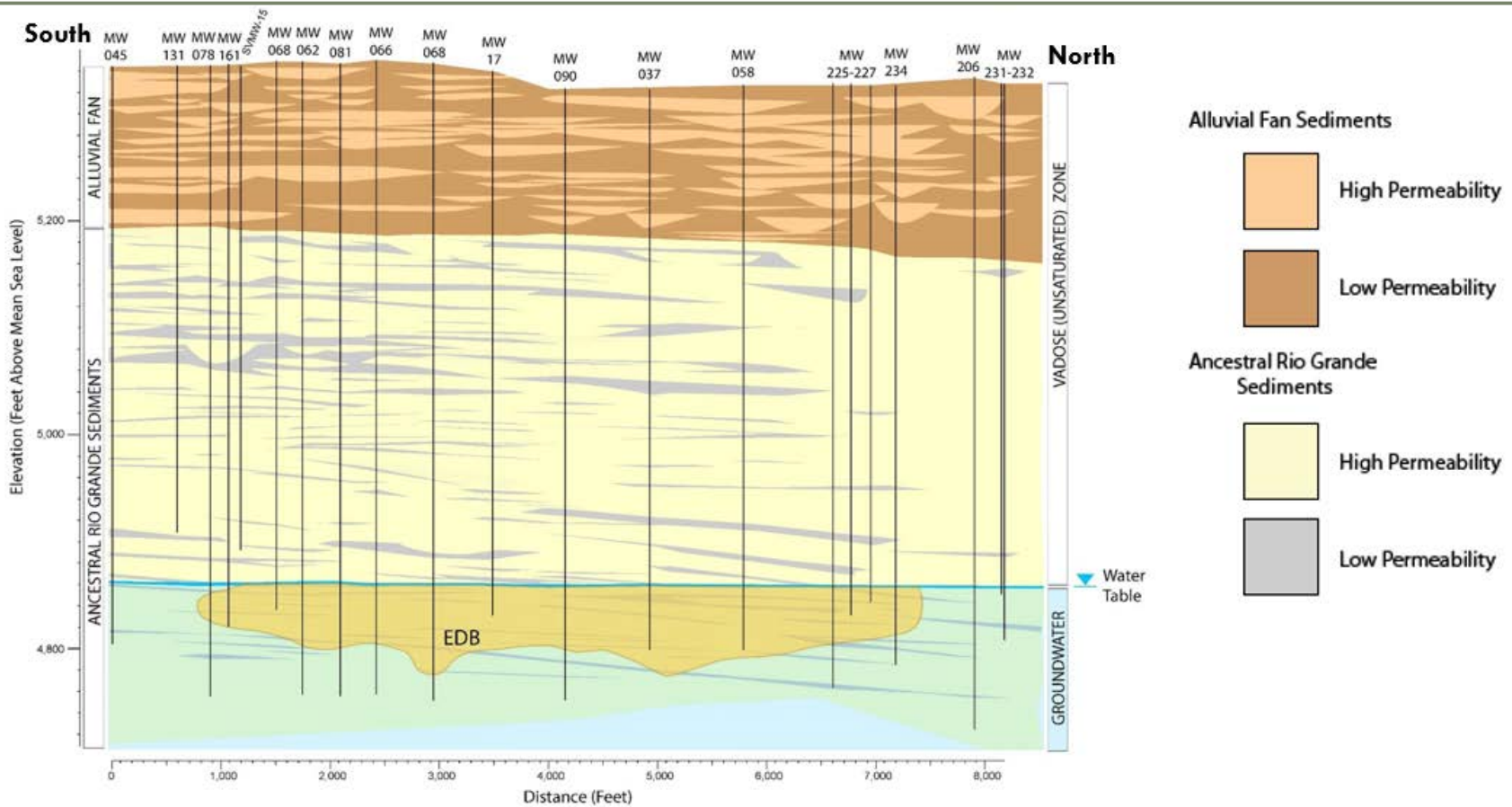




KIRTLAND AIR FORCE BASE AVIATION FUEL LEAK CLEANUP STRATEGIC PLAN FOR 2019



April 25, 2019

Dennis McQuillan
Chief Scientist

NMED's Four Guiding Principles

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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 to Protect Albuquerque's Aquifer and Drinking Water

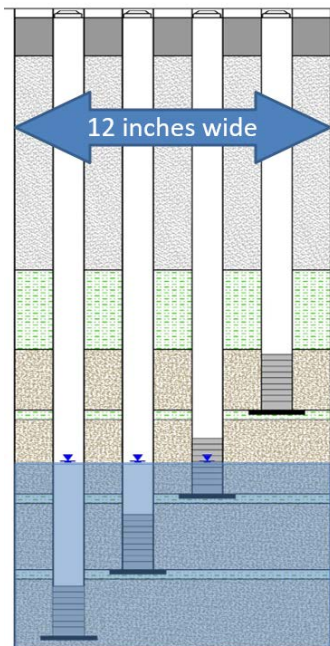
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- 1. Implement a robust site monitoring and wellhead protection program**
- 2. Update the Conceptual Site Model**
- 3. Deploy multiple engineered technologies**
- 4. Continue to involve, provide information to, and collaborate with the public**



1. Site Monitoring and Wellhead Protection

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Groundwater

- Drilling to fill data gaps caused by rising water table is complete. The new data will be evaluated for adequacy.

Soil Vapor

- Monitoring to confirm no risk of vapor intrusion will be done by the Air Force.

LNAPL

- Core drilling to fill data gaps on residual LNAPL is complete.

Drinking Water

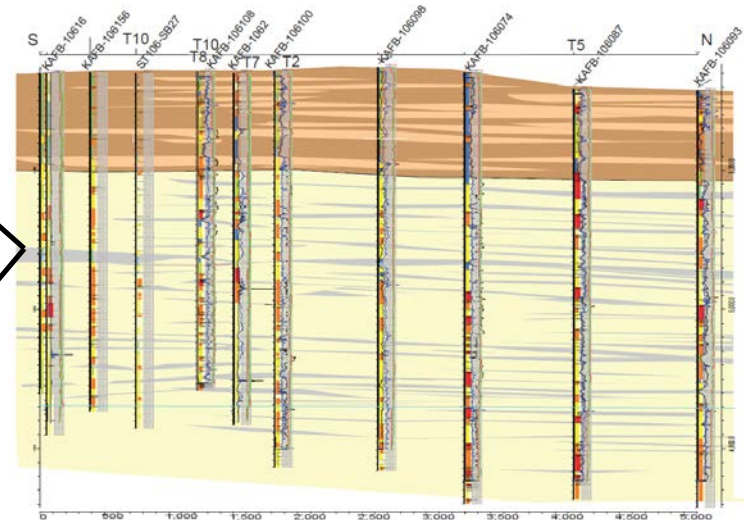
- Monthly monitoring shows no detections of EDB in drinking water wells or sentinel wells.



2. Update the Conceptual Site Model

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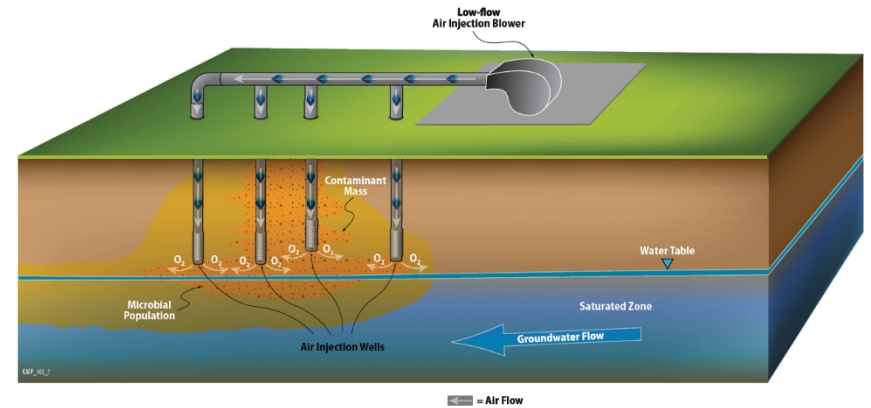
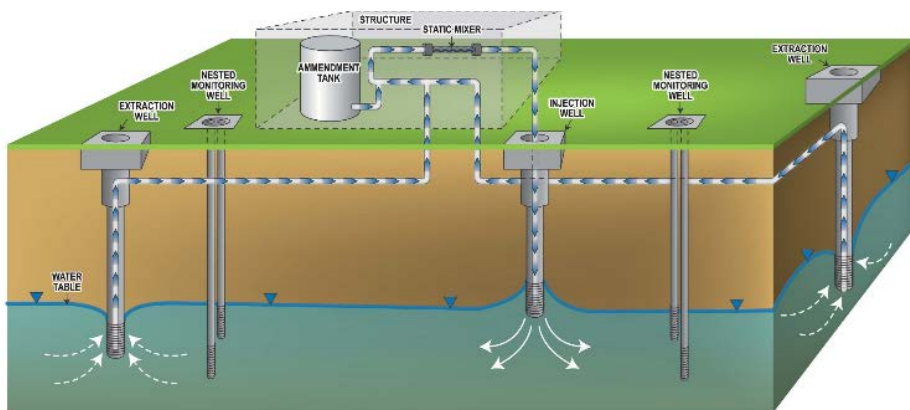
- ❑ The Air Force updates the model as necessary to describe physical, chemical and biological processes that affect the migration and fate of fuel contamination in soil, soil vapor and groundwater.
- ❑ The Conceptual Site Model is a critical tool in predicting the behavior of groundwater and the plume. A variety of factors, including geology, water table levels and rates of natural degradation, can affect this behavior.



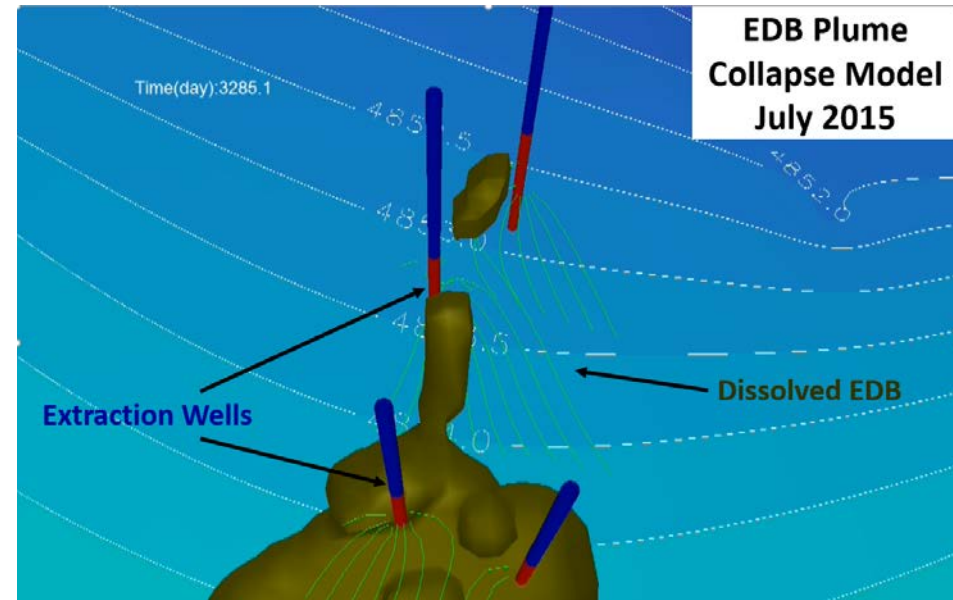
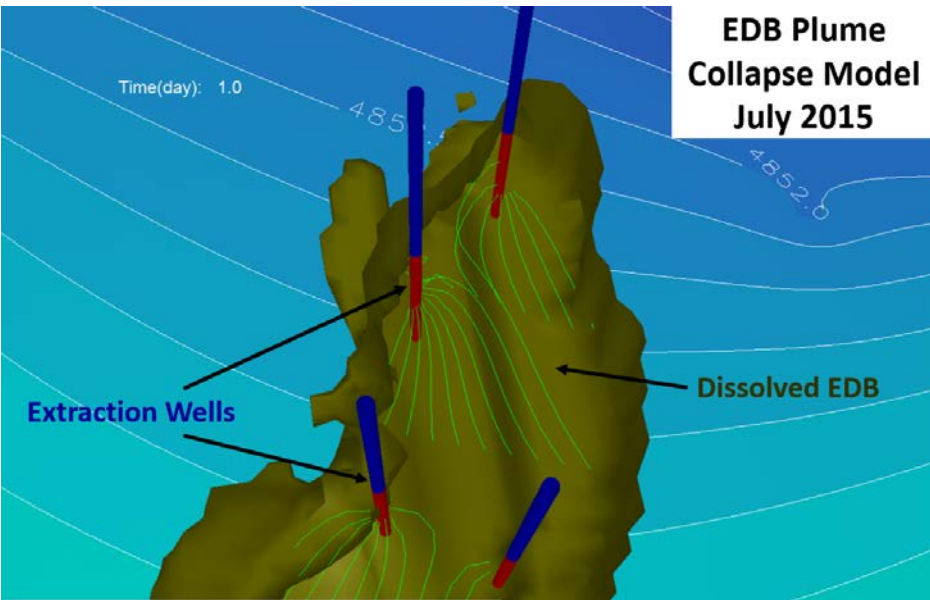
3. Deploy and Evaluate Multiple Engineered Technologies

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- Continue to collapse the northern area of the EDB plume by operating the groundwater pump-and-treat system.
- Continue the *in-situ* groundwater EDB biodegradation pilot test.
- Begin the bioventing pilot test to supply soil bacteria with oxygen and moisture.

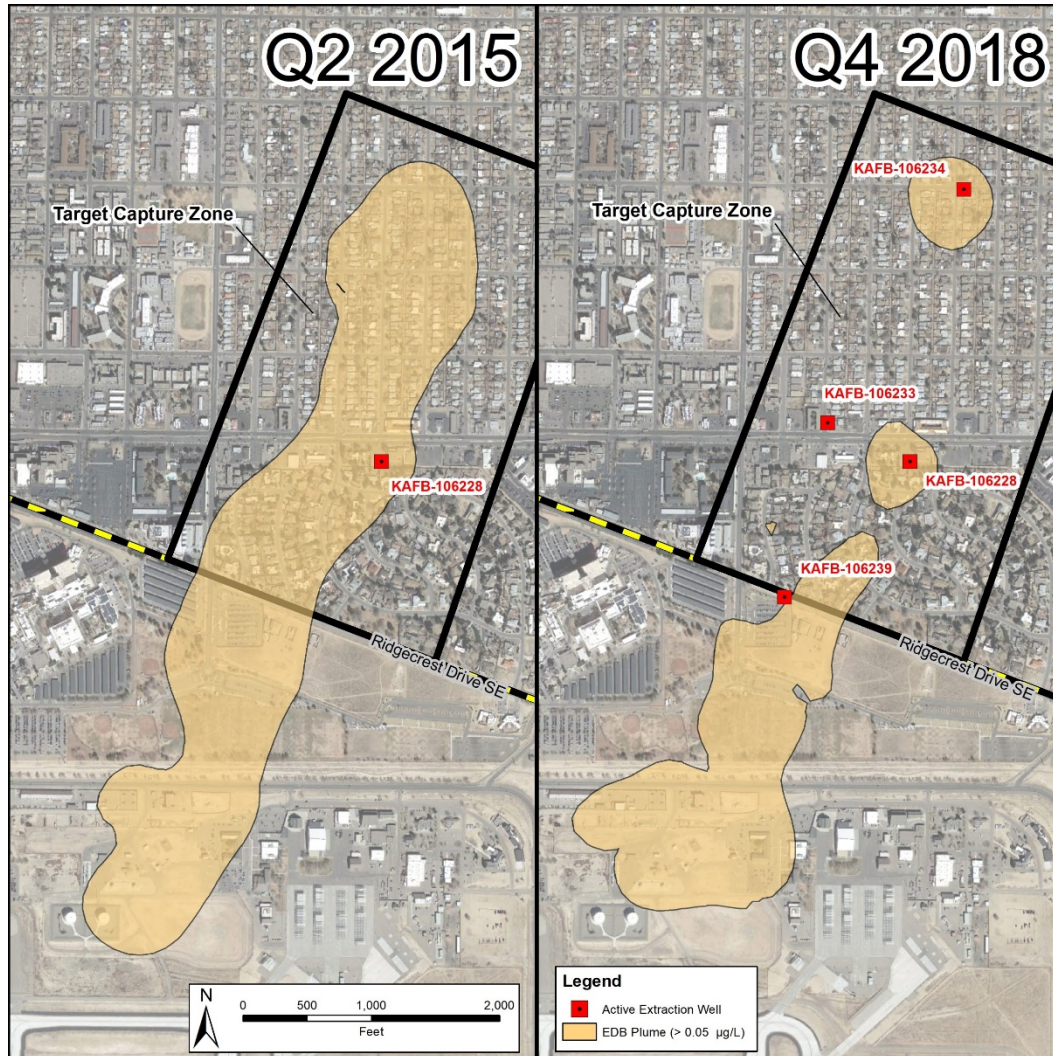


2015 EDB Plume Collapse Modeling Used to Locate and Design Extraction Wells



Modeling by Scott Ellinger, U.S. EPA

3. Evidence of EDB Plume Collapse North of Ridgecrest Dr.

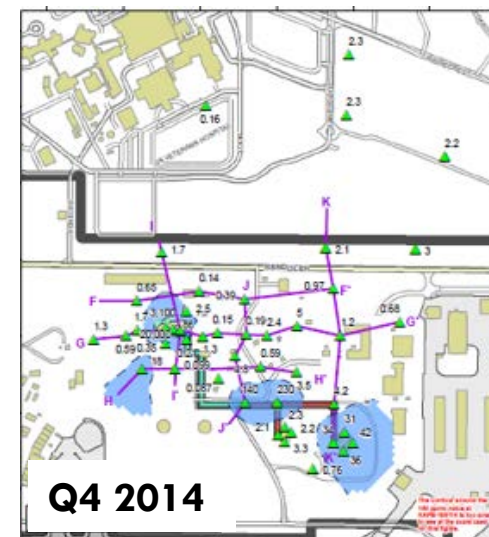
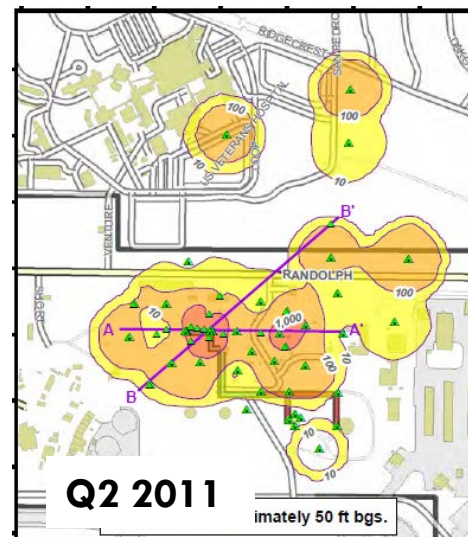
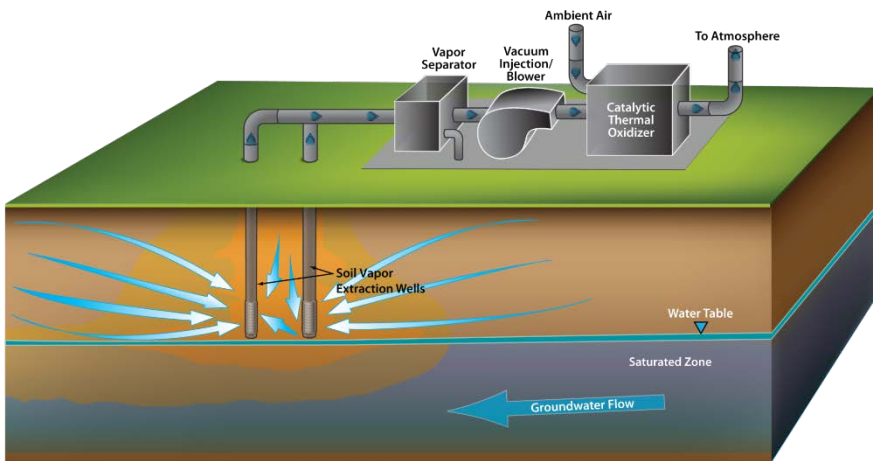


- Target Capture Zone (TCZ) is groundwater north of Ridgecrest Dr. SE
- EDB plume is mapped as groundwater concentrations greater than the Drinking Water Standard of 0.05 µg/L
- Second quarter of 2015 (Q2 2015) was before startup of groundwater pump-and-treat system

3. Soil Vapor Remediation

- **Interim Corrective Measures for soil vapor contamination include:**
 - 12 years of Soil Vapor Extraction (SVE) (completed)
 - 4 years of modified bioslurping (completed)
- **NMED required upgrades to the SVE system which were put in place early in 2013. The extraction rate was increased from about 50 to 1,800 cubic feet per minute.**
- **By September of 2014, soil vapor contamination levels had decreased substantially throughout the vadose zone.**

Total VOC @ 50' depth



**Benzene and
EDB in Soil
Vapor Probes
Nearest to
Residential and
VA Hospital
Areas
(Q4 2018)**

 **Soil Vapor
Probe**

**ND means
not detected**



3. – Vapor Intrusion Summary

The Air Force will perform shallow soil vapor monitoring in the residential area and on the VA Hospital campus to:

- **confirm that a vapor intrusion hazard does not exist; and**
- **ensure that the bioventing pilot test does not create a vapor intrusion hazard.**



4. Public Involvement and Collaboration

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- Public meetings, poster sessions, deep dives, and field trips
- NMED Public Involvement Plan
- Engage students

