



PCE SOUTHEAST / PCE/TCE NORTHEAST CONTAMINATION SITE'S

Susan Fisher
EPA Region 7
Project Manager

ACRONYMS

PCE (Tetrachloroethene):

- A man-made chemical that is widely used for dry cleaning clothes
- It evaporates easily into the air
- a colorless liquid with a mild, chloroform-like odor - has a sharp, sweet odor

TCE (Trichloroethene):

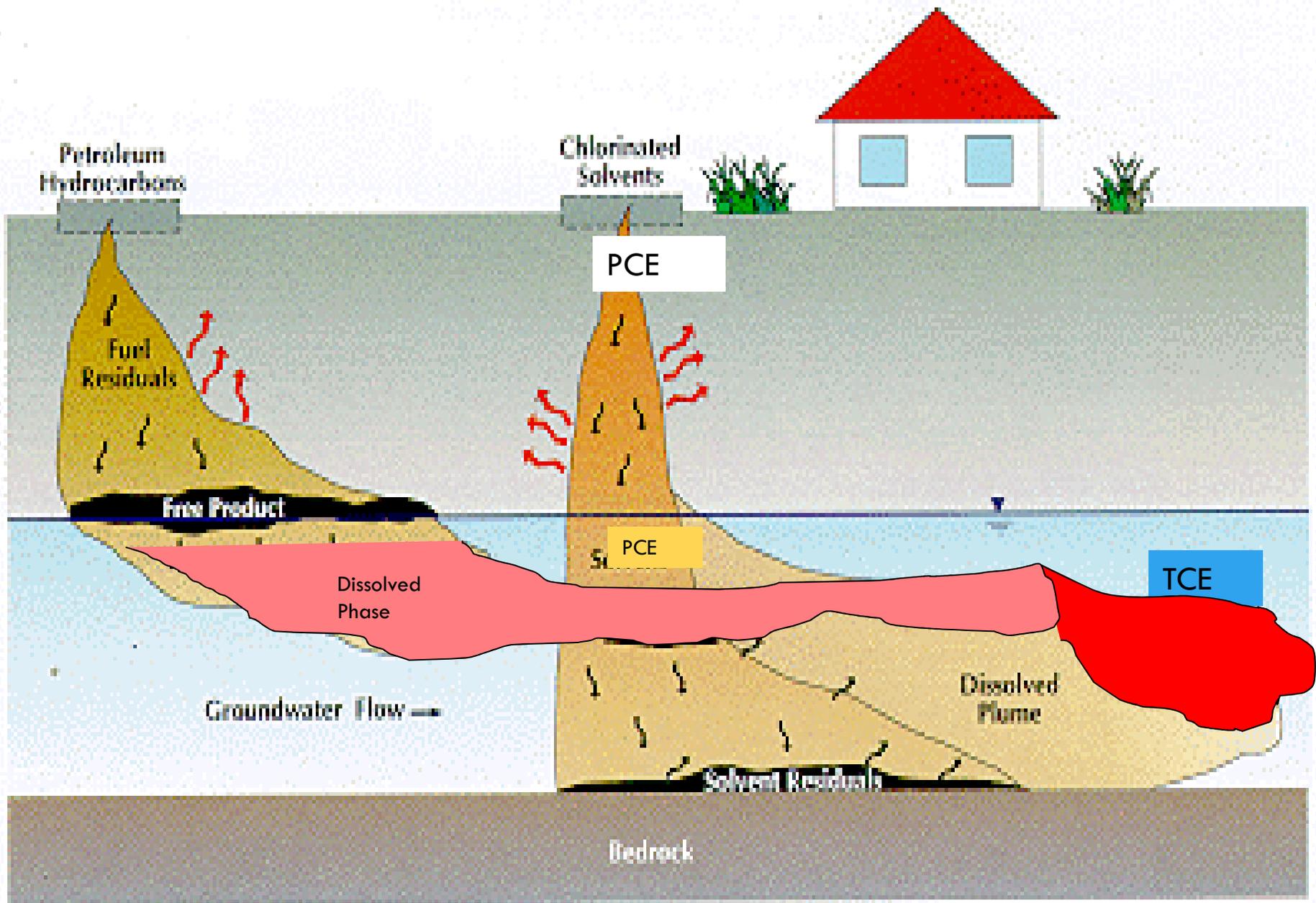
- Remove grease from fabricated metal parts and in the production of some textiles.
- PCE degrades to TCE under certain circumstances
- A colorless or blue liquid with a chloroform-like odor - has a sharp, sweet odor

CCL₄ (Carbon Tetrachloride)

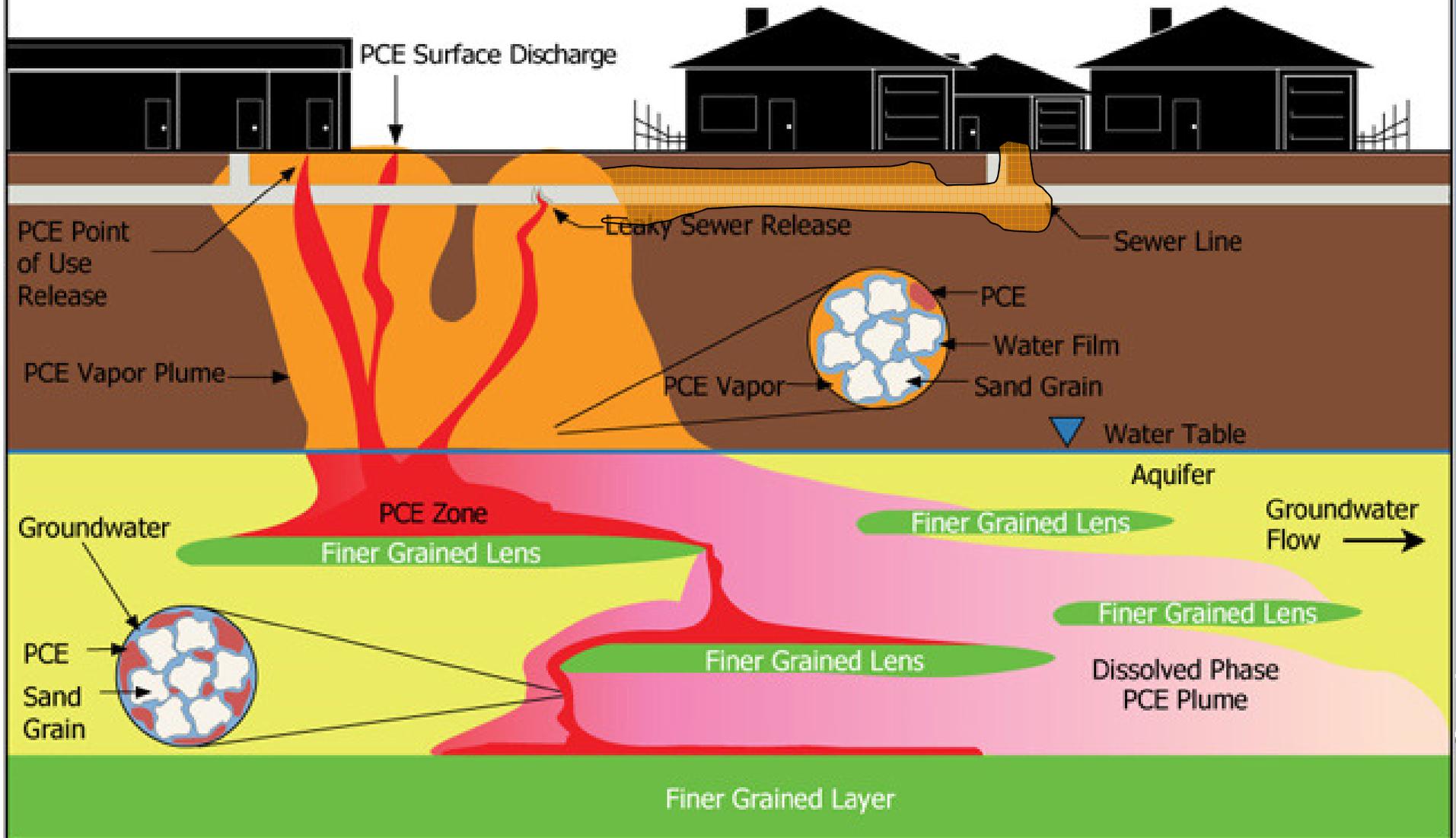
- used as a fumigant for insecticides in grain elevators
- a clear heavy organic liquid with a sweet aromatic odor similar to chloroform

For more information about these chemicals go to:

<http://water.epa.gov/drink/contaminants/basicinformation/>



The PCE Challenge



HEALTH EFFECTS

Cancer Risk for PCE and TCE
is classified by EPA as “likely to be carcinogenic” to humans.

Maximum Contaminant Levels (MCL)

Drinking Water – 5 ug/L

Vapor Intrusion

	Screening Levels		Removal Action Levels	
	Sub slab		Indoor Air	
	PCE $\mu\text{g}/\text{m}^3$	TCE $\mu\text{g}/\text{m}^3$	PCE $\mu\text{g}/\text{m}^3$	TCE $\mu\text{g}/\text{m}^3$
Residential	1,400	70	42	2.1
Industrial	6,000	293	180	8.8

$\mu\text{g}/\text{m}^3$ = microgram per cubic meter

SITE HISTORY

- 1990: NDEQ discovered TCE in some of York's municipal wells.
 - NDEQ sampled 20 private water wells in Northeast section of York
 - NDEQ found 8 wells with TCE above MCLs
- USDA found CCL_4 in Northeast section of York during groundwater sampling in 1993 and 1994
- 2009 NDEQ discovered TCE in 3 residential wells in the Northeast above MCLs
- Residences with contaminants in their well above MCLs were hooked to city water
- 2010 EPA collected groundwater samples in the Northeast section of York
- During groundwater sampling by EPA in the Northeast section of York a PCE groundwater plume was discovered in Southeast section of York

Map of Contamination Plumes that EPA is working on

- Legend
- TCE and PCE
 - York PCE

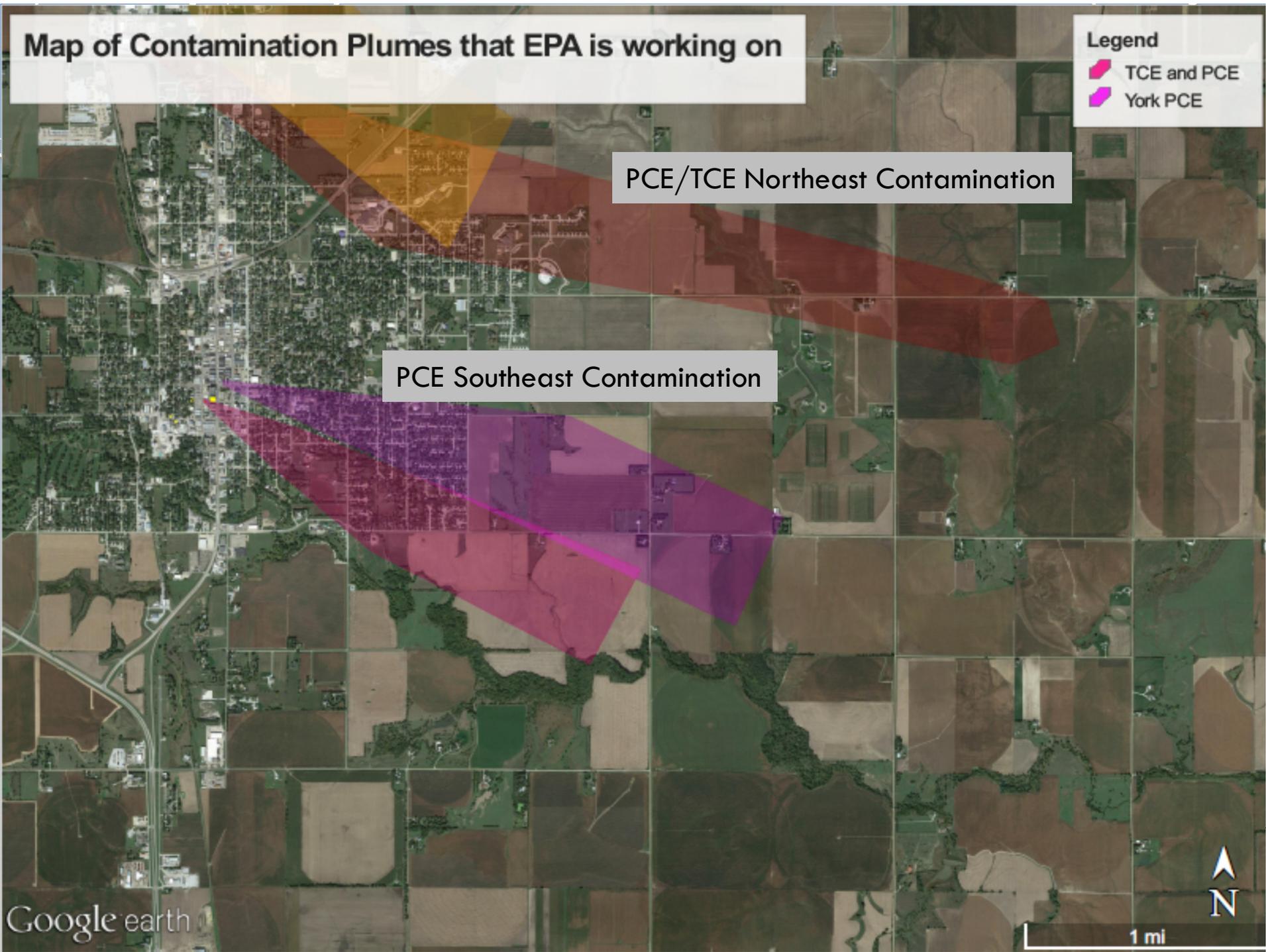
PCE/TCE Northeast Contamination

PCE Southeast Contamination

Google earth



1 mi



REMOVAL ACTION

- Collect water samples from private drinking water wells
 - Provide alternate drinking water to those with PCE and/or TCE contamination in their well
- Collect groundwater and soil samples to determine the extent of the contamination and locate source areas
- Collect soil gas samples in properties in the form of sub slab and indoor air samples
 - Install vapor mitigation systems in residential homes and businesses where PCE and/or TCE exceed the removal action levels for soil gas contaminants

Private Drinking Water Well Sampling to Date

- Approximately 185 drinking water samples have been collected
- Approximately 31 drinking water wells have been disconnected and city water has been hooked up to residence
- Approximately 6 whole house filter have been installed in residences

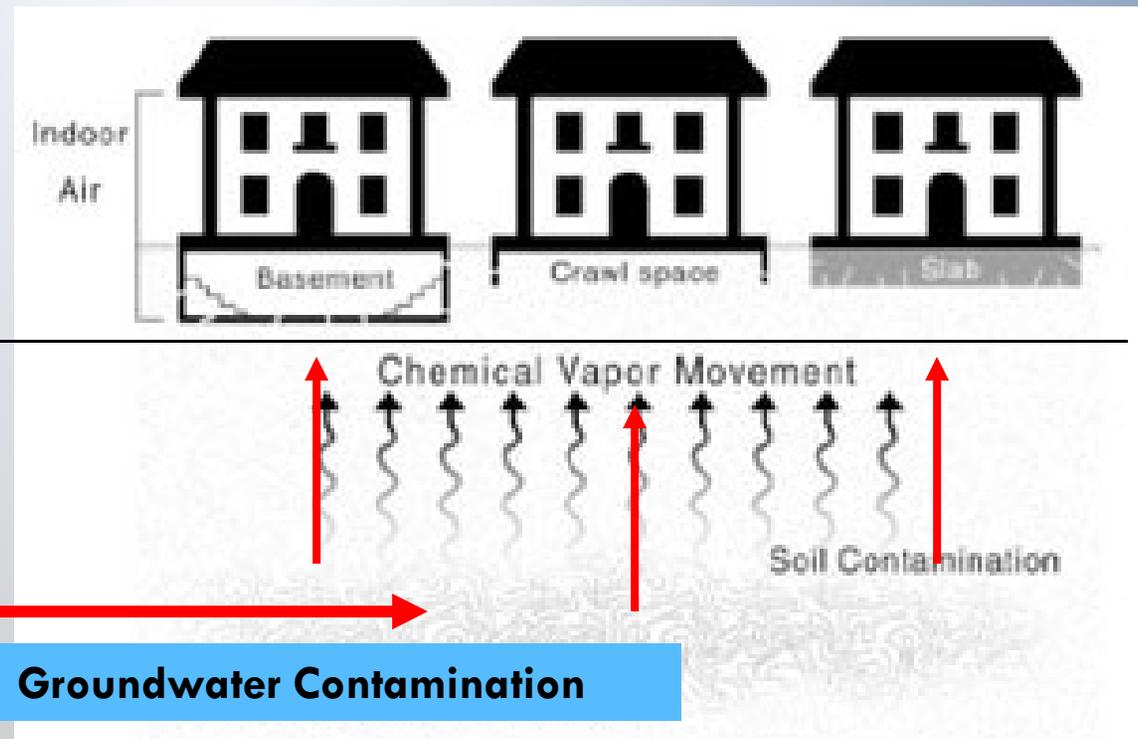
Future Private Drinking Water Well Sampling

- Resample private drinking water wells in the area of the plumes
- Additional wells over the MCLs hook up to city water or install whole house filters



WHAT IS VAPOR INTRUSION?

Chemical Spill-PCE



Must Connect GW, SG, SS, IA



SUB SLAB AND INDOOR AIR SAMPLING





VAPOR ABATEMENT SYSTEM INSTALLATION

EXTRACTION PIPE INTO SLAB



Based on radius of influence testing, multiple extraction points may be necessary
Note: Looking for entire slab to be under vacuum



VAPOR ABATEMENT SYSTEM INSTALLATION OUTSIDE FAN AND VENT



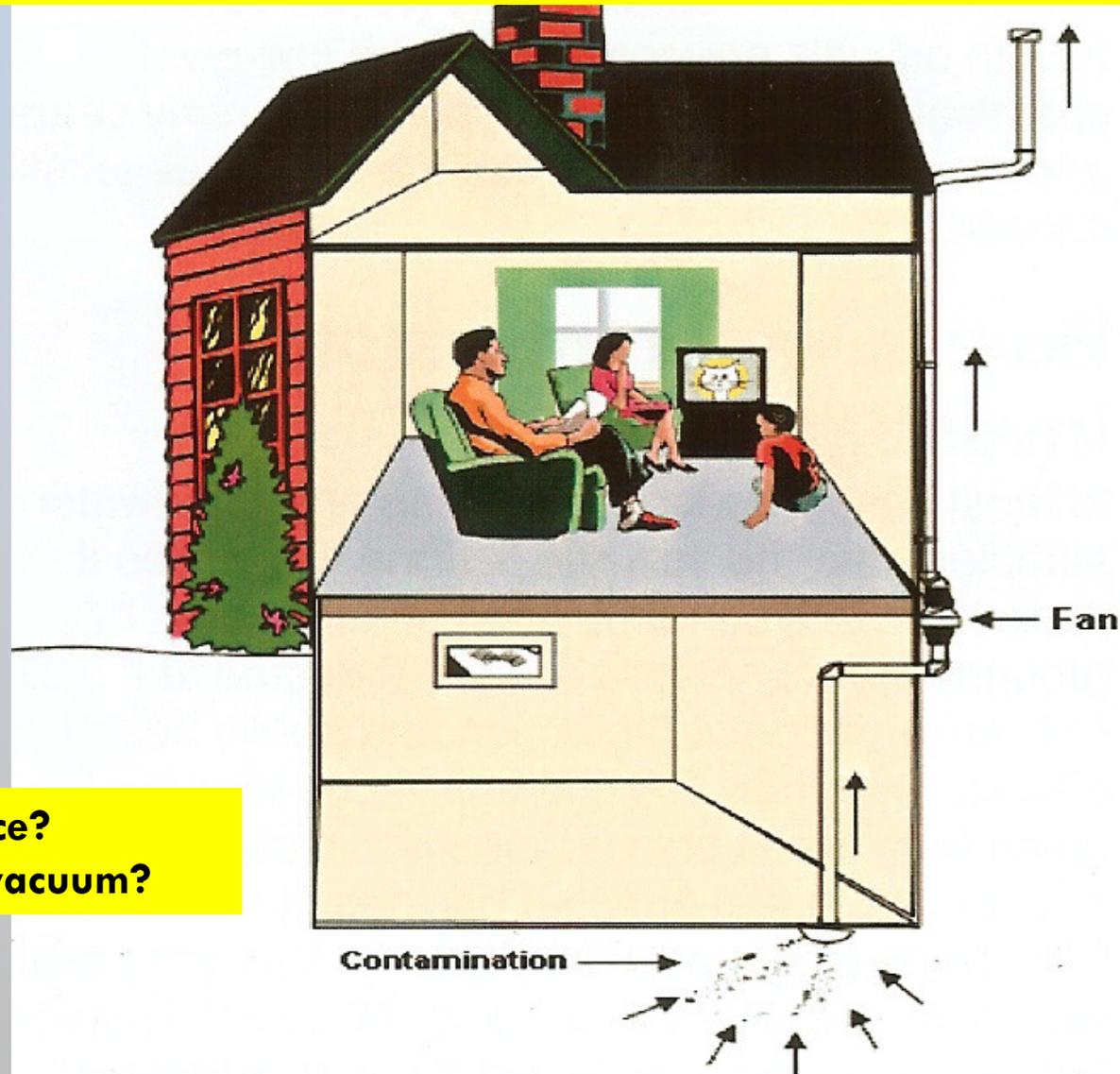
Per local code, vent above highest window





Vapor Abatement Mitigation System

(Sub-Slab Depressurization System or SSDS)



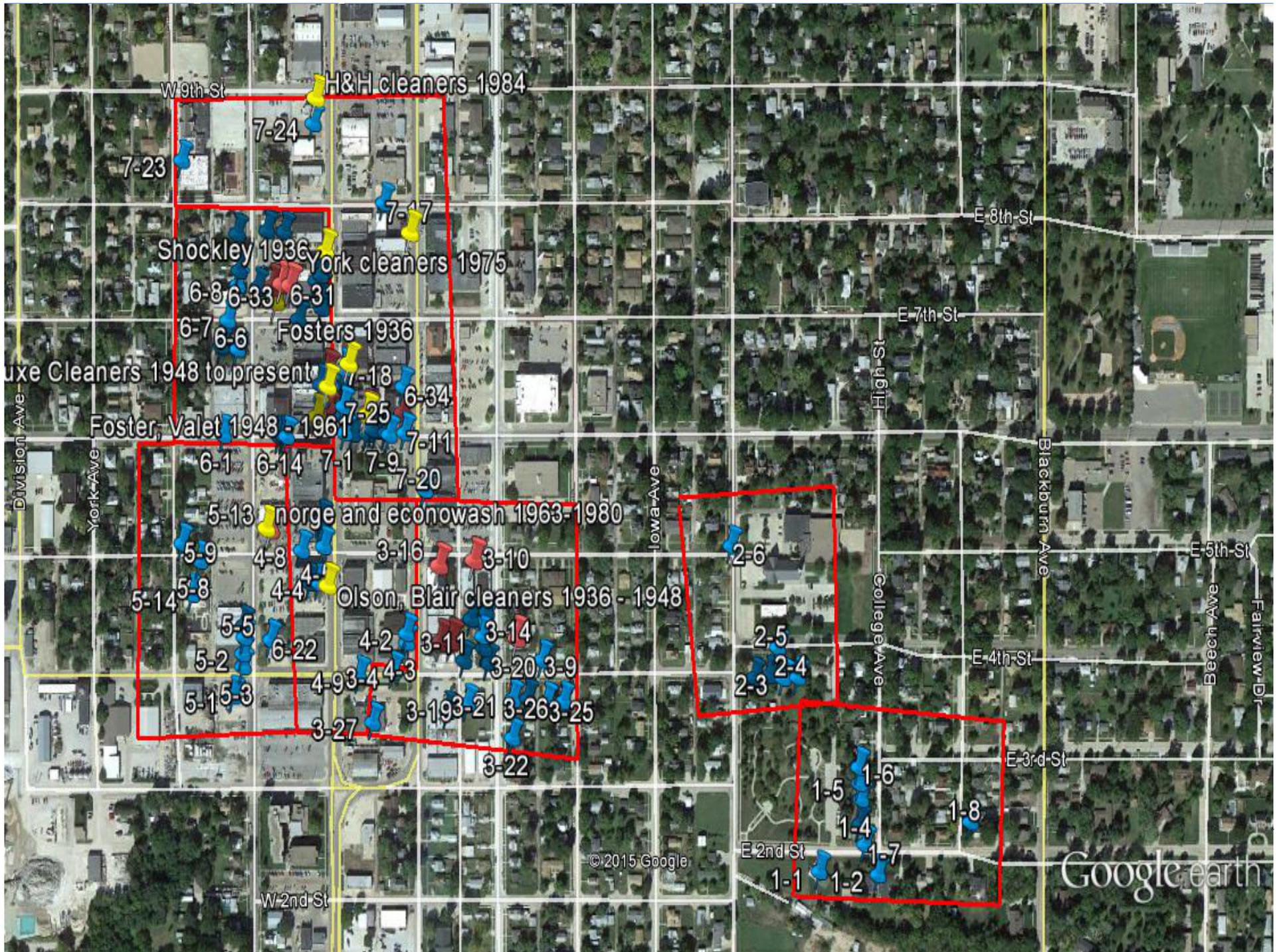
Radius of Influence?
Least amount of vacuum?

Vapor Intrusion Sampling to Date

- Approximately 31 indoor air samples have been collected
- Approximately 105 sub-slab samples have been collected
- Approximately 15 vapor mitigation systems will be installed

Future Vapor Intrusion Sampling

- Resample properties previously sampled for 4 quarters (properties without vapor mitigation systems).
- Additional vapor intrusion sampling in properties not previously sampled



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QUESTIONS?

For more information, please contact:

Susan Fisher

1-800-223-0425

or

913-551-7919

FISHER.SUSAN@EPA.GOV