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BUTCH TONGATE
Cabinet Secretary

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Deputy Secretary

July 27, 2018

The Honorable Maggie Hart Stebbins
Bernalillo County Commissioner, District 3

The Honorable Pat Davis
Albuquerque City Councilor District 6

Sent by email to Janis Hartley, jhartley@bernco.gov

RE: Kirtland Air Force Base (KAFB) Bulk Fuels Facility (BFF) aviation fuel leak

Dear Commissioner Hart Stebbins and Councilor Davis:

The New Mexico Environment Department (NMED) is in receipt of your letter dated July 12, 2018 regarding the KAFB BFF cleanup project. Protecting Albuquerque's aquifer and drinking water supply wells continues to be a top priority for NMED. During the past several years, significant progress has been made to investigate the magnitude and extent of groundwater contamination, and to implement interim corrective measures to abate soil-vapor and groundwater contamination.

The Air Force's Resource Conservation and Recovery Act (RCRA) Facility Investigation Report (RFI) submitted in January 2017 was determined by NMED to contain a number of technical deficiencies that were discussed in numerous calls and meetings in 2017. A draft letter detailing these deficiencies was provided to the Air Force in January 2018. This draft letter resulted in the initiation of negotiations between NMED and the Air Force to resolve the technical deficiencies, and the letter was never finalized. Early in the negotiations, it was agreed that the RFI would be re-submitted in two phases. The Phase 1 RFI would include all investigations and data through December 31, 2015, and the Phase 2 RFI would include all investigations and data after January 1, 2016. At the time of my March 21, 2018 presentation to the Albuquerque Bernalillo County Water Utility Authority (ABCWUA) governing board, discussions with the Air Force to resolve the RFI technical deficiencies were still ongoing. The Phase 1 RFI is undergoing internal review by the Air Force and we expect it will be submitted to our office in August.

KAFB4690



As you are aware, the KAFB BFF aviation fuel leak has created exceedances of state and federal water quality and environmental standards. The RFI is a document that is part of the regulatory process that will ultimately lead to abatement of the contamination. Discussions, including negotiations, between NMED, as the regulator, and the Air Force, as the regulated entity, to resolve technical deficiencies in the RFI regulatory document, are not public discussions or meetings. The Phase 1 and 2 RFI reports, when submitted, will be public documents.

On November 16, 2017, NMED directed the Air Force to use a numerical or analytical model for plume capture analysis in accordance with U.S. Environmental Protection Agency (EPA) guidance, which can be found at <https://www.env.nm.gov/wp-content/uploads/2016/05/KAFB-BFFS-Notice-of-Deficiency-11-16-2017.pdf>. While models had been developed earlier in the project by EPA and by CB&I, the Air Force's consultant at that time, the Air Force's preferred model for complying with NMED's plume capture directive was FEFLOW. The rationale for the Air Force's preference for FEFLOW was explained in their April 5, 2018 letter to NMED, which can be found at <https://hwbdocuments.env.nm.gov/Kirtland%20AFB/KAFB4655.pdf>. NMED conditionally approved the Air Force's use of FEFLOW for plume capture analysis by letter of April 23, 2018, which can be found at <https://hwbdocuments.env.nm.gov/Kirtland%20AFB/KAFB4681.pdf>. While FEFLOW is a proprietary model, the FEFLOW viewer can be downloaded for free. In the viewer mode, FEFLOW does not need a license, and Supermesh files, models and results can be loaded and inspected. A reviewer can open model files in any text reader and identify the full suite of assigned aquifer property, recharge, layer elevation, and boundary condition values. On April 24, 2018 the Air Force contractor provided ABCWUA and NMED staff with a demonstration of the FEFLOW viewer.

NMED has retained Daniel B. Stephens and Associates (DBS&A) to provide modeling expertise as follows:

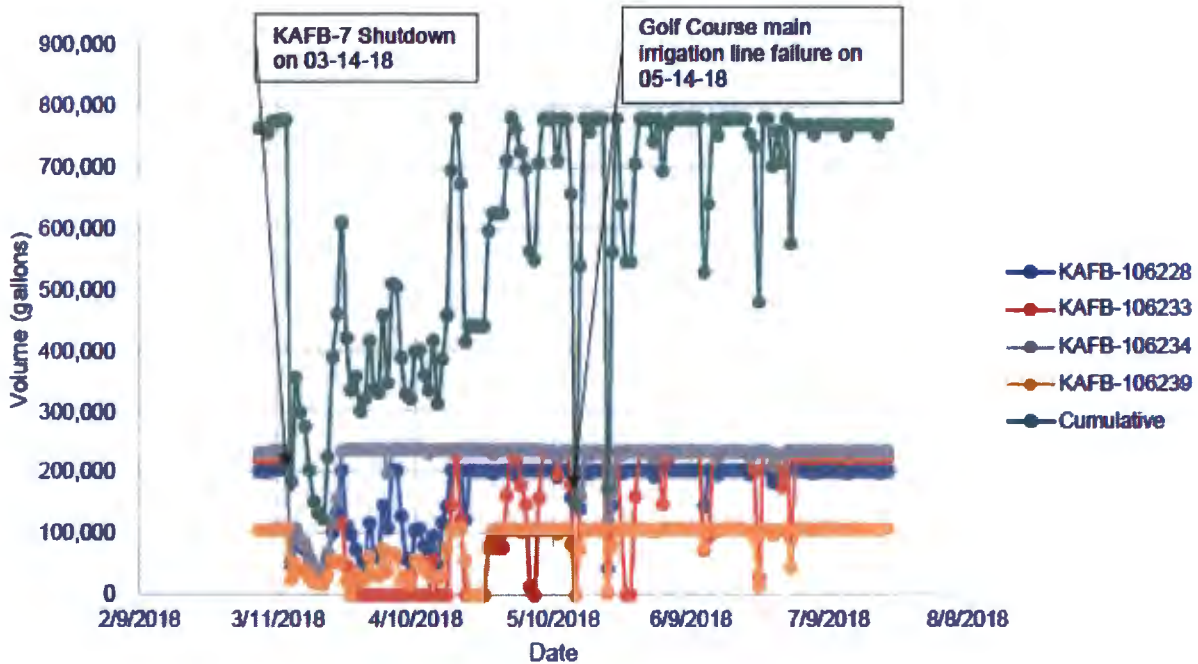
- Review of FEFLOW plume capture modeling performed by the Air Force; and
- Independent plume capture modeling utilizing a public domain software.

DBS&A attended a technical work group (modeling) meeting on June 14, 2018 that also was attended by the Air Force, NMED, ABCWUA and Intera, the ABCWUA consultant. The first written report prepared for NMED by DBS&A is attached for your information and was previously provided to ABCWUA and to the City of Albuquerque Environmental Health Department (AEHD). We hope to compare results from these different plume capture models at the next public meeting scheduled for November 15, 2018. While models are useful tools, it is important to note that actual plume capture and plume collapse will be verified by multiple lines of evidence, including decreases in contaminant concentrations and in shrinkage of the plume footprint area, as observed in site monitoring wells.

As your letter points out, actual pumping rates realized in the field do not always agree with what the pumping rates were expected to be. Models used to analyze performance of the groundwater extraction system will be verified and calibrated through the use of actual field data. While overall pumping rates have sometimes slowed down due to maintenance, mechanical issues and

installation of new equipment, the four extraction wells have been pumping at close to maximum capacity for most of the past three months, as shown in the graph of daily extraction volume below.

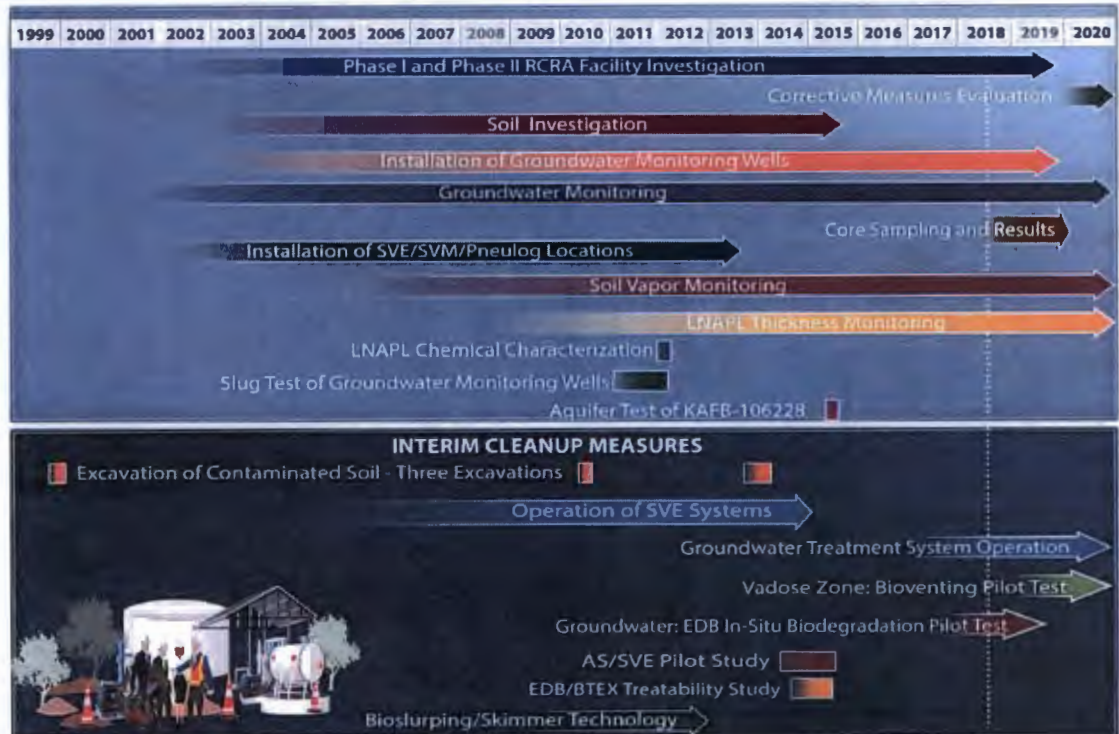
Daily Extraction Volume of the KAFB BFF Extraction Wells



An attempt by the Air Force to retrofit an extraction well with a variable pump speed controller was unsuccessful due to electrical issues that caused equipment overheating. The well pumps, however, can be turned on and off to pump for less than 24 hours per day, as has been done at other pump and treat sites.

An updated schedule for the timing of data collection, reporting and filling of remaining data gaps was also presented at the July 12, 2018 public meeting. Copies of those slides are provided below. Additionally, NMED will begin to publish a periodic newsletter for the BFF cleanup project that will be posted on our website and sent to our listserv subscribers. As you requested, a copy of the organizational chart for the NMED team working on the KAFB BFF project also is provided below.

Site Activity Timeline



AS Air Sparge • ITCE - Benzene, Toluene, Ethylbenzene and Xylenes • EDB - Ethylene Dibromide • LNAPL - Light Non-Aqueous Phase Liquid • RFI - RCRA Facility Investigation • SVE - Soil Vapor Extraction • SVM - Soil Vapor Monitoring

2018 to 2020 Activities

2018

- In-situ bioremediation pilot test is underway
- Drilling to fill groundwater and LNAPL data gaps is underway
- Public Involvement Plan will be published for public comment, then finalized with edits/additions based on public input
- Risk Assessment will be finalized
- Phase 1 RFI report will be submitted
- Bioventing pilot test will be commenced
- Plume capture analyses will be performed by USAF and NMED

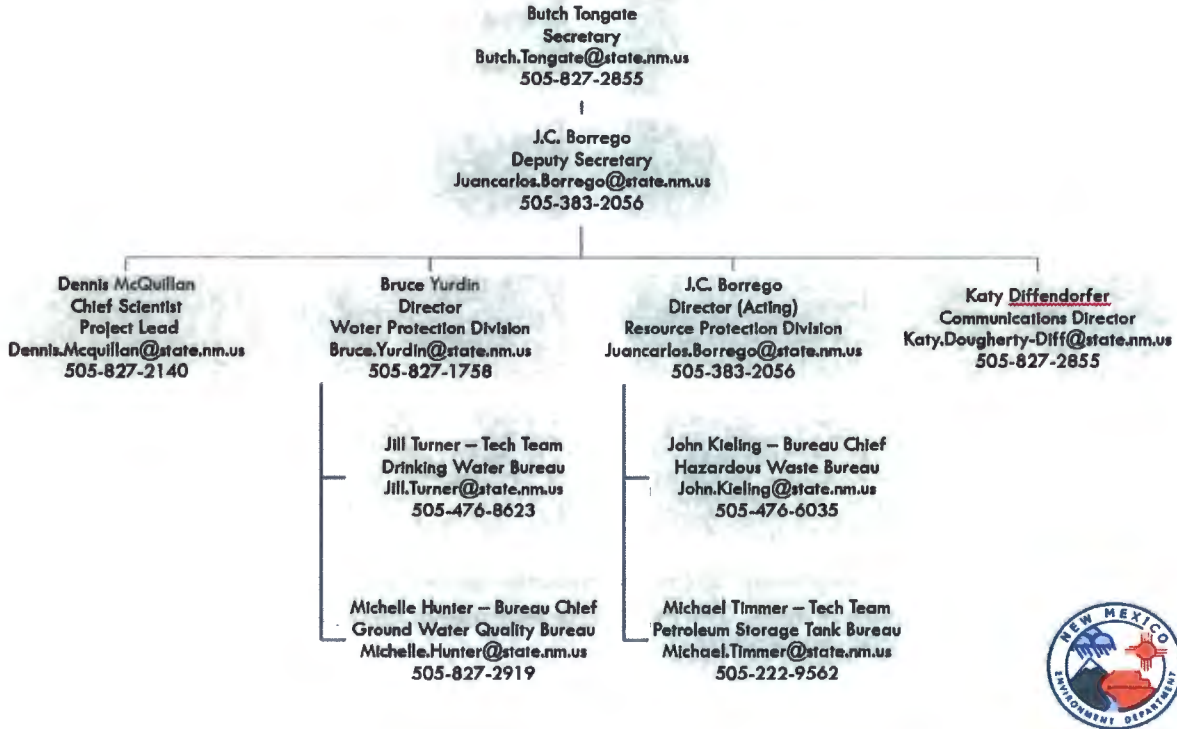
2019

- Site investigations and pilot tests will be completed
- Phase 2 RFI report will be submitted

2020

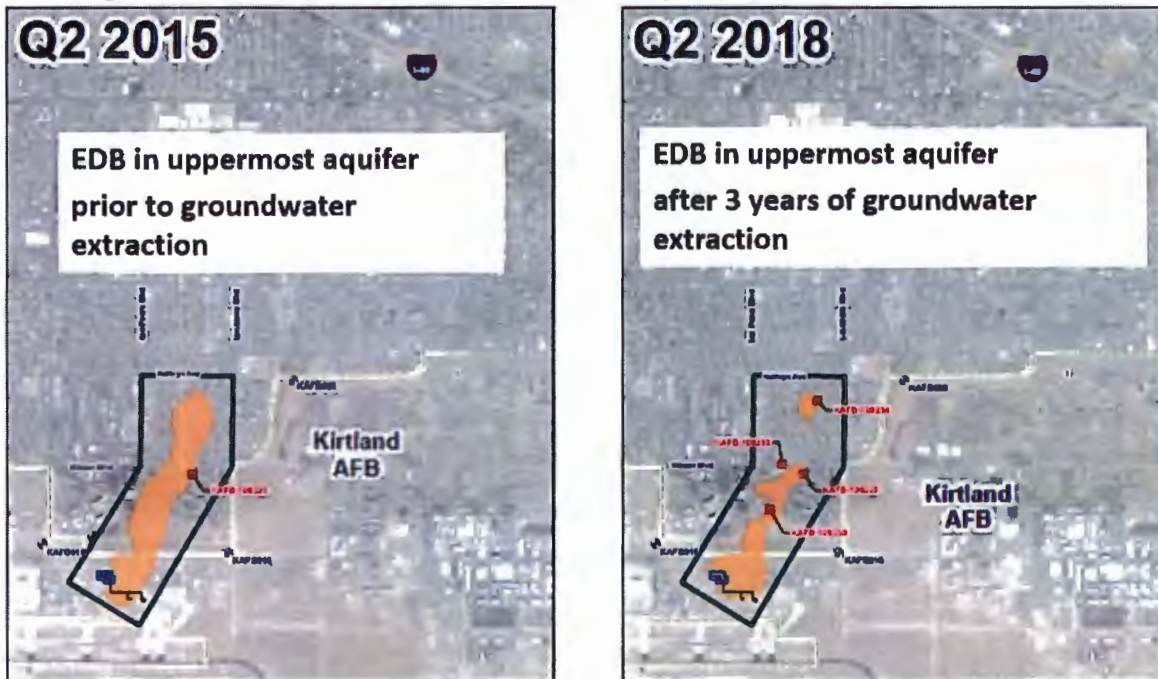
- Corrective Measures Evaluation will begin

NMED's Kirtland Air Force Base Fuel Cleanup Team



NMED agrees that stakeholders should know whether the extraction system is working as planned. During the July 12, 2018 public meeting, the Air Force and NMED presented strong evidence (shown below) of what is most likely the early stages of plume collapse resulting from the extraction and treatment of more than 400 million gallons of groundwater over the last three years. The Air Force, NMED, ABCWUA and AEHD, with support from federal, state, county, and city elected and executive officials, were successful in collaborating on this groundwater extraction system that now appears to be collapsing the contamination plume away from ABCWUA drinking water wells to the north.

Strong Evidence of EDB Plume Collapse



The EDB footprint in the groundwater extraction area has varied, but is presently the smallest it has been since extraction began in 2015. The most likely explanation for this is that the extraction system is beginning to collapse the plume.

NMED appreciates your comments and questions on the project. Please contact me if you have any additional questions.

Sincerely,

Dennis McQuillan
Chief Scientist

cc: B. Tongate, NMED Secretary
J.C. Borrego, NMED Deputy Secretary
Col. M. Gibbs, KAFB
K. Lynnes, KAFB
B. Renaghan, AFCEC
B. Faris, AEHD
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L. King, EPA-Region 6 (6PD-N)
J. Kieling, NMED-HWB
M. Hunter, NMED-GWQB

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B. Yurdin, NMED-WPD

File: KAFB 2018 Bulk Fuels Facility Spill