



WHY I SHOULD STICK MY  
NOSE IN OTHER PEOPLE'S  
BUSINESS

OR

WHY I SHOULD PARTICIPATE IN ALL  
PHASES OF THE DATA LIFE CYCLE

# Data Life Cycle

- Planning
  - Directed planning process
  - Plan documents
  - Contracting Services
- Implementation
  - Sampling – laboratory samples
  - Analysis – laboratory analysis
- Assessment
  - Verification
  - Validation
  - Data quality assessment
- Blame

Often the only places where lab personnel are considered key players

# MARLAP Warning

- “Although the diagram represents the data life cycle in a linear fashion, it is important to note that the actual process is an iterative one, with feedback loops”
- Summary
  - Don’t go through the steps one at a time and think you are done

# Additional Warning

- Steps appear compartmentalized
  - Everyone has their own job
- Steps truly overlap
  - Everyone should stick their nose in everyone else's business

# Example

- Characterize a questionable set of soil piles
- Large project with high visibility
- Many other projects to be completed at the site

# Objectives

- Stakeholders meet to determine objectives
  - Determine if soil piles are dangerous to the public
  - Determine exactly what is in the piles
  - Efficacy of field testing methods at site
    - Can XRF and ISOCS be used to save money on future projects?
    - Determine efficacy as a screening tool
    - Possible to use in risk assessment?

# Planning

- Many planning meetings held
  - Want to get everything just right
- Carefully select an appropriate sampling design
  - Use splits to be able to compare analytical lab measurements with XRF and ISOCS results
- Statistical analysis thoroughly discussed and evaluated before a single sample was collected

# Safety Question

- Measurements obtained
- Soil piles are safe
  - All analytes of concern present in amounts well below action limits
- Conclusions based on lab techniques
  - Highly defensible



# XRF Results

- Measured barium, chromium, lead, and uranium
- Relative error of upper confidence limits (UCLs) as large as 690% compared to laboratory data
- 5% of lead measurements were false positives relative to the no action limit
- 16% of uranium measurements were false positives relative to the no action limit
- 56% of uranium measurements were false negatives relative to background
- Chromium was not detected by XRF at background levels

# ISOCS Results

- Measured Cs-137 and U-238
- Relative error of upper confidence limits (UCLs) as large as 540% compared to laboratory data
- 60% false negative rate relative to the no action limit for Cs-137
- Unable to detect U-238 at background levels
- Unable to detect U-238 at the no action limit

# Conclusions from Results

- XRF and ISOCS data cannot be used to compute UCLs
- Data were not adequately conclusive to determine if XRF and ISOCS were sufficient for screening

# What Now?

- Stakeholders were certain results would be better
- Decided not to use XRF and ISOCS on future projects

# Fast Forward - Lab

- Several months after project completed
  - Conversed with a subject matter expert from a laboratory familiar with the project
  - Insisted that better results should have been obtained
  - Explained sample preparation methods that may have produced data sufficiently accurate to compute UCLs
  - Questioned whether field workers properly performed XRF and ISOCs

# Fast Forward - Field

- Spoke with person in charge of field sampling
  - Followed instructions exactly as outlined in vendor instructions
    - Not as rigorous as the method outlined by lab subject matter expert
  - Spoke with lab prior to sampling
    - Lab insisted on all or nothing – they wanted complete control or did not want to help
    - Too expensive so knowledge from lab personnel not available
  - Unaware that XRF and ISOCS data were to be used to compute UCLs
    - Believed that XRF and ISOCS data were only to be qualitative

# Breakdown

- Extensive planning, but ...
  - Laboratory personnel and field workers absent from all planning
  - Objectives not conveyed to those gathering the data
  - Laboratory personnel not consulted to ensure best practices were used in the field
  - Vendor information not adequate for data needs

# Missing Pieces

- Data needs were specific but lab was not consulted on proper protocol for data needs
- Laboratory personnel were unwilling to provide information essential to project success when approached by field workers
- Data needs were not conveyed to those collecting and analyzing the data



# Lessons Learned

- What about next time?
  - Laboratory personnel need to be involved in planning meetings
  - Laboratory personnel should meet with field samplers to ensure that field methods are executed properly for data needs
  - Project planners need to involve key personnel from all phases

# Own Your Expertise

- Don't wait to be asked
  - Nobody will ask you because they don't know they need you
- Recognize that you may not be given the control you want or need
  - Be willing to help however you can
- Don't be afraid to be pushy
  - They don't know they need your help
  - They don't know how you can help

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