFR	Gasoline	4.7	11.0	White	1,000	4,392

1. EFR = External Floating Roof, VFR = Vertical Fixed Roof, HFR = Horizontal Fixed Roof
2. Maximum throughput based on previously permitted limits.

Fuel Type	Permit Limit Throughput (gal/yr)[1]
JET-A	40,553,272
Gasoline	20,539

1. Total combined fuel usage for all fuel storage tanks above will not exceed this throughput limit.

Emissions Factors

Hazardous Air Pollutant Vapor Speciation (Weight %)

		Weight %		
Compound	CAS #	Diesel	Gasoline	JP-8/Jet A
Benzene	71-43-2	0.20	0.65	3.38E-02
1,2,4-Trimethylbenzene	95-63-6	4.67	–	–
Cumene (Isopropylbenzene)	98-82-8	–	0.01	1.81E-01
Ethylbenzene	100-41-4	0.31	0.05	1.59E-01
Fluorene	86-73-7	–	–	3.44E-03
Hexane	110-54-3	0.04	0.59	–
Isooctane (2,2,4-Trimethyl Pentane)	540-84-1	–	0.75	1.23E-03
Naphthalene	91-20-3	–	–	2.68E-01
Phenylbenzene (1,1'-biphenyl)	92-52-4	–	–	6.78E-02
Pyrene	129-00-0	–	–	1.00E-05
Toluene	108-88-3	2.30	0.73	2.19E-01
Xylenes (mixed isomers)	1330-20-7	5.83	0.21	1.19E-02

1. Calculated Using Raoult's Law and Values from Table 16-5, Air Emissions Guide for Air Force Stationary Sources, AFCEC, October 2014.

Emissions

External Floating Roof Tanks - Fuel Storage Maximum Emission Rates

Pollutant	CAS #	Emissions[1, 2, 3]									
		620		621		622		623		Total	
		JET-A, B351, STANDING		JET-A, B351, WORKING		JET-A, B356, STANDING		JET-A, B356, WORKING			
		(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(tpy)
VOCs	-	201.62	0.10	368.42	0.18	244.90	0.12	265.06	0.13	**1,079.99**	**0.54**
Total HAPs	-	1.91	9.53E-04	3.48	1.74E-03	2.31	1.16E-03	2.51	1.25E-03	**10.21**	**0.01**
Benzene	71-43-2	0.07	3.41E-05	0.12	6.23E-05	0.08	4.14E-05	0.09	4.48E-05	**0.37**	**1.83E-04**

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: Fuel Storage
Process IDs: Multiple (See Below)

1,2,4-Trimethylbenzene	95-63-6	–	–	–	–	–	–	–	–	–	–
Cumene (Isopropylbenzene)	98-82-8	0.36	1.82E-04	0.67	3.33E-04	0.44	2.22E-04	0.48	2.40E-04	**1.95**	**9.77E-04**
Ethylbenzene	100-41-4	0.32	1.60E-04	0.59	2.93E-04	0.39	1.95E-04	0.42	2.11E-04	**1.72**	**8.59E-04**
Fluorene	86-73-7	0.01	3.47E-06	0.01	6.34E-06	0.01	4.21E-06	0.01	4.56E-06	**0.04**	**1.86E-05**
Hexane	110-54-3	–	–	–	–	–	–	–	–	–	–
Isooctane (2,2,4-Trimethylpentane)	540-84-1	2.48E-03	1.24E-06	4.53E-03	2.27E-06	3.01E-03	1.51E-06	3.26E-03	1.63E-06	**0.01**	**6.64E-06**
Naphthalene	91-20-3	0.54	2.70E-04	0.99	4.94E-04	0.66	3.28E-04	0.71	3.55E-04	**2.89**	**1.45E-03**
Phenylbenzene (1,1'-biphenyl)	92-52-4	0.14	6.83E-05	0.25	1.25E-04	0.17	8.30E-05	0.18	8.99E-05	**0.73**	**3.66E-04**
Pyrene	129-00-0	2.02E-05	1.01E-08	3.68E-05	1.84E-08	2.45E-05	1.22E-08	2.65E-05	1.33E-08	**1.08E-04**	**5.40E-08**
Toluene	108-88-3	0.44	2.21E-04	0.81	4.03E-04	0.54	2.68E-04	0.58	2.90E-04	**2.37**	**1.18E-03**
Xylenes (mixed isomers)	1330-20-7	0.02	1.20E-05	0.04	2.19E-05	0.03	1.46E-05	0.03	1.58E-05	**0.13**	**6.43E-05**

Vertical Fixed Roof Tanks - Fuel Storage Maximum Emission Rates

Pollutant	CAS #	Emissions[1, 2, 3]													
		624		625		626		627		632		633		Total	
		JET-A, B350, STANDING		JET-A, B350, WORKING		JET-A, B359, STANDING		JET-A, B359, WORKING		JET-A, B366, STANDING		JET-A, B366, WORKING			
		(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(tpy)
VOCs	-	81.67	0.04	63.07	0.03	81.67	0.04	118.39	0.06	98.60	0.05	13.39	0.01	**456.79**	**0.23**
Total HAPs	-	0.77	3.86E-04	0.60	2.98E-04	0.77	3.86E-04	1.12	5.59E-04	0.93	4.66E-04	0.13	6.33E-05	**4.32**	**2.16E-03**
Benzene	71-43-2	0.03	1.38E-05	0.02	1.07E-05	0.03	1.38E-05	0.04	2.00E-05	0.03	1.67E-05	4.53E-03	2.26E-06	**0.15**	**7.72E-05**
1,3-Butadiene	106-99-0	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Cumene (Isopropylbenzene)	98-82-8	0.15	7.39E-05	0.11	5.71E-05	0.15	7.39E-05	0.21	1.07E-04	0.18	8.92E-05	0.02	1.21E-05	**0.83**	**4.13E-04**
Ethylbenzene	100-41-4	0.13	6.49E-05	0.10	5.01E-05	0.13	6.49E-05	0.19	9.41E-05	0.16	7.84E-05	0.02	1.06E-05	**0.73**	**3.63E-04**
Fluorene	86-73-7	2.81E-03	1.40E-06	2.17E-03	1.08E-06	2.81E-03	1.40E-06	4.07E-03	2.04E-06	3.39E-03	1.70E-06	4.61E-04	2.30E-07	**0.02**	**7.86E-06**
Hexane	110-54-3	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Isooctane (2,2,4-Trimethylpentane)	540-84-1	1.00E-03	5.02E-07	7.76E-04	3.88E-07	1.00E-03	5.02E-07	1.46E-03	7.28E-07	1.21E-03	6.06E-07	1.65E-04	8.23E-08	**0.01**	**2.81E-06**
Naphthalene	91-20-3	0.22	1.09E-04	0.17	8.45E-05	0.22	1.09E-04	0.32	1.59E-04	0.26	1.32E-04	0.04	1.79E-05	**1.22**	**6.12E-04**
Phenylbenzene (1,1'-biphenyl)	92-52-4	0.06	2.77E-05	0.04	2.14E-05	0.06	2.77E-05	0.08	4.01E-05	0.07	3.34E-05	0.01	4.54E-06	**0.31**	**1.55E-04**
Pyrene	129-00-0	8.17E-06	4.08E-09	6.31E-06	3.15E-09	8.17E-06	4.08E-09	1.18E-05	5.92E-09	9.86E-06	4.93E-09	1.34E-06	6.69E-10	**4.57E-05**	**2.28E-08**
Toluene	108-88-3	0.18	8.94E-05	0.14	6.91E-05	0.18	8.94E-05	0.26	1.30E-04	0.22	1.08E-04	0.03	1.47E-05	**1.00**	**5.00E-04**
Xylenes (mixed isomers)	1330-20-7	0.01	4.86E-06	0.01	3.75E-06	0.01	4.86E-06	0.01	7.04E-06	0.01	5.87E-06	1.59E-03	7.97E-07	**0.05**	**2.72E-05**

Horizontal Fixed Roof Tanks - Fuel Storage Maximum Emission Rates

Pollutant	CAS #	Emissions[1, 2, 3]									
		666		669		662		663		Total	
		GASOLINE, B368, STANDING		GASOLINE, B368, WORKING		GASOLINE, B2201, STANDING		GASOLINE, B2201, WORKING			
		(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(tpy)
VOCs	-	13,958.84	6.98	735.49	0.37	1,173.83	0.59	140.49	0.07	**16,008.65**	**8.00**
Total HAPs	-	417.37	0.21	21.99	0.01	35.10	0.02	4.20	2.10E-03	**478.66**	**0.24**
Benzene	71-43-2	90.73	0.05	4.78	2.39E-03	7.63	3.81E-03	0.91	4.57E-04	**104.06**	**0.05**
1,3-Butadiene	106-99-0	–	–	–	–	–	–	–	–	–	–
Cumene (Isopropylbenzene)	98-82-8	1.40	6.98E-04	0.07	3.68E-05	0.12	5.87E-05	0.01	7.02E-06	**1.60**	**8.00E-04**
Ethylbenzene	100-41-4	6.98	3.49E-03	0.37	1.84E-04	0.59	2.93E-04	0.07	3.51E-05	**8.00**	**4.00E-03**
Fluorene	86-73-7	–	–	–	–	–	–	–	–	–	–
Hexane	110-54-3	82.36	0.04	4.34	2.17E-03	6.93	3.46E-03	0.83	4.14E-04	**94.45**	**0.05**
Isooctane (2,2,4-Trimethylpentane)	540-84-1	104.69	0.05	5.52	2.76E-03	8.80	4.40E-03	1.05	5.27E-04	**120.06**	**0.06**
Naphthalene	91-20-3	–	–	–	–	–	–	–	–	–	–
Phenylbenzene (1,1'-biphenyl)	92-52-4	–	–	–	–	–	–	–	–	–	–
Pyrene	129-00-0	–	–	–	–	–	–	–	–	–	–
Toluene	108-88-3	101.90	0.05	5.37	2.68E-03	8.57	4.28E-03	1.03	5.13E-04	**116.86**	**0.06**
Xylenes (mixed isomers)	1330-20-7	29.31	0.01	1.54	7.72E-04	2.47	1.23E-03	0.30	1.48E-04	**33.62**	**0.02**

1. VOC emissions previously calculated using AP-42 approved methods and the Air Program Information Management System (APIMS).
2. Calculation Methodology:
   E_{Max} = $E_{Historic}$ x 4.21
   E_{Max} = Max VOC Emissions
   $E_{Historic}$ = Max Historic VOC Emissions
   The factor of 4.21 is the ratio of the maximum number of hours per year (8,760) to current average actual site operating hours of eight hours per day, five days per
3. HAP Calculation Methodology:
   E_{HAP} = E_{VOC} x (WP_{HAP}/100)
   E_{HAP} = HAP Emissions (lb/yr)
   E_{VOC} = VOC Emissions (lb/yr)
   WP_{HAP} = Weight percent HAP in the fuel (%)
   100 = Factor for converting weight percent to weight fraction (%)
   Emission calculation methodology from Section 16 of Air Emissions Guide for Air Force Stationary Sources, AFCEC, October 2014.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: Loading - Diesel, JET-A
Process IDs: 642, 643, 644

Source List and Maximum Throughput

Process ID	Description	Fuel Type	Throughout (gal/yr)[1]	
			2007[1]	Max[2]
642	JET-A to Trucks, Tank 351, 356	JET-A	40,918,465	172,266,738
643	JET-A to Aircraft, Tank 351, 356	JET-A	40,918,466	172,266,742
644	Diesel to Trucks, Bldg 405	Diesel/ Bio-Diesel	39,862	167,819

1. Luke AFB determined that 2007 is respresentative of a typical operations year; therefore maximum operations are determined from this baseline year.
2. Baseline usage has been scaled up by a factor of 4.21 to arrive at a maximum usage (i.e., 8,760 hrs / 2,080 hrs).

Emissions Factors

Loading Loss Calculation

Loading Loss Equation Parameter		Value	
		JET-A	Diesel
Saturation (S) Factor	S	0.6	0.6
True Vapor Pressure (psi)	P	0.0954	0.022
Molecular Weight of Vapor (lb/lb-mole)	M	130	130
Temperature of Bulk Liquid Loaded (°R)	T	559.67	559.67
Capture Efficiency (%)	CAPeff	0	0
Control Efficiency (%)	CONeff	0	0
Loading Loss (lb/1000 gal)	L_L	0.1657	0.0382

1. Loading loss calculated in accordance with Section 5.2-"Transportation and Marketing of Petroleum Liquids," Compilation of Air Pollutant Emission Factors - Volume I: Stationary Point and Area Sources, Fifth Edition, U.S. Environmental Protection Agency, July 2008. The equation used is shown below:

$L_L = 12.46*SPM/T*(1-(CAPeff/100 - CONeff/100))$

12.46 = Equation constant (°R lb-mol/psia 10^3 gal);
S = Saturation factor;
P = True vapor pressure of fuel (psia);
M = Vapor molecular weight of the fuel (lb/lb-mol);
T = Temperature of bulk liquid loaded (°R);
Cap = Capture efficiency of the loading terminal (%);
CE = Efficiency of the control device (%); and
100 = Factor for converting a percent to a fraction (%)

Saturation factor, true vapor pressure, and vapor molecular weight taken from Air Emissions Guide for Air Force Stationary Sources, AFCEC, Table 16-1 and 16-2, October 2014 at 100 F.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: Loading - Diesel, JET-A
Process IDs: 642, 643, 644

Hazardous Air Pollutant Vapor Speciation (Weight %)

Hazardous Air Pollutant	CAS #	JET-A[1]	Diesel[2]
Benzene	71-43-2	3.38E-02	0.20
Cumene	98-82-8	1.81E-01	-
Ethyl Benzene	100-41-4	1.59E-01	0.31
Fluorene	86-73-7	3.44E-03	-
Hexane	110-54-3	-	0.04
Isooctane	540-84-1	1.23E-03	-
Naphthalene	91-20-3	2.68E-01	-
Phenylbenzene	92-52-4	6.78E-02	-
Pyrene	129-00-0	1.00E-05	-
Toluene	108-88-3	2.19E-01	2.30
1,2,4-Trimethylbenzene	95-63-6	-	4.67
Xylenes	1330-20-7	1.19E-02	5.83

1. JP-8 speciation taken from Values taken from Air Emissions Guide for Air Force Stationary Sources, Table 13-2, AFCEC, October 2014.
2. Diesel calculated using USEPA Tanks 4.09d from liquid weight percents.

Emissions

Pollutant	CAS #	JET-A 642			JET-A 643			Diesel 644		
		(lb/hr)	(lb/yr)	(ton/yr)	(lb/hr)	(lb/yr)	(ton/yr)	(lb/hr)	(lb/yr)	(ton/yr)
VOCs	-	13.72	28,538.45	14.27	13.72	28,538.45	14.27	3.08E-03	6.41	3.21E-03
Total HAPs	-	0.13	269.74	0.13	0.13	269.74	0.13	4.11E-04	0.86	4.28E-04
Benzene	71-43-2	4.64E-03	9.65	4.82E-03	4.64E-03	9.65	4.82E-03	6.16E-06	0.01	6.41E-06
Cumene	98-82-8	0.02	51.65	0.03	0.02	51.65	0.03	-	-	-
Ethyl Benzene	100-41-4	0.02	45.38	0.02	0.02	45.38	0.02	9.56E-06	0.02	9.94E-06
Fluorene	86-73-7	4.72E-04	0.98	4.91E-04	4.72E-04	0.98	4.91E-04	-	-	-
Hexane	110-54-3	-	-	-	-	-	-	1.23E-06	2.56E-03	1.28E-06
Isooctane	540-84-1	1.69E-04	0.35	1.76E-04	1.69E-04	0.35	1.76E-04	-	-	-
Naphthalene	91-20-3	0.04	76.48	0.04	0.04	76.48	0.04	-	-	-
Phenylbenzene	92-52-4	0.01	19.35	0.01	0.01	19.35	0.01	-	-	-
Pyrene	129-00-0	1.37E-06	2.85E-03	1.43E-06	1.37E-06	2.85E-03	1.43E-06	-	-	-
Toluene	108-88-3	0.03	62.50	0.03	0.03	62.50	0.03	7.09E-05	0.15	7.37E-05
1,2,4-Trimethylbenzene	95-63-6	-	-	-	-	-	-	1.44E-04	0.30	1.50E-04
Xylenes	1330-20-7	1.63E-03	3.40	1.70E-03	1.63E-03	3.40	1.70E-03	1.80E-04	0.37	1.87E-04

1. Calculation Methodology:
$E_{HAP} = E_{VOC} \times (WP_{HAP}/100)$
E_{HAP} = HAP Emissions (lb/yr)
E_{VOC} = VOC Emissions (lb/yr)
WP_{HAP} = Weight percent HAP in the fuel (%)
100 = Factor for converting weight percent to weight fraction (%)
Emission calculation methodology from Section 16 of Air Emissions Guide for Air Force Stationary Sources, AFCEC, October 2014.
Hourly emissions were estimated as annual emissions divided by actual operating hours (2,080 hr/yr).

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: Fuel Dispensing - Gasoline
Process ID: 653

Source List and Maximum Throughput

Process ID	Facility ID	Description	Fuel Type	Fuel Usage (gal)
				Max[2]
653	368	Military Service Station	Gasoline	1,199,988

1. Limited to 99,999 gallons per month to remain below NESHAP CCCCCC requirements.

Emissions Factors

Emission Source	Emission Factor (lb/1000 gal)[1]
	Gasoline
Displacement	11

1. Gasoline emission factors from EPA document AP 42, Section 5.2, Table 5.2-7, dated June 2008.

Hazardous Air Pollutant Vapor Speciation (Weight %)

HAP	CAS #	Gasoline
Benzene	71-43-2	0.65
Cumene	98-82-8	0.01
Ethyl Benzene	100-41-4	0.05
Hexane	110-54-3	0.59
Toluene	108-88-3	0.73
2,2,4-Trimethylpentane	540-84-1	0.75
Xylenes (mixed isomers)	1330-20-7	0.21

1. Calculated using USEPA Tanks 4.09d from liquid weight percents.

Emissions

Fuel Type	CAS #	Emissions[1, 2]		
		653		
		(lb/yr)	(lb/yr)	(tpy)
VOC	--	6.35	13,199.87	6.60
Total HAPs	--	0.19	394.68	0.20
Benzene	71-43-2	4.12E-02	85.80	0.04
Cumene	98-82-8	6.35E-04	1.32	6.60E-04
Ethyl Benzene	100-41-4	3.17E-03	6.60	3.30E-03
Hexane	110-54-3	3.74E-02	77.88	0.04
Toluene	108-88-3	4.63E-02	96.36	0.05
2,2,4-Trimethylpentane	540-84-1	4.76E-02	99.00	0.05
Xylenes (mixed isomers)	1330-20-7	1.33E-02	27.72	0.01

1. Emissions for displacement and spillage are calculated separately, using the methodology below:

E_{VOC} = Q x 1/1,000 x EF

E_{VOC} = Emissions (lb/yr)

Q = Annual quantity of fuel transferred (gal/yr)

1,000 = Factor for converting gal to 10^3 gal ($gal/10^3 gal$)

EF = Emissions factor ($lb/10^3$ gal).

Emission calculation methodology from Section 16 of Air Emissions Guide for Air Force Stationary Sources, AFCEC, October 2014, for uncontrolled fuel transfer.

2. Calculation Methodology:

$E_{HAP} = E_{VOC} \times (WP_{HAP}/100)$

E_{HAP} = HAP Emissions (lb/yr)

E_{VOC} = VOC Emissions (lb/yr)

WP_{HAP} = Weight percent HAP in the fuel (%)

100 = Factor for converting weight percent to weight fraction (%)

Emission calculation methodology from Section 16 of Air Emissions Guide for Air Force Stationary Sources, AFCEC, October 2014.

Hourly emissions were estimated as annual emissions divided by actual operating hours (2,080 hr/yr).

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: Solvent Cleaning Equipment (Degreasers)
Process ID: Multiple (See Below)

Source List

Process ID[1]	Solvent Type	VOC Content (lb/gal)	HAP Content (lb/gal)	Solvent Used (gal/yr)		Percent Recovered/ Disposed
				2007[2]	Max[3]	
701	Safety Kleen	6.8	0	293	1,233.53	70%
706	ZEP Dyna 680, Type II	6.39	0	20	84.20	0%
707	Formula 724	6.5	0	N/A	100	0%
708	Penetone 724	6.5	0	N/A	100	0%
709	Penetone 725	6.58	0	N/A	100	0%
710	PD 680, TYPE III	6.39	0	N/A	100	0%
711	Calla 296	1.01	0	N/A	100	0%
712	Super Agitene 141	6.67	0	N/A	100	0%
713	Tectyl 275 (Finger P	5.11	0	N/A	100	0%

1. Process ID's are seperated by solvent type rather than units. For a listing of specific units and Facility ID's, refer to the equipment list included with this application.
2. Luke AFB determined that 2007 is respresentative of a typical operations year; therefore maximum operations are determined from this baseline year.
3. Baseline usage has been scaled up by a factor of 4.21 to arrive at a maximum usage (i.e., 8,760 hrs / 2,080 hrs). For solvents that do not have 2007 usage, maximum was set to 100 gal/yr based on knowledge of operations.

Emissions

Pollutant	Process ID	Emissions[1,2]		
		(lb/yr)	(lb/yr)	(tpy)
VOC	701	1.21	2,516.40	1.26
	706	0.26	538.04	0.27
	707	0.31	650.00	0.33
	708	0.31	650.00	0.33
	709	0.32	658.00	0.33
	710	0.31	639.00	0.32
	711	0.05	101.00	0.05
	712	0.32	667.00	0.33
	713	0.25	511.00	0.26
	Total	3.33	6,930.44	3.47

1. Calculation Methodology:
E_{VOC} = Q*D*(1-R/100)
E_{VOC} = Emissions (lb/yr)
Q = Solvent Used (gal/yr)
D = Solvent Density (lb/gal)
R = Percent Recovered (%)
Hourly emissions were estimated as annual emissions divided by actual operating hours (2,080 hr/yr).

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
March 2016

Source Type: Miscellaneous Chemical Use and Surface Coating
Process IDs: Multiple (See Below)

Source List and Usage

Process ID	Process Type/Description	Material Type	2007 Usage[1] (gal/yr)	Max Usage[2] (gal/yr)
751	General Maintenance Materials: Multiple Buildings	Paint	142.56	600.18
752		Primer	101.82	428.66
753		Thinner	10.00	42.10
757		Adhesive	133.40	561.61
760		Sealer	614.74	2,588.06
762		Alcohol	232.63	979.37
770		Miscellaneous Cleaners, Corrosion Prevention, Hardeners, Etc.	4,871.67	20,509.73
775	Corrosion Control: Building 922 (with Two 3-Stage PM and Carbon Filters; Control ID 520; Stack ID 801)	Paint	1,635.65	6,886.09
776		Primer	827.74	3,484.79
777		Thinner	508.00	2,138.68
779		Alcohol	21.00	88.41
780		Adhesive	21.90	92.20
781		Sealant	27.58	116.11

1. Luke AFB determined that 2007 is representative of a typical operations year; therefore maximum operations are determined from this baseline year.
2. Baseline usage has been scaled up by a factor of 4.21 to arrive at a maximum usage (i.e., 8,760 hrs / 2,080 hrs).

Emissions - GENERAL MAINTENANCE MATERIALS, MULTIPLE BLDGS

Compound	CAS	751				752				753				757				760			
		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions	
		(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)
$PM/PM_{10}/PM_{2.5}$	--	--	0.46	957.29	0.48	--	0.30	627.32	0.31	--	--	--	--	--	--	--	--	--	--	--	--
VOC	--	568.46	1.16	2,393.22	1.20	372.52	0.75	1,568.31	0.78	53.30	0.11	224.39	0.11	361.65	0.73	1,522.55	0.76	2,440.71	4.94	10,275.39	5.14
Total HAPS	--	--	0.12	239.32	0.12	--	0.08	156.83	0.08	--	0.11	224.39	0.11	--	0.07	152.25	0.08	--	0.49	1,027.64	0.51

Compound	CAS	762				770				TOTAL			
		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions	
		(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)
$PM/PM_{10}/PM_{2.5}$	--	--	--	--	--	--	--	--	--	--	--	0.76	1,584.61
VOC	--	1,533.11	3.10	6,454.39	3.23	17,542.25	35.51	73,852.87	36.93	22,872.00	46.29	96,291.12	48.15
Total HAPS	--	--	0.31	645.44	0.32	--	3.55	7,386.29	3.69	--	4.73	9,831.87	4.92

Emissions - CORROSION CONTROL BLD 922, CONTROLLED BY CARBON FILTERS & FLAME TEST MONITORING

Compound	CAS	775				776				777				779				780			
		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions	
		(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)
$PM/PM_{10}/PM_{2.5}$	--	--	0.06	100.74	0.05	--	0.02	43.17	0.02	--	--	--	--	--	--	--	--	--	--	--	--
VOC	--	1,196.48	2.42	5,037.18	2.52	512.70	1.04	2,158.47	1.08	674.67	1.37	2,840.36	1.42	26.25	0.05	110.51	0.06	9.82	0.02	41.34	0.02
Total HAPS	--	--	0.24	503.72	0.25	--	0.10	215.85	0.11	--	1.37	2,840.36	1.42	--	0.01	11.05	0.01	--	1.90E-03	4.13	2.07E-03

Compound	CAS	781				TOTAL			
		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions	
		(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)
$PM/PM_{10}/PM_{2.5}$	--	--	--	--	--	--	0.07	143.91	0.07
VOC	--	14.20	0.03	59.78	0.03	2,434.12	4.93	10,247.85	5.12
Total HAPS	--	--	2.87E-03	5.96	2.99E-03	--	1.72	3,561.09	1.79

Note: Based on knowledge of typical operations, PM emissions from paint and primer application were assumed to be 40% of VOC emissions and a filter efficiency of 90% was assumed for Building 922. All other solvents were assumed to be hand applied. Therefore, PM emission were set to be negligible. HAP emissions were assumed to be 10% of VOC emissions, except for thinners, HAP emissions were set to be 100% of VOC emissions.
Hourly emissions were estimated as annual emissions divided by actual operating hours (2,080 hr/yr).

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Company Name & Location: Luke Air Force Base

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Date Feb-15

EMISSION SOURCES

Estimated Potential to Emit as per Rule 100.

Review of applications and issuance of permits will be expedited by supplying all necessary information on this table.

REGULATED AIR POLLUTANT DATA					EMISSION POINT DISCHARGE PARAMETERS										
Emission Point (1)		Chemical Composition of Total Stream	R. Air Pollutant Emission Rate		UTM Coordinates of Emissions Pt. (5)			Stack Sources (6)					Non Point Sources (7)	
Number	Name	Regulated Air Pollution Name (2)	#/ HR. (3)	Tons/ Year (4)	Zone	East (Mtrs)	North (Mtrs)	Height Above Ground/ Feet	Height Above Structure/ Feet	Exit Data DIA. (ft)	Exit Data VEL. (fps)	Exit Data Temp (°F)	Length (ft.)	Width (ft.)
001	External Combustion Sources - Natural Gas	CO	10.15	44.47	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		NOx	12.09	52.94										
		SOx	0.07	0.32										
		PM	0.92	4.02										
		PM_{10}	0.92	4.02										
		$PM_{2.5}$	0.92	4.02										
		VOC	0.66	2.91										
		Total HAPs	0.02	0.08										
002	External Combustion Sources - Propane	CO	0.08	0.36	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		NOx	0.14	0.62										
		SOx	<0.01	<0.01										
		PM	0.01	0.03										
		PM_{10}	0.01	0.03										
		$PM_{2.5}$	0.01	0.03										
		VOC	0.01	0.05										
		Total HAPs	<0.01	<0.01										
003	Fire Fighter Training - Building 7213	CO	0.24	0.25	12	371529	3710102						THD	THD
		NOx	0.88	0.91										
		SOx	<0.01	<0.01										
		PM	0.15	0.16										
		PM_{10}	0.15	0.16										
		$PM_{2.5}$	0.15	0.16										
		VOC	0.38	0.39										
		Total HAPs	0.01	0.01										
300	Stationary Internal Combustion, Small Emergency Generators, All Under 600 hp	CO	51.15	12.79	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		NOx	237.76	59.44										
		SOx	15.65	3.91										
		PM	17.06	4.26										
		PM_{10}	16.72	4.18										
		$PM_{2.5}$	16.72	4.18										
		VOC	18.58	4.65										
		Total HAPs	0.21	0.05										

Maricopa County
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Company Name & Location: Luke Air Force Base

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EMISSION SOURCES

Estimated Potential to Emit as per Rule 100

Review of applications and issuance of permits will be expedited by supplying all necessary information on this table.

REGULATED AIR POLLUTANT DATA					EMISSION POINT DISCHARGE PARAMETERS										
Emission Point (1)		Chemical Composition of Total Stream	R. Air Pollutant Emission Rate		UTM Coordinates of Emissions Pt. (5)			Stack Sources (6)					Non Point Sources (7)	
Number	Name	Regulated Air Pollution Name (2)	#/ HR. (3)	Tons/ Year (4)	Zone	East (Mtrs)	North (Mtrs)	Height Above Ground/ Feet	Height Above Structure/ Feet	Exit Data DIA. (ft)	Exit Data VEL. (fps)	Exit Data Temp (°F)	Length (ft.)	Width (ft.)
330	Aircraft Engine Testing - Bldg 1006, 1012, & 1016 - F-100-PW-220	CO	551.32	12.76	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		NOx	765.64	29.13										
		SOx	34.93	0.84										
		PM	74.93	2.09										
		PM_{10}	74.93	2.09										
		$PM_{2.5}$	67.64	1.88										
		VOC	106.38	4.17										
		Total HAPs	4.09	0.38										
332	Aircraft Engine Testing - Bldg 1006 - F-100-PW-229	CO	462.98	0.41	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		NOx	740.41	2.40										
		SOx	23.52	0.06										
		PM	53.46	0.16										
		PM_{10}	53.46	0.16										
		$PM_{2.5}$	48.22	0.15										
		VOC	115.47	0.08										
		Total HAPs	3.08	0.03										
360	Stationary Internal Combustion, Large Emergency Generators, All 600 hp +	CO	14.26	3.56	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		NOx	53.66	13.42										
		SOx	0.03	0.01										
		PM	1.68	0.42										
		PM_{10}	1.68	0.42										
		$PM_{2.5}$	1.68	0.42										
		VOC	1.48	0.37										
		Total HAPs	0.03	0.01										
502	Woodworking - Waste Bin Emptying - Bldg 247, 339, 415, and 948	PM	0.01	0.01	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		PM_{10}	0.01	0.01										
		$PM_{2.5}$	0.01	0.01										
503	Woodworking - Bin Vents - Bldg 247, 339, 415, and 948	PM	<0.01	<0.01	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		PM_{10}	<0.01	<0.01										
		$PM_{2.5}$	<0.01	<0.01										
516	Woodworking - Dust Collection Systems - 247, 339, and 415	PM	0.07	0.07	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		PM_{10}	0.07	0.07										
		$PM_{2.5}$	0.07	0.07										

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Company Name & Location: Luke Air Force Base

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EMISSION SOURCES

Estimated Potential to Emit as per Rule 100.

Review of applications and issuance of permits will be expedited by supplying all necessary information on this table.

REGULATED AIR POLLUTANT DATA					EMISSION POINT DISCHARGE PARAMETERS									
Emission Point (1)		Chemical Composition of Total Stream	R. Air Pollutant Emission Rate		UTM Coordinates of Emissions Pt. (5)			Stack Sources (6)					Non Point Sources (7)	
Number	Name	Regulated Air Pollution Name (2)	#/ HR. (3)	Tons/ Year (4)	Zone	East (Mtrs)	North (Mtrs)	Height Above Ground/ Feet	Height Above Structure/ Feet	Exit Data DIA. (ft)	Exit Data VEL. (fps)	Exit Data Temp (°F)	Length (ft.)	Width (ft.)
515	Walk-In Abrasive Blasting Booth	PM	<0.01	<0.01	12	371529	3710102	TBD	TBD	TBD	TBD	TBD		
		PM_{10}	<0.01	<0.01										
		$PM_{2.5}$	<0.01	<0.01										
		Total HAPs	<0.01	<0.01										
520	Fuel Cell Maintenance - Internal Tank	VOC	0.62	0.65	12	371529	3710102						Varies	Varies
		Total HAPs	0.01	0.01										
521	Fuel Cell Maintenance - External Tank	VOC	0.19	0.20	12	371529	3710102						Varies	Varies
		Total HAPs	<0.01	<0.01										
522	Fuel Cell Maintenance - External Tank	VOC	0.09	0.10	12	371529	3710102						Varies	Varies
		Total HAPs	<0.01	<0.01										
523	Aircraft Defueling Prior to Fuel Cell Maintenance	VOC	0.01	0.01	12	371529	3710102						Varies	Varies
		Total HAPs	<0.01	<0.01										
620	Fuel Storage Tank - B351, STANDING	VOC	0.02	0.10	12									
		Total HAPs	<0.01	<0.01										
621	Fuel Storage Tank - B351, WORKING	VOC	0.18	0.18	12									
		Total HAPs	<0.01	<0.01										
622	Fuel Storage Tank - B356, STANDING	VOC	0.03	0.12	12									
		Total HAPs	<0.01	<0.01										
623	Fuel Storage Tank - B356, WORKING	VOC	0.13	0.13	12									
		Total HAPs	<0.01	<0.01										
624	Fuel Storage Tank - B350, STANDING	VOC	0.01	0.04	12									
		Total HAPs	<0.01	<0.01										
625	Fuel Storage Tank - B350, WORKING	VOC	0.03	0.03	12									
		Total HAPs	<0.01	<0.01										
626	Fuel Storage Tank - B359, STANDING	VOC	0.01	0.04	12									
		Total HAPs	<0.01	<0.01										
627	Fuel Storage Tank - B359, WORKING	VOC	0.06	0.06	12									
		Total HAPs	<0.01	<0.01										

Maricopa County
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Company Name & Location: Luke Air Force Base

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Date Feb-15

EMISSION SOURCES

Estimated Potential to Emit as per Rule 100.

Review of applications and issuance of permits will be expedited by supplying all necessary information on this table.

REGULATED AIR POLLUTANT DATA					EMISSION POINT DISCHARGE PARAMETERS									
Emission Point (1)		Chemical Composition of Total Stream	R. Air Pollutant Emission Rate		UTM Coordinates of Emissions Pt. (5)			Stack Sources (6)					Non Point Sources (7)	
Number	Name	Regulated Air Pollution Name (2)	#/ HR. (3)	Tons/ Year (4)	Zone	East (Mtrs)	North (Mtrs)	Height Above Ground/ Feet	Height Above Structure/ Feet	Exit Data DIA. (ft)	Exit Data VEL. (fps)	Exit Data Temp (°F)	Length (ft.)	Width (ft.)
632	Fuel Storage Tank - B366, STANDING	VOC	0.01	0.05	12									
		Total HAPs	<0.01	<0.01										
633	Fuel Storage Tank - B366, WORKING	VOC	0.01	0.01	12									
		Total HAPs	<0.01	<0.01										
642	Fuel Loading (Dispensing) - JET-A to Trucks, Tank 351, 356	VOC	13.72	14.27	12	371529	3710102						TBD	TBD
		Total HAPs	0.13	0.13										
643	Fuel Loading (Dispensing) - JET-A to Aircraft, Tank 351, 356	VOC	13.72	14.27	12	371529	3710102						TBD	TBD
		Total HAPs	0.13	0.13										
644	Fuel Loading (Dispensing) - Diesel to Trucks, Bldg 405	VOC	<0.01	<0.01	12	371529	3710102						TBD	TBD
		Total HAPs	<0.01	<0.01										
653	Fuel Dispensing - Gasoline - Military Service Station	VOC	6.35	6.60	12	371529	3710102						TBD	TBD
		Total HAPs	0.19	0.20										
662	B2201, STANDING	VOC	0.13	0.59	12									
		Total HAPs	<0.01	0.02										
663	B2201, WORKING	VOC	0.07	0.07	12									
		Total HAPs	<0.01	<0.01										
666	Fuel Storage Tank - B368, STANDING	VOC	1.59	6.98	12									
		Total HAPs	0.05	0.21										
669	B368, WORKING	VOC	0.35	0.37	12									
		Total HAPs	0.01	0.01										
701	Solvent Cleaning - Safety Kleen	VOC	1.21	1.26	12	371529	3710102						Varies	Varies
706	Solvent Cleaning - ZEP Dyna 680, Type II	VOC	0.26	0.27	12	371529	3710102						Varies	Varies
707	Solvent Cleaning - Formula 724	VOC	0.31	0.33	12	371529	3710102						Varies	Varies
708	Solvent Cleaning - Penetone 724	VOC	0.31	0.33	12	371529	3710102						Varies	Varies

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EMISSION SOURCES

Estimated Potential to Emit as per Rule 100.

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REGULATED AIR POLLUTANT DATA					EMISSION POINT DISCHARGE PARAMETERS										
Emission Point (1)		Chemical Composition of Total Stream	R. Air Pollutant Emission Rate		UTM Coordinates of Emissions Pt. (5)			Stack Sources (6)					Non Point Sources (7)	
Number	Name	Regulated Air Pollution Name (2)	#/ HR. (3)	Tons/ Year (4)	Zone	East (Mtrs)	North (Mtrs)	Height Above Ground/ Feet	Height Above Structure/ Feet	Exit Data DIA. (ft)	Exit Data VEL. (fps)	Exit Data Temp (°F)	Length (ft.)	Width (ft.)
709	Solvent Cleaning - Penetone 725	VOC	0.32	0.33	12	371529	3710102						Varies	Varies
710	Solvent Cleaning - PD 680, TYPE III	VOC	0.31	0.32	12	371529	3710102						Varies	Varies
711	Solvent Cleaning - Calla 296	VOC	0.05	0.05	12	371529	3710102						Varies	Varies
712	Solvent Cleaning - Super Agitene 141	VOC	0.32	0.33	12	371529	3710102						Varies	Varies
713	Solvent Cleaning - Tectyl 275 (Finger Print Remover)	VOC	0.25	0.26	12	371529	3710102						Varies	Varies
751	Surface Coating - Paint - General Maintenance Materials, Multiple Bldgs	PM	0.46	0.48	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		PM_{10}	0.46	0.48										
		$PM_{2.5}$	0.46	0.48										
		VOC	1.15	1.20										
		Total HAPs	0.12	0.12										
752	Chemical and Solvent Use - Primer - General Maintenance Materials, Multiple Bldgs	PM	0.30	0.31	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		PM_{10}	0.30	0.31										
		$PM_{2.5}$	0.30	0.31										
		VOC	0.75	0.78										
		Total HAPs	0.08	0.08										
753	Chemical and Solvent Use - Thinner - General Maintenance Materials, Multiple Bldgs	VOC	0.11	0.11	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		Total HAPs	0.11	0.11										
757	Chemical and Solvent Use - Adhesive - General Maintenance Materials, Multiple Bldgs	VOC	0.73	0.76	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		Total HAPs	0.07	0.08										
760	Chemical and Solvent Use - Sealer - General Maintenance Materials, Multiple Bldgs	VOC	4.94	5.14	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		Total HAPs	0.49	0.51										
762	Chemical and Solvent Use - Alcohol - General Maintenance Materials, Multiple Bldgs	VOC	3.10	3.23	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		Total HAPs	0.31	0.32										
770	Chemical and Solvent Use - Misc. Cleaners, Corrosion Prev., Hardeners, etc. - General	VOC	35.51	36.93	12	371529	3710102	Varies	Varies	Varies	Varies	Varies		
		Total HAPs	3.55	3.69										

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EMISSION SOURCES

Estimated Potential to Emit as per Rule 100.

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REGULATED AIR POLLUTANT DATA					EMISSION POINT DISCHARGE PARAMETERS										
Emission Point (1)		Chemical Composition of Total Stream	R. Air Pollutant Emission Rate		UTM Coordinates of Emissions Pt. (5)			Stack Sources (6)					Non Point Sources (7)	
Number	Name	Regulated Air Pollution Name (2)	#/ HR. (3)	Tons/ Year (4)	Zone	East (Mtrs)	North (Mtrs)	Height Above Ground/ Feet	Height Above Structure/ Feet	Exit Data DIA. (ft)	Exit Data VEL. (fps)	Exit Data Temp (°F)	Length (ft.)	Width (ft.)
775	Surface Coating - Paint - Corrosion Control Bld 922, Controlled by Carbon Filters & F	PM	0.05	0.05	12	372960	3711288	30		3	0.2	80		
		PM_{10}	0.05	0.05										
		$PM_{2.5}$	0.05	0.05										
		VOC	2.42	2.52										
		Total HAPs	0.24	0.25										
776	Surface Coating - Primer - Corrosion Control Bld 922, Controlled by Carbon Filters &	PM	0.02	0.02	12	372960	3711288	30		3	0.2	80		
		PM_{10}	0.02	0.02										
		$PM_{2.5}$	0.02	0.02										
		VOC	1.04	1.08										
		Total HAPs	0.10	0.11										
777	Surface Coating - Thinner - Corrosion Control Bld 922, Controlled by Carbon Filters &	VOC	1.37	1.42	12	372960	3711288	30		3	0.2	80		
		Total HAPs	1.37	1.42										
779	Surface Coating - Alcohol - Corrosion Control Bld 922, Controlled by Carbon Filters &	VOC	0.05	0.06	12	372960	3711288	30		3	0.2	80		
		Total HAPs	0.01	0.01										
780	Surface Coating - Adhesive - Corrosion Control Bld 922, Controlled by Carbon Filters	VOC	0.02	0.02	12	372960	3711288	30		3	0.2	80		
		Total HAPs	<0.01	<0.01										
781	Surface Coating - Sealant - Corrosion Control Bld 922, Controlled by Carbon Filters &	VOC	0.03	0.03	12	372960	3711288	30		3	0.2	80		
		Total HAPs	<0.01	<0.01										

Ground Elevation of Facility Above Mean Sea Level (ft.) : 1,100 feet

ADEQ Standard Conditions are 293K and 101.3 Kilopascals (A.A.C. R18-2-101)

General Instructions:

(1) Identify each emission point with a unique number for this plant site, consistent with emission point identification used on plot plan, previous permits, and Emissions Inventory Questionnaire. Include fugitive emissions. Limit emission point number to eight (8) character spaces. For each emission point use as many lines as necessary to list regulated air pollutant data. Typical emission point names are: heater, vent, boiler, tank, reactor, separator, baghouse, fugitive, etc. Abbreviations are O.K.

(2) Components to be listed include regulated air pollutants as defined in R18-2-101. Examples of typical component names are: Carbon Monoxide (CO), Nitrogen Oxides (NOx) , Sulfur Dioxide (SO2), Volatile Organic Compounds (VOC) , particulate matter (PM) , particulate less than 10 microns (PM 10), etc. Abbreviations are O.K.

(3) Pounds per hour (#/HR) is maximum potential emission rate expected by applicant.

(4) Tons per year is annual maximum potential emission expected by applicant, Which takes into account process operating schedule.

(5) As a minimum applicant shall furnish a facility plot plan as described in the filing instructions. UTM coordinates are required only if the source is a major source or is required to perform refined modeling for the purposes of demonstrating compliance with ambient air quality guidelines.

(6) Supply additional information as follows if appropriate :

(a) Stack exit configuration other than a round vertical stack. Show length and width for a rectangular stack. Indicate if horizontal discharge with a note.

(b) Stack's height above supporting or adjacent structures if structure is within 3 "stack height above the ground" of stack.

(7) Dimensions of non point sources as defined in R18-2-101.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
December 2015

Source Type: External Combustion
Process ID: 001, 002

Source List and Usage

Process ID	Equipment Size	Fuel Type	Total Heat Input[1] (MMBTU/hr)	Maximum Operation (hr/yr)	Maximum Fuel Use	Throughput Units
001	<10 MMBtu/hr	Nat. Gas	124	8,760	1,059	MMscf/yr
002	<10 MMBtu/hr	Propane	1	8,760	95	Mgal/yr

1. Total MMBtu/hr includes all external combustion units at Luke AFB. The total number was rounded up to the nearest MMBTU/hr.
2. The following heating values were used for unit conversion (MMBtu to gal):
For Natural Gas: 1,026 MMBtu/MMscf
For Propane: 92 MMBtu/10^3 gal
from Air Emissions Guide for Air Force Stationary Sources, Table 11-2, AFCEC, October 2014.

Emissions Factors

Pollutant	CAS #	Natural Gas (lb/MMscf)[1]	Propane (lb/Mgal)[2]
CO	-	84	7.5
NOx	-	100	13
SOx	-	0.6	0.018
PM	-	7.6	0.7
PM_{10}	-	7.6	0.7
$PM_{2.5}$	-	7.6	0.7
VOC	-	5.5	1
Acenaphthene	83-32-9	1.80E-06	1.65E-07
Acenaphthylene	208-96-8	1.80E-06	1.65E-07
Acetaldehyde	75-07-0	4.30E-03	2.84E-04
Acrolein	107-02-8	2.70E-03	2.47E-04
Anthracene	120-12-7	2.40E-06	2.20E-07
Arsenic	7440-38-2	2.00E-04	1.83E-05
Benz(a)anthracene	56-55-3	1.80E-06	1.65E-07
Benzene	71-43-2	8.00E-03	5.31E-04
Benzo(b)fluoranthene	205-99-2	1.80E-06	1.65E-07
Benzo(k)fluoranthene	207-08-9	1.80E-06	1.65E-07
Benzo(g,h,i)perylene	191-24-2	1.20E-06	1.46E-07
Benzo(a)pyrene	50-32-8	1.20E-06	1.46E-07
Beryllium	7440-41-7	1.20E-05	1.10E-06
Cadmium	7440-43-9	1.10E-03	1.01E-04
Chromium	7440-47-3	1.40E-03	1.28E-04
Chrysene	218-01-9	1.80E-06	1.65E-07
Cobalt Compounds	7440-48-4	8.40E-05	7.69E-06
Dibenzo(a,h)anthracene	53-70-3	1.20E-06	1.46E-07
Dichlorobenzene	25321-22-6	1.20E-03	1.10E-04
7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	1.46E-06
Ethyl Benzene	100-41-4	9.50E-03	6.31E-04
Fluoranthene	206-44-0	3.00E-06	2.75E-07
Fluorene	86-73-7	2.80E-06	2.56E-07
Formaldehyde	50-00-0	7.50E-02	6.86E-03
Hexane	110-54-3	6.30E-03	4.21E-04
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	1.65E-07
Lead	7439-92-1	5.00E-04	4.58E-05
Manganese	7439-96-5	3.80E-04	3.48E-05
Mercury	7439-97-6	2.60E-04	2.38E-05
3-Methylchloranthrene	56-49-5	1.80E-06	1.65E-07
2-Methylnaphthalene	91-57-6	2.40E-05	2.16E-06
Naphthalene	91-20-3	3.00E-04	2.75E-05
Nickel	7440-02-0	2.10E-03	1.92E-04
Phenanathrene	85-01-8	1.70E-05	1.56E-06
Pyrene	129-00-0	5.00E-06	4.58E-07
Selenium Compounds	7782-49-2	2.40E-05	2.20E-06
Toluene	108-88-3	3.66E-02	2.42E-03
Xylenes	1330-20-7	-	1.80E-03

1. Air Emissions Guide for Air Force Stationary Sources, Tables 11-3, 11-4, AFCEC, October 2014. Emission factors are derived from AP-42 and Mohave Desert Air Quality Management District.

2. Air Emissions Guide for Air Force Stationary Sources, Tables 11-13, 11-14, AFCEC, October 2014. Emission factors are derived from AP-42 and Mohave Desert Air Quality Management District.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
December 2015

Source Type: External Combustion
Process ID: 001, 002

Emissions

Pollutant	CAS #	Emissions[1]					
		001			002		
		(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
CO	-	10.15	88,931.93	44.47	0.08	714.13	0.36
NOx	-	12.09	105,871.35	52.94	0.14	1,237.83	0.62
SOx	-	0.07	635.23	0.32	1.96E-04	1.71	0.00
PM	-	0.92	8,046.22	4.02	0.01	66.65	0.03
PM_{10}	-	0.92	8,046.22	4.02	0.01	66.65	0.03
$PM_{2.5}$	-	0.92	8,046.22	4.02	0.01	66.65	0.03
VOC	-	0.66	5,822.92	2.91	0.01	95.22	0.05
Total HAPs	-	0.02	158.86	0.08	1.51E-04	1.32	6.61E-04
Acenaphthene	83-32-9	2.18E-07	1.91E-03	9.53E-07	1.79E-09	1.57E-05	7.86E-09
Acenaphthylene	208-96-8	2.18E-07	1.91E-03	9.53E-07	1.79E-09	1.57E-05	7.86E-09
Acetaldehyde	75-07-0	5.20E-04	4.55	2.28E-03	3.09E-06	0.03	1.35E-05
Acrolein	107-02-8	3.26E-04	2.86	1.43E-03	2.68E-06	0.02	1.18E-05
Anthracene	120-12-7	2.90E-07	2.54E-03	1.27E-06	2.39E-09	2.09E-05	1.05E-08
Arsenic	7440-38-2	2.42E-05	0.21	1.06E-04	1.99E-07	1.74E-03	8.71E-07
Benz(a)anthracene	56-55-3	2.18E-07	0.00	9.53E-07	1.79E-09	1.57E-05	7.86E-09
Benzene	71-43-2	9.67E-04	8.47	4.23E-03	5.77E-06	0.05	2.53E-05
Benzo(b)fluoranthene	205-99-2	2.18E-07	1.91E-03	9.53E-07	1.79E-09	1.57E-05	7.86E-09
Benzo(k)fluoranthene	207-08-9	2.18E-07	1.91E-03	9.53E-07	1.79E-09	1.57E-05	7.86E-09
Benzo(g,h,i)perylene	191-24-2	1.45E-07	1.27E-03	6.35E-07	1.59E-09	1.39E-05	6.95E-09
Benzo(a)pyrene	50-32-8	1.45E-07	1.27E-03	6.35E-07	1.59E-09	1.39E-05	6.95E-09
Beryllium	7440-41-7	1.45E-06	0.01	6.35E-06	1.20E-08	1.05E-04	5.24E-08
Cadmium	7440-43-9	1.33E-04	1.16	5.82E-04	1.10E-06	0.01	4.81E-06
Chromium	7440-47-3	1.69E-04	1.48	7.41E-04	1.39E-06	0.01	6.09E-06
Chrysene	218-01-9	2.18E-07	0.00	9.53E-07	1.79E-09	1.57E-05	7.86E-09
Cobalt Compounds	7440-48-4	1.02E-05	0.09	4.45E-05	8.36E-08	7.32E-04	3.66E-07
Dibenzo(a,h)anthracene	53-70-3	1.45E-07	1.27E-03	6.35E-07	1.59E-09	1.39E-05	6.95E-09
Dichlorobenzene	25321-22-6	1.45E-04	1.27	6.35E-04	1.20E-06	0.01	5.24E-06
7,12-Dimethylbenz(a)anthracene	57-97-6	1.93E-06	0.02	8.47E-06	1.59E-08	1.39E-04	6.95E-08
Ethyl Benzene	100-41-4	1.15E-03	10.06	5.03E-03	6.86E-06	0.06	3.00E-05
Fluoranthene	206-44-0	3.63E-07	3.18E-03	1.59E-06	2.99E-09	2.62E-05	1.31E-08
Fluorene	86-73-7	3.38E-07	2.96E-03	1.48E-06	2.78E-09	2.44E-05	1.22E-08
Formaldehyde	50-00-0	9.06E-03	79.40	3.97E-02	7.46E-05	0.65	3.27E-04
Hexane	110-54-3	7.61E-04	6.67	3.33E-03	4.58E-06	0.04	2.00E-05
Indeno(1,2,3-cd)pyrene	193-39-5	2.18E-07	1.91E-03	9.53E-07	1.79E-09	1.57E-05	7.86E-09
Lead	7439-92-1	6.04E-05	0.53	2.65E-04	4.98E-07	4.36E-03	2.18E-06
Manganese	7439-96-5	4.59E-05	0.40	2.01E-04	3.78E-07	3.31E-03	1.66E-06
Mercury	7439-97-6	3.14E-05	0.28	1.38E-04	2.59E-07	2.27E-03	1.13E-06
3-Methylchloranthrene	56-49-5	2.18E-07	1.91E-03	9.53E-07	1.79E-09	1.57E-05	7.86E-09
2-Methylnaphthalene	91-57-6	2.90E-06	0.03	1.27E-05	2.35E-08	2.06E-04	1.03E-07
Naphthalene	91-20-3	3.63E-05	0.32	1.59E-04	2.99E-07	2.62E-03	1.31E-06
Nickel	7440-02-0	2.54E-04	2.22	1.11E-03	2.09E-06	0.02	9.14E-06
Phenanathrene	85-01-8	2.05E-06	0.02	9.00E-06	1.70E-08	1.49E-04	7.43E-08
Pyrene	129-00-0	6.04E-07	0.01	2.65E-06	4.98E-09	4.36E-05	2.18E-08
Selenium Compounds	7782-49-2	2.90E-06	0.03	1.27E-05	2.39E-08	2.09E-04	1.05E-07
Toluene	108-88-3	4.42E-03	38.75	1.94E-02	2.63E-05	0.23	1.15E-04
Xylenes	1330-20-7	-	-	-	1.96E-05	0.17	8.57E-05

2. Calculation Methodology:

E_{POL} = FC * EF

E_{POL} = Emissions of a particular pollutant (lb/yr);

FC = Quantity of fuel consumed per year (units/yr); and

EF = Emission factor (lb/units).

Emission calculation methodology from Section 11 of Air Emissions Guide for Air Force Stationary Sources, AFCEC, October 2014.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
December 2015

Source Type: Fire Fighter Training
Process ID: 003

Source List and Usage

Process ID	Facility ID	Fuel Type	Fuel Usage (gal)	
			3-Yr Average [1]	Max [2]
003	7213	Propane	7,800	32,838

1. 3-Yr Average includes usage from 2012-2014 to obtain a baseline actual usage.
2. Baseline usage has been scaled up by a factor of 4.21 to arrive at a maximum usage (i.e., 8,760 hrs / 2,080 hrs).

Emissions Factors

Pollutant	CAS #	Propane ($lb/10^3$ gal)[1]
CO	-	15.4
NOx	-	55.7
SOx	-	0.02
PM	-	9.5
PM_{10}	-	9.5
$PM_{2.5}$	-	9.5
VOC	-	24.0
Formaldehyde	50-00-0	0.7

1. Emission factors taken rom Air Emissions Guide for Air Force Stationary Sources, AFCEC, Table 12-1, October 2014.

Emissions

Pollutant	CAS #	Emissions[1]		
		(lb/hr)	(lb/yr)	(tpy)
CO	-	0.24	505.71	0.25
NOx	-	0.88	1,829.08	0.91
SOx	-	3.16E-04	0.66	3.28E-04
PM	-	0.15	311.96	0.16
PM_{10}	-	0.15	311.96	0.16
$PM_{2.5}$	-	0.15	311.96	0.16
VOC	-	0.38	788.11	0.39
Total HAPs	-	0.01	22.99	0.01
Formaldehyde	50-00-0	0.01	22.99	0.01

1. Calculation Methodology:

$E_{POL} = Q * EF$

E_{POL} = Emissions of a particular pollutant (lb/yr);

Q = Quantity of fuel consumed per year (10^3 gal/yr for propane); and

EF = Emission factor ($lb/10^3$ gal for propane).

Emission calculation methodology from Section 12 of Air Emissions Guide for Air Force Stationary Sources, AFCEC, October 2014.

Hourly emissions were estimated as annual emissions divided by actual operating hours (2,080 hr/yr).

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
December 2015

Source Type: Stationary Internal Combustion
Process IDs: 300, 360

Source List and Usage

Process ID	Power Rating[1] (hp)	Maximum Run Time[2] (hr/yr/unit)
Diesel Fired Generators ≤450 kW or 600 hp		
300	9,000	500
Diesel Fired Generators >450 kW or 600 hp		
360	2,800	500

1. Total power rating includes all generators at Luke AFB for that particular rating category. The total number was rounded up to the nearest 100 hp.
2. 500 hours per unit is based on guidance provided in Calculating Potential to Emit for Emergency Generators, EPA, September 1995.

Emissions Factors

Pollutant	CAS #	Diesel[1]	
		Engines < 600 HP	Engines 600 < hp ≤ 3000
		(lb/hp-hr)	(lb/hp-hr)
CO	-	7.68E-03	6.88E-03
NOx	-	3.57E-02	2.59E-02
SOx	-	2.35E-03	1.23E-05
PM	-	2.56E-03	8.09E-04
PM_{10}	-	2.51E-03	8.09E-04
$PM_{2.5}$	-	2.51E-03	8.09E-04
VOC	-	2.79E-03	7.16E-04
1,3-Butadiene	106-99-0	3.16E-07	3.16E-07
Acenaphthene	83-32-9	1.15E-08	3.79E-08
Acenaphthylene	208-96-8	4.09E-08	7.47E-08
Acetaldehyde	75-07-0	6.20E-06	2.04E-07
Acrolein	107-02-8	7.48E-07	6.37E-08
Anthracene	120-12-7	1.51E-08	9.95E-09
Benz(a)anthracene	56-55-3	1.36E-08	5.03E-09
Benzene	71-43-2	7.55E-06	6.28E-06
Benzo(a)pyrene1.52E-	50-32-8	1.52E-09	2.08E-09
Benzo(b)fluoranthene	205-99-2	8.02E-10	8.98E-09
Benzo(g,h,i)perylene	191-24-2	3.96E-09	4.50E-09
Benzo(k)fluoranthene	207-08-9	1.25E-09	1.76E-09
Chrysene	218-01-9	2.86E-09	1.24E-08
Dibenz(a,h)anthracene	53-70-3	4.72E-09	2.80E-09
Fluoranthene	206-44-0	6.16E-08	3.26E-08
Fluorene	86-73-7	2.36E-07	1.04E-07
Formaldehyde	50-00-0	9.55E-06	6.38E-07
Indeno(1,2,3-c,d)pyrene	193-39-5	3.03E-09	3.35E-09
Naphthalene	91-20-3	6.86E-07	1.05E-06
Phenanthrene	85-01-8	2.38E-07	3.30E-07
Pyrene	129-00-0	3.87E-08	3.00E-08
Toluene	108-88-3	3.31E-06	2.27E-06
Xylenes	1330-20-7	2.31E-06	1.56E-06

1. Emissions factors taken from Air Emissions Guide for Air Force Stationary Sources, AFCEC, Tables 28-3 and 28-4, October 2014. Pre-2007 factors were used to provide a conservative estimate.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
December 2015

Source Type: Stationary Internal Combustion
Process IDs: 300, 360

Emissions

Pollutant[1]	CAS #	300			360		
		<600hp			600 < hp ≤ 3000		
		(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
CO	-	51.15	25,574.40	12.79	14.26	7,127.68	3.56
NOx	-	237.76	118,881.00	59.44	53.66	26,832.40	13.42
SOx	-	15.65	7,825.50	3.91	0.03	12.74	0.01
PM	-	17.06	8,528.13	4.26	1.68	838.12	0.42
PM_{10}	-	16.72	8,358.30	4.18	1.68	838.12	0.42
$PM_{2.5}$	-	16.72	8,358.30	4.18	1.68	838.12	0.42
VOC	-	18.58	9,290.70	4.65	1.48	741.78	0.37
Total HAPs	-	0.21	104.37	0.05	0.03	13.51	0.01
1,3-Butadiene	106-99-0	2.10E-03	1.05	5.26E-04	6.55E-04	0.33	1.64E-04
Acenaphthene	83-32-9	7.66E-05	0.04	1.91E-05	7.85E-05	0.04	1.96E-05
Acenaphthylene	208-96-8	2.72E-04	0.14	6.81E-05	1.55E-04	0.08	3.87E-05
Acetaldehyde	75-07-0	4.13E-02	20.65	0.01	4.23E-04	0.21	1.06E-04
Acrolein	107-02-8	4.98E-03	2.49	1.25E-03	1.32E-04	0.07	3.30E-05
Anthracene	120-12-7	1.01E-04	0.05	2.51E-05	2.06E-05	0.01	5.15E-06
Benz(a)anthracene	56-55-3	9.06E-05	0.05	2.26E-05	1.04E-05	0.01	2.61E-06
Benzene	71-43-2	5.03E-02	25.14	0.01	1.30E-02	6.51	3.25E-03
Benzo(a)pyrene1.52E-	50-32-8	1.01E-05	0.01	2.53E-06	4.31E-06	2.15E-03	1.08E-06
Benzo(b)fluoranthene	205-99-2	5.34E-06	2.67E-03	1.34E-06	1.86E-05	0.01	4.65E-06
Benzo(g,h,i)perylene	191-24-2	2.64E-05	0.01	6.59E-06	9.32E-06	4.66E-03	2.33E-06
Benzo(k)fluoranthene	207-08-9	8.33E-06	4.16E-03	2.08E-06	3.65E-06	1.82E-03	9.12E-07
Chrysene	218-01-9	1.90E-05	0.01	4.76E-06	2.57E-05	0.01	6.42E-06
Dibenz(a,h)anthracene	53-70-3	3.14E-05	0.02	7.86E-06	5.80E-06	2.90E-03	1.45E-06
Fluoranthene	206-44-0	4.10E-04	0.21	1.03E-04	6.75E-05	0.03	1.69E-05
Fluorene	86-73-7	1.57E-03	0.79	3.93E-04	2.15E-04	0.11	5.39E-05
Formaldehyde	50-00-0	6.36E-02	31.80	0.02	1.32E-03	0.66	3.30E-04
Indeno(1,2,3-c,d)pyrene	193-39-5	2.02E-05	0.01	5.04E-06	6.94E-06	3.47E-03	1.74E-06
Naphthalene	91-20-3	4.57E-03	2.28	1.14E-03	2.18E-03	1.09	5.44E-04
Phenanthrene	85-01-8	1.59E-03	0.79	3.96E-04	6.84E-04	0.34	1.71E-04
Pyrene	129-00-0	2.58E-04	0.13	6.44E-05	6.22E-05	0.03	1.55E-05
Toluene	108-88-3	2.20E-02	11.02	0.01	4.70E-03	2.35	1.18E-03
Xylenes	1330-20-7	1.54E-02	7.69	3.85E-03	3.23E-03	1.62	8.08E-04

1. Calculation Methodology:

E_{Pol} = OT x PO x LF/100 x EF_{Pol}

E_{Pol} = Emissions (lb/yr)

OT = Operating Time (hr/yr)

PO = Rated power output of engines (hp)

LF = Engine load factor (%); 74% per Air Emissions Guide for Air Force Stationary Sources, Table 28-8, AFCEC, October 2014.

EF_{Pol} = Emissions factor (lb/hp-hr)

Emission calculation methodology from Air Emissions Guide for Air Force Stationary Sources, Section 28, AFCEC, October 2014.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
December 2015

Source Type: Jet Engine Testing
Process ID: 330, 332

Source List and Usage

Process ID	Facility ID	Aircraft	Engine	Numer of Engine Tests	
				2007 [1]	Max[2]
330	1006, 1012, 1016	F-16	F100-PW-220	228	960
332	1006, 1016	F-16	F100-PW-229	17	72

1. Luke AFB determined that 2007 is respresentative of a typical operations year; therefore maximum limits are determined from this baseline year.
2. Baseline usage has been scaled up by a factor of 4.21 to arrive at a maximum usage limit (i.e., 8,760 hrs / 2,080 hrs).

EPN	Maximum Time-In-Mode (mins/test)[1]				
	Idle	Approach	Intermediate	Military	Afterburner
330	30.0	N/A[2]	2.6	10.1	0.7
332	30.0	N/A[2]	2.6	10.1	0.7

1. Maximum Time-In-Modes obtained from interviewing base personnel on operating procedures.
2. Not applicable; engine is not tested in this mode.

Emissions Factors

Fuel Flowrates

Aircraft	Engine	Fuel Flowrate per Mode (lb/hr)[1]				
		Idle	Approach	Intermediate	Military	Afterburner
F-16	F100-PW-220	1,084	3,837	5,770	9,679	41,682
F-16	F100-PW-229	1,087	3,098	5,838	11,490	20,793

1. Fuel flowrates taken from Air Emissions Guide for Air Force Mobile Sources, AFCEC, Table 2-8, October 2014.

F100-PW-220 Engine Emissions Factors

Pollutant	CAS	Emissions Factors per Mode (lb/1000lb)[1,2]				
		Idle	Approach	Intermediate	Military	Afterburner
CO	-	35.30	1.92	0.86	0.86	11.99
NO_X	-	4.61	12.53	22.18	29.32	8.37
SO_X[3]	-	0.60	0.60	0.60	0.60	0.60
PM	-	2.06	2.63	2.06	1.33	1.15
PM_{10}	-	2.06	2.63	2.06	1.33	1.15
$PM_{2.5}$	-	1.85	2.37	1.85	1.20	1.04
VOC	-	7.94	5.12	2.89	1.79	1.53
Total HAPs	-	1.31E+00	8.80E-03	3.11E-02	3.45E-02	5.16E-02
Acenaphthylene	208-96-8	5.38E-04	--	--	--	--
Acetaldehyde	75-07-0	2.41E-01	--	7.00E-03	1.30E-02	1.60E-02
Acrolein	107-02-8	8.40E-02	--	--	--	--
Benzene	71-43-2	4.70E-02	3.87E-04	1.89E-04	4.90E-04	1.82E-04
Carbon Tetrachloride	56-23-5	2.31E-04	3.02E-04	3.09E-04	1.85E-04	2.23E-05
Dibenzofuran	132-64-9	6.49E-04	--	--	--	--
Dibutyl Phthalate	84-74-2	2.23E-04	2.14E-04	1.77E-04	1.47E-04	8.33E-04
1,4-Dichlorobenzene	106-46-7	--	4.90E-05	3.90E-04	1.77E-04	3.16E-06
Di(2-Ethylhexyl) Phthalate (DEHP)	117-81-7	1.35E-03	2.83E-03	2.04E-03	2.35E-03	3.93E-03
Ethylbenzene	100-41-4	2.99E-03	1.93E-04	2.70E-04	3.44E-04	4.01E-05
Fluorene	86-73-7	3.35E-04	--	--	--	8.76E-05
Formaldehyde	50-00-0	7.77E-01	--	--	2.00E-03	2.00E-02
Hexachlorobutadiene	87-68-3	--	4.06E-04	1.40E-03	5.74E-04	--
Methylene Chloride	75-09-2	6.94E-04	1.35E-03	3.06E-03	3.16E-03	1.07E-03
2-Methylnaphthalene	91-57-6	2.59E-02	3.30E-04	2.60E-04	3.53E-04	4.51E-04
Naphthalene	91-20-3	3.42E-02	2.13E-04	3.96E-04	4.01E-04	4.12E-04
2-Nitrophenol	88-75-5	5.91E-03	--	--	--	--
4-Nitrophenol	100-02-7	5.57E-03	--	--	--	--
Phenanthrene	85-01-8	4.48E-04	--	--	--	1.33E-04
Phenol	108-95-2	1.35E-02	--	--	2.68E-04	1.04E-03
Propanal	123-38-6	4.90E-02	--	8.00E-03	6.00E-03	7.00E-03
Pyrene	129-00-0	1.79E-04	--	--	--	--
Styrene	100-42-5	5.02E-04	--	2.78E-04	--	--
1,1,2,2-Tetrachloroethane	79-34-5	--	--	6.96E-04	2.52E-04	--
Tetrachloroethene	127-18-4	--	--	2.40E-03	8.96E-04	--
1,2,4-Trichlorobenzene	120-82-1	--	3.43E-04	2.04E-03	7.29E-04	3.22E-05
1,1,1-Trichloroethane	71-55-6	1.38E-03	5.02E-04	3.36E-04	5.61E-04	7.21E-05
Trichloroethene	79-01-6	--	--	9.17E-05	--	--
m,p-Xylene	1330-20-7	1.47E-02	1.40E-03	1.43E-03	2.11E-03	2.59E-04
o-Xylene	95-47-6	3.61E-03	2.81E-04	3.51E-04	4.73E-04	5.80E-05

1. Emissions factors taken from Air Emissions Guide for Air Force Mobile Sources, AFCEC, Table 2-8 and 2-9, October 2014.
2. HAP emissions factors for engine F100-PW-220 were not available. HAP emission factors for engine F100-PW-200 were used as a surrogate as emissions from this engine.
3. SO_X emission factor calculated as follows:

$EF_{SOx} = SO_X$ emission factor (lb/10^3 lb)
S = Weight percent sulfur content of the fuel (%)
20 = Factor for converting units from weight percent to lb/10^3 lb (lb/% 10^3 lb)
Note: JET-A maximum sulfur content = 0.03%

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
December 2015

Source Type: Jet Engine Testing
Process ID: 330, 332

F100-PW-229 Emissions Factors

Parameter	CAS	Emissions Factors per Mode (lb/1000lb)[1,2]				
		Idle	Approach	Intermediate	Military	Afterburner
CO	-	10.17	1.17	0.15	0.33	21.51
NO_X	-	3.80	15.08	17.54	29.29	14.30
SO_X[3]	-	0.60	0.60	0.60	0.60	0.60
PM	-	2.06	2.63	2.06	1.33	1.15
PM_{10}	-	2.06	2.63	2.06	1.33	1.15
$PM_{2.5}$	-	1.85	2.37	1.85	1.20	1.04
VOC	-	0.45	0.24	0.35	0.31	5.26
Total HAPs	-	1.31E+00	8.80E-03	3.11E-02	3.45E-02	5.16E-02
Acenaphthylene	208-96-8	5.38E-04	--	--	--	--
Acetaldehyde	75-07-0	2.41E-01	--	7.00E-03	1.30E-02	1.60E-02
Acrolein	107-02-8	8.40E-02	--	--	--	--
Benzene	71-43-2	4.70E-02	3.87E-04	1.89E-04	4.90E-04	1.82E-04
Carbon Tetrachloride	56-23-5	2.31E-04	3.02E-04	3.09E-04	1.85E-04	2.23E-05
Dibenzofuran	132-64-9	6.49E-04	--	--	--	--
Dibutyl Phthalate	84-74-2	2.23E-04	2.14E-04	1.77E-04	1.47E-04	8.33E-04
1,4-Dichlorobenzene	106-46-7	--	4.90E-05	3.90E-04	1.77E-04	3.16E-06
Di(2-Ethylhexyl) Phthalate (DEHP)	117-81-7	1.35E-03	2.83E-03	2.04E-03	2.35E-03	3.93E-03
Ethylbenzene	100-41-4	2.99E-03	1.93E-04	2.70E-04	3.44E-04	4.01E-05
Fluorene	86-73-7	3.35E-04	--	--	--	8.76E-05
Formaldehyde	50-00-0	7.77E-01	--	--	2.00E-03	2.00E-02
Hexachlorobutadiene	87-68-3	--	4.06E-04	1.40E-03	5.74E-04	--
Methylene Chloride	75-09-2	6.94E-04	1.35E-03	3.06E-03	3.16E-03	1.07E-03
2-Methylnaphthalene	91-57-6	2.59E-02	3.30E-04	2.60E-04	3.53E-04	4.51E-04
Naphthalene	91-20-3	3.42E-02	2.13E-04	3.96E-04	4.01E-04	4.12E-04
2-Nitrophenol	88-75-5	5.91E-03	--	--	--	--
4-Nitrophenol	100-02-7	5.57E-03	--	--	--	--
Phenanthrene	85-01-8	4.48E-04	--	--	--	1.33E-04
Phenol	108-95-2	1.35E-02	--	--	2.68E-04	1.04E-03
Propanal	123-38-6	4.90E-02	--	8.00E-03	6.00E-03	7.00E-03
Pyrene	129-00-0	1.79E-04	--	--	--	--
Styrene	100-42-5	5.02E-04	--	2.78E-04	--	--
1,1,2,2-Tetrachloroethane	79-34-5	--	--	6.96E-04	2.52E-04	--
Tetrachloroethene	127-18-4	--	--	2.40E-03	8.96E-04	--
1,2,4-Trichlorobenzene	120-82-1	--	3.43E-04	2.04E-03	7.29E-04	3.22E-05
1,1,1-Trichloroethane	71-55-6	1.38E-03	5.02E-04	3.36E-04	5.61E-04	7.21E-05
Trichloroethene	79-01-6	--	--	9.17E-05	--	--
m,p-Xylene	1330-20-7	1.47E-02	1.40E-03	1.43E-03	2.11E-03	2.59E-04
o-Xylene	95-47-6	3.61E-03	2.81E-04	3.51E-04	4.73E-04	5.80E-05

1. Emissions factors taken from Air Emissions Guide for Air Force Mobile Sources, AFCEC, Table 2-8 and 2-9, October 2014.
2. HAP emissions factors for engine F100-PW-220 were not available. HAP emission factors for engine F100-PW-200 were used as a surrogate as emissions from this engine.
3. SO_x emission factor calculated as follows:

EF_{SOx} = SO_x emission factor (lb/10^3 lb)
S = Weight percent sulfur content of the fuel (%)
20 = Factor for converting units from weight percent to lb/10^3 lb (lb/% 10^3 lb)
Note: JET-A maximum sulfur content = 0.03%

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
December 2015

Source Type: Jet Engine Testing
Process ID: 330, 332

Emissions
Process ID: 330
F100-PW-220 Emissions

Pollutant	CAS	Emissions per Mode (lb/yr)[1]					Total Emissions		
		Idle	Approach[2]	Intermediate	Military	Afterburner	(lb/hr)	(lb/yr)	(tpy)
CO	-	18,367.30	N/A	206.43	1,345.15	5,597.39	551.32	25,516.26	12.76
NO_X	-	2,398.68	N/A	5,323.91	45,860.19	3,907.44	765.64	58,255.85	29.13
SO_X	-	312.19	N/A	144.02	938.48	280.10	34.93	1,674.79	0.84
PM	-	1,071.86	N/A	494.47	2,080.29	536.86	74.93	4,183.48	2.09
PM_{10}	-	1,071.86	N/A	494.47	2,080.29	536.86	74.93	4,183.48	2.09
$PM_{2.5}$	-	962.59	N/A	444.06	1,876.95	485.51	67.64	3,769.11	1.88
VOC	-	4,131.34	N/A	693.69	2,799.79	714.26	106.38	8,339.08	4.17
Total HAPs	-	682.09	N/A	7.47	53.92	24.10	4.09	767.58	0.38
Acenaphthylene	208-96-8	0.28	N/A	0.0000	0.0000	0.0000	0.0006	0.2799	0.0001
Acetaldehyde	75-07-0	125.40	N/A	1.6802	20.3336	7.4694	1.0944	154.8804	0.0774
Acrolein	107-02-8	43.71	N/A	0.0000	0.0000	0.0000	0.0911	43.7069	0.0219
Benzene	71-43-2	24.46	N/A	0.0454	0.7664	0.0850	0.0644	25.3518	0.0127
Carbon Tetrachloride	56-23-5	0.12	N/A	0.0742	0.2894	0.0104	0.0048	0.4941	0.0002
Dibenzofuran	132-64-9	0.34	N/A	0.0000	0.0000	0.0000	0.0007	0.3377	0.0002
Dibutyl Phthalate	84-74-2	0.12	N/A	0.0425	0.2299	0.3889	0.0374	0.7773	0.0004
1,4-Dichlorobenzene	106-46-7	0.00	N/A	0.0936	0.2769	0.0015	0.0041	0.3719	0.0002
Di(2-Ethylhexyl) Phthalate (DEHP)	117-81-7	0.70	N/A	0.4897	3.6757	1.8347	0.1998	6.7025	0.0034
Ethylbenzene	100-41-4	1.56	N/A	0.0648	0.5381	0.0187	0.0098	2.1773	0.0011
Fluorene	86-73-7	0.17	N/A	0.0000	0.0000	0.0409	0.0040	0.2152	0.0001
Formaldehyde	50-00-0	404.29	N/A	0.0000	3.1283	9.3368	1.6953	416.7537	0.2084
Hexachlorobutadiene	87-68-3	0.00	N/A	0.3360	0.8978	0.0000	0.0136	1.2339	0.0006
Methylene Chloride	75-09-2	0.36	N/A	0.7345	4.9426	0.4995	0.0936	6.5378	0.0033
2-Methylnaphthalene	91-57-6	13.48	N/A	0.0624	0.5521	0.2105	0.0518	14.3014	0.0072
Naphthalene	91-20-3	17.79	N/A	0.0951	0.6272	0.1923	0.0604	18.7095	0.0094
2-Nitrophenol	88-75-5	3.08	N/A	0.0000	0.0000	0.0000	0.0064	3.0751	0.0015
4-Nitrophenol	100-02-7	2.90	N/A	0.0000	0.0000	0.0000	0.0060	2.8982	0.0014
Phenanthrene	85-01-8	0.23	N/A	0.0000	0.0000	0.0621	0.0060	0.2952	0.0001
Phenol	108-95-2	7.02	N/A	0.0000	0.4192	0.4855	0.0606	7.9290	0.0040
Propanal	123-38-6	25.50	N/A	1.9203	9.3848	3.2679	0.4491	40.0686	0.0200
Pyrene	129-00-0	0.09	N/A	0.0000	0.0000	0.0000	0.0002	0.0931	0.0000
Styrene	100-42-5	0.26	N/A	0.0667	0.0000	0.0000	0.0021	0.3279	0.0002
1,1,2,2-Tetrachloroethane	79-34-5	0.00	N/A	0.1671	0.3942	0.0000	0.0065	0.5612	0.0003
Tetrachloroethene	127-18-4	0.00	N/A	0.5761	1.4015	0.0000	0.0225	1.9775	0.0010
1,2,4-Trichlorobenzene	120-82-1	0.00	N/A	0.4897	1.1402	0.0150	0.0202	1.6449	0.0008
1,1,1-Trichloroethane	71-55-6	0.72	N/A	0.0807	0.8775	0.0337	0.0119	1.7098	0.0009
Trichloroethene	79-01-6	0.00	N/A	0.0220	0.0000	0.0000	0.0005	0.0220	0.0000
m,p-Xylene	1330-20-7	7.65	N/A	0.3432	3.3003	0.1209	0.0554	11.4132	0.0057
o-Xylene	95-47-6	1.88	N/A	0.0843	0.7398	0.0271	0.0129	2.7295	0.0014

1. Calculation Methodology:

$E_{Pol} = FFR \times 1/1,000 \times T_{Test} \times EF_{Pol}$

E_{Pol} = Emissions (lb/yr)

FFR = Fuel flow rate (lb/hr)

1,000 = Factor for converting pounds to 10^3 pounds (lb/10^3 lb)

T_{Test} = Total annual time engine testing occurred while operating at the applicable fuel flow rate (hr/yr)

EF_{Pol} = Emissions factor (lb/10^3 lb)

2. Not applicable; engine is not tested in this mode.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
December 2015

Source Type: Jet Engine Testing
Process ID: 330, 332

Process ID: 332
F100-PW-229 Emissions

Pollutant	CAS	Emissions per Mode (lb/yr)[1]					Total Emissions		
		Idle	Approach[2]	Intermediate	Military	Afterburner	(lb/hr)	(lb/yr)	(tpy)
CO	-	397.97	N/A	2.73	45.96	375.70	462.98	822.36	0.41
NO_X	-	148.70	N/A	319.48	4,078.89	249.77	740.41	4,796.84	2.40
SO_X	-	23.48	N/A	10.93	83.56	10.48	23.52	128.44	0.06
PM	-	80.61	N/A	37.52	185.21	20.09	53.46	323.43	0.16
PM_{10}	-	80.61	N/A	37.52	185.21	20.09	53.46	323.43	0.16
$PM_{2.5}$	-	72.39	N/A	33.70	167.11	18.16	48.22	291.37	0.15
VOC	-	17.61	N/A	6.38	43.17	91.87	115.47	159.03	0.08
Total HAPs	-	51.30	N/A	0.57	4.80	0.90	3.08	57.57	0.03
Acenaphthylene	208-96-8	0.0211	N/A	0.0000	0.0000	0.0000	0.0006	0.0211	0.0000
Acetaldehyde	75-07-0	9.4308	N/A	0.1275	1.8104	0.2795	0.7849	11.6481	0.0058
Acrolein	107-02-8	3.2871	N/A	0.0000	0.0000	0.0000	0.0913	3.2871	0.0016
Benzene	71-43-2	1.8392	N/A	0.0034	0.0682	0.0032	0.0616	1.9141	0.0010
Carbon Tetrachloride	56-23-5	0.0090	N/A	0.0056	0.0258	0.0004	0.0046	0.0408	0.0000
Dibenzofuran	132-64-9	0.0254	N/A	0.0000	0.0000	0.0000	0.0007	0.0254	0.0000
Dibutyl Phthalate	84-74-2	0.0087	N/A	0.0032	0.0205	0.0145	0.0203	0.0470	0.0000
1,4-Dichlorobenzene	106-46-7	0.0000	N/A	0.0071	0.0246	0.0001	0.0044	0.0318	0.0000
Di(2-Ethylhexyl) Phthalate (DEHP)	117-81-7	0.0528	N/A	0.0372	0.3273	0.0686	0.1221	0.4859	0.0002
Ethylbenzene	100-41-4	0.1170	N/A	0.0049	0.0479	0.0007	0.0096	0.1705	0.0001
Fluorene	86-73-7	0.0131	N/A	0.0000	0.0000	0.0015	0.0022	0.0146	0.0000
Formaldehyde	50-00-0	30.4056	N/A	0.0000	0.2785	0.3493	1.2834	31.0334	0.0155
Hexachlorobutadiene	87-68-3	0.0000	N/A	0.0255	0.0799	0.0000	0.0148	0.1054	0.0001
Methylene Chloride	75-09-2	0.0272	N/A	0.0557	0.4401	0.0187	0.0772	0.5416	0.0003
2-Methylnaphthalene	91-57-6	1.0135	N/A	0.0047	0.0492	0.0079	0.0431	1.0753	0.0005
Naphthalene	91-20-3	1.3383	N/A	0.0072	0.0558	0.0072	0.0527	1.4086	0.0007
2-Nitrophenol	88-75-5	0.2313	N/A	0.0000	0.0000	0.0000	0.0064	0.2313	0.0001
4-Nitrophenol	100-02-7	0.2180	N/A	0.0000	0.0000	0.0000	0.0061	0.2180	0.0001
Phenanthrene	85-01-8	0.0175	N/A	0.0000	0.0000	0.0023	0.0033	0.0199	0.0000
Phenol	108-95-2	0.5283	N/A	0.0000	0.0373	0.0182	0.0394	0.5838	0.0003
Propanal	123-38-6	1.9175	N/A	0.1457	0.8356	0.1223	0.3145	3.0210	0.0015
Pyrene	129-00-0	0.0070	N/A	0.0000	0.0000	0.0000	0.0002	0.0070	0.0000
Styrene	100-42-5	0.0196	N/A	0.0051	0.0000	0.0000	0.0022	0.0247	0.0000
1,1,2,2-Tetrachloroethane	79-34-5	0.0000	N/A	0.0127	0.0351	0.0000	0.0070	0.0478	0.0000
Tetrachloroethene	127-18-4	0.0000	N/A	0.0437	0.1248	0.0000	0.0243	0.1685	0.0001
1,2,4-Trichlorobenzene	120-82-1	0.0000	N/A	0.0372	0.1015	0.0006	0.0210	0.1392	0.0001
1,1,1-Trichloroethane	71-55-6	0.0540	N/A	0.0061	0.0781	0.0013	0.0114	0.1395	0.0001
Trichloroethene	79-01-6	0.0000	N/A	0.0017	0.0000	0.0000	0.0005	0.0017	0.0000
m,p-Xylene	1330-20-7	0.5752	N/A	0.0260	0.2938	0.0045	0.0540	0.8996	0.0004
o-Xylene	95-47-6	0.1413	N/A	0.0064	0.0659	0.0010	0.0126	0.2145	0.0001

1. Calculation Methodology:

E_{Pol} = FFR x 1/1,000 x T_{Test} x EF_{Pol}

E_{Pol} = Emissions (lb/yr)

FFR = Fuel flow rate (lb/hr)

1,000 = Factor for converting pounds to 10^3 pounds (lb/10^3 lb)

T_{Test} = Total annual time engine testing occurred while operating at the applicable fuel flow rate (hr/yr)

EF_{Pol} = Emissions factor (lb/10^3 lb)

2. The greater of the Intermediate or Military fuel flow rates and emissions factors were used for each pollutant.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
December 2015

Source Type: Woodworking
Process ID: 502, 503, 516

Source List and Usage

Process ID	Facility ID	Description	Dust Collection System	Capture Effeciency (%)[1]	Control Effeciency (%)[1]
502	247, 339, 415, 948	Waste Bin Emptying	N/A	0	0
503	247, 339, 415, 948	Cyclone Bin Vents	N/A	0	0
516	247	Hobby Shop	Baghouse (Control ID 500)	100	85
	339	Construction/Refurbishing of Base Signs	Cyclone (Control ID 506)		
	415	Mock-up/model Fabrication	Cyclone (Control ID 502)		

1. Control efficiencies taken from Maricopa County Emissions Inventory Help Sheet for the Woodworking Industry (2014) for cyclones.
The cyclone control efficiency of 85% was used rather than the baghouse control efficiency of 99% for Building 247 to allow for a conservative estimate.

Process ID	Wood Waste Collected (ton/yr)	
	2007 [1]	Max[2]
502	2.34	10
503	2.34	10
516	2.34	10

1. Luke AFB determined that 2007 is respresentative of a typical operations year; therefore maximum operations are determined from this baseline year.
2. Baseline usage has been scaled up by a factor of 4.21 to arrive at a maximum usage (i.e., 8,760 hrs / 2,080 hrs).

Emissions Factors

Pollutant	Emissions Factor (lb/ton wood waste hauled away)[1]		
	Baghouse or Cyclone Operations	Wood Waste Storage Bin Vent	Wood Waste Storage Bin Loadout
$PM/PM_{10}/PM_{2.5}$	100.00	0.58	1.2

1. Emission factors taken from Emission Inventory Help Sheet for the Woodworking Industry, Maricopa County Air Quality Department, 2014.

Emissions

Pollutant	Emissions								
	502			503			516		
	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
$PM/PM_{10}/PM_{2.5}$	0.01	11.82	0.01	2.75E-03	5.71	2.86E-03	0.07	147.77	0.07

1. Calculation Methodology:

$E_{Pol} = Q \times EF_{Pol} \times 1 - (CAP_{eff}/100 \times CON_{eff}/100)$

E_{Pol} = Emissions (lb/yr)

Q = Annual quantity of wood waste hauled away (ton/yr)

EF_{Pol} = Emissions factor (lb/ton wood waste hauled away)

CAP_{eff} = Capture Efficiency (%)

CON_{eff} = Control Efficiency (%)

Emission calculation methodology from Emission Inventory Help Sheet for the Woodworking Industry, Maricopa County Air Quality Department, 2014.
Hourly emissions were estimated as annual emissions divided by actual operating hours (2,080 hr/yr).

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
December 2015

Source Type: Abrasive Blasting
Process ID: 515

Source List and Usage

Process ID	Facility ID	Description	Make	Media Type	Control	Media Usage (lb/yr)	
						2007 [1]	Max [2]
515	907	Walk-In Abrasive Blasting Booth	Pauli-Griffin	Garnet	Baghouse (Control ID 522)	700	2,947

1. Luke AFB determined that 2007 is respresentative of a typical operations year; therefore maximum operations are determined from this baseline year.
2. Baseline usage has been scaled up by a factor of 4.21 to arrive at a maximum usage (i.e., 8,760 hrs / 2,080 hrs).

Emissions Factors

Pollutant	Emissions Factor[1, 2] ($lb/10^3 lb$)
PM	0.59
PM_{10}	0.59
$PM_{2.5}$	0.55

1. Emission factors taken from Air Emissions Guide for Air Force Stationary Sources, Table 2-1, AFCEC, October 2014.
2. PM emission factor not available. PM emissions conservatively assumed to equal PM_{10} emissions.

Emissions

Pollutant	Emissions[1]		
	(lb/hr)	(lb/yr)	(tpy)
PM	0.0008	1.74	0.0009
PM_{10}	0.0008	1.74	0.0009
$PM_{2.5}$	0.0008	1.62	0.0008
Total HAPs[2]	0.0008	1.74	0.0009

1. Calculation Methodology:

E_{Pol} = Q x 1/1,000 x EF_{Pol}

E_{Pol} = Emissions (lb/yr)

Q = Annual blast media consumed (lb/yr)

1,000 = Factor for converting pounds to 10^3 pounds ($lb/10^3$ lb)

EF_{Pol} = Emissions factor ($lb/10^3$ lb of blast media used)

Emission calculation methodology from Section 2 of Air Emissions Guide for Air Force Stationary Sources, AFCEC, October 2014, for uncontrolled abrasive blasting. Hourly emissions were estimated as annual emissions divided by actual operating hours (2,080 hr/yr).

2. Speciation data not available. Total HAP emissions conservatively assumed to equal PM emissions.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
December 2015

Source Type: Fuel Cell Maintenance
Process IDs: 520, 521, 522

Source List and Usage

Process ID	Facility ID	Tank Description	Fuel Tank Volume (gal)	Numer of Cells Purged	
				2007 [1]	Max[2]
520	968	Internal Tank	1,050	532	2,240
521		External Tank	370	467	1,966
522		External Tank	300	279	1,175

1. Luke AFB determined that 2007 is respresentative of a typical operations year; therefore maximum operations are determined from this baseline year.
2. Baseline usage has been scaled up by a factor of 4.21 to arrive at a maximum usage (i.e., 8,760 hrs / 2,080 hrs).

Emissions Factors

JET-A Physical Properties[1]

Property	Description	Value	Units
M_V	Vapor Molecular Weight	130	lb/lb-mol
P_{VA}[2]	Vapor Pressure	9.54E-02	psia
R	Ideal Gas Law	10.732	psia•ft3/°R•lb-mol
T_{LA}	Daily Liquid Average Surface Temperature	560	R
C_{VOC}[3]	Vapor Saturation Concentration	0.00206	lb/ft^3

1.Values taken from Air Emissions Guide for Air Force Stationary Sources, Table 13-1, AFCEC, October 2014.
2. Vapor pressure at daily average liquid surface temperature, conservatively assumed to equal 100 °F.
3. Calculation Methodology:
$C_{VOC} = (M_V \times P_{VA}) / (R \times T_{LA})$
M_V = Vapor molecular weight (lb/lb-mol);
P_{VA} = Vapor pressure at the daily average liquid surface temperature (psia);
R = Ideal gas constant (10.732 psia•ft^3/°R•lb-mol); and
T_{LA} = Daily average liquid surface temperature (°R).

Hazardous Air Pollutant Vapor Speciation (Weight %)

Hazardous Air Pollutant	CAS #	JET-A
Benzene	71-43-2	3.38E-02
Cumene	98-82-8	1.81E-01
Ethyl Benzene	100-41-4	1.59E-01
Fluorene	86-73-7	3.44E-03
Isooctane	540-84-1	1.23E-03
Naphthalene	91-20-3	2.68E-01
Phenylbenzene	92-52-4	6.78E-02
Pyrene	129-00-0	1.00E-05
Toluene	108-88-3	2.19E-01
Xylenes	1330-20-7	1.19E-02

1. Speciation taken from Values taken from Air Emissions Guide for Air Force Stationary Sources, Table 13-2, AFCEC, October 2014.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
December 2015

Source Type: Fuel Cell Maintenance
Process IDs: 520, 521, 522

Emissions

Fuel Type	CAS #	Emissions[1]											
		520 Internal Tank - 1050 gal			521 External Tank - 370 gal			522 External Tank - 300 gal			Total		
		(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)	(lb/hr)	(lb/yr)	(tpy)
VOC	–	0.62	1,297.49	0.65	0.19	401.35	0.20	0.09	194.41	0.10	**0.91**	**1,893.25**	**0.95**
Total HAPs	–	0.01	12.26	0.01	0.00	3.79	1.90E-03	0.00	1.84	9.19E-04	**0.01**	**17.89**	**0.01**
Benzene	71-43-2	0.00	0.44	2.19E-04	0.00	0.14	6.78E-05	0.00	0.07	3.29E-05	**0.00**	**0.64**	**3.20E-04**
Cumene	98-82-8	0.00	2.35	1.17E-03	0.00	0.73	3.63E-04	0.00	0.35	1.76E-04	**0.00**	**3.43**	**1.71E-03**
Ethyl Benzene	100-41-4	0.00	2.06	1.03E-03	0.00	0.64	3.19E-04	0.00	0.31	1.55E-04	**0.00**	**3.01**	**1.51E-03**
Fluorene	86-73-7	2.15E-05	0.04	2.23E-05	6.64E-06	0.01	6.90E-06	3.22E-06	0.01	3.34E-06	**3.13E-05**	**0.07**	**3.26E-05**
Isooctane	540-84-1	7.67E-06	0.02	7.98E-06	2.37E-06	4.94E-03	2.47E-06	1.15E-06	2.39E-03	1.20E-06	**1.12E-05**	**0.02**	**1.16E-05**
Naphthalene	91-20-3	0.00	3.48	1.74E-03	0.00	1.08	5.38E-04	0.00	0.52	2.61E-04	**0.00**	**5.07**	**2.54E-03**
Phenylbenzene	92-52-4	0.00	0.88	4.40E-04	0.00	0.27	1.36E-04	0.00	0.13	6.59E-05	**0.00**	**1.28**	**6.42E-04**
Pyrene	129-00-0	6.24E-08	1.30E-04	6.49E-08	1.93E-08	4.01E-05	2.01E-08	9.35E-09	1.94E-05	9.72E-09	**9.10E-08**	**1.89E-04**	**9.47E-08**
Toluene	108-88-3	0.00	2.84	1.42E-03	0.00	0.88	4.39E-04	0.00	0.43	2.13E-04	**0.00**	**4.15**	**2.07E-03**
Xylenes	1330-20-7	0.00	0.15	7.72E-05	0.00	0.05	2.39E-05	0.00	0.02	1.16E-05	**0.00**	**0.23**	**1.13E-04**

1. Calculation Methodology:

$E_{VOC} = 2 \times C_{VOC} \times 0.13368 \times \sum(V \times N)$

E_{VOC} = Annual emissions of VOC (lb/yr);

2 = Factor used for the conservative estimate of emissions representing twice the fuel cell volume;

C_{VOC} = VOC concentration in the fuel cell (lb/ft^3);

0.13368 = Factor for converting cubic feet to gallons (ft^3/gal);

V = Fuel cell volume (gal/unit); and

N = Number of fuel cells purged/ventilated in a year (units/yr).

Emission calculation methodology from Section 13 of Air Emissions Guide for Air Force Stationary Sources, AFCEC, October 2014.

Hourly emissions were estimated as annual emissions divided by actual operating hours (2,080 hr/yr).

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
December 2015

Source Type: Fuel Cell Maintenance - Aircraft Defueling
Process ID: 523

Source List and Maximum Throughput

Process ID	Facility ID	Description	Fuel Type	Throughout (gal/yr)	
				2007 [1]	Max [2]
523	968	Aircraft Defueling Prior to Fuel Cell Maintenance	JET-A	106,400	447,944

1. Luke AFB determined that 2007 is respresentative of a typical operations year; therefore maximum operations are determined from this baseline year.
2. Baseline usage has been scaled up by a factor of 4.21 to arrive at a maximum usage (i.e., 8,760 hrs / 2,080 hrs).

Emissions Factors

Loading Loss Calculation

Loading Loss Equation Parameter		Value
		JET-A
Saturation (S) Factor	S	1.45
True Vapor Pressure (psi)	P	0.0085
Molecular Weight of Vapor (lb/lb-mole)	M	130
Temperature of Bulk Liquid Loaded (°R)	T	520
Capture Efficiency (%)	CAPeff	0
Control Efficiency (%)	CONeff	0
Loading Loss (lb/1000 gal)	L_L	0.0384

1. Loading loss calculated in accordance with Section 5.2-"Transportation and Marketing of Petroleum Liquids," Compilation of Air Pollutant Emission Factors - Volume I: Stationary Point and Area Sources, Fifth Edition, U.S. Environmental Protection Agency, July 2008. The equation used is shown below:

$L_L = 12.46*SPM/T*(1-(CAPeff/100 - CONeff/100))$

12.46 = Equation constant (°R lb-mol/psia 10^3 gal);
S = Saturation factor;
P = True vapor pressure of fuel (psia);
M = Vapor molecular weight of the fuel (lb/lb-mol);
T = Temperature of bulk liquid loaded (°R);
Cap = Capture efficiency of the loading terminal (%);
CE = Efficiency of the control device (%); and
100 = Factor for converting a percent to a fraction (%)

Saturation factor, true vapor pressure, and vapor molecular weight taken from Air Emissions Guide for Air Force Stationary Sources, AFCEC, Table 16-1 and 16-2, October 2014.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
December 2015

Source Type: Fuel Cell Maintenance - Aircraft Defueling
Process ID: 523

Hazardous Air Pollutant Vapor Speciation (Weight %)

Hazardous Air Pollutant	CAS #	JET-A
Benzene	71-43-2	3.38E-02
Cumene	98-82-8	1.81E-01
Ethyl Benzene	100-41-4	1.59E-01
Fluorene	86-73-7	3.44E-03
Isooctane	540-84-1	1.23E-03
Naphthalene	91-20-3	2.68E-01
Phenylbenzene	92-52-4	6.78E-02
Pyrene	129-00-0	1.00E-05
Toluene	108-88-3	2.19E-01
Xylenes	1330-20-7	1.19E-02

1. Speciation taken from Values taken from Air Emissions Guide for Air Force Stationary Sources, Table 13-2, AFCEC, October 2014.

Emissions

Pollutant	CAS #	Emissions[1]		
		523		
		(lb/hr)	(lb/yr)	(ton/yr)
VOCs	-	8.27E-03	17.20	8.60E-03
Total HAPs	-	7.81E-05	1.63E-01	8.13E-05
Benzene	71-43-2	2.79E-06	5.81E-03	2.91E-06
Cumene	98-82-8	1.50E-05	3.11E-02	1.56E-05
Ethyl Benzene	100-41-4	1.31E-05	2.73E-02	1.37E-05
Fluorene	86-73-7	2.84E-07	5.92E-04	2.96E-07
Isooctane	540-84-1	1.02E-07	2.12E-04	1.06E-07
Naphthalene	91-20-3	2.22E-05	4.61E-02	2.30E-05
Phenylbenzene	92-52-4	5.61E-06	1.17E-02	5.83E-06
Pyrene	129-00-0	8.27E-10	1.72E-06	8.60E-10
Toluene	108-88-3	1.81E-05	3.77E-02	1.88E-05
Xylenes	1330-20-7	9.84E-07	2.05E-03	1.02E-06

1. Calculation Methodology:

$E_{HAP} = E_{VOC} \times (WP_{HAP}/100)$

E_{HAP} = HAP Emissions (lb/yr)

E_{VOC} = VOC Emissions (lb/yr)

WP_{HAP} = Weight percent HAP in the fuel (%)

100 = Factor for converting weight percent to weight fraction (%)

Emission calculation methodology from Air Emissions Guide for Air Force Stationary Sources, Section 16, AFCEC, October 2014.

Hourly emissions were estimated as annual emissions divided by actual operating hours (2,080 hr/yr).

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
December 2015

Source Type: Fuel Storage
Process IDs: Multiple (See Below)

Source List and Maximum Usage

Process ID	Facility ID	Description	Tank Type[1]	Fuel Type	Diameter (ft)	Shell Length (ft)	Shell Color	Capacity (gal)	Maximum Throughput[2] (gal)
620	351	B351, STANDING	EFR	JET-A	45.0	n/a	White	413,779	16,704,220
621	351	B351, WORKING	EFR	JET-A	45.0	n/a	White	413,779	16,704,220
622	356	B356, STANDING	EFR	JET-A		n/a			22,700,454
623	356	B356, WORKING	EFR	JET-A		n/a			22,700,454
624	350	B350, STANDING	VFR	JET-A	30.0	44.0	White	206,219	371,858
625	350	B350, WORKING	VFR	JET-A	30.0	44.0	White	206,219	371,858
626	359	B359, STANDING	VFR	JET-A	30.0	44.0	White	206,219	697,907
627	359	B359, WORKING	VFR	JET-A	30.0	44.0	White	206,219	697,907
632	366	B366, STANDING	VFR	JET-A	21.0	20.0	White	38,864	78,833
633	366	B366, WORKING	VFR	JET-A	21.0	20.0	White	38,864	78,833
666	368	B368, STANDING	VFR	Gasoline	15.0	30.0	White	35,000	16,147
669	368	B368, WORKING	VFR	Gasoline	15.0	30.0	White	35,000	16,147
662	2201	B2201, STANDING	HFR	Gasoline	4.7	11.0	White	1,000	4,392
663	2201	B2201, WORKING	HFR	Gasoline	4.7	11.0	White	1,000	4,392

1. EFR = External Floating Roof, VFR = Vertical Fixed Roof, HFR = Horizontal Fixed Roof
2. Maximum throughput based on previously permitted limits.

Fuel Type	Permit Limit Throughput (gal/yr)[1]
JET-A	40,553,272
Gasoline	20,539

1. Total combined fuel usage for all fuel storage tanks above will not exceed this throughput limit.

Emissions Factors

Hazardous Air Pollutant Vapor Speciation (Weight %)

		Weight %		
Compound	CAS #	Diesel	Gasoline	JP-8/Jet A
Benzene	71-43-2	0.20	0.65	3.38E-02
1,2,4-Trimethylbenzene	95-63-6	4.67	–	–
Cumene (Isopropylbenzene)	98-82-8	–	0.01	1.81E-01
Ethylbenzene	100-41-4	0.31	0.05	1.59E-01
Fluorene	86-73-7	–	–	3.44E-03
Hexane	110-54-3	0.04	0.59	–
Isooctane (2,2,4-Trimethyl Pentane)	540-84-1	–	0.75	1.23E-03
Naphthalene	91-20-3	–	–	2.68E-01
Phenylbenzene (1,1'-biphenyl)	92-52-4	–	–	6.78E-02
Pyrene	129-00-0	–	–	1.00E-05
Toluene	108-88-3	2.30	0.73	2.19E-01
Xylenes (mixed isomers)	1330-20-7	5.83	0.21	1.19E-02

1. Calculated Using Raoult's Law and Values from Table 16-5, Air Emissions Guide for Air Force Stationary Sources, AFCEC, October 2014.

Emissions

External Floating Roof Tanks - Fuel Storage Maximum Emission Rates

Pollutant	CAS #	Emissions[1, 2, 3]									
		620		621		622		623		Total	
		JET-A, B351, STANDING		JET-A, B351, WORKING		JET-A, B356, STANDING		JET-A, B356, WORKING			
		(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(tpy)
VOCs	-	201.62	0.10	368.42	0.18	244.90	0.12	265.06	0.13	**1,079.99**	**0.54**

Luke Air Force Base
Title V Permit Renewal
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December 2015

Source Type: Fuel Storage
Process IDs: Multiple (See Below)

Total HAPs	-	1.91	9.53E-04	3.48	1.74E-03	2.31	1.16E-03	2.51	1.25E-03	**10.21**	**0.01**
Benzene	71-43-2	0.07	3.41E-05	0.12	6.23E-05	0.08	4.14E-05	0.09	4.48E-05	**0.37**	**1.83E-04**
1,2,4-Trimethylbenzene	95-63-6	--	--	--	--	--	--	--	--	--	--
Cumene (Isopropylbenzene)	98-82-8	0.36	1.82E-04	0.67	3.33E-04	0.44	2.22E-04	0.48	2.40E-04	**1.95**	**9.77E-04**
Ethylbenzene	100-41-4	0.32	1.60E-04	0.59	2.93E-04	0.39	1.95E-04	0.42	2.11E-04	**1.72**	**8.59E-04**
Fluorene	86-73-7	0.01	3.47E-06	0.01	6.34E-06	0.01	4.21E-06	0.01	4.56E-06	**0.04**	**1.86E-05**
Hexane	110-54-3	--	--	--	--	--	--	--	--	--	--
Isooctane (2,2,4-Trimethylpentane)	540-84-1	2.48E-03	1.24E-06	4.53E-03	2.27E-06	3.01E-03	1.51E-06	3.26E-03	1.63E-06	**0.01**	**6.64E-06**
Naphthalene	91-20-3	0.54	2.70E-04	0.99	4.94E-04	0.66	3.28E-04	0.71	3.55E-04	**2.89**	**1.45E-03**
Phenylbenzene (1,1'-biphenyl)	92-52-4	0.14	6.83E-05	0.25	1.25E-04	0.17	8.30E-05	0.18	8.99E-05	**0.73**	**3.66E-04**
Pyrene	129-00-0	2.02E-05	1.01E-08	3.68E-05	1.84E-08	2.45E-05	1.22E-08	2.65E-05	1.33E-08	**1.08E-04**	**5.40E-08**
Toluene	108-88-3	0.44	2.21E-04	0.81	4.03E-04	0.54	2.68E-04	0.58	2.90E-04	**2.37**	**1.18E-03**
Xylenes (mixed isomers)	1330-20-7	0.02	1.20E-05	0.04	2.19E-05	0.03	1.46E-05	0.03	1.58E-05	**0.13**	**6.43E-05**

Vertical Fixed Roof Tanks - Fuel Storage Maximum Emission Rates

Pollutant	CAS #	Emissions[1, 2, 3]													
		624		625		626		627		632		633		Total	
		JET-A, B350, STANDING		JET-A, B350, WORKING		JET-A, B359, STANDING		JET-A, B359, WORKING		JET-A, B366, STANDING		JET-A, B366, WORKING			
		(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(tpy)
VOCs	-	81.67	0.04	63.07	0.03	81.67	0.04	118.39	0.06	98.60	0.05	13.39	0.01	**456.79**	**0.23**
Total HAPs	-	0.77	3.86E-04	0.60	2.98E-04	0.77	3.86E-04	1.12	5.59E-04	0.93	4.66E-04	0.13	6.33E-05	**4.32**	**2.16E-03**
Benzene	71-43-2	0.03	1.38E-05	0.02	1.07E-05	0.03	1.38E-05	0.04	2.00E-05	0.03	1.67E-05	4.53E-03	2.26E-06	**0.15**	**7.72E-05**
1,3-Butadiene	106-99-0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cumene (Isopropylbenzene)	98-82-8	0.15	7.39E-05	0.11	5.71E-05	0.15	7.39E-05	0.21	1.07E-04	0.18	8.92E-05	0.02	1.21E-05	**0.83**	**4.13E-04**
Ethylbenzene	100-41-4	0.13	6.49E-05	0.10	5.01E-05	0.13	6.49E-05	0.19	9.41E-05	0.16	7.84E-05	0.02	1.06E-05	**0.73**	**3.63E-04**
Fluorene	86-73-7	2.81E-03	1.40E-06	2.17E-03	1.08E-06	2.81E-03	1.40E-06	4.07E-03	2.04E-06	3.39E-03	1.70E-06	4.61E-04	2.30E-07	**0.02**	**7.86E-06**
Hexane	110-54-3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Isooctane (2,2,4-Trimethylpentane)	540-84-1	1.00E-03	5.02E-07	7.76E-04	3.88E-07	1.00E-03	5.02E-07	1.46E-03	7.28E-07	1.21E-03	6.06E-07	1.65E-04	8.23E-08	**0.01**	**2.81E-06**
Naphthalene	91-20-3	0.22	1.09E-04	0.17	8.45E-05	0.22	1.09E-04	0.32	1.59E-04	0.26	1.32E-04	0.04	1.79E-05	**1.22**	**6.12E-04**
Phenylbenzene (1,1'-biphenyl)	92-52-4	0.06	2.77E-05	0.04	2.14E-05	0.06	2.77E-05	0.08	4.01E-05	0.07	3.34E-05	0.01	4.54E-06	**0.31**	**1.55E-04**
Pyrene	129-00-0	8.17E-06	4.08E-09	6.31E-06	3.15E-09	8.17E-06	4.08E-09	1.18E-05	5.92E-09	9.86E-06	4.93E-09	1.34E-06	6.69E-10	**4.57E-05**	**2.28E-08**
Toluene	108-88-3	0.18	8.94E-05	0.14	6.91E-05	0.18	8.94E-05	0.26	1.30E-04	0.22	1.08E-04	0.03	1.47E-05	**1.00**	**5.00E-04**
Xylenes (mixed isomers)	1330-20-7	0.01	4.86E-06	0.01	3.75E-06	0.01	4.86E-06	0.01	7.04E-06	0.01	5.87E-06	1.59E-03	7.97E-07	**0.05**	**2.72E-05**

Horizontal Fixed Roof Tanks - Fuel Storage Maximum Emission Rates

Pollutant	CAS #	Emissions[1, 2, 3]									
		666		669		662		663		Total	
		GASOLINE, B368, STANDING		GASOLINE, B368, WORKING		GASOLINE, B2201, STANDING		GASOLINE, B2201, WORKING			
		(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(ton/yr)	(lb/yr)	(tpy)
VOCs	-	13,958.84	6.98	735.49	0.37	1,173.83	0.59	140.49	0.07	**16,008.65**	**8.00**
Total HAPs	-	417.37	0.21	21.99	0.01	35.10	0.02	4.20	2.10E-03	**478.66**	**0.24**
Benzene	71-43-2	90.73	0.05	4.78	2.39E-03	7.63	3.81E-03	0.91	4.57E-04	**104.06**	**0.05**
1,3-Butadiene	106-99-0	--	--	--	--	--	--	--	--	--	--
Cumene (Isopropylbenzene)	98-82-8	1.40	6.98E-04	0.07	3.68E-05	0.12	5.87E-05	0.01	7.02E-06	**1.60**	**8.00E-04**
Ethylbenzene	100-41-4	6.98	3.49E-03	0.37	1.84E-04	0.59	2.93E-04	0.07	3.51E-05	**8.00**	**4.00E-03**
Fluorene	86-73-7	--	--	--	--	--	--	--	--	--	--
Hexane	110-54-3	82.36	0.04	4.34	2.17E-03	6.93	3.46E-03	0.83	4.14E-04	**94.45**	**0.05**
Isooctane (2,2,4-Trimethylpentane)	540-84-1	104.69	0.05	5.52	2.76E-03	8.80	4.40E-03	1.05	5.27E-04	**120.06**	**0.06**
Naphthalene	91-20-3	--	--	--	--	--	--	--	--	--	--
Phenylbenzene (1,1'-biphenyl)	92-52-4	--	--	--	--	--	--	--	--	--	--
Pyrene	129-00-0	--	--	--	--	--	--	--	--	--	--
Toluene	108-88-3	101.90	0.05	5.37	2.68E-03	8.57	4.28E-03	1.03	5.13E-04	**116.86**	**0.06**
Xylenes (mixed isomers)	1330-20-7	29.31	0.01	1.54	7.72E-04	2.47	1.23E-03	0.30	1.48E-04	**33.62**	**0.02**

1. VOC emissions previously calculated using AP-42 approved methods and the Air Program Information Management System (APIMS).
2. Calculation Methodology:
   $E_{Max} = E_{Historic} \times 4.21$
   E_{Max} = Max VOC Emissions
   $E_{Historic}$ = Max Historic VOC Emissions
   The factor of 4.21 is the ratio of the maximum number of hours per year (8,760) to current average actual site operating hours of eight hours per day, five days per
3. HAP Calculation Methodology:
   $E_{HAP} = E_{VOC} \times (WP_{HAP}/100)$
   E_{HAP} = HAP Emissions (lb/yr)
   E_{VOC} = VOC Emissions (lb/yr)
   WP_{HAP} = Weight percent HAP in the fuel (%)
   100 = Factor for converting weight percent to weight fraction (%)
   Emission calculation methodology from Section 16 of Air Emissions Guide for Air Force Stationary Sources, AFCEC, October 2014.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
December 2015

Source Type: Loading - Diesel, JET-A
Process IDs: 642, 643, 644

Source List and Maximum Throughput

Process ID	Description	Fuel Type	Throughout (gal/yr)[1]	
			2007 [1]	Max[2]
642	JET-A to Trucks, Tank 351, 356	JET-A	40,918,465	172,266,738
643	JET-A to Aircraft, Tank 351, 356	JET-A	40,918,466	172,266,742
644	Diesel to Trucks, Bldg 405	Diesel/ Bio-Diesel	39,862	167,819

1. Luke AFB determined that 2007 is respresentative of a typical operations year; therefore maximum operations are determined from this baseline year.
2. Baseline usage has been scaled up by a factor of 4.21 to arrive at a maximum usage (i.e., 8,760 hrs / 2,080 hrs).

Emissions Factors

Loading Loss Calculation

Loading Loss Equation Parameter		Value	
		JET-A	Diesel
Saturation (S) Factor	S	0.6	0.6
True Vapor Pressure (psi)	P	0.0954	0.022
Molecular Weight of Vapor (lb/lb-mole)	M	130	130
Temperature of Bulk Liquid Loaded (°R)	T	559.67	559.67
Capture Efficiency (%)	CAPeff	0	0
Control Efficiency (%)	CONeff	0	0
Loading Loss (lb/1000 gal)	L_L	0.1657	0.0382

1. Loading loss calculated in accordance with Section 5.2-"Transportation and Marketing of Petroleum Liquids," Compilation of Air Pollutant Emission Factors - Volume I: Stationary Point and Area Sources, Fifth Edition, U.S. Environmental Protection Agency, July 2008. The equation used is shown below:

$L_L = 12.46*SPM/T*(1-(CAPeff/100 - CONeff/100))$

12.46 = Equation constant (°R lb-mol/psia 10^3 gal);
S = Saturation factor;
P = True vapor pressure of fuel (psia);
M = Vapor molecular weight of the fuel (lb/lb-mol);
T = Temperature of bulk liquid loaded (°R);
Cap = Capture efficiency of the loading terminal (%);
CE = Efficiency of the control device (%); and
100 = Factor for converting a percent to a fraction (%)

Saturation factor, true vapor pressure, and vapor molecular weight taken from Air Emissions Guide for Air Force Stationary Sources, AFCEC, Table 16-1 and 16-2, October 2014 at 100 F.

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
December 2015

Source Type: Loading - Diesel, JET-A
Process IDs: 642, 643, 644

Hazardous Air Pollutant Vapor Speciation (Weight %)

Hazardous Air Pollutant	CAS #	JET-A[1]	Diesel[2]
Benzene	71-43-2	3.38E-02	0.20
Cumene	98-82-8	1.81E-01	-
Ethyl Benzene	100-41-4	1.59E-01	0.31
Fluorene	86-73-7	3.44E-03	-
Hexane	110-54-3	-	0.04
Isooctane	540-84-1	1.23E-03	-
Naphthalene	91-20-3	2.68E-01	-
Phenylbenzene	92-52-4	6.78E-02	-
Pyrene	129-00-0	1.00E-05	-
Toluene	108-88-3	2.19E-01	2.30
1,2,4-Trimethylbenzene	95-63-6	-	4.67
Xylenes	1330-20-7	1.19E-02	5.83

1. JP-8 speciation taken from Values taken from Air Emissions Guide for Air Force Stationary Sources, Table 13-2, AFCEC, October 2014.
2. Diesel calculated using USEPA Tanks 4.09d from liquid weight percents.

Emissions

Pollutant	CAS #	JET-A 642			JET-A 643			Diesel 644		
		(lb/hr)	(lb/yr)	(ton/yr)	(lb/hr)	(lb/yr)	(ton/yr)	(lb/hr)	(lb/yr)	(ton/yr)
VOCs	-	13.72	28,538.45	14.27	13.72	28,538.45	14.27	3.08E-03	6.41	3.21E-03
Total HAPs	-	0.13	269.74	0.13	0.13	269.74	0.13	4.11E-04	0.86	4.28E-04
Benzene	71-43-2	4.64E-03	9.65	4.82E-03	4.64E-03	9.65	4.82E-03	6.16E-06	0.01	6.41E-06
Cumene	98-82-8	0.02	51.65	0.03	0.02	51.65	0.03	-	-	-
Ethyl Benzene	100-41-4	0.02	45.38	0.02	0.02	45.38	0.02	9.56E-06	0.02	9.94E-06
Fluorene	86-73-7	4.72E-04	0.98	4.91E-04	4.72E-04	0.98	4.91E-04	-	-	-
Hexane	110-54-3	-	-	-	-	-	-	1.23E-06	2.56E-03	1.28E-06
Isooctane	540-84-1	1.69E-04	0.35	1.76E-04	1.69E-04	0.35	1.76E-04	-	-	-
Naphthalene	91-20-3	0.04	76.48	0.04	0.04	76.48	0.04	-	-	-
Phenylbenzene	92-52-4	0.01	19.35	0.01	0.01	19.35	0.01	-	-	-
Pyrene	129-00-0	1.37E-06	2.85E-03	1.43E-06	1.37E-06	2.85E-03	1.43E-06	-	-	-
Toluene	108-88-3	0.03	62.50	0.03	0.03	62.50	0.03	7.09E-05	0.15	7.37E-05
1,2,4-Trimethylbenzene	95-63-6	-	-	-	-	-	-	1.44E-04	0.30	1.50E-04
Xylenes	1330-20-7	1.63E-03	3.40	1.70E-03	1.63E-03	3.40	1.70E-03	1.80E-04	0.37	1.87E-04

1. Calculation Methodology:

$E_{HAP} = E_{VOC} \times (WP_{HAP}/100)$

E_{HAP} = HAP Emissions (lb/yr)

E_{VOC} = VOC Emissions (lb/yr)

WP_{HAP} = Weight percent HAP in the fuel (%)

100 = Factor for converting weight percent to weight fraction (%)

Emission calculation methodology from Section 16 of Air Emissions Guide for Air Force Stationary Sources, AFCEC, October 2014.

Hourly emissions were estimated as annual emissions divided by actual operating hours (2,080 hr/yr).

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
December 2015

Source Type: Fuel Dispensing - Gasoline
Process ID: 653

Source List and Maximum Throughput

Process ID	Facility ID	Description	Fuel Type	Fuel Usage (gal)
				Max[2]
653	368	Military Service Station	Gasoline	1,199,988

1. Limited to 99,999 gallons per month to remain below NESHAP CCCCCC requirements.

Emissions Factors

Emission Source	Emission Factor (lb/1000 gal)[1]
	Gasoline
Displacement	11

1. Gasoline emission factors from EPA document AP 42, Section 5.2, Table 5.2-7, dated June 2008.

Hazardous Air Pollutant Vapor Speciation (Weight %)

HAP	CAS #	Gasoline
Benzene	71-43-2	0.65
Cumene	98-82-8	0.01
Ethyl Benzene	100-41-4	0.05
Hexane	110-54-3	0.59
Toluene	108-88-3	0.73
2,2,4-Trimethylpentane	540-84-1	0.75
Xylenes (mixed isomers)	1330-20-7	0.21

1. Calculated using USEPA Tanks 4.09d from liquid weight percents.

Emissions

Fuel Type	CAS #	Emissions[1, 2]		
		653		
		(lb/yr)	(lb/yr)	(tpy)
VOC	--	6.35	13,199.87	6.60
Total HAPs	--	0.19	394.68	0.20
Benzene	71-43-2	4.12E-02	85.80	0.04
Cumene	98-82-8	6.35E-04	1.32	6.60E-04
Ethyl Benzene	100-41-4	3.17E-03	6.60	3.30E-03
Hexane	110-54-3	3.74E-02	77.88	0.04
Toluene	108-88-3	4.63E-02	96.36	0.05
2,2,4-Trimethylpentane	540-84-1	4.76E-02	99.00	0.05
Xylenes (mixed isomers)	1330-20-7	1.33E-02	27.72	0.01

1. Emissions for displacement and spillage are calculated separately, using the methodology below:

E_{VOC} = Q x 1/1,000 x EF

E_{VOC} = Emissions (lb/yr)

Q = Annual quantity of fuel transferred (gal/yr)

1,000 = Factor for converting gal to 10^3 gal (gal/10^3gal)

EF = Emissions factor (lb/10^3 gal).

Emission calculation methodology from Section 16 of Air Emissions Guide for Air Force Stationary Sources, AFCEC, October 2014, for uncontrolled fuel transfer.

2. Calculation Methodology:

E_{HAP} = E_{VOC} x (WP_{HAP}/100)

E_{HAP} = HAP Emissions (lb/yr)

E_{VOC} = VOC Emissions (lb/yr)

WP_{HAP} = Weight percent HAP in the fuel (%)

100 = Factor for converting weight percent to weight fraction (%)

Emission calculation methodology from Section 16 of Air Emissions Guide for Air Force Stationary Sources, AFCEC, October 2014.

Hourly emissions were estimated as annual emissions divided by actual operating hours (2,080 hr/yr).

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
December 2015

Source Type: Solvent Cleaning Equipment (Degreasers)
Process ID: Multiple (See Below)

Source List

Process ID[1]	Solvent Type	VOC Content (lb/gal)	HAP Content (lb/gal)	Solvent Used (gal/yr)		Percent Recovered/ Disposed
				2007 [2]	Max[3]	
701	Safety Kleen	6.8	0	293	1,233.53	70%
706	ZEP Dyna 680, Type II	6.39	0	20	84.20	0%
707	Formula 724	6.5	0	N/A	100	0%
708	Penetone 724	6.5	0	N/A	100	0%
709	Penetone 725	6.58	0	N/A	100	0%
710	PD 680, TYPE III	6.39	0	N/A	100	0%
711	Calla 296	1.01	0	N/A	100	0%
712	Super Agitene 141	6.67	0	N/A	100	0%
713	Tectyl 275 (Finger Pt	5.11	0	N/A	100	0%

1. Process ID's are seperated by solvent type rather than units. For a listing of specific units and Facility ID's, refer to the equipment list included with this application.
2. Luke AFB determined that 2007 is respresentative of a typical operations year; therefore maximum operations are determined from this baseline year.
3. Baseline usage has been scaled up by a factor of 4.21 to arrive at a maximum usage (i.e., 8,760 hrs / 2,080 hrs). For solvents that do not have 2007 usage, maximum was set to 100 gal/yr based on knowledge of operations.

Emissions

Pollutant	Process ID	Emissions[1,2]		
		(lb/yr)	(lb/yr)	(tpy)
VOC	701	1.21	2,516.40	1.26
	706	0.26	538.04	0.27
	707	0.31	650.00	0.33
	708	0.31	650.00	0.33
	709	0.32	658.00	0.33
	710	0.31	639.00	0.32
	711	0.05	101.00	0.05
	712	0.32	667.00	0.33
	713	0.25	511.00	0.26
	Total	3.33	6,930.44	3.47

1. Calculation Methodology:

E_{voc} = Q*D*(1-R/100)

E_{voc} = Emissions (lb/yr)

Q = Solvent Used (gal/yr)

D = Solvent Density (lb/gal)

R = Percent Recovered (%)

Hourly emissions were estimated as annual emissions divided by actual operating hours (2,080 hr/yr).

Luke Air Force Base
Title V Permit Renewal
Air Quality Permit No. V97-017 - Renewal Calculations
December 2015

Source Type: Miscellaneous Chemical Use and Surface Coating
Process IDs: Multiple (See Below)

Source List and Usage

Process ID	Process Type/Description	Material Type	2007 Usage[1] (gal/yr)	Max Usage[2] (gal/yr)
751	General Maintenance Materials Multiple Buildings	Paint	142.56	900.18
752		Primer	101.82	428.66
753		Thinner	10.00	42.10
757		Adhesive	133.40	561.61
760		Sealer	614.74	2,588.06
762		Alcohol	232.63	979.37
770		Miscellaneous Cleaners, Corrosion Prevention, Hardeners, Etc.	4,871.67	20,509.73
775	Corrosion Control: Building 922 (with Two 3-Stage PM and Carbon Filters; Control ID 520; Stack ID 801)	Paint	1,635.65	6,886.09
776		Primer	827.74	3,484.79
777		Thinner	508.00	2,138.68
779		Alcohol	21.00	88.41
780		Adhesive	21.90	92.20
781		Sealant	27.58	116.11

1. Luke AFB determined that 2007 is representative of a typical operations year. Therefore maximum operations are determined from this baseline year.
2. Baseline usage has been scaled up by a factor of 4.21 to arrive at a maximum usage (i.e., 8,760 hrs / 2,080 hrs).

Emissions - GENERAL MAINTENANCE MATERIALS, MULTIPLE BLDGS

Compound	CAS	751				752				753				757				760				762				770				TOTAL			
		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions	
		(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)
$PM/PM_{10}/PM_{2.5}$	--	--	0.46	967.29	0.48	--	0.30	627.32	0.31	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.76	1,594.61	0.79
VOC	--	566.46	1.15	2,393.22	1.20	372.52	0.75	1,566.31	0.78	53.30	0.11	224.39	0.11	361.65	0.73	1,522.55	0.76	2,440.71	4.94	10,275.39	5.14	1,533.11	3.10	6,454.39	3.23	17,542.25	35.51	73,852.47	36.93	**22,872.00**	**46.29**	**96,291.12**	**48.15**
Total HAPS	--	--	0.12	239.32	0.12	--	0.08	155.63	0.08	--	0.11	224.39	0.11	--	0.07	152.25	0.08	--	0.49	1,027.54	0.51	--	0.31	645.44	0.32	--	3.55	7,385.29	3.69	--	**4.73**	**9,831.07**	**4.92**

Emissions - CORROSION CONTROL BLD 922, CONTROLLED BY CARBON FILTERS & FLAME TEST MONITORING

Compound	CAS	775				776				777				779				780				781				TOTAL			
		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions		2007 Emissions	Hourly Emissions	Max Emissions	
		(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)	(lb/yr)	(lb/hr)	(lb/yr)	(tpy)
$PM/PM_{10}/PM_{2.5}$	--	--	0.06	100.74	0.05	--	0.02	43.17	0.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.07	143.91	0.07
VOC	--	1,196.46	2.42	5,037.18	2.52	512.70	1.04	2,158.47	1.08	674.67	1.37	2,840.36	1.42	26.25	0.05	110.51	0.06	9.82	0.02	41.34	0.02	14.20	0.03	59.76	0.03	**2,434.12**	**4.93**	**10,247.65**	**5.12**
Total HAPS	--	--	0.24	503.72	0.25	--	0.10	215.85	0.11	--	1.37	2,840.36	1.42	--	0.01	11.05	0.01	--	1.99E-03	4.13	2.07E-03	--	2.87E-03	5.96	2.99E-03	--	1.72	3,581.09	1.79

Note: Based on knowledge of typical operations, PM emissions from paint and primer application were assumed to be 40% of VOC emissions and a filter efficiency of 80% was assumed for Building 922. All other solvents were assumed to be hand applied; therefore, PM emission were set to be negligible. HAP emissions were assumed to be 10% of VOC emissions, except for thinners. HAP emissions were set to be 100% of VOC emissions.
Hourly emissions were estimated as annual emissions divided by actual operating hours (2,080 hr/yr).

APPENDIX B – EXISTING O&M PLANS

Adopted	22 Mar 04
Approved	10 Jun 04
Revised	29 Jun 09
Approved	19 Aug 09

56th Force Support Squadron
Auto Hobby Shop
Located at Luke Air Force Base

Permit No. V97017

Spray Paint Booth
Building 235

Operation and Maintenance Plan

HEALTH, SAFETY AND ENVIRONMENTAL
June 2009

Table of Content

Attachments:

- Sample Maintenance Log

OPERATION AND MAINTENANCE PLAN
FOR
Spray Painting Facility

I GENERAL INFORMATION

Business Name: 56 Fighter Wing

Business Address: Bldg 235, Luke Air Force Base, Arizona 85309-1149

Permit Number: V97-017

Date of Preparation/Revision: 29 June 2009

General description of overall facility operations: Training aircrew and maintenance personnel on the F-16 aircraft

Brief description of process ducted to control device including pollutants emitted: The spray paint booth is used to refinish and touch-up painting of Luke's military member's personal vehicles. Pollutants emitted from this site will be PM and VOC.

Complete description of control device(s) covered by the plan including manufacturer, model, rated capacity, total number of identical units, equipment identification number, etc.:

MANUFACTURER: Devilbliss
MODEL NAME: Ultra Concept Downdraft Spray Booth,
MODELNUMBER: System 2000
TOTAL NUMBER OF UNITS: 1
RATED CAPACITY: 5 HP
EFFICIENCY RATING: All filters will have efficiency rating of at least 93% for PM-10 removal.

Three different types of particulate filters are used.

Intake Filter: These filters have an average filtration capacity and retain their effectiveness as long as the pressure differential creates a pressure difference between the front and the back of the filters.

Floor Filter: These filters have an excellent filtration capacity for trapping the dry paint residue and retain their effectiveness as long as the pressure differential creates a pressure difference.

Ceiling Filter: These filters have a very high filtration capacity to guarantee that the output air is adequately filtered and retain their effectiveness as long as the pressure differential creates a pressure difference between the front and the back of the filters.

II. OPERATIONS PLAN

1. The Spray Mode is the period of time during which the paint material is being sprayed onto the vehicle. The emission control system (ECS) shall operate at all times that painting is conducted. During the painting process, the operating cycle ensures the correct air pressure and temperature for the painter, as well as air filtration for proper results of the paint application. A magnehelic gauge is located near the front entry door, close to control panel mounted on the booth. The magnehelic gauge is used monitor the pressure in the spray booth cabin, during the spray mode. The magnehelic reading is to be checked each time the paint booth is started. The reading should be at least 0.15 psi. This is adjustable by changing the position of the exhaust motor damper. If the reading is above the norm, open the damper to lower the pressure. When the damper is open completely, and the reading remains above the norm, the floor filters (exhaust) should be changed. If proper settings cannot be achieved after replacing the floor filters, shut down operation and call a certified technician to service the system.

2. The spray cycle is as follows: The damper positions itself automatically to allow the intake blower assembly to only draw in outside fresh air. All the air then passes through the pre-filter and then around heat exchanger. The outside air is heated to the preset temperature on the control panel and enters into the plenum of the booth. The air enters the booth by passing through the 10 micron ceiling filters and is evenly distributed throughout. The air is exhausted beneath the floor through the paint-stop filters, where the overspray is removed. The filtered air enters the exhaust side of the mechanical unit where it is expelled through the stack to the outside.

Operational Parameters and Limits

Parameter	Units	Limits	Instrument	Frequency
Differential Pressure	Pounds per Square Inch (PSI)	0.15 to 0.5 psi	Magnehelic	Prior to each use.
Visible Emissions	Opacity	No Visible Emissions	N/A	Weekly
Intake Filters	Hours	500	Hour Meter	Change filters every 500 hours
Floor Filters	Hours	100	Hour Meter	Change filters every 100 hours
Ceiling Filters	Hours	1800	Hour Meter	Change filters every 1800 hours

3. Paint Booth Filters have an efficiency rating of greater than 93 percent for particulate removal.

III MAINTENANCE PLAN

1. Filters will be inspected weekly for rips, tears, or sags and replaced as needed.
2. Magnehelic Gage will be check prior to each use. Range of operations is 0.15 and 0.5 psi.

NOTES: Records are required to be maintained for a minimum of five years.

5. TRAINING REQUIREMENTS

All personnel will be briefed on the operation and maintenance of equipment prior to use of this facility. Briefings will include VOC recordkeeping requirements.

RECOMMENDED FILTER CHANGE FOR BLOWTHERM SPRAY BOOTHS

Monoblock Intake Filters (2):

A. Replace intake filters (2) at about 500 hours. This will vary with local conditions.
B. Replace with new Blowtherm approved six pocket filters.
C. Replace when panel light indicates. (optional feature on some panels)

Floor Filters:

A. Replace floor filters at 100 hours spray time.
B. Replace floor filters with Blowtherm approved fiberglass extract material or equivalent
C. Replace floor filters when panel light indicates (optional feature on some panels) or when optimum booth pressure cannot be achieved (.15-.5 psi)

Ceiling Filters:

A. Replace ceiling filters at 1800 hours according to how much air pollution is in your area or how well the monoblock intake filters are serviced. Some types of intake ceiling filters may need to be replaced more often.
B. Replace ceiling filters when panel light indicates. (optional feature on some panels.)
C. Replace when filters become dark gray or black in color.
D. Ceiling filters should be replaced with the Blowtherm approved filters or equivalent. Contact your local distributor for specifications.

Filter Change Dates

	Floor	**Intake**	**Ceiling**
Date:			
Date:			
Date:			
Date:			
Date:			
Date:			
Date:			

SPRAY BOOTH
INSPECTION LOG
FOR MONTH OF _____
BLDG 235

DATE	MANOMETER READING BEFORE EACH USE (0.15 – 0.5 psi)	WEEKLY FILTER INSPECTION [1] (y/n)	WEEKLY OUTSIDE INSPECTION[2] (y/n)	INITIALS	COMMENTS (Annotate when filters changed)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					

1. **Weekly check all filters for sags, gaps, and holes.**
2. **Weekly inspect the facility for evidence of any spraying activity that occurred outside of the booth.**

Adopted	13 Jan 09
Updated	29 Jun 09
Approved	19 Aug 09

56th Services Squadron
Wood Skills Shop
Located at Luke Air Force Base

Permit No. V97-017

Dust Collector
Building 247

Operation and Maintenance Plan

Prepared by 56 CES Air Program Manager

HEALTH, SAFETY AND ENVIRONMENTAL
June 2009

Table of Content

Attachments:
Sample Maintenance Log

CARTRIDGE DUST COLLECTOR

I GENERAL INFORMATION

Business Name: 56 Fighter Wing

Business Address: Bldg 247, Luke Air Force Base, Arizona 85309-1149

Permit Number: V97-017

Date of Preparation/Revision: 29 Jun 09

General description of overall facility operations: Training aircrew and maintenance personnel on the F-16 aircraft

Brief description of process ducted to control device including pollutants emitted: The Dust Collector is used in the wood hobby shop to extract wood dust from several operations.

Complete description of control device covered by the plan including manufacturer, model, rated capacity, total number of identical units, equipment identification number, etc.:

The unit is a FARR Air Pollution Control Gold Series® Dust Collector
Model Number: GS-16
Serial Number: 851210001
HP: 25
CFM: 10,000
Efficiency Rating: 99.9%

II OPERATIONS PLAN

1. System Operation

The dust collector is designed with removable air filters where in coming dust-laden air enters the inlet plenum. A baffle then forces large or heavy particles to drop out of the air stream and fall into the hopper. The air passes through the filter media from the outside to the inside of the filter cartridge and exits through the clean top of each filter cartridge. The air then flows from the filters into the clean-air plenum, where it enters the fan inlet and is exhausted. The dust is captured on the outside surface of the filter media. This system shall operate at all times that woodworking equipment is in operation.

Parameter	Units	Limits	Instrument	Frequency
Differential Pressure	Pounds per Square Inch (PSI)	0.3 to 6 psi	Magnehelic	Daily
Visible Emissions	Opacity	No Visible Emissions	N/A	Weekly

2. Filter Cleaning

The Gold Cone cartridge elements are sequentially cleaned by back flushing with air. This momentary airflow reversal is induced by a short burst of compressed air. The air is released from the compressed air reservoir by a fast-acting, high-flow diaphragm valve. This "pulse" of air dislodges the accumulated dust from the filter element. The dislodged dust then drops into the hopper or collection drawers. Each pulse cleans one row of filter cartridges leaving the remaining cartridges available to continue filtering the ventilation air. This allows for the cleaning of filter cartridges to take place without the need to stop the ventilation system. A clean filter system at start-up should have a differential pressure of approximately 0.5 psi, and normal operations should occur between a differential pressure of 3-4 psi.

3. Emissions control system will be in operation at all times when woodworking activities are being conducted.

III MAINTENANCE PLAN

Daily
1. Check controller and pressure drop.
2. Verify Solenoids are operating if pressure drop is sufficient.
3. Visual check for emissions.

Weekly:
1. During operations a visual inspection will be performed to ensure no visual emissions are coming from the unit.

Monthly:
1. Visually check compressed air lines, including line filters and dryers.
2. Inspect fans for corrosion and material build-up.
3. Visually check drive belts for wear and tension.
4. Visually check hoses and clamps.
5. Inspect housing for corrosion.

Quarterly:
1. Check accuracy of indicating equipment.
2. Inspect and lubricate appropriate items.
3. Spot-check cartridge appearance.
4. Inspect screw conveyor/airlock bearings for lubrication.
5. Check packing glands.
6. Operate damper valves.
7. Inspect filter cartridges.
8. Check duct for dust build-up.
9. Observe damper valves for proper seating.
10. Check gaskets on doors.

Annually:
1. Inspect inlet baffle for wear.
2. Inspect paint, insulation, etc.
3. Check screw conveyor and/or airlock for wear or abrasion.
4. Check fan belts.
5. Check welds.
6. Inspect hopper for wear.
7. Check explosion vents.

NOTES: Records are required to be maintained for a minimum of five years.

IV TRAINING REQUIREMENTS

All personnel responsible for the dust collection system will be properly trained and records of such training will be kept on file in personnel folders.

Operating Parameter Log Sheet MONTH/YEAR: _____

Equipment: FARR GS-16 Cartridge Dust Collector
Parameter: Pressure Drop and Visible Emissions
Measurement Range: 0.3 – 6.0 psi* Recording Frequency: Daily

Day of Month	Initials	Visible Emissions? (Y/N)**	Pressure Drop Reading (psi)	Within Range? (Y/N)	Solenoids Operating? (Y/N)	If not within range, note action taken*
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
(29)						
(30)						
(31)						

*Note periods when system is "not in use".
**If visible emissions are observed, contact Yvonne Newell at 856-8488

Operating Parameter Log Sheet YEAR: _____

Equipment: FARR GS-16 Cartridge Dust Collector
Parameter: Inspections
Recording Frequency: Monthly

Day of Month	Initials	Visually inspect air lines and air line filters (good/bad)	Inspect Fans and Housing for Corrosion? (good/bad)	Visually Inspect Belts (good/bad)	Visually Check Hoses and Clamps (good/bad)	If not within range, note action taken*
Jan						
Feb						
Mar						
Apr						
May						
June						
July						
Aug						
Sept						
Oct						
Nov						
Dec						

*Note periods when system is "not in use".
**If visible emissions are observed, contact Yvonne Newell at 856-8488

Operating Parameter Log Sheet

YEAR: _____

Equipment: FARR GS-16 Cartridge Dust Collector
Parameter: Inspections

Recording Frequency: Quarterly and Annual

Check	JAN - MAR	APR – JUN	JUL – SEP	OCT – DEC	Annual
Initials					
Check Accuracy of Pressure Drop Gauge					
Inspect and Lubricate Appropriate Items					
Spot check Cartridge Appearance					
Inspect Screw Conveyor/Airlock Bearings for Lubrication					
Check Packing Glands					
Operate Damper Valves					
Inspect Filter Cartridges					
Check Duct for Dust Buildup					
Observe Damper Valves for Proper Seating					
Check Gaskets on Doors					
Inspect Inlet Baffle for Wear					
Inspect Paint, Insulation					
Check Welds and Inspect Hopper					
Check Explosion Vents					

Adopted	22 Mar 04
Approved	10 Jun 04
Revised	27 Sep 10
Approved	27 Sep 10
Revised	6 Aug 13
Approved	6 Aug 13

56th Transportation Squadron

Located at Luke Air Force Base

Permit No. V97-017

Spray Paint Booth

Building 291

Operation and Maintenance Plan

HEALTH, SAFETY AND ENVIRONMENTAL
September 2010

Table of Content

Attachments:

- Sample Maintenance Log

OPERATION AND MAINTENANCE PLAN
FOR
Spray Painting Facility

I GENERAL INFORMATION

Business Name: 56 Fighter Wing

Business Address: Bldg 291, Luke Air Force Base, Arizona 85309-1149

Permit Number: V97-017

Date of Preparation/Revision: 27 September 2010

General description of overall facility operations: Training aircrew and maintenance personnel on the F-16 aircraft

Brief description of process ducted to control device including pollutants emitted: The spray paint booth is used to refinish and touch-up painting of Luke's vehicles.

Complete description of control device covered by the plan including manufacturer, model, rated capacity, total number of identical units, equipment identification number, etc.:

MANUFACTURER: Blowtherm
MODEL: Ultra 2000 Spray Booth
IDENTIFICATION NUMBER: 4940PBLO-3750
TOTAL NUMBER OF UNITS: 1
RATED CAPACITY: 10 hp
EFFICIENCY RATING: All filters will have an efficiency rating of at least 93 percent for PM10 removal.

3 different types of particulate filters are used.

Intake Filter: These filters have an average filtration capacity and retain their effectiveness as long as the pressure differential creates a pressure difference between the front and the back of the filters.

Floor Filter: These filters have an excellent filtration capacity for trapping the dry paint residue and retain their effectiveness as long as the pressure differential creates a pressure difference.

Ceiling Filter: These filters have a very high filtration capacity to guarantee that the output air is adequately filtered and retain their effectiveness as long as the pressure differential creates a pressure difference between the front and the back of the filters.

II. OPERATIONS PLAN

1. The Spray Mode is the period of time during which the paint material is being sprayed onto the vehicle. The emission control system (ECS) shall operate at all times that painting is conducted. During the painting process, the operating cycle ensures the correct air pressure and temperature for the painter, as well as air filtration for proper results of the paint application. A magnehelic gauge is located near the front entry door, close to control panel mounted to booth. The magnehelic gauge is used monitor the pressure in the spray booth cabin, during the spray mode. The magnehelic reading is to be checked each time the paint booth is started. The reading should be less than 0.1" water column. This is adjustable by changing the position of the exhaust motor damper. If the reading is above the norm, open the damper to lower the pressure. When the damper is open completely, and the reading remains above the norm, the floor filters (exhaust) should be changed. If proper settings cannot be achieved after replacing the floor filters, shut down operation and call a certified technician to service the system.

2. The spray cycle is as follows: The damper positions itself automatically to allow the intake blower assembly to only draw in outside fresh air. All the air then passes through the pre-filter and then around heat exchanger. The outside air is heated to the preset temperature on the control panel and enters into the plenum of the booth. The air enters the booth by passing through the 10 micron ceiling filters and is distributed throughout. The air is exhausted beneath the floor through the paint-stop filters, where the overspray is removed. The filtered air enters the exhaust side of the mechanical unit where it is expelled through the stack to the outside.

Operational Checks and Parameters

Parameter	Units	Limits	Instrument	Frequency
Differential Pressure	Pounds per Square Inch (PSI)	0.01" – 0.09" W.C.	Magnehelic	Prior to each use.
Visible Emissions	Opacity	No Visible Emissions	N/A	Weekly
Intake Filters	Hours	500	Hour Meter	Change filters every 500 hours
Floor Filters	Hours	100	Hour Meter	Change filters every 100 hours
Ceiling Filters	Hours	1800	Hour Meter	Change filters every 1800 hours

3. Paint Booth Filters have an efficiency rating of greater than 93 percent for particulate removal.

III MAINTENANCE PLAN

1. Filters will be inspected prior to each use for rips, tears, or sags and replaced as needed.
2. Magnehelic Gage will be checked prior to each use. Range of operation is 0.01" to .09" water column.

NOTES: Records are required to be maintained for a minimum of five years.

IV TRAINING REQUIREMENTS

All Allied Trades personnel will be briefed on the operation and maintenance of equipment upon arrival to this duty location. Briefings will include VOC recordkeeping requirements.

RECOMMENDED FILTER CHANGE FOR BLOWTHERM SPRAY BOOTHS

Monoblock Intake Filters (2):

A. Replace intake filters (2) at about 500 hours. This will vary with local conditions.
B. Replace with new Blowtherm approved six pocket filters.
C. Replace when panel light indicates. (optional feature on some panels)

Floor Filters:

A. Replace floor filters at 100 hours spray time.
B. Replace floor filters with Blowtherm approved fiberglass extract material or equivalent
C. Replace floor filters when panel light indicates (optional feature on some panels) or when optimum booth pressure cannot be achieved (less than 0.1 psi)

Ceiling Filters:

A. Replace ceiling filters at 1800 hours according to how much air pollution is in your area or how well the monoblock intake filters are serviced. Some types of intake ceiling filters may need to be replaced more often.
B. Replace ceiling filters when panel light indicates. (optional feature on some panels.)
C. Replace when filters become dark gray or black in color.
D. Ceiling filters should be replaced with the Blowtherm approved filters or equivalent. Contact your local distributor for specifications.

Filter Change Dates

	Floor	**Intake**	**Ceiling**
Date:			
Date:			
Date:			
Date:			
Date:			
Date:			
Date:			

Spray Booth
For Month of _____
BLDG 291

Date	Magnahelic Reading (0.01"-0.09" WC)	Weekly Check for Gaps, Sags, or missing filters (y/n)	Observation of Painting Activities Outside of Booth (y/n)	Monthly Inspection of Paint Gun Cleaner for Leaks (y/n)	Initials	Comments
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

Adopted	22 Mar 04
Approved	10 Jun 04
Revised	29 Jun 09
Approved	19 Aug 09

56th Civil Engineer Squadron
Wood Shop
Located at Luke Air Force Base

Permit No. V97-017

Cyclone
Building 339

Operation and Maintenance Plan

Prepared by 56 CES Air Program Manager

HEALTH, SAFETY AND ENVIRONMENTAL
June 2009

Table of Content

Attachments:
Sample Maintenance Log

OPERATION AND MAINTENANCE PLAN
FOR
Cyclone Dust Collection System

I GENERAL INFORMATION

Business Name: 56 Fighter Wing

Business Address: Bldg 339, Luke Air Force Base, Arizona 85309-1149

Permit Number: V97-017

Date of Preparation/Revision: 29 June 2009

General description of overall facility operations: Training aircrew and maintenance personnel on the F-16 aircraft

Brief description of process ducted to control device including pollutants emitted: Carpentry shop is responsible for facility maintenance and repair. Pollutant emitted is PM

Complete description of control device covered by the plan including manufacturer, model, rated capacity, total number of identical units, equipment identification number, etc.:

1. Skimmer Dust Removal System
   MANUFACTURE: American Air Filter, Louisville, KY
   SIZE: 16
   SERIAL NUMBER: S730261

2. Induction A/C Motor
   MODEL NUMBER: SKE256BC205B
   RATED CAPACITY: 20 hp
   MANUFACTURE: General Electric Systems
   Fort Wayne, IN

3. System is over 30 years old.

4. EFFICIENCY RATING: 70 percents for PM-10 is the standard cyclone efficiency as per EPA.

II OPERATIONS PLAN

Woodworking operations that occur within this facility are exhausted into duct work that empties into the cyclone. The cyclone removes larger particulates from the gas stream. The general principle of inertia separation is that the particulate-laden gas is forced to change direction. As gas changes direction, the inertia of the particles causes them to continue in the original direction and be separated from the gas stream. The walls of the cyclone narrow toward the bottom of the unit, allowing the particles to be collected in a drum. The cleaner air leaves the cyclone through the top of the chamber, flowing upward in a spiral vortex, formed within a downward moving spiral. The cyclone will be in operation at all times when woodworking equipment is in use.

Operational Parameters and Limits

Visible Emissions	Opacity	No Visible Emissions	N/A	Weekly

III MAINTENANCE PLAN

DAILY
1. Check dust storage unit, empty if ¾ full

WEEKLY
1. During operations check for visual emissions
2. Check and empty the dust storage containing unit

MONTHLY
1. Check of all ductwork for loose and missing hardware or holes

ANNUAL
1. Lubricate/grease moving parts on electric motor and hopper
2. Replace belts as needed

NOTES: Records are required to be maintained for a minimum of five years.

IV TRAINING REQUIREMENTS

Training is conducted al all new airman and civilian shop personnel during the initial shop orientation.

CYCLONE MAINTENANCE LOG
BLDG 339
FOR THE MONTH OF _____

Day	DAILY: Check amount of waste in drum empty if 3/4 full	Week #	WEEKLY: During operations check for visible emissions	WEEKLY: Empty waste drum	MONTHLY: Check equipment for holes, loose/missing hardware or holes	ANNUAL: Lubricate/ grease moving parts	ANNUAL: Replace Belts as needed
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COPIES WILL BE MAINTAINED FOR 5 YEARS.

Adopted	22 Mar 04
Approved	10 Jun 04
Revised	29 Jun 09
Approved	19 Aug 09

56th Civil Engineer Squadron
Operations Flight
Located at Luke Air Force Base

Permit No. V97-017

Spray Paint Booth
Building 339

Operation and Maintenance Plan

Prepared by 56 CES Air Program Manager

HEALTH, SAFETY AND ENVIRONMENTAL
June 2009

Table of Content

Attachments:

- Sample Maintenance Log

OPERATION AND MAINTENANCE PLAN
FOR
Spray Painting Facility

I GENERAL INFORMATION

Business Name: 56 Fighter Wing

Business Address: Bldg 339, Luke Air Force Base, Arizona 85309-1149

Permit Number: V97-017

Date of Preparation/Revision: 29 Jun 09

General description of overall facility operations: Training aircrew and maintenance personnel on the F-16 aircraft

Brief description of process ducted to control device including pollutants emitted: The spray paint booth is used to paint and refinish a variety of signs and woodworking products. Pollutants emitted are VOC's and PM.

Complete description of control device covered by the plan including manufacturer, model, rated capacity, total number of identical units, equipment identification number, etc.:

MANUFACTURE: Binks
MODEL NUMBER: 75509
CAPACITY: 664 gallons
DYNAPRECIPITOR: Water Wash Spray Booth
RATED CAPACITY: UNKNOWN, ID PLATE ILLEGIBLE
EFFICIENCY: Filters will have an efficiency rating of at least 93 percent for PM10 removal

NOTE: Water wash system is inoperable, only electric ventilation is used.

The Chemco filters that are used have a 98 percent efficiency rating.

II. OPERATIONS PLAN

Painting of small objects occurs in this booth. The paint booth shall be operated at all times that spray painting is conducted. Booth uses exhaust filters or paint overspray arrestors to decrease emissions from the shop by capturing the over-sprayed coating mist and particles before the air is exhausted from the shop into the environment. These filters are located opposite to where the intake air enters. Readings from a manometer are used to establish a change out schedule for the exhaust filters. Once the manometer exceeds 0.5 reading, the filter are removed and replaced. Only HVLP spray painting guns will be used.

Operational Parameters and Limits

Parameter	Units	Limits	Instrument	Frequency
Differential Pressure	Pounds per Square Inch (PSI)	0.15 to 0.5 psi	Magnehelic	Prior to each use.
Visible Emissions	Opacity	No Visible Emissions	N/A	Weekly

1. Weekly inspection of area around the spray booth will be inspected for signs of painting that occurred outside of the spray paint booth.

III MAINTENANCE PLAN

1. Filters will be inspected prior to each use for rips, tears, or sags and replaced as needed.
2. Magnehelic Gage will be check prior to each use. Range of operations is 0.15 and 0.5 inches of water.

NOTES: Records are required to be maintained for a minimum of five years.

IV TRAINING REQUIREMENTS

Personnel will be briefed on the operation and maintenance of equipment upon arrival to this duty location. Briefings will include VOC record keeping requirements.

SPRAY BOOTH
INSPECTION LOG
FOR MONTH OF _____
BLDG 339

DATE	MANOMETER READING (0.15-0.5 psi)	WEEKLY FILTER INSPECTION[1] (y/n)	WEEKLY OUTSIDE INSPECTION[2] (y/n)	MONTHLY INSPECT SPRAY GUN CLEANER FOR LEAKS[3] (y/n)	INITIALS	COMMENTS
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1. Weekly inspect all the filters for sags, gaps, and holes and repair as required.
2. Weekly inspect the facility for evidence of any spraying activity that occurred outside of the booth.
3. Monthly inspection of outside spray gun cleaning area. (No spills, no hose leaks, and no equipment left in gun cleaning area.)

Adopted	22 Mar 04
Approved	10 Jun 04
Revised	29 Jun 09
Approved	19 Aug 09
Revised	23 Jul 15
Approved	26 Aug 15

Det 1, 4444 Ops
Wood Shop
Located at Luke Air Force Base

Permit No. V97-017

Cyclone
Building 415

Operation and Maintenance Plan

Prepared by 56 CES Air Program Manager

HEALTH, SAFETY AND ENVIRONMENTAL
July 2015

Table of Content

Attachments:
Sample Maintenance Log

OPERATION AND MAINTENANCE PLAN
FOR
Wood Dust Collector

I GENERAL INFORMATION

Business Name: 56 Fighter Wing

Business Address: Bldg 415, Luke Air Force Base, Arizona 85309-1149

Permit Number: V97-017

Date of Preparation/Revision: 23 July 2015

General description of overall facility operations: Training aircrew and maintenance personnel on the F-16 aircraft

Brief description of process ducted to control device including pollutants emitted: The dust collector removes wood dust created at the source and collects it into an outside hopper. Pollutant emitted PM.

Complete description of control device covered by the plan including manufacturer, model, rated capacity, total number of identical units, equipment identification number, etc.:

MANUFACTURE: CYCLO-MAX
MODEL NUMBER: C3625-H65-24
NUMBER OF UNITS: 1
RATED CAPACITY: 25 HP
EFFICIENCY RATE: 70% for PM-10 is the standard cyclone efficiency according to EPA

II. OPERATIONS PLAN

Woodworking operations that occur within this facility are exhausted into duct work that empties into the cyclone. The cyclone removes larger particulates from the gas stream. The general principle of inertia separation is that the particulate-laden gas is forced to change direction. As gas changes direction, the inertia of the particles causes them to continue in the original direction and be separated from the gas stream. The walls of the cyclone narrow toward the bottom of the unit, allowing the particles to be collected in a drum. The cleaner air leaves the cyclone through the top of the chamber, flowing upward in a spiral vortex, formed within a downward moving spiral. The cyclone will be in operation at all times when woodworking equipment is in use.

Operational Parameters and Limits

Parameter	Units	Limits	Instrument	Frequency
Visible Emissions	Opacity	No Visible Emissions	N/A	Weekly

III MAINTENANCE PLAN

DAILY

1. Ensure all blast gates operate when individual machines are turned on.
2. Check and empty hopper if ¾ full.

WEEKLY

1. Check and empty hopper weekly.
2. Weekly during operations a visual inspection will be performed to ensure no visual emissions are coming from the unit.

ANNUALLY

1. Inspect all duct work for leaks.
2. Lubricate bearings.
3. Inspect belts and replace as needed.

IV TRAINING REQUIREMENTS

All new personnel are trained on the Dust collector usage and safety upon arrival to the unit. This training is documented in the worker's AF Form 55.

FOR DAY	DAILY		WEEKLY		ANNUAL		
	Check amount of waste in drum empty if 3/4 full	Check all blast gates for proper operation	During operations check for visual emissions	Empty waste drum	Lubricate/ grease moving parts	Inspect all duct work for leaks	Inspect and Replace Belts as needed.
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31							

INITIAL WHEN COMPLETED.

Adopted	22 Mar 04
Approved	10 Jun 04
Revised	29 Sep 10
Approved	05 Oct 10

Det 1, ACC TRSS
Located at Luke Air Force Base

Permit No. V97-017

Spray Paint Booth
Building 415

Operation and Maintenance Plan

Prepared by 56 CES Air Program Manager

HEALTH, SAFETY AND ENVIRONMENTAL
September 2010

Table of Content

Attachments:
- Sample Maintenance Log

OPERATION AND MAINTENANCE PLAN
FOR
SPRAY PAINTING FACILITY

I GENERAL INFORMATION

Business Name: 56 Fighter Wing

Business Address: Bldg 415, Luke Air Force Base, Arizona 85309-1149

Permit Number: V97-017

Date of Preparation/Revision: 29 Sep 10

General description of overall facility operations: Training aircrew and maintenance personnel on the F-16 aircraft

Brief description of process(es) ducted to control device including pollutants emitted: The spray paint booth is used to paint and refinish a variety of air crew training devices. Pollutants being emitted are VOC's and PM.

Complete description of control device(s) covered by the plan including manufacturer, model, rated capacity, total number of identical units, equipment identification number, etc.:

MANUFACTURER: This room was converted into a spray painting area by base personnel.
NUMBER OF UNITS: 1
RATED CAPACITY: Unknown
FILTER EFFICIENCY: 93 percent

II. OPERATIONS PLAN

Painting of small objects occurs in this booth. The paint booth shall be operated at all times when spray painting is conducted. Booths use exhaust filters or paint overspray arrestors to decrease emissions from the shop by capturing the over-sprayed coating mist and particles before that air is exhausted from the shop into the environment. These filters are located at the opposite end of the intake filters in cross-draft booths. Readings from a manometer is used to establish a change out schedule for the exhaust filters. Once the manometer exceeds 0.5 inches of water column reading, filter are removed and replaced. Only HVLP spray painting guns will be used.

Operational Parameters and Limits

Parameter	Units	Limits	Instrument	Frequency
Differential Pressure	Inches of Water Column (W.C.)	0.15 to 0.5 W.C.	Manometer	Prior to each use.
Visible Emissions	Opacity	No Visible Emissions	N/A	Weekly

1. Paint Booth Filters have an efficiency rating of greater than 93 percent for particulate removal.
2. The area around the spray booth will be inspected weekly for signs of painting that occurred outside of the spray paint booth.

III MAINTENANCE PLAN

1. Filters will be inspected prior to each use for rips, tears, or sags and replaced as needed.
2. Manometer will be check prior to each use. Range of operations is 0.15 and 0.5 W.C.

NOTES: Records are required to be maintained for a minimum of five years.

IV TRAINING REQUIREMENTS

Personnel will be briefed on the operation and maintenance of equipment upon arrival to this duty location. Briefings will include VOC record keeping requirements.

SPRAY BOOTH
INSPECTION LOG
FOR MONTH OF _____
BLDG 415

DATE	MANOMETER READING (0.15 – 0.5 W.C.)	WEEKLY FILTER INSPECTION (y/n)	WEEKLY OUTSIDE INSPECTION (y/n)	INITIALS	COMMENTS
1					
2					
3					
4					
5					
6					
7					
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Adopted	22 Mar 04
Approved	10 Jun 04
Revised	27 Jul 09
Approved	9 Aug 09

56th Equipment Maintenance Squadron
Fabrication Flight
Corrosion Control
Located at Luke Air Force Base

Permit No. V97-017

ABRASIVE BLASTING BOOTH
Building 907

Operation and Maintenance Plan

Prepared by 56 CES Air Program Manager

HEALTH, SAFETY AND ENVIRONMENTAL
July 2009

Table of Content

Attachments:

1. Maintenance Log (Daily, Weekly, Monthly)
2. Hourly Usage Log
3. Monthly Manometer Log

OPERATION AND MAINTENANCE PLAN
FOR
Bead Blaster

OPERATION AND MAINTENANCE (O&M) PLAN

I. GENERAL INFORMATION

Business Name: 56 Fighter Wing

Business Address: Bldg 907, Luke Air Force Base, Arizona 85309-1149

Permit Number: V97-017

Date of Preparation/Revision: August 2011

General description of overall facility operations: Training aircrew and maintenance personnel on the F-16 aircraft

Brief description of process ducted to control device including pollutants emitted: The bead blaster is used for removing paint from aircraft parts and support equipment.

Complete description of control device(s) covered by the plan including manufacturer, model, rated capacity, total number of identical units, equipment identification number, etc.:

Pauli Systems Model PD411D, Grit Blast Unit consists of metal enclosure, a media reclaiming blast machine, and a self cleaning dust collector system:

- Blast/Reclaimer assembly consists of a cyclone separator, storage hopper and a low profile hopper, and a blast machine. The cyclone separates the used and unused media though a specified gravity by dropping unused media into the hopper and carrying away the wasted media to the dust collection system.
- Dust Collector Assembly consists of blower, 24 filter elements (HEPA) 99.9% to 5 micron, and an electronic controlled pneumatic cleaning system (6 pulse valves). This cleaning system injects a blast of air into the dust collector cartridge knocking off the loose particles (dust) in dust collector drum located at the bottom section of the dust collection unit.
-

Item	Specifications			
General Supply Air	220 cfm at 100 psi with ½ inch blast nozzle, 50 psi blast pressure			
Blast/Reclaimer Blower Capacity Storage Hopper Capacity	900 cfm 18 cu. ft (1,000 lb plastic; 1600 lb glass beads; 2700 lb aluminum oxide)			
Dust Collector Blower Capacity	12,000 cfm, 15 hp (Size 1)			
	40 PSI	60 PSI	80 PSI	100 PSI
½ inch Nozzle	159	217	274	332

II OPERATIONS PLAN

Daily Operations Table

You should look for the following items after startup:

Parameter	Unit	Limits	Instrument	Frequency
Visible Emission at cyclone	Opacity	No Visible Emissions	N/A	Daily
Differential Pressure at dust collector	Inches of water	0.1 – 2.6	Manometer	Weekly

How to Start Equipment:

a. Set control panel disconnect switch to ON.
b. Press control panel BLOWER 2 START pushbutton.
c. Press control panel BLOWER 1 START pushbutton.
d. Set control panel LIGHTING switch to ON.
e. Open blast machine air valve to allow air flow to air purifier.
f. Close blast machine inlet valve petcock
g. If necessary, open needle valve (above moisture separator) to allow air flow to low profile hopper vibrator.

Note: If emissions are visible stop all operation immediately, Notify the immediate supervisor and lockout the machine as required. **Do not operate in this condition**. See shut down procedure below. Emission control system shall be operating when any abrasive blasting is being conducted.

Equipment Shutdown Procedure:

a. On control panel, press BLOWER 1 and BLOWER 2 STOP pushbuttons, set LIGHTING switch to OFF and set disconnect switch to OFF.
b. Shut blast machine air valve.
c. Shut needle valve (above moisture separator).
d. Open inlet valve petcock to relieve pressure in blast machine.

III MAINTENANCE PLAN

Daily

1. Check to ensure door seals properly
2. Inspect blast media for contamination/moisture
3. Inspect magnetic separator and remove any particles
4. Check and clean dust hopper for build-up as necessary

Weekly

1. Check and annotate manometer reading. Manometer should read between 0.1 and 2.6 inches of water.
2. Clear foreign objects from hopper screen
3. Check and replace blast hoses for cracks.
4. Check for visible emissions.

Monthly

1. Check filters for serviceably; replace filters if the manometer reads 2.6 or higher.

IV Training Requirements

Personnel will be brief on the operation and maintenance of equipment upon arrival to this duty location. This training is documented in the worker's AF Form 55.

CYCLONE MAINTENANCE LOG
BLDG 907
FOR THE MONTH OF _____

	DAILY				WEEKLY				MONTHLY
	Check door seals	Check and clean dust hopper	Check and clean magnetic separator	Check media for contamination and moisture	During operations check for visual emissions	Check and annotate manometer	Check and replace blast hose when cracked	Clear foreign objects from hopper screen	Check and replace filters when manometer exceeds 2.6" of water
1									
2									
3					1				
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7									
8					2				
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13									
14					3				1
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21					4				
22									
23									
24									
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26									
27									
28					5				
29									
30									
31									

INITIAL WHEN COMPLETED. NOTE: RECORDS MUST BE RETAINED FOR FIVE YEARS

BLASTING USAGE LOG
BLDG 907
FOR THE MONTH OF _____
(CHANGE OUT MEDIA AFTER 800 HOURS OF OPERATION)

Day	LAST NAME	START	STOP	TOTAL HOURS TO DATE	POUNDS OF MEDIA ADDED
1					
2					
3					
4					
5					
6					
7					
8					
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10					
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13					
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31					

NOTE: RECORDS MUST BE RETAINED FOR FIVE YEARS

DUST COLLECTOR LOG
Building 907
FOR MONTH OF _____

CHANGE HEPA FILTERS WHEN READING REACHES 2.6" OR ABOVE

FILTERS LAST CHANGED ON _____

FORM IS TO BE MAINTAINED FOR 5 YEARS

CODE/FILTER CHANGED

F = 24 HEPA FILTERS

Adopted	22 Mar 04
Approved	10 Jun 04
Revised	22 May 09
Approved	19 Aug 09
Revised	17 Aug 11
Approved	26 Aug 19

56th Equipment Maintenance Squadron
Fabrication Flight
Corrosion Control

Located at Luke Air Force Base

Permit No. V97-017

SPRAY PAINT BOOTH

Building 922

Operation and Maintenance Plan

Prepared by 56 CES Air Program Manager

HEALTH, SAFETY AND ENVIRONMENTAL
May 2009

Table of Content

Attachments:

1. Sample Manometer Log
2. Sample Maintenance Log

OPERATION AND MAINTENANCE (O&M) PLAN

I. GENERAL INFORMATION

Business Name: 56 Fighter Wing

Business Address: Bldg 922E and 922W, Luke Air Force Base, Arizona 85309-1149

Permit Number: V97-017

Date of Preparation/Revision: August 2011

General description of overall facility operations: Training aircrew and maintenance personnel on the F-16 aircraft

Brief description of process ducted to control device including pollutants emitted: Painting of aerospace equipment. Particulate matter and VOC's

Complete description of control device covered by the plan including manufacturer, model, rated capacity, total number of identical units, equipment identification number, etc.:

2 each - JBI Spray Booths, Industrial Dry Type, Model: TDB-6816-S Cross Draft System. Each booth is identical and consists of 68' x 68' cross draft paint booth internally with 3 stage particulate (175 element) filtration system rated at 93% efficient and a single stage activated carbon pellet filter for VOC absorption rated above 83% efficient.

2 each - 2 Control Instruments Corporation Model: DATAMAX 4000 Gas and Vapor Monitoring system. Unit consists of 4 channel monitoring system that ranges from 0-99% LFL for combustible gas only and 0-99.9% LEL for PPM monitoring. Organic matter (sampling) is burned in hydrogen flame releasing ions which are collected and analyzed and converted into a PPM concentration reading. The control device is a VOC alarm that is triggered when VOC are exceeding the set limit. See Calibration instruction in equipment operation manual.

3 each - Paint Booth Blowers per paint booth: Hartzell Fan, Inc

a. Two paint booths are located in Bldg 922.

1each Blower Motor	40 HP	1800 RPM

II OPERATIONS PLAN

Daily Operations Table

You should look for the following items after startup:

Parameter	Units	Limits	Instrument	Frequency
Visible Emissions	Opacity	No Visible Emissions	N/A	Daily
Voc Meter	PPM	Alarm Generated	DataMax 4000	Daily
Differential Pressure	Inches of water	0.1 – 2.6	Manometer	Prior to Use but not more frequent than once per day
Painting outside of facility		No painting allowed		Weekly

Sequence of Startup Operation:

a. Turn on the power to the panel at the main breaker. (The black handle on the face of the control panel.)
b. Turn on the lights for the booth (both the ceiling and side lights). Select the on position on the LIGHTS ON / OFF switches.
c. Depress the SYSTEM START button to enter the system start-up sequence.
d. The following lights will illuminate once the start button is depressed:
   - "SYSTEM ENERGIZED" light
   - "EXHAUST UNIT #1 ON" light
   - "EXHAUST UNIT #2 ON" light
   - "EXHAUST UNIT #3 ON" light
e. The switch for VOC detection should be selected for the ON position at all times.
f. Depressing the "EMERGENCY STOP" button at any time will shut down the system.

NOTE: If the VOC alarm is triggered immediately shut the booth down and cease all paint operations until the contractor can be consulted. **Do not operate in this condition.** Emissions control system shall be in operation at all times when painting activities are being conducted.

Sequence Shutdown Operation:

b. Turn off the power by depressing the SYSTEM STOP button.
c. Turn off the lights for the booth (both ceiling and side lights) by selecting the position off on the LIGHTS ON / OFF switch.
d. Turn off the power to the panel at the main breaker (black handle on the face of the control panel).

III MAINTENANCE PLAN

Daily

1. Inspect filters for rips, tears, or sags
2. Check and annotate manometer reading, prior to use but no more frequent than daily.
   a. Manometer should read between 0.1 and 2.6 inches of water.
   b. Filter Change out will be direct at the following:
      1st stage curtains: .4" above baseline
      2nd stage and 3rd stage: 1.5" above baseline*.

      *Note: if all 3 stage need to be change before monthly maintenance, then the contractor will be contacted and arrangements will be made in advance to change the filters, the booth will not be operated above these set standards

Weekly

1. Inspected for evidence of painting occurring outside of facility.

Monthly

1. Contractor performs all preventative maintenance monthly and filter changes as required to include the following:
   a. Independent laboratory testing of the charcoal filters for absorption efficiency, Filter changed out when they reach 82% efficiency and below. Booth operation will stop until this can be accomplished.
   b. Check and replace door seals, lighting, and all booth related equipment as required.
   c. Check gas levels on flame ionization system, order replacement gas, and recalibration of the system after gas change out or if unit is reading recalibration error code.

NOTES: Records are required to be maintained for a minimum of five years.

IV Training Requirements

Personnel will be brief on the operation and maintenance of equipment upon arrival to this duty location to include VOC record keeping requirements and proper paint application methods. This training will be track in personnel AF Form 55.

BLDG 922 SPRAY BOOTH DAILY INSPECTION CHECKLIST

DATE (Day/Month/Year)	TIME (HH:MM)	FILTER INSPECTION (No Gaps, Sags, or Holes)	FACILITY INSPECTION (Spraying outside of facility)	NAME (Rank, First Name, Last Name)

WEEKLY MANOMETER READING PER JBI ORIGINAL BASELINE ____			
CHANGE ROLL-UP FILTERS WHEN READING REACHES 0.4" ABOVE BASELINE			
CHANGE ALL 3 STAGES WHEN READING REACHES 1.5" ABOVE ORIGINAL BASELINE			
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[illegible]			
FORM IS TO BE MAINTAINED FOR 5 YEARS			
CODE/FILTER CHANGED			
R = ROLL UP (PRESTAGE)			
S1 = STAGE 1 (24"X24" SQUARE)			
S2 = STAGE 2 (TEABAGS)			
C = CARBONS			
D = FRONT DOOR (24"X24" SQUARE)			

TYPE	LOCATION	BASE NO.	SERVICE DUE	HYDRO DUE