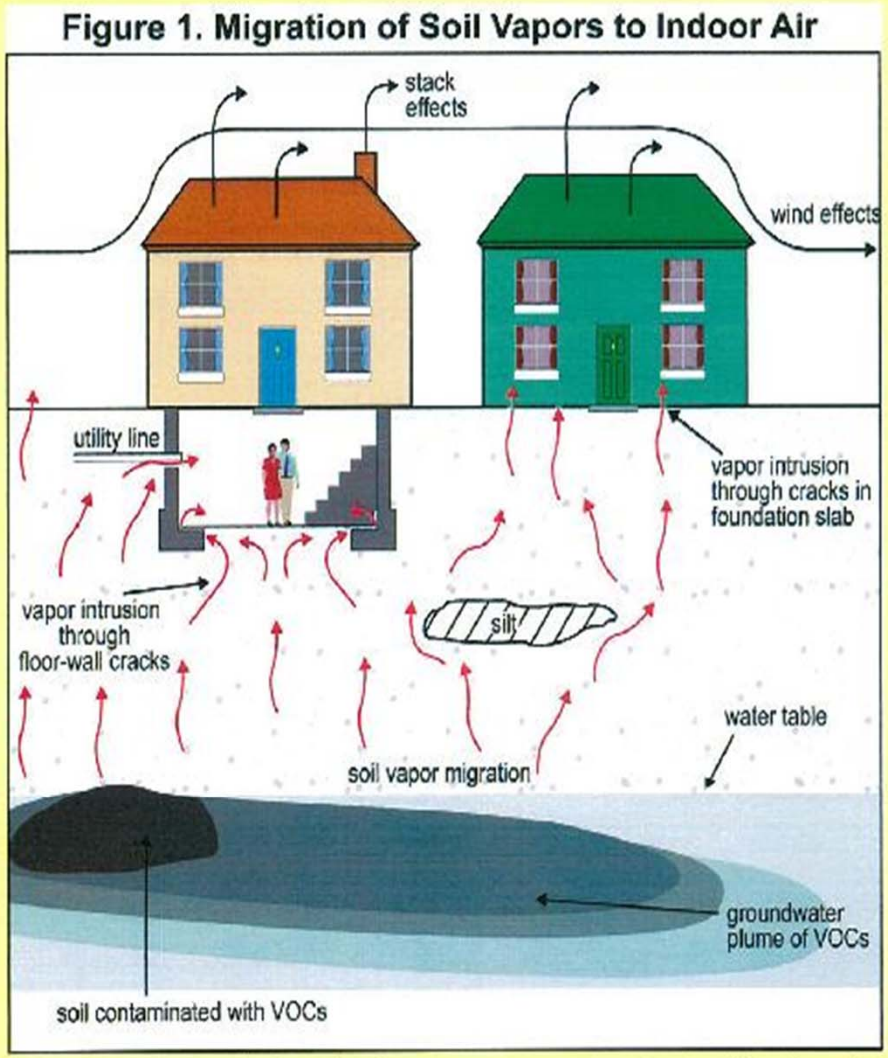
Soil Vapor Conditions & the Soil Vapor Extraction System in Residential Roxana, Illinois

Presenter: Bill Sinnott

Illinois Environmental Protection Agency
Bureau of Land
Permits Section
217/524-3310
Bill.sinnott@illinois.gov

Why are we concerned about soil vapors?



Excerpted from USEPA's 2008 Brownfields Technology Primer: Vapor Intrusion Considerations for Redevelopment

Soil Vapor is short-hand for contaminant vapors found in soils above underground contamination.

Groundwater contamination and vapor monitoring results led to IEPA requiring Shell to perform testing under homes (sub-slab) and in homes for vapors.

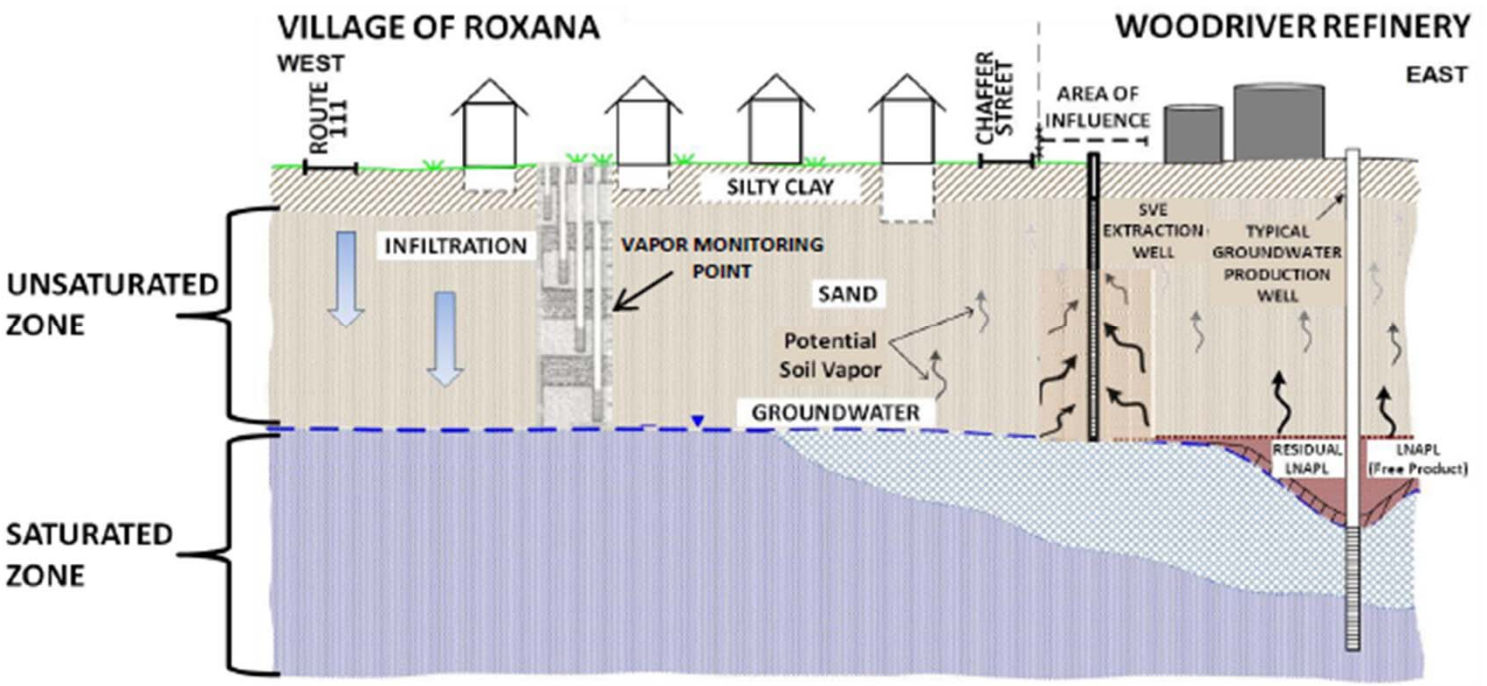
Temporary Measures

Based on that testing and area vapor monitoring point data, temporary internal combustion engine (ICE) units (for example a truck engine) were installed to remove and combust the vapors in the affected area at 4th St. and Chaffer.

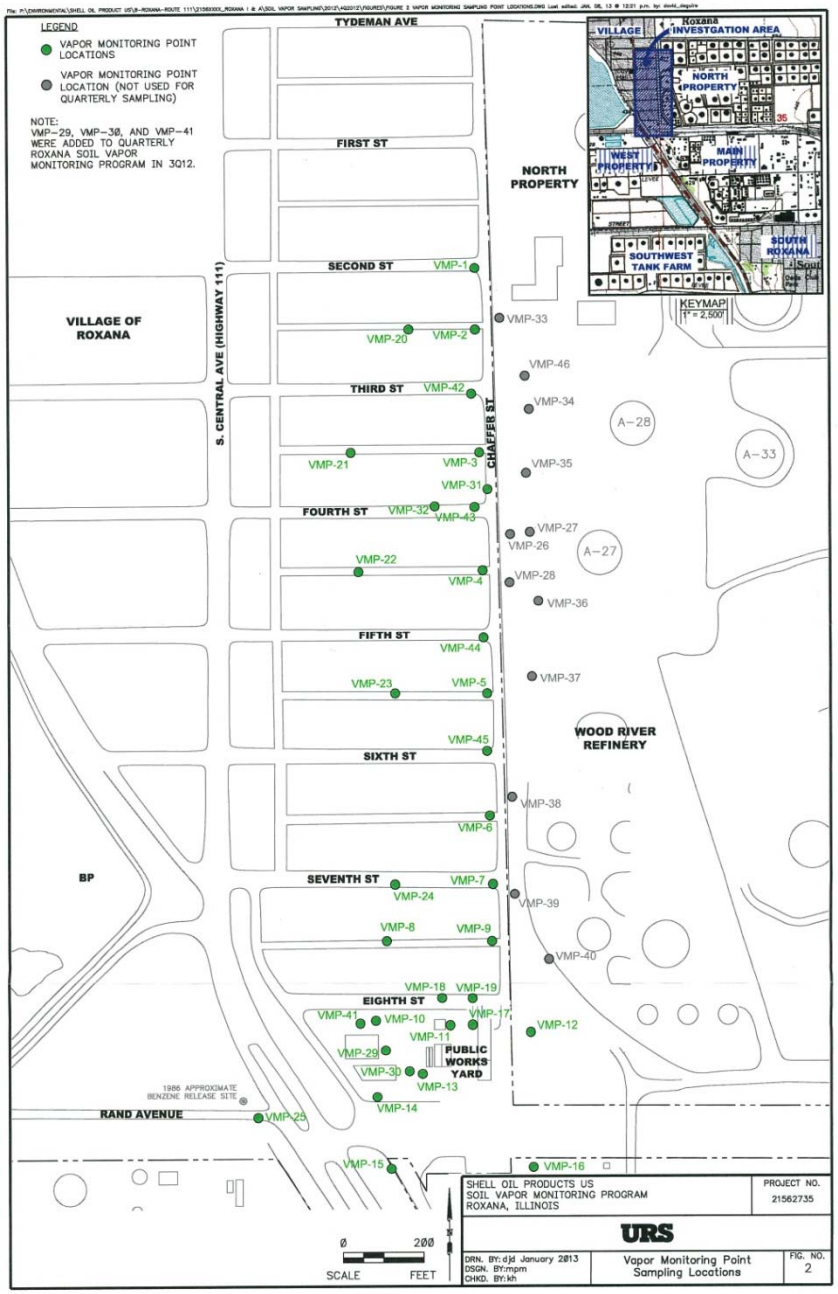
ICE units operated from May 2011 to January 2012.

SVE Wells and Vapor Monitoring Points

The SVE wells extract vapors and the vapor monitoring wells measure concentrations of those vapors.



The graph was created by URS and modified for the purpose of this presentation



Monitoring of Vapors

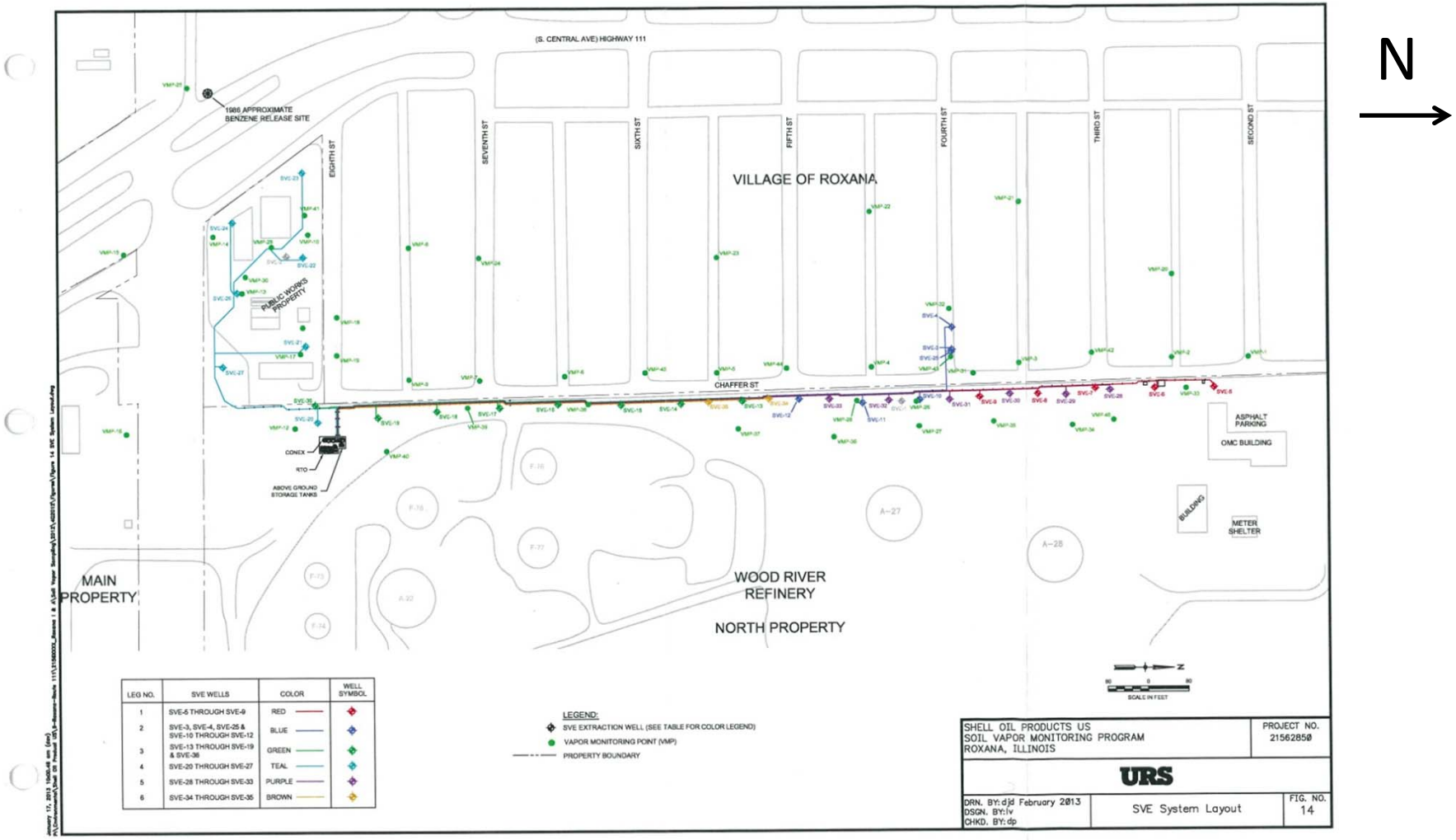
Today we have 55 Vapor Monitoring Points (VMPs) located in Roxana and on the Wood River Refinery property.

Vapor monitoring wells are sampled at approximately 5, 10, 25 and 40 feet below ground surface.

Vapor monitoring wells are monitored quarterly and based on their results more wells will be added as needed.

Full-Scale Soil Vapor Extraction System (SVE) to destroy and remove vapors

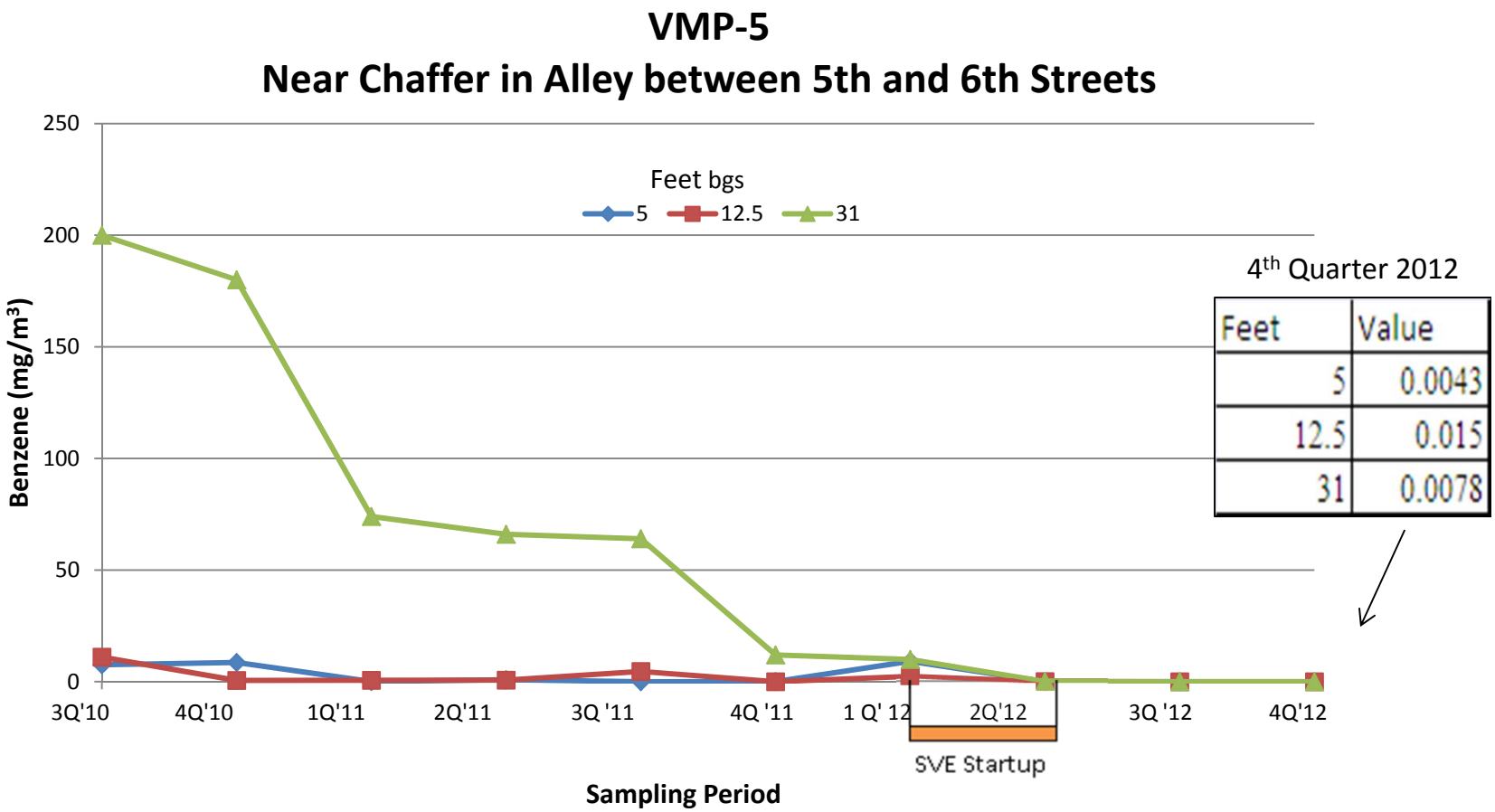
- Installation began in January and ended in April 2012 which is located between 4th & Chaffer and along the west fence line of the refinery.
- In December 2012 the full scale system was expanded to include wells at the Public Works Yard.



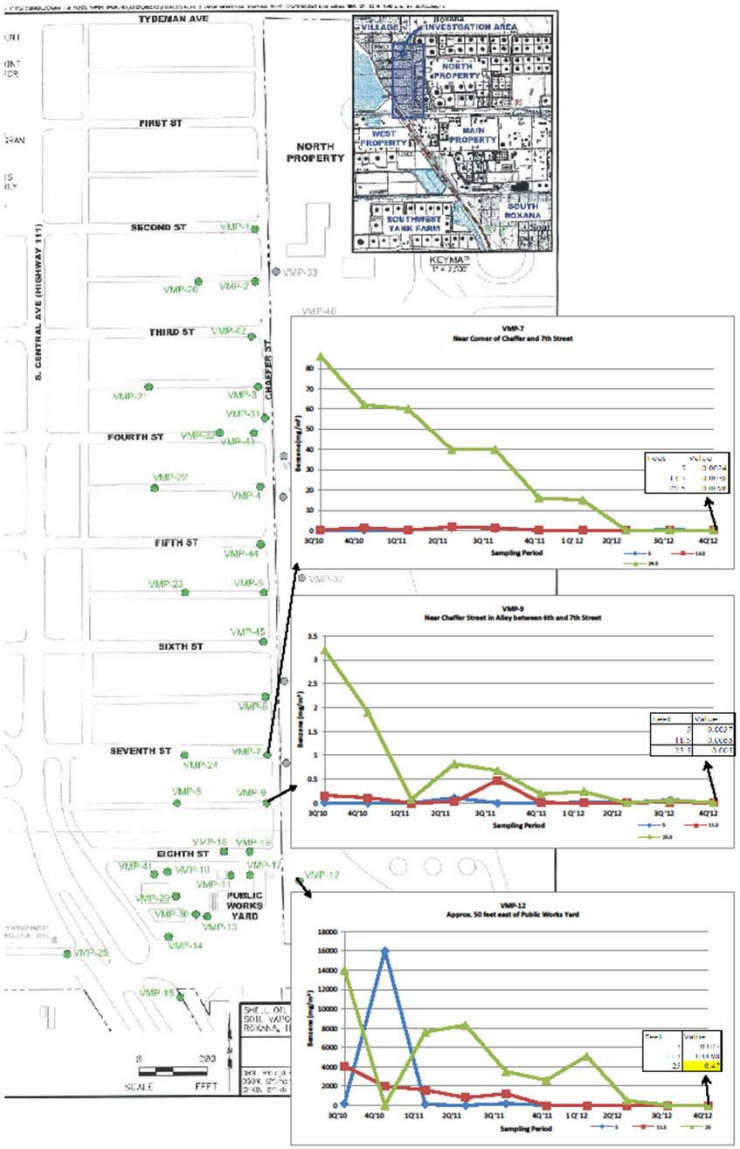
N →

Benzene Vapor Concentrations Before and After Start-up of the SVE System

The shallow concentrations have remained low, while the deeper concentrations have significantly decreased.



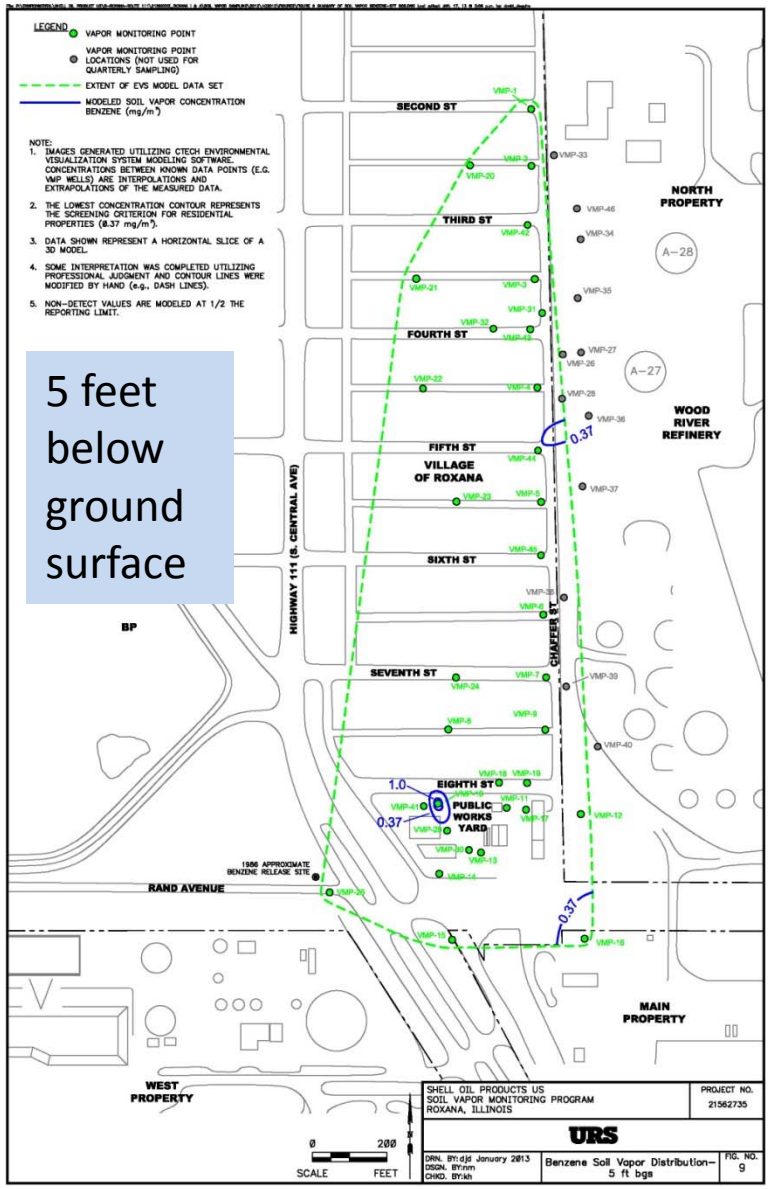
Feet	Value
5	0.0043
12.5	0.015
31	0.0078

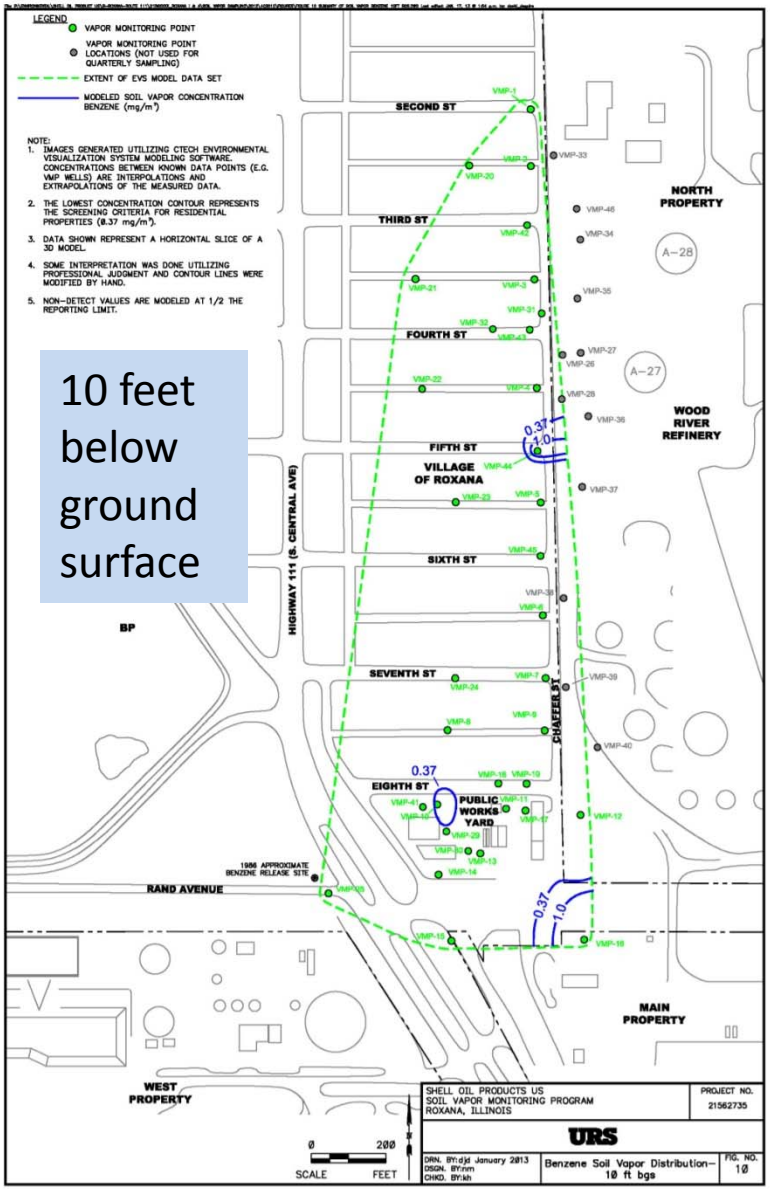


Multiple Locations of Benzene Vapor Levels Over Time Beneath the Study Area

Please note that all concentration trends are dropping and shallow vapor concentrations are consistently low beneath the Village of Roxana.

Current Conditions for Benzene Soil Vapors beneath Roxana at 5 feet and 10 feet below the ground surface 4th Quarter 2012





Future Activities

- Monitoring and vapor extraction will continue until the vapor remediation objectives are met.
- Additional soil sampling was recently performed at the Public Works Yard, and this information will be used to determine if additional remedial measures are necessary. The report of this analytical data is currently under review.