



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 377TH AIR BASE WING (AFMC)

KAFB Red 94

ENTERED

7 Oct 94

377 ABW/EMC
2000 Wyoming SE
KAFB, NM 87117-5659

Barbara Hoditschek
New Mexico Environment Department
Hazardous and Radioactive Materials Bureau
525 Camino De Los Marquez
P.O. Box 26110
Santa Fe, New Mexico 87502

Dear Ms Hoditschek

As discussed with NMED in August of 1994, air modeling of the Kirtland Air Force Base (KAFB) Open Detonation (OD) unit has been performed. The attached "white paper" of the modeling results indicate that no impact to the air occurs during OD treatment events. The modeling results have been compared to AQCR 702.

Based on the comparison KAFB proposes at this time to take no further action based on the modeling results. Operations at the OD will continue to follow the practices described in the Resource Conservation and Recovery Act (RCRA) Part B permit application.

If you have any questions, please contact Terry Cooper at 846-0007.

Respectfully

Walter S. Darr III
WALTER S. DARR III
Chief Compliance
Environmental Management

Attachment

1. White Paper on Modeling

KAFB1519



RESULTS OF AIR MODELING FOR THE KIRTLAND AIR FORCE BASE OPEN DETONATION AND OPEN BURNING TREATMENT FACILITIES

INTRODUCTION

Kirtland Air Force Base (KAFB), located in Albuquerque, New Mexico, treats various hazardous materials through open detonation (OD) and open burning (OB). The waste treated at the OB and OD units is characterized as D001 and D003. Treatment at the OD unit is facilitated by the use of explosives. Treatment at the OB unit is accomplished by igniting munitions with fuel and wood.

Criteria and non-criteria pollutant emissions from these events were estimated based on emission factors derived by the U.S. Army Armament, Munitions and Chemical Command and from the United States Environment Protection Agency (USEPA) Compilation of Air Pollution Emission Factors (AP-42). These emissions were modeled to arrive at off-site receptor air concentrations using the INPUFF model. The INPUFF model is considered to be the best for determining OD and OB single event point sources.

PURPOSE

The INPUFF modeling was performed to show that no significant air pollution impacts are occurring from treatment activities at the OB/OD units located within KAFB. In the near future, as the City of Albuquerque obtains regulatory authority for the Clean Air Act, KAFB will have to prove that no impacts to the ambient air is occurring from treatment activities. In addition, the air modeling performed on the OB and OD units will be used in conjunction with soil sampling results to further show that no contamination is occurring due to treatment events.

PROCEDURES AND METHODS

The INPUFF model concentrations of the off-site receptors were compared to both Bernalillo ambient air quality standards and New Mexico Quality Control Regulation (AQCR) 702 limits, to determine if the OB or OD treatment activities have significant impact on air quality. The constituents modeled were taken from Appendix B of the OB and OD unit Resource Conservation and Recovery Act (RCRA) Part B permit applications. Currently treatment occurs only at the OD unit. The nearest off-site receptor is approximately 5600 meters from the EOD range.

Comparisons of the highest modeled concentrations from the OB and OD unit treatment activities to the national, state and Bernalillo County ambient air quality

standards can be found in Table 1-1. The results in Table 1-1 and 1-2 are for a distance of 1.5 kilometers in a 24 hour period.

RESULTS

The results of the INPUFF modeling are found in Table 1-1 and Table 1-2 of this paper. Results of the modeling have been compared to applicable air quality standards for the national, state and Bernalillo County. For every pollutant, modeled concentrations fall far below the applicable ambient air quality standards.

INTERPRETATION OF DATA

Comparisons of the highest modeled concentrations from the OB and OD treatment activities to the applicable air emission standards can be found in Table 1-1 and Table 1-2. Over 30 constituents were modeled and compared to the New Mexico standards. The AQCR 702 limits correspond to one thousandth of the occupational exposure levels. Again, all modeled pollutant concentrations fell far below their corresponding AQCR 702 limits. See Table 1-2 of this paper for the modeled concentrations.

CONCLUSION

Based on these results, the OB and OD treatment activities at KAFB should not have a significant impact on the air quality at off-site receptor locations.

Based on the comparison of the INPUFF model results to the AQCR 702 standards the treatment activities at the OB and OD units does not have a significant impact on the air quality in Bernalillo County or the receptor sites. Therefore, KAFB will take no further action (a risk assessment will not be performed) and the practices at the OD/OB units will continue as described in the OB and OD RCRA Part B permit applications. The practices in the RCRA Part B permit application that prevent significant impacts in: no treatment activities when atmospheric conditions are unfavorable; limiting what can be treated at the OB and OD units; obeying the burn-no-burn regulation.

**Table 1-1
Comparison of Modeled OB/OD Results to Ambient Air Quality Standards**

Pollutant	Bernalillo Ambient Air Standard	State AA Standard	Federal AA Standard	Highest KAFB Open Burning Result (ug/m³)	Highest KAFB Open Detonation Result (ug/m³)
Copper and Zinc					
30-day	10 ug/m ³			--	--
Beryllium					
30-day	0.01 ug/m ³	0.01 ug/m ³		NA	NA
Carbon Monoxide					
1-hour	15 mg/m ³	13.1 ppm	40,000 ug/m ³	9.86E-04	1.93E-03
8-hour		8.7 ppm	10,000 ug/m ³	1.23E-04	2.44E-04
Annual	4.6 mg/m ³			3.01E-06	7.51E-06
Non-Methane Hydrocarbons					
3-hour	100 ug/m ³	0.19 ppm		4.37E-07	2.86E-06
Hydrogen Sulfide					
1-hour	0.003 ppm	0.010 ppm		3.00E-04	7.56E-05
Sulfur Dioxide					
3-hour			1300 ug/m ³	9.87E-07	1.09E-05
24-hour	92 ug/m ³	0.10 ppm	365 ug/m ³	1.23E-07	1.39E-06
Annual	11 ug/m ³	0.02 ppm	80 ug/m ³	9.02E-09	1.27E-07
PM10					
24-hour	150 ug/m ³	150 ug/m ³	150 ug/m ³	6.85E-06	1.92E-03
7-day		110 ug/m ³		9.79E-07	2.74E-04

30-day		90 ug/m ³		2.28E-07	6.40E-05
Annual	60 ug/m ³	60 ug/m ³	50 ug/m ³	5.01E-07	1.75E-04
Lead					
30-day	3 ug/m ³			6.83E-09	8.17E-08
3-month			1.5 ug/m ³	6.00E-08	3.82E-08
Nitrogen Dioxide					
24-hour	117 ug/m ³	0.10 ppm		7.19E-07	1.04E-05
Annual	100 ug/m ³	0.05 ppm	100 ug/m ³	5.26E-08	9.47E-07

NA = No beryllium is detonated or burned at KAFB.

-- = No emission factor was available.

**Table 1-2
Comparison of Modeled OB/OD Results to AQCR 702 Levels (1/1000 OEL)**

Pollutant	AQCR 702 Limit (ug/m³)	Maximum Open Burn Concentration (ug/m³)	Maximum Open Detonation Concentration (ug/m³)
Nitric Oxide	--	2.03E-04	5.97E-05
Methane	--	6.57E-07	9.81E-06
Benzene	--	1.03E-08	4.49E-07
Pyrene	--	ND	8.99E-10
Phenol	19.0	3.62E-08	1.03E-07
Dibenzo(a)furan	--	2.30E-09	5.39E-03
Diphenylamine	10.0	ND	1.27E-09
2,4,6-TNT	0.5	4.12E-10	1.38E-08
1-Nitropyrene	--	1.64E-10	4.33E-09
RDX	1.5	ND	8.58E-09
Picric Acid	0.1	ND	2.04E-10
Napthalene	50.0	1.18E-08	6.13E-07
Benzo(a)anthracene	--	1.36E-10	6.54E-10
Benzo(a)pyrene	0.001	7.40E-09	1.23E-08
2,4-Dinitrotoluene	1.5	8.55E-11	3.43E-08
2,6-Dinitrotoluene	1.5	1.18E-10	2.90E-08
2-Nitronapthalene	--	4.46E-10	1.10E-09
N-Nitroso diphenyl amine	--	1.23E-08	5.03E-09
1,3,5 Trinitrobenzene	--	ND	1.12E-11
2-Nitrodiphenylamine	--	1.23E-08	2.94E-10
Biphenyl	1.5	ND	2.12E-10
Phenanthrene	--	ND	7.56E-10
4-Nitrophenol	--	5.67E-09	1.06E-08
Acetylene	--	4.33E-07	7.44E-08
Paraffins	2.00	5.74E-07	5.92E-07
Olefins	--	6.52E-07	1.24E-07
Dibenzyl[A,H]- Anthracene	--	ND	7.07E-09

1&2 Methyl Napthalene	--	ND	1.23E-07
3-Trimethyl 3-Phenylindane	--	ND	2.33E-09
Nonbenzene Aromatics	--	8.05E-07	1.22E-07
Chromium	0.5	3.92E-08	1.44E-08
Nickel	1.0	1.31E-08	1.04E-08
Cadmium	0.05	ND	1.17E-08
Antimony	0.5	3.92E-08	4.33E-09
Barium	0.5	1.31E-09	3.80E-06
Ammonia	18.0	ND	2.49E-04
Hydrogen Cyanide	10.0	ND	1.60E-02
Aluminum	10.0	1.09E-06	ND
Iron	5.00	4.96E-06	ND

ND = No detection.