

May 2016 Workshop Questions and Summary Notes for Breakout Sessions

1. **Assessment Work at Petroleum Drycleaning Sites:** Develop a Site Assessment Work Plan for a petroleum solvent drycleaning site (map attached).
 - Propose sampling locations and selection criteria
 - Propose analytical suites
 - Discuss what equipment would be used.
 - Put sample locations near source areas and look at historical information, site screening results, and Sanborn maps are helpful.
 - Sample near transfer machine, former ASTs, dryer vent, vacuum water, floor drains, drum storage, dumpster, swale. Where did they dry cartridges?
 - Sample 8260 full suite, TRPHs w/speciation, FL-Pro, 8015 mineral spirit, finger print (TPH), metals in hot areas, MADEP – speciation, sample for VOCs also (spotting agents).
 - Equipment - DPT, FID, mobile lab, MAGs, shallow piezometers, GPR if concerns with USTs.
 - From Bill Linn – site had two non-recovery dryers, lint was lit up, starting to get more of these sites. The primary petrol COCs: naphthalene, TMB, BTEX
 - Drycleaners prior to 1962 likely used petrol, after that Perc was in use.
 - Drycleaner are required to characterize waste as prior to disposing as non-hazardous. The drycleaner should keep this information on site.
2. **Report Contents & Formats:** Propose contents and formats for the following reports/documents:
 - Groundwater Monitoring Report
 - Combine the groundwater monitoring reports with the O&M reports.
 - Field notes in the report – note any changes of: ownership, property alterations, change in tenants, damaged wells, nearby sensitive receptors (schools/daycares). [Should be O&M Report as well.]
 - Tables, figures, notes, conclusions recommendations
 - Photo documentation
 - Operation & Maintenance Report
 - Combine the groundwater monitoring reports with the O&M reports. Or include GW Analytical Summary and GW Elevation Tables in reports when GW monitoring was not performed.
 - Current status of facility and operational dates including solvent used should be in introduction or site history section.
 - Standard tables for consistency and easier review.
 - Operational notes, design vs. actual, recommendations for continued operation
 - Mass removal discussion & timeframe changes – updates to CSM
 - Field observations – system optimization/troubleshooting/resolution
 - Photo documentation
 - Problems experienced & solutions
 - Site Assessment Work Plan
 - Use a standard format
 - Have a CSM, update regularly, photo documentation
 - All should be routed through PG (Bill Linn) for review.

- Site Rehabilitation Completion Report
- See Bill's bullets
- Needs to include ALL data to support SRCR.
- Combine with O&M or GW monitoring report, Conclusions – meets 62-780 criteria because...
 - Monitor Well Abandonment Report
- Include drillers completion reports, use standardize format, photo documentation (before and after)

- 3. **Conducting Site Assessments:** Propose alternate approaches to site assessment work. Consider the following factors: active/inactive drycleaning facilities, equipment utilized, data to be collected, analytical suites and reporting.
 - For active DC – compliance assistance, regulations and requirements are met, Consider Risk to HH&E.
 - Set source wells and establish downgradient MWs at property boundary. No MAGs unless a risk to HH&E.
 - Inactive DC - continue triad approach, allow for opportunities to digest data, continually refine CSM, Identify exit strategy early on
 - Goal for work plan – to develop a plan that would be adequate to close a site or to facilitate presumptive remedy implementation.
 - SAWPs –Should include basic information – lithology data, HPT and EC data, would diminish some of the discrepancies.
 - Maps and tables in SAWP are useful, all of this is revised as soon as we begin sampling, should identify areas of interest not points.
 - Collecting data with 2"well may serve a purpose for bio-trap samplers, slug test etc.
 - Program could take a regional approach to assessing sites at one time.
 - Contractor should be in communication with site manager and/or PG during field work. Call should be made at mid-day and before leaving site in order to discuss observations, necessary changes to scope of work and if assessment work is complete for that phase.
 - Offsite access should be discussed with potentially impacted downgradient property owners while onsite. Know the offsite access agreement and be ready to discuss with these property owners.

- 4. **Moving from Site Assessment to Remediation:** How can the transition from SAR into RAE or ISR be accelerated?
 - Should have a CSM in work plan – get engineering staff into the discussion during assessment. Update the CSM frequently.
 - Communication – contractor to owner, contractor to DEP, DEP to contractor – provide feedback on all steps.
 - Collect data for presumptive remedy – bio sampling, Oxidant demand, and bench scale testing.
 - Geologist and engineers need to have all the data during assessment (avoid go-backs)
 - MAGs wells = SVE wells; total depth & screen intervals of wells should address the vadose zone targeted for treatment; screen wells at least a foot above the water table

- Rent equipment based on fixed unit rate and short-term use.
 - Send the engineers out to run the MAGs
 - Think ahead – get off-site access agreements on issue off-site notice.
5. Under what scenarios would you propose bioaugmentation and/or biostimulation and what lines of evidence would you use to justify the proposal?
- All about delivery. Need to understand lithology and a good handle on CSM, what is the desired outcome, mass storage, vs. mass transport. Does subsurface geology and initial bio-geo parameters look good? ID limiting factors. pH, DO, TOC, Bio?
 - Just do it – low cost relative to just bio.
 - Do you need to test for DHE? Not if you are going to augment – the cost to augment will offset the cost to test for the gene. Can test later on if you see Cis stall.
 - If pH is a problem you will need to buffer. Run a bench scale that will run 28 days. Buffer amendment will show if you can keep it there. Titrate the soils, and check the pH every day, very inexpensive.
6. What are the critical criteria to be considered prior to beginning a soil excavation (example: waste characterization, weather, onsite scales, etc.)?
- Look at feasibility of excavation
 - Site layout and access to contaminated soils, building foundations, current business, depth of impacts, depth to water, staging areas, utilities (private locate), evaluate lithology (sand, clay, or rock); geotechnical evaluation
 - Cost/benefit – small digs (not as critical) disposal characterization (haz vs. non haz), Ex-situ treatment, exposure vs. gw source
 - Methodology – LDA, Sheet pile, long stick (conventional), shoring, vacuum removal?
 - Considerations: site survey pre and post, dewatering, stormwater management, erosion control, on-site scale vs. local scale, air monitoring/dust mitigation, IDW characterization (total and TCLP), establish sampling protocol.
 - Site Restoration: surface completion (hydroseed/sod/asphalt/concrete), utilities, density/compaction requirements, confirmation of backfill, weather (dig in dry season), photo documentation, confirmation sampling
 - Discuss site restoration needs with site owners and work with them. Share costs if they need something better than they had before.
7. **Improving MAGS™ Sampling**
- Data Analysis
- a. What has been the best data analysis method and how close is it to actual system startup?
 - TO-15 Summa and fixed lab
 - startup should closely match MAGs (within an order of magnitude)
 - b. What are the best presentation methods, graphs, tables, figures?
 - ROI figure and tag boxes with mobile lab data, a table summary with vac/flow rate/time/PID/lab/pore volumes/distance to VMPs or points where induced vacuum data is collected/total depth/screen intervals
 - c. What are actionable levels? What is a high, low & average detection
 - Should be site specific, look at soil & groundwater data
 - <1 mg/m3 threshold/ low
 - 1-10 mg/m3 average

- > 10mg/m³ high
 - d. What do we do when MAGS data does not match soil & groundwater conditions (i.e. no soil or groundwater impacts but detections with MAGS)?
- Look at FOC, converging lines of evidence
- If site meet 62-780 criteria for NFA may close site. Unless, you have rare case of very high MAGs but no soil/groundwater, you need to look closer;
 - e. How do we handle high water tables?
- Need to know ahead of MAGs and adjust vacuum.
- Limit the number of steps you do – look for presence/absence.
- If groundwater is less than 2 feet MAGs may be difficult.
- Modify MAGs points – go with larger diameter points.
- f. MAGS at active DCs?
 - For a non-PCE drycleaner – yes
 - For active PCE drycleaner - It may be appropriate based on risk. Sites that are highly contaminated/have receptors MAGs may be warranted to implement ISR.
 - There may be situations where we would do it but know you could get drawdown.
- g. How do we measure and account for potential cross contamination for equipment and from background?
 - Usually an ambient air issue, rarely is it an equipment issue.
 - Hand pumps may cause cross contamination.
 - Look at sample times if operating drycleaner; document the DC activities during vapor sampling in the field notes
- a. What has worked? Field GC, PID? Colorimetric tubes? Lab grab samples?
- Use field GC on case-by-case basis, PID is the standard. Colorimetric (case-by-case). Fixed lab grab samples are standard.
- b. When should air samples be collected (Peaks)?
- At the beginning of the test
- c. How many VMPs? Locations?
- As long as there is adequate coverage with MAGs pts. Don't need more points.
- May need VMPs to verify ROI if not enough MAGS pts.

SVE Pilot Test?

- a. What is a sufficient blower size? Vacuum? Flow rate?
 - Blower single phase. Measure flow, vacuum, where is the flow data coming from.
 - Blower size – 2.5-5 hp, vacuum 40 – 100"
 - Flow Rate 0-50 cfm
- b. How many step downs (or step ups)?
- c. What data should be collected & when?
 - Step tests – 30 to 60 minutes. 3 increments of vacuum. Tell the technician what to do, 10, 20, 30 minutes and adjust
 - What are the merits of a step test? ROI doesn't change but by a fraction. Using the data for design data may use step test to determine ROI.
 - Also, using different vacuum points will tell you about heterogeneity of soil.
 - As you crank up the wells you begin to see well losses. (full scale?)
 - Goal is to find optimal flow vs vacuum. Where do we see diminishing returns on flow based on applied vacuum while not entraining water? Test should answer this question.

- Step testing on all wells may be time consuming. Can just do one or two and then do the rest using the optimum design values.
- SVE pilot test vs. triangulating to determine mass. Go back and do the rest based on the design data.

8. **Sites in Natural Attenuation Monitoring (NAM) Scenario**

Drycleaning site where active drycleaning operations are no longer being conducted. After completion of contamination assessment the site was placed into monitored natural attenuation. Monitoring has been conducted for a *number of years* and shows little contaminant degradation and/or reduction in contaminant concentrations. Develop an approach for evaluating stalled NAM sites.

- Inactive DC – has not undergone any remediation. What are the expectations? Realistic timeframe? What are the degradation rates?
- CSM – source get a good handle on; were soil samples collected beneath the DC; inside MW? What are the risk drivers?
- Data – Bio geo, ID limiting factors, are we simply monitoring VOCs or are we sampling for geo chem params?
- Evaluation – plume stable/shrinking. Does the site qualify for conditional closure?
- NAM Scenarios - timeframe – review to see if there is degradation. If you have persistent PCE, there may be still a source.
- Evaluate CSRCO or long term monitoring/remediation. Maybe PBC?

9. **Site Conceptual Model**

The content of our Site Assessment Reports is largely what data was collected, how and where it was collected and what contaminant concentrations were detected. A Site Conceptual Model needs to be included in the SAR. Propose a format and content for a Site Conceptual Model. What are the important elements and why?

- CSM for SAR starts with “quick and dirty” CSM in work plan – historical research and site visit is key. Check CLM for other nearby sites in other Programs for something to start with.
- From day 1, DSCP has used triad approach and communication enables real time CSM adjustments. Don't wait for SAR (60 days later).
- Format – minimal text and awesome figures/cross section
- Elements: research results, suspected source areas, current configurations, lithology, receptors, utilities, groundwater depth/flow, soil MAGs, GW data, future land use.
- Bullet points by media – CSM is a general summary that you put at the end of your SAR and make changes to it as you go along (edit as the site evolves).
- Note changes in flow direction, right now we don't have a mechanism.
- Use better photo logs - let them speak for what's going on at the site. Photo documentation can show utility layout.
- New Jersey has a really good document that describes what a good CSM is. Could be as simple as a picture that shows the story.