Data Usability
A Small Town Case Study

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Years ago on city-owned property stood a shed used by the utilities department. This property is located downtown, and is a perfect site for a shopping center and a parking lot.

Developer A offers to redevelop and purchase this property from the city, so soil testing was performed to test for suspected contaminants.
**Site Information**

- **Shed area** - suspected contamination source, is now under a grocery store interior meat cooler
- **Monitoring wells** - 35 temporary wells surrounding <1 square acre property
- **Developer B** wishes to build 300 Condos + 40000 SF retail shops/restaurants
Contamination Identified

- Dieldrin was detected in the soil above FDEP cleanup standard levels, so the contaminated soil was excavated and removed.
- Temporary monitoring wells were placed around the site, and low level detection of dieldrin was found away from the site.
- Interested parties were concerned, so further studies were performed to define the source and delineate the plume.
**Discussion**

- It is obvious that pesticides were used in the past to eliminate termites and other insects.
- The developer may not want to purchase this property from the city if it is contaminated.
- FDEP has concerns and requests for the consultant to delineate the plume and determine the extent of the contamination.
- City staff and council are concerned about the cost of the ongoing monitoring and clean-up. ($600-800K)
Dieldrin - Chlorinated Hydrocarbon

✦ Produced in 1948 to replace DDT
✦ Banned in the 70’s due to toxicity studies
  – Neurotoxin
  – Linked to Parkinson’s disease
✦ Is a Priority Pollutant for effluent monitoring (Clean Water Act)
✦ Is now on the “Unregulated” drinking water pesticide list
Dieldrin Detection

- In the 22 wells around the site, there was detection in 5 wells that were confirmed on several sampling dates. Additional wells were constructed on adjacent property.
- 0.017 ug/L was the highest concentration detected on the city “shed” site.
- 0.05 ug/L was detected on the adjacent property where a strip mall used to be.
Dieldrin, “Unregulated” DW SOC - Method Detection Limits

- EPA 505 0.012 ug/L
- EPA 508.1 0.010 ug/L
- EPA 525.2 0.120 ug/L
- No DW Maximum Contaminant Limit
- EPA 608 0.002 ug/L
- FL-DEP GW 0.002 ug/L
Analytical Approach to 2ppt

- Extract greater sample volume
- Concentrate extract
- Calibrate to limit of instrument detection
GC/ECD Chromatography

- Dual Column, or 2nd column confirmation
- Typical Retention Times
  - 6.73
  - 6.77
- Consider chlordane peaks
  - 5.5 - 7.26
Data Validation

- Verify dieldrin peaks are not actually chlordane (requested analysis was for dieldrin only, but there is calibration curve data).
- No scientific certainty that it is dieldrin because the concentrations are too low for GC/MS confirmation.
- EPA method criteria were met by GC/ECD to call it dieldrin.
- Prove that extraction and analytical scheme can detect these low levels.
Who’s Dieldrin is this?

- Since the concentration is higher on the neighboring property, the city doesn’t want to continue paying for remediation.
- The plume is not migrating, nor is the high concentration well downgradient from the city site.
- The strip mall most likely had its own pesticide treatment in the 1950’s and 60’s, and it is not the city’s concern.
Options for Resolution

- Continue to clean-up the ‘plume’ (est. total mass to be 0.114 grams with >$1MM devoted to clean up, may not be enough.
- Use Institutional Controls:
  - Deed restriction to never place a potable well on-site.
  - If there was a well, it may meet DW standards but you are not permitted to use the water for irrigation.
Site Schematic

Legend
- Surface Water Sampling Location
- Monitoring Well Location
- Building
- Road, Highway / Edge: remove
- Parking Lot
- Retention Pond
- Surface Water Management Pond
- Sampling Well (B)
- Field Log: Field Data: Blank Result (ppb/ml)
- 1-Jun-07: 0.0015 U

Notes:
1. All groundwater results are presented in micrograms per liter (µg/L).
2. The Groundwater Cleanup Target Level (GCTL) for dieldrin is 0.003 µg/L.
3. Dieldrin results in excess of the GCTL are indicated with yellow shaded cells and bold text.
4. U indicates not detected above the indicated method detection limit.
5. T indicates that the result is greater than the method detection limit but less than the practical quantitation limit.

Analytical Results for Dieldrin in Shallow Monitoring Wells (screened 15-25 ft, BLS)
Former City of Maitland Maintenance Yard
231 N. Wayne Avenue
Maitland, Orange County, Florida

Figure
**Data Review**

- City staff are not educated to question the consultant regarding detection levels.
- Could the dieldrin peaks at this low concentration actually be chlordane?
- Must state clean-up standards be the sole source of direction for projects?
Someone has to decide

✦ Sometimes Cleanup is not the right option. That is why other avenues are available.
✦ At this level of detection, laws allow you to drink this water, but not discharge it back on the ground.
Hopeful Resolution

- Use the deed restriction approach to save time and city/tax payer dollars.