# New Mexico Environment Department

## 2019 Strategic Plan

## Kirtland Air Force Base Fuel Leak

Dear Stakeholder,

Cleaning up the contamination caused by the U.S. Air Force at Kirtland Air Force Base remains a top priority for the New Mexico Environment Department.

While the USAF has made significant strides in mitigating the aviation fuel release, the work is far from complete.

Under the base's Resource Conservation and Recovery Act (RCRA) corrective action permit administered by the state, the USAF has completed most of the investigations and pilot tests.

Throughout 2019, the USAF will fill remaining data gaps and complete investigations that will inform the RCRA corrective measures evaluation.

As we focus on progressing this year, we are also celebrating encouraging data from last year which indicates the groundwater pump-and-treat measure began collapsing the northern region of the groundwater plume. To date, more than 585 million gallons of contaminated groundwater have been extracted, treated to less-than-detectable concentrations and used to water the Kirtland golf course or injected back into the aquifer - that's equal to around 887 Olympic swimming pools! We are hopeful that additional data-gathering will confirm the plume is collapsing in that area.

I am committed to holding the USAF accountable to its obligations, to the environment and to New Mexicans.

I also want to thank the public, especially those in the impacted neighborhoods, for their continued cooperation and participation in the remedial process.

Sincerely,
James C. Kenney
Cabinet Secretary
New Mexico Environment Department

## Background

The U.S. Air Force (USAF) discovered a decades-old leak in an aviation fuel pipeline at Kirtland Air Force Base in 1999 and reported the leak to the New Mexico Environment Department (NMED). The fuel, which contained the additive ethylene dibromide (EDB) until the mid-1970s, had seeped into groundwater and a plume of EDB had spread off-base to the north, threatening public drinking water supplies.

The leak was caused by years of vehicles traveling over a section of buried pipe used to transport the fuel, eventually causing rocks to wear holes in the pipe. Upon discovery of the leak, the USAF stopped using the pipes and replaced them with an aboveground fuel transport system.

Since the discovery of the leak, NMED has overseen and enforced the remediation of soil and groundwater contamination.

To stop the plume from spreading further north of the base and toward drinking water supply wells, the USAF installed a "pump-and-treat" system as an interim measure in 2015 to pull the northern extent of the plume back toward the source area.

The Air Force has implemented and completed a number of additional interim corrective measures throughout the years, including the excavation of 4,822 tons of heavily contaminated soil, 12 years of soil vapor extraction and four years of bioslurping.


Pictured is the plume in 2015, before the pump-and-treat system began operating.

## Status

Area drinking water wells have continued to be protected from contamination.

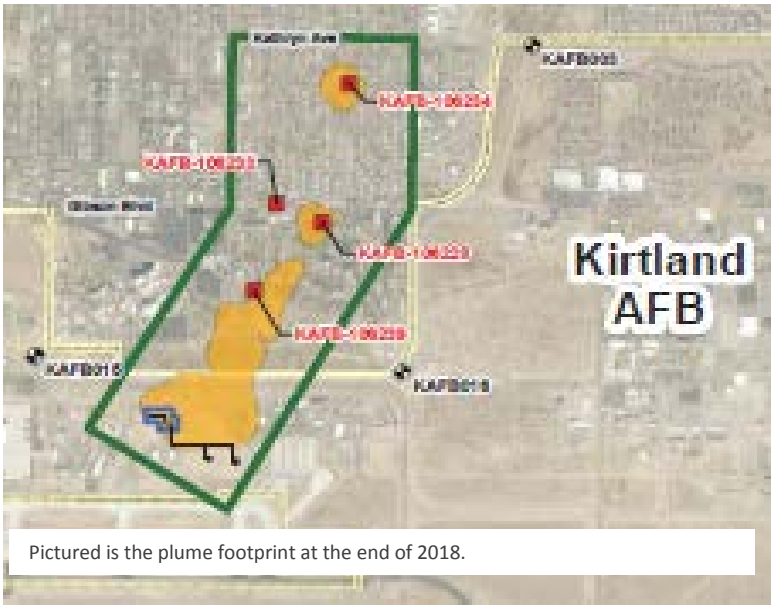
Last year yielded encouraging data that may indicate the mass and footprint of the northern portion of the EDB plume are decreasing.

However, the rising water table has flooded 61 of the monitoring wells, causing a need for more monitoring wells to be installed. Work to drill and complete 16 additional monitoring/coring wells began in 2018 and was completed earlier this year.

Groundwater extraction and treatment, an interim corrective measure, continued throughout 2018 and is ongoing. USAF completed four groundwater extraction wells from 2015 to 2017 which are currently pumping at a combined rate of around 540 gallons per minute.

The enhanced in-situ anaerobic groundwater EDB biodegradation pilot test that began in 2017 continues. Amendments introduced have successfully stimulated groundwater bacteria and significantly reduced EDB concentrations.

Both the pilot test and "pump-and-treat" system are interim corrective measures intended to reduce risks of groundwater contamination.




Pictured is the plume footprint at the end of 2018.

## NMED's Guiding Principles

Our four guiding principles are the means by which we protect and restore the environment and foster a healthy and prosperous New Mexico for present and future generations.

**1. Science**

Using the best available science and data to inform our decision-making in protecting public health and the environment.

**2. Innovation**

Employing creative engineering and technological solutions to address environmental problems.

**3. Collaboration**

Engaging communities and interested stakeholders in environmental decision-making.

**4. Compliance**

Ensuring meaningful compliance with state regulations and permits.

## 2019 Activities

### 1. Implement a robust site monitoring and wellhead protection program

- Groundwater: The rising water table flooded many of the monitoring wells in the EDB plume. USAF drilled six new monitoring wells in 2018. Earlier this year, USAF completed eight LNAPL core holes as monitoring wells. Eleven previously dry soil-vapor and groundwater wells that now have water are being used as monitoring wells.

- Soil-vapor: NMED is requiring the Air Force to fill data gaps in vapor monitoring to confirm conclusions made in its 2017 Risk Assessment Report. While the Risk Assessment Report stated that contaminant exposure via vapor intrusion into indoor air in buildings located off-base was an incomplete pathway, NMED believes

additional, shallower vapor monitoring is necessary. NMED is requiring the Air Force to submit a complete vapor monitoring work plan by May 30.

- LNAPL: USAF completed LNAPL coring in March. This is necessary to determine the physical, chemical and biological nature of LNAPL and identify bacteria present in this area. This data will be used to inform a remedial solution for LNAPL. The Air Force will submit a report to NMED summarizing LNAPL investigation findings by November 1.

- USAF will continue to test drinking water wells monthly and sentinel wells quarterly. Neither have had any EDB detections to date.

## 2. Update the Conceptual Site Model

- The USAF updates the model as necessary to describe physical, chemical and biological processes that affect the migration and fate of fuel contamination in soil, soil vapor and groundwater.

- The Conceptual Site Model is a critical tool in predicting the behavior of groundwater and the plume. A variety of factors, including water table levels and rates of natural degradation, can affect this behavior.

## 3. Deploy multiple engineered technologies

- The EDB in-situ biodegradation pilot test that began last year continues. NMED is requiring the Air Force to submit a report on the project's progress by May 1. The project is expected to be completed this year.

- The Air Force will begin a bioventing pilot test intended to deliver oxygen and moisture to soil bacteria desiccated by 12 years of soil vapor extraction. The addition of oxygen and moisture may revitalize the bacteria so they will continue to degrade fuel constituents in the soil. NMED has approved the Air Force's plan submitted on this pilot test. The Air Force must ensure the test does not cause vapor intrusion hazards. The Air Force will submit the results of the bioventing test to NMED by Jan. 31, 2020.


- The “pump-and-treat” system will continue to operate.

### 4. Continue to involve, provide information to and collaborate with the public

- Public meetings and preceding technical poster sessions are scheduled for April 25, July 25 and October 24.

- NMED’s Public Involvement Plan will go out for public comment this summer.

- NMED will engage students interested in science by making presentations at schools and encouraging and assisting students with the creation of papers, physical models, digital animations and other work based on protecting the environment.

- NMED will continue to educate and engage the community, including neighborhood associations, schools and other community organizations, in order to inform and involve the public in this project.

## Looking forward

All interim corrective measures and pilot tests are intended to inform the selection of a final remedy. The Corrective Measures Evaluation required by RCRA is expected to begin after completion of the Phase 2 RCRA Facility Investigation Report and Final Risk Assessment.

If USAF fails to adhere to its RCRA permit, it will be subject to enforcement action under NMED’s Hazardous Waste Act or other applicable provisions of law. NMED may grant requested extensions for submittal of reports or other deliverables if USAF shows good cause and a proposed alternate schedule.

## Glossary of Terms

EDB: ethylene dibromide

Kirtland AFB: Kirtland Air Force Base

LNAPL: Light non-aqueous phase liquid

NMED: New Mexico Environment Department

RCRA: Resource Conservation and Recovery Act

USAF: United States Air Force



## For more information:

Maddy Hayden
Public Information Officer
(505) 827-0314
maddy.hayden@state.nm.us

New Mexico Environment Department
1190 St. Francis Drive
Santa Fe, New Mexico 87505
Office: (505) 827-2855

To sign up for Kirtland email updates from NMED:

https://public.govdelivery.com/accounts/NMED/subscriber/new

## Key Dates in 2019

April 25: Public meeting

May 1: In-situ biodegradation pilot test progress report submitted by USAF

May 30: Soil-vapor monitoring work plan submitted by USAF

July 25: Public meeting

Oct. 24: Public meeting

Nov. 1: LNAPL investigation report submitted by USAF

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