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**NEW MEXICO  
ENVIRONMENT DEPARTMENT**

***Hazardous Waste Bureau***

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DAVE MARTIN  
Secretary

BUTCH TONGATE  
Acting Deputy Secretary

**CERTIFIED MAIL - RETURN RECEIPT REQUESTED**

September 28, 2011

Colonel Robert L. Maness  
Base Commander  
377 ABW/CC  
2000 Wyoming Blvd. SE  
Kirtland AFB, NM 87117-5606

John Pike  
Director, Environmental Management Section  
377 MSG/CEANR  
2050 Wyoming Blvd., Suite 116  
Kirtland AFB, NM 87117-5270

**RE: OCCURENCES OF GAS BUBBLES IN GROUNDWATER SAMPLES, BULK  
FUELS FACILITY SPILL, SOLID WASTE MANAGEMENT UNITS ST-106 AND  
SS-111, AUGUST 2011  
KIRTLAND AIR FORCE BASE, EPA ID# NM9570024423**

Dear Colonel Maness and Mr. Pike:

The New Mexico Environment Department (NMED) has received a memorandum (hereafter referred to as the Memo) dated August 5, 2011, on the subject "Occurrences of Gas Bubbles in KAFB Groundwater Samples", authored by Mr. Jonathan Myers of Shaw Environmental & Infrastructure, Inc. (Shaw). The Memo was sent to NMED by Mr. Wayne Bitner of Kirtland Air Force Base (KAFB) as an email attachment on August 11, 2011. The Memo was written in response to the observation of gas bubbles in groundwater samples being collected for analysis of volatile organic compounds (VOCs). NMED expressed concern that gas bubbles in water samples would be detrimental to sample integrity. The Memo outlines Shaw's position (and presumably KAFB's position) that the observed gas bubbles are carbon dioxide gas (CO<sub>2</sub>) that has exsolved from the water samples as a result of the reduction in fluid pressure when samples are retrieved from wells screened several tens of feet below the water table.

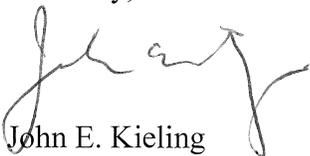
While this may be a plausible explanation, other explanations are possible, including an air leak in the sample tubing. One way to differentiate between these two potential sources of gas bubbles is to sample and analyze the gas. If the gas is chiefly CO<sub>2</sub>, then exsolved CO<sub>2</sub> is likely the source of the gas bubbles. If the results of the gas analysis are similar to the composition of air, then an air leak in the sampling equipment is likely the source of the gas bubbles.

Therefore, NMED directs the U. S. Air Force (Permittee) to submit to the NMED by **October 27, 2011** a list of wells in which gas bubbles have been and are being observed, and which are not known to be the result of entrained air from a leak in sampling equipment. Gas bubbles were observed by the NMED in water samples from wells KAFB-106045, KAFB-106061, and KAFB-106081. NMED also directs the Permittee to collect and analyze the gas bubbles in water samples from the wells on the list to determine the composition of the gas or gases. This sampling must be completed by **November 10, 2011**. The results of the testing must be submitted to the NMED by **February 7, 2011**.

The Permittee shall also ensure that groundwater samples shall not contain entrained air from leaking sampling equipment. Any such leaking equipment shall be repaired or replaced before groundwater samples are collected for laboratory analysis.

Should you have any questions, please contact Mr. William Moats of my staff at (505) 222-9551.

Sincerely,



John E. Kieling  
Acting Chief  
Hazardous Waste Bureau

cc: W. Moats, NMED HWB  
W. McDonald, NMED HWB  
S. Brandwein, NMED HWB  
S. Reuter, NMED PSTB  
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