Soil Treatability Study

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Status

- Current study phases of Soil Partitioning and Mercury are complete
  - Final reports are in production
- Phase 1 of Natural Attenuation is complete
  - Literature review report has been completed
- Bioremediation, Phytoremediation and Phase 2 of Natural Attenuation
  - Awaiting results of final EFH (Extractable Fuel Hydrocarbons) sample analyses
  - Samples were collected Tuesday
  - Results will be incorporated as soon as they are received from the laboratory (three to four weeks)

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Conclusions

- Soil Partitioning
  - Contaminant concentrations are highest at the surface
    - We may be able to limit the amount of material we have to excavate
  - Soil size partitioning will not greatly reduce the amount of material we have to treat or dispose of
  - Still looking at the possibility of soil washing for addressing the contaminants found on coarse material and sands

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Conclusions

- Mercury
  - The types of mercury found in the surface soils should, theoretically, be candidates for phytoremediation or soil washing
    - We did not see mercury accumulation in the plant tissues of our phytoremediation study
  - Soil washing may be our best option for removing mercury from surface soils
  - The types of mercury found in the deeper soils are tightly bound to the soil particles
    - We need to look at disposal or alternative treatment options for these types of mercury

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Conclusions

- Bioremediation
  - Bacteria and fungi in SSFL Area IV soils should be capable of biodegrading the COIs, albeit slowly
  - Using known bioremediation stimulants, we were not able to significantly increase biodegradation rates
  - White-rot fungi may be an option for dioxin-contaminated soil
  - Bioremediation may be an option for areas with limited exposure potential and low contaminant concentrations

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Conclusions

- Phytoremediation
  - Phytoremediation of the contaminants appears to be a slow process
  - Stimulants (e.g., fertilizer, chelating agents) did not significantly increase contaminant uptake by plants or contaminant degradation by the plants
  - Phytoremediation could be an option in areas with low contaminant concentrations

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Conclusions

- Natural Attenuation
  - Literature suggests contaminants in Area IV soils will eventually biodegrade, but some compounds will degrade very slowly
  - Our bioremediation and phytoremediation studies suggest longer estimated times for remediation than originally predicted from the published studies
  - There is evidence that natural attenuation is occurring at SSFL, but it is and will be a long process

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Next Steps

- Review analyses from most recent EFH samples
- Complete all study reports for publication
- Consider possible follow-on studies to build upon what we have learned
  - Soil washing
  - Field studies of biodegradation
- Incorporate what we have learned into future soil remedial actions for a more effective clean-up