

PFAS CASE STUDY CANNON AIR FORCE BASE

Curry County, New Mexico

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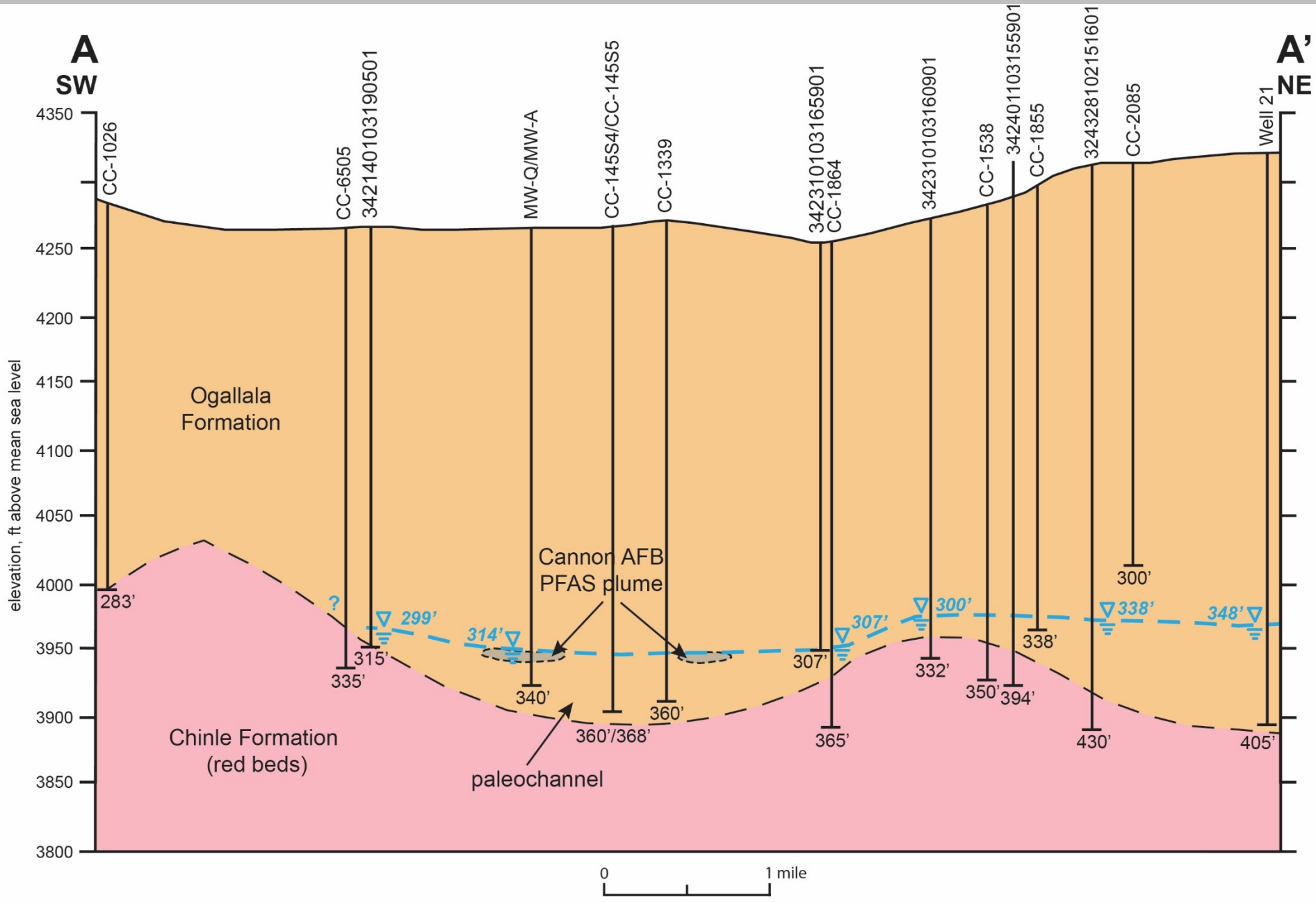
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WATER-RESOURCE AND ENVIRONMENTAL CONSULTANTS
ALBUQUERQUE, NEW MEXICO

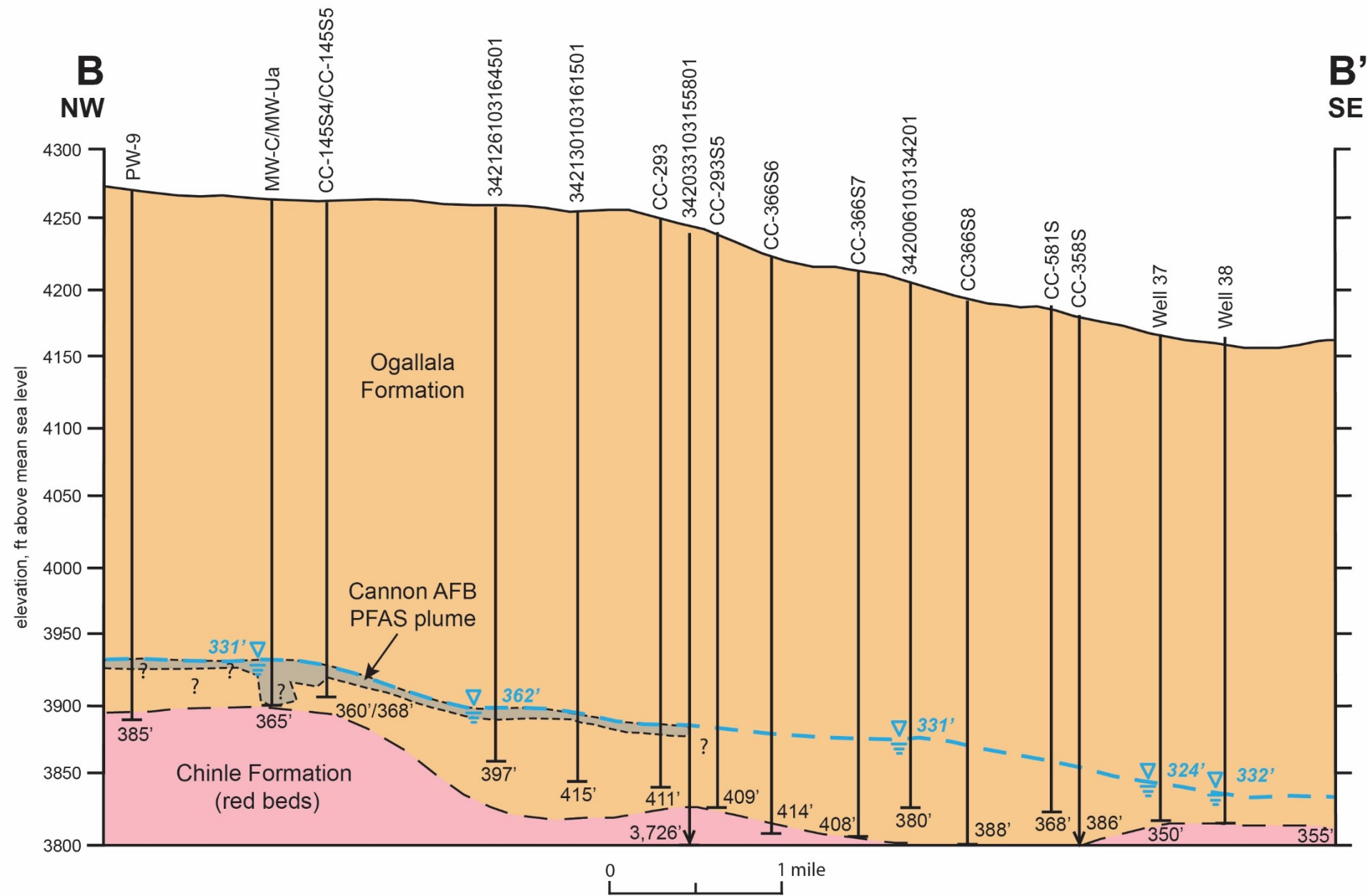
Background

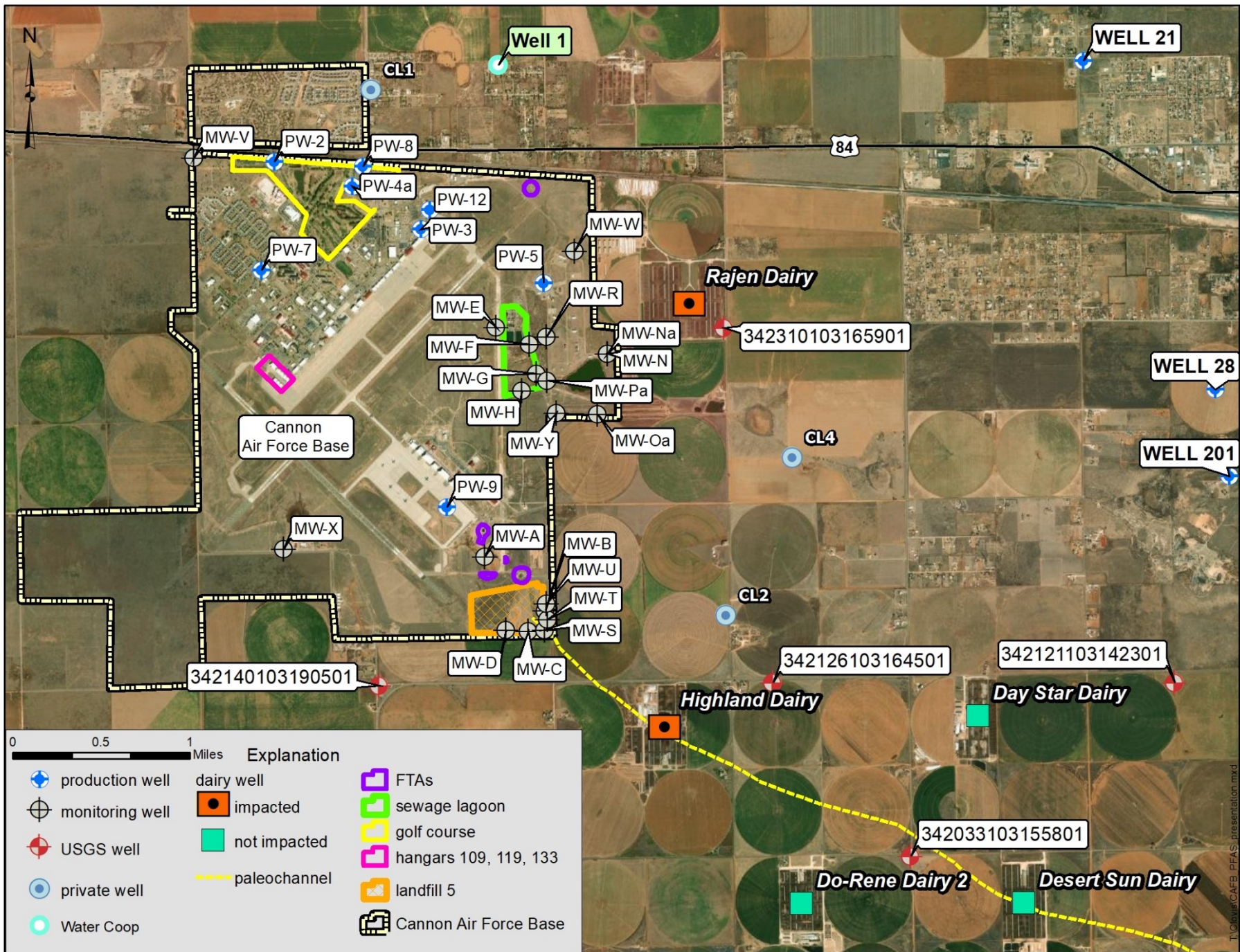
- October 2018 US Air Force informed local government in Curry County, NM that PFAS (per- and polyfluoroalkyl substances) compounds had been detected in 4 of 19 off-site wells
- 3 wells were located at nearby dairies and concentrations exceeded 0.070 $\mu\text{g}/\text{L}$ for two of the most common PFAS compounds
 - perfluorooctanoic acid (PFOA) and
 - perfluorooctane sulfonic acid (PFOS) combined
- Lifetime health advisory limit is 0.070 $\mu\text{g}/\text{L}$
- Unable to sell milk or cows due to contaminated water ingested by cows

Background

- Some evidence to suggest that manure from the dairies spread at other locations have locally caused low-concentration contamination
- Aqueous film forming foams (AFFFs) containing PFAS compounds used in fire-fighting foams is a likely source of contamination
- 19 distinct areas were identified at Cannon AFB that may have been impacted
- Ogallala aquifer is the primary aquifer area
- Pumping exceeds recharge and many areas of the aquifer have been dewatered



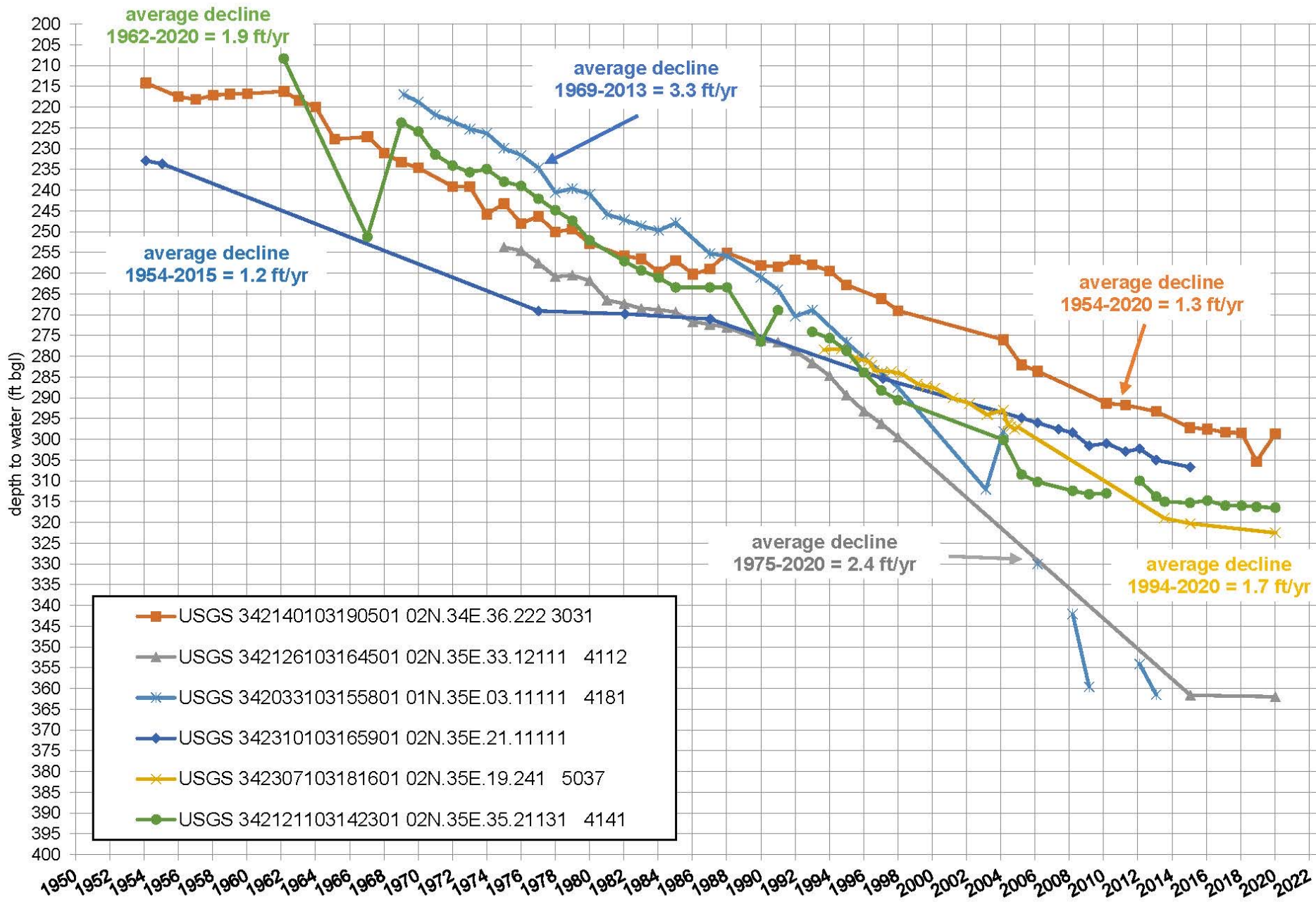


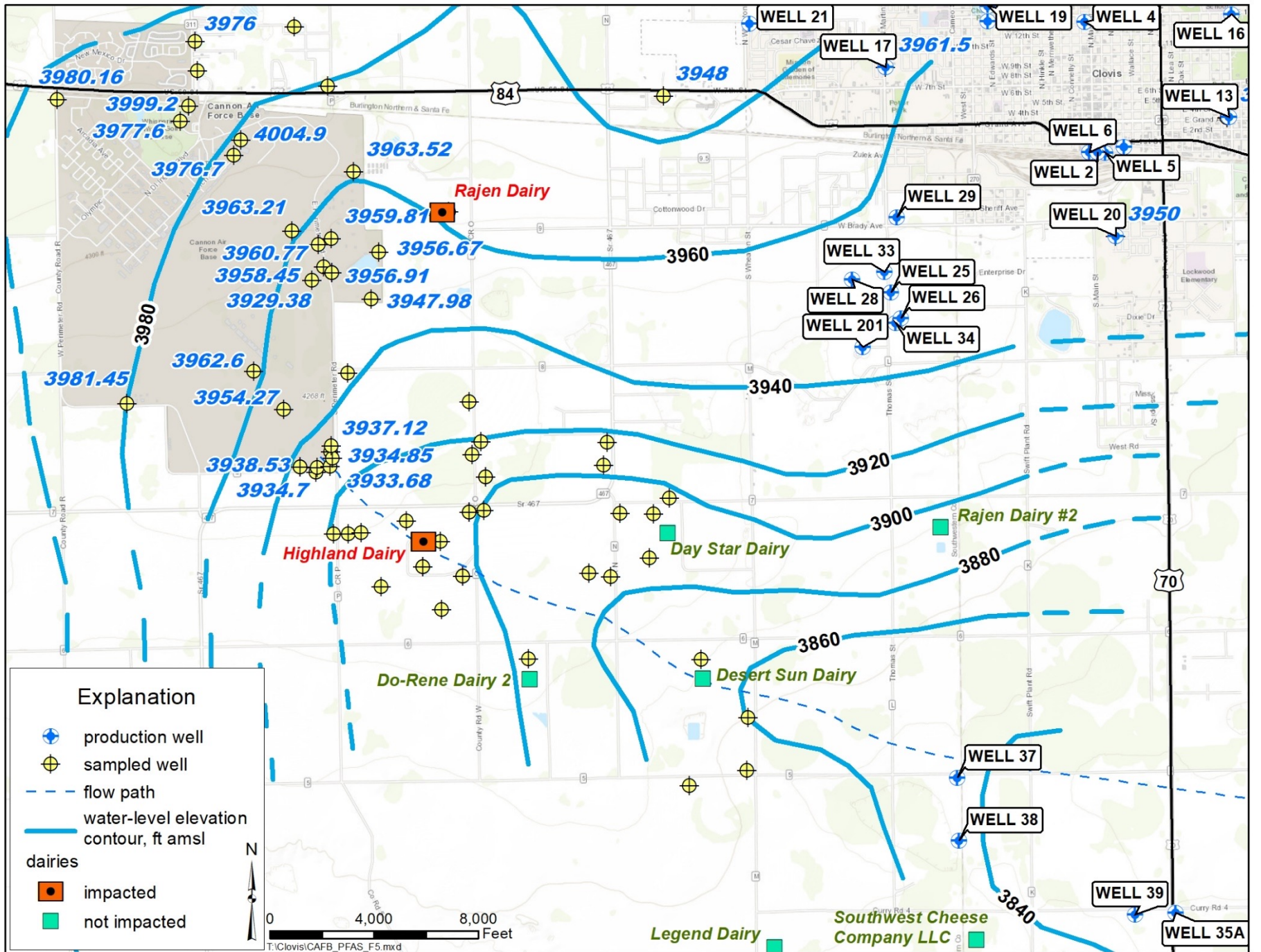


0 0.5 1 Miles



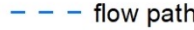
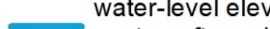


Explanation

- production well
- monitoring well
- USGS well
- private well
- Water Coop
- dairy well impacted
- dairy well not impacted
- FTAs
- sewage lagoon
- golf course
- hangars 109, 119, 133
- landfill 5
- Cannon Air Force Base
- paleochannel





Explanation

-  production well
-  sampled well
-  flow path
-  water-level elevation contour, ft amsl
- dairies
-  impacted
-  not impacted



0 4,000 8,000 Feet

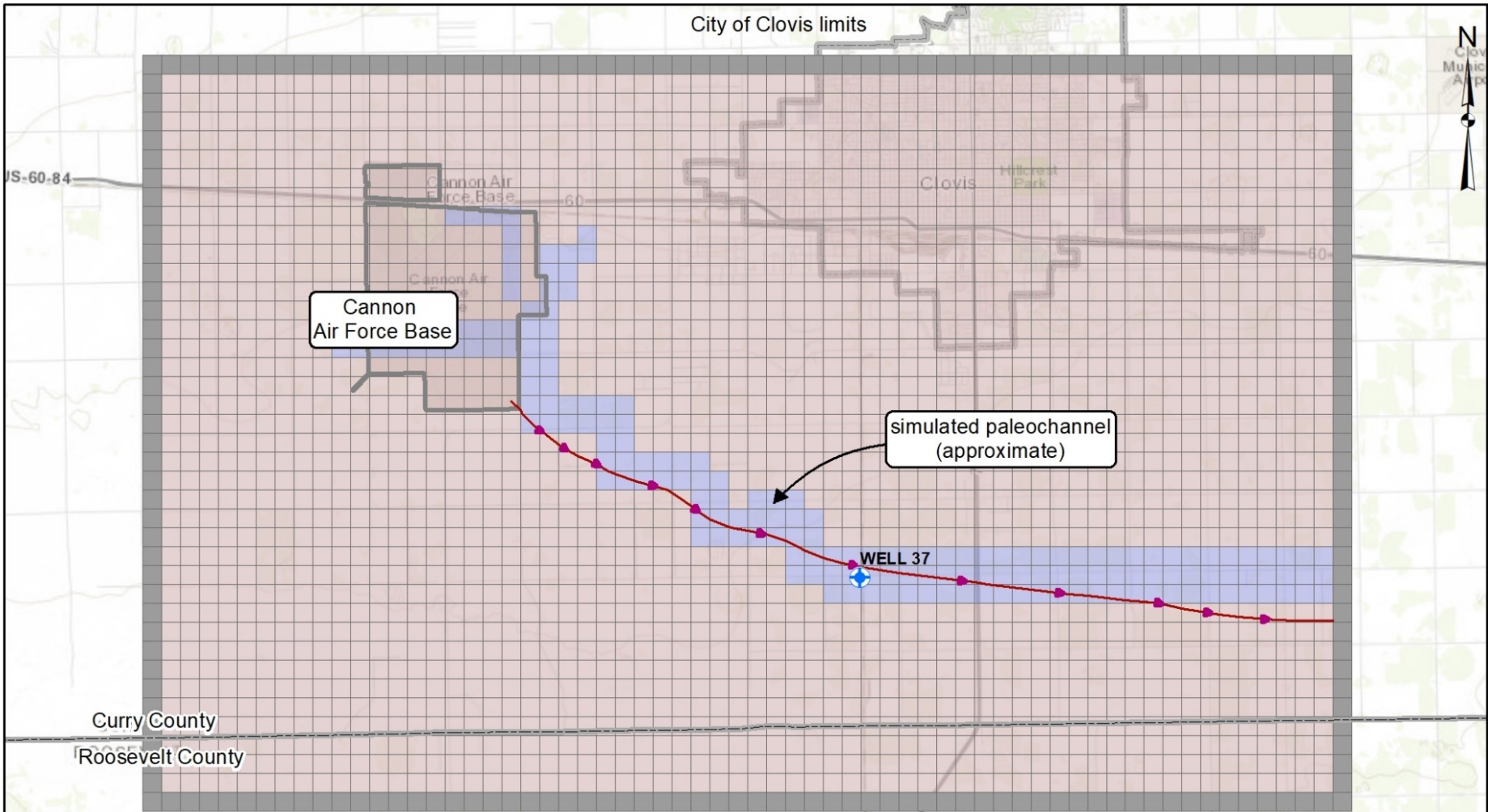
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Legend Dairy








Southwest Cheese Company LLC

Groundwater Flow Model

- USGS MODFLOW model
- one-layer, superposition
- 0.25 mi² cells; Model area 160 mi²
- particle tracking
- area withdrawals 24,751 ac-ft/yr
- objective to estimate travel time to nearby municipal water supply wells



Explanation

	production well		groundwater flow model grid		70
	10-year time-step		general head boundary		120
	conceptual particle path	0 2 4 Miles			

hydraulic conductivity, ft/day

Model Results

- Plume migration from Cannon AFB to Highland Dairy was about 30 years (400 ft/yr)
 - Similar to when Cannon AFB begin using AFFF
- Simulation indicates about 20 years to reach nearby municipal well of concern
- Limitations:
 - NM State Engineer does not require metering of agriculture uses; withdrawals estimated
 - Ongoing reduction in saturated thickness and dewatering of aquifer will effect long-term predictions