



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

DEC 09 2015

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2000 Wyoming Blvd SE  
Kirtland AFB, NM 87117-5600

Mr. John Kieling  
Chief, Hazardous Waste Bureau  
New Mexico Environment Department  
2905 Rodeo Park Drive East, Bldg 1  
Santa Fe, New Mexico 87505

Dear Mr. Kieling,

Please find attached, *“Follow-up documentation regarding false nitrite and phosphate detections in influent and effluent samples from the Bulk Fuel Facility Temporary Treatment System, at Kirtland Air Force Base, New Mexico under Temporary Permission to Discharge DP-1770”*.

Samples of influent (untreated) and effluent (treated) groundwater at the Kirtland Air Force Base Bulk Fuel Facility Temporary Treatment System (TTS) were collected on September 8, 2015 at the request of Dr. Patrick Longmire so he could evaluate the potential for formation of precipitates if the treated water is re-injected into the aquifer at well KAFB-7. These samples were reported to contain nitrite at a concentration exceeding the 1.0 mg/L USEPA maximum contaminant limit (MCL). Evaluation of the laboratory analyses, and subsequent resampling on September 15, 2015, showed that the initial reported concentrations were false, and that nitrite in both the influent and effluent samples was non-detect at a detection limit of 0.015 mg/L. The attached report documents the receipt of the initial data, shutdown of the TTS until the results were reviewed, and collection and analysis of additional samples to confirm that nitrite was non-detect.

If you have any questions or concerns, please contact Mr. L. Wayne Bitner at (505) 853-3484 or at [ludie.bitner@us.af.mil](mailto:ludie.bitner@us.af.mil) or Ms. Victoria Branson at (505) 846-6362 or at [victoria.branson@us.af.mil](mailto:victoria.branson@us.af.mil).

ERIC H. FROEHLICH, Colonel, USAF  
Commander

Attachement:

Follow-up documentation regarding false nitrite and phosphate detections in influent and effluent samples from the Bulk Fuel Facility Temporary Treatment System, at Kirtland Air Force Base, New Mexico under Temporary Permission to Discharge DP-1770, December 7, 2015

cc:

NMED-EHD (Roberts, McQuillan, Agnew)  
NMED-HWB (Cobrain, McDonald)  
NMED-GWQB (Huddleson, Pullen, Hunter)  
NMED-PSTB (Reuter)

NMED-OGC (Kendall)

SAF-IEE (Lynnes)

U.S.EPA Region 6 (King, Ellinger)

AFCEC-CZRX (Bodour)

USACE-ABQ District Office (Simpler, Phaneuf)

Public Info Repository (Central New Mexico Community College), Administrative Record/Information  
Repository (AR/IR), and File

December 7, 2015

**Subject: Follow-up documentation regarding false nitrite and phosphate detections in influent and effluent samples from the Bulk Fuel Facility Temporary Treatment System, at Kirtland Air Force Base, New Mexico under Temporary Permission to Discharge DP-1770**

Dr. Patrick Longmire, an Engineer Specialist with the New Mexico Environment Department (NMED) DOE Oversight Bureau, requested that Kirtland Air Force Base (KAFB) collect one-time samples of influent groundwater and treated (effluent) groundwater from the Bulk Fuel Facility (BFF) Temporary Treatment System (TTS) to evaluate the potential for formation of precipitates if the treated water is re-injected into the aquifer at well KAFB-7. These samples were collected on September 8, 2015 and analyzed for the following analytes: total and dissolved metals, anions, total organic carbon, dissolved organic carbon, total Kjeldahl nitrogen (TKN), total and dissolved alkalinity, and total dissolved solids.

The preliminary analytical results were received from Cal Sciences at 10 PM Friday September 11, 2015, by e-mail. The results showed that nitrite (as nitrogen) concentrations reported in both influent and effluent samples at 2.4 mg/L, which exceeded the 1.0 mg/L USEPA maximum contaminant limit (MCL). Phosphate, which has no federal MCL or New Mexico Water Quality Control Commission (WQCC) groundwater standard, was detected at 2.7 mg/L. All other analytes that had a federal MCL or WQCC groundwater standard were present at less than the applicable standard.

The reported nitrite exceedance and phosphate concentration were not consistent with prior analytical results from groundwater or treated effluent. As a result, CB&I requested the instrument raw data for the anion analyses. Based on the chromatograms for both samples, CB&I concluded that false nitrite and phosphate results were reported. There was no instrument peak within the nitrite retention time window and there was no instrument response within the phosphate retention time window. If nitrite and phosphate were truly present in these samples, then the instrument would generate positive responses that fall within the target analyte retention time windows. These conclusions were then discussed with Cal Sciences, and the laboratory reviewed other non-KAFB samples which contained nitrite and phosphate and had been analyzed immediately prior to the KAFB samples. Cal Sciences concluded that, due to a data loading error, nitrite and phosphate data were incorrectly reported for the KAFB samples. Except for nitrite and phosphate, results of other anions matched the chromatograms.

The analytical results for the September 8, 2015 samples and the results of CB&I's preliminary data evaluation were then reported to the New Mexico Environment Department Hazardous Waste Bureau (NMED-HWB) by email the morning of September 15, 2015. In addition to the data evaluation, KAFB and the NMED HWB agreed to the following conservative course of action in response to the nitrite results:

- (1) The temporary treatment plant would be shut down and remain so until the data issue was resolved and
- (2) Influent and effluent samples would be collected and submitted to Cal Sciences for nitrite and phosphate analysis.

The temporary treatment plant shut down automatically at 1:00 AM on Monday September 14, 2015 due to a programmable logic controller (PLC) programming problem, and was confirmed shut down by the operator at 7:03AM on September 14, 2015. A second set of influent and effluent samples (from the influent and effluent equilibration/holding tanks since the system was not running) were collected on September 15, 2015 and sent to Cal Sciences for same-day analysis of nitrite. Cal Sciences' preliminary analytical results, which were received on September 16, 2015, reported nitrite as non-detect at a detection limit of 0.015 mg/L. After performing maintenance while the system was shut down, treatment operations resumed at 6:45 AM on Saturday September 19, 2015.

The final analytical report, which was received on October 6, 2015, corrected nitrite to non-detect at a detection limit of 0.015 mg/L in both the influent and effluent samples to the Temporary Treatment System in the September 8, 2015 samples. It was also confirmed that nitrite was non-detect at a detection limit of 0.015 mg/L in both the influent and effluent September 15, 2015 samples. Phosphate was also corrected to non-detect in the September 8 influent and effluent samples. The analytical results are summarized in Table 1.

The Cal Sciences' October 6, 2015 Corrective Action Report states that the chemist had loaded the wrong analytical data file into the Laboratory Information Management System (LIMS). The chemist discovered that it was the wrong file and loaded the correct data file, but nitrite and o-phosphate data were not overwritten by the new uploaded file in the LIMS. The corrective action was that, rather than attempting to overwrite an existing, incorrect LIMS file, the incorrect file would be cleared before the correct data file is uploaded. The final analytical and quality control reports for the corrected September 8, 2015 samples and the September 15, 2015 samples, and the Cal Sciences Corrective Action Report, are attached.

**Table 1. Laboratory Data Analysis**Final validated and QC'ed September 8, 2015 results:

LOCATION CODE		KAFB-106228-INF				KAFB-106228-EFF			
SAMPLE NO		RAPID- INF01				RAPID- EFF01			
SAMPLE DATE		9/8/2015				9/8/2015			
LABORATORY		Cal Science				Cal Science			
LAB DATA DUE		9/11/2015				9/11/2015			
Parameter	EPA MCLs <sup>a</sup>	Result	DL	LOD	LOQ	Result	DL	LOD	LOQ
Nitrite as Nitrogen	1	ND	0.015	0.05	0.1	ND	0.015	0.05	0.1
Phosphate	NE	ND	0.031	0.05	0.1	ND	0.031	0.05	0.1

Final validated and QC'ed September 15, 2015 results:

LOCATION CODE		KAFB-106228-INF				KAFB-106228-EFF			
SAMPLE NO		RAPID- INF02				RAPID- EFF02			
SAMPLE DATE		9/15/2015				9/15/2015			
LABORATORY		Cal Science				Cal Science			
LAB DATA DUE		9/16/2015				9/16/2015			
Parameter	EPA MCLs <sup>a</sup>	Result	DL	LOD	LOQ	Result	DL	LOD	LOQ
Nitrite as Nitrogen	1	ND	0.015	0.05	0.1	ND	0.015	0.05	0.1

## Notes:

a = EPA MCLs are from the EPA RSL Table, dated June 2015.

NE = not established

ND = not detected

DL = detection limit (the smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence)

LOD = limit of detection (the smallest concentration of a substance that must be present in a sample in order to be detected at 99% confidence level)

LOQ = limit of quantitation (lowest concentration of a substance that produces a quantitative result within specified limits of precision and bias)