

# MIP System Field Test Results for High Level TPH-GRO

Salina, KS  
Summer 2011

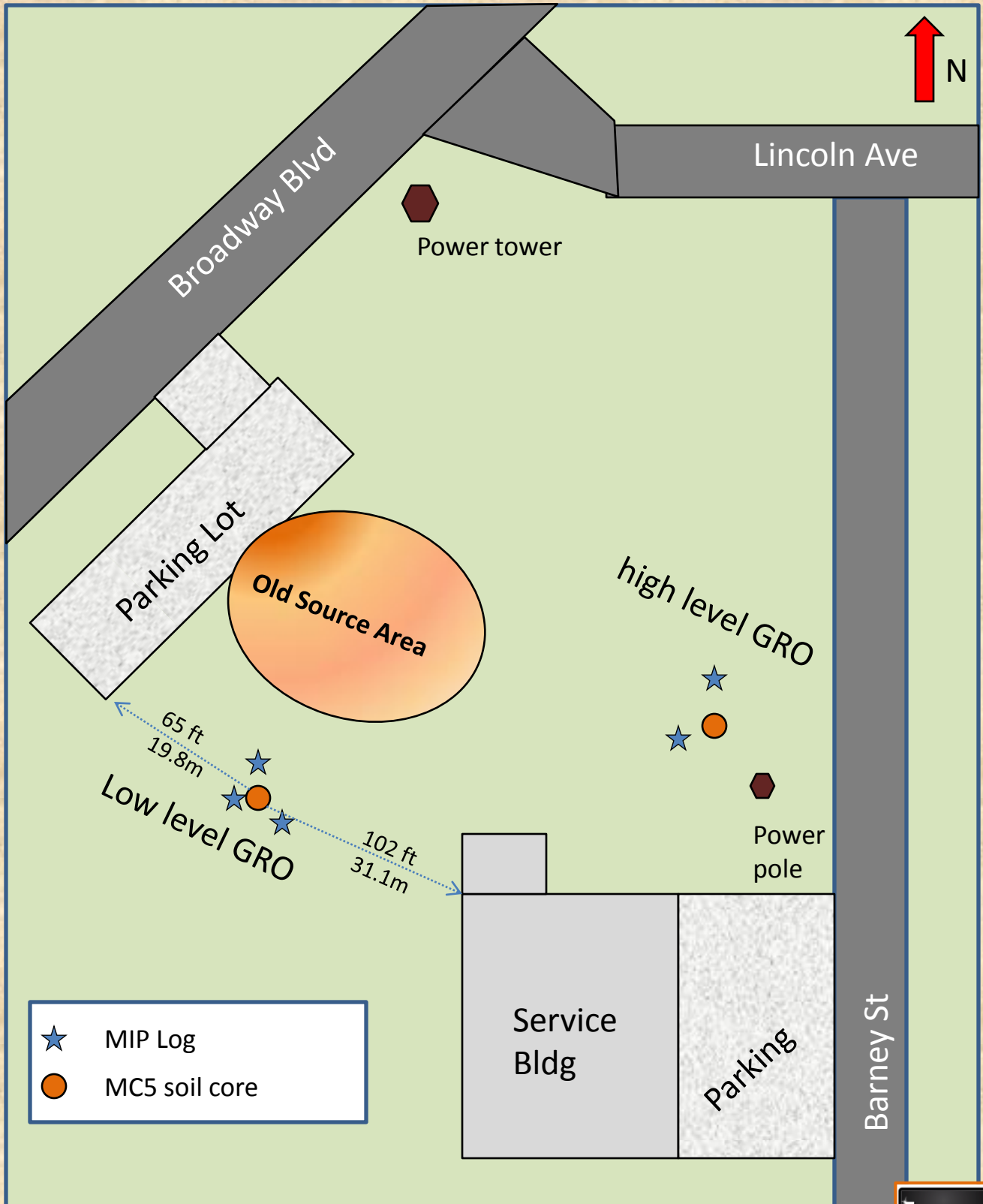


Tom Christy and Blake Slater run MIP logs at local site in Salina, KS where gasoline contaminates the soil and groundwater. Release occurred over 10 years ago. This log is being run at the hi-level GRO test area.

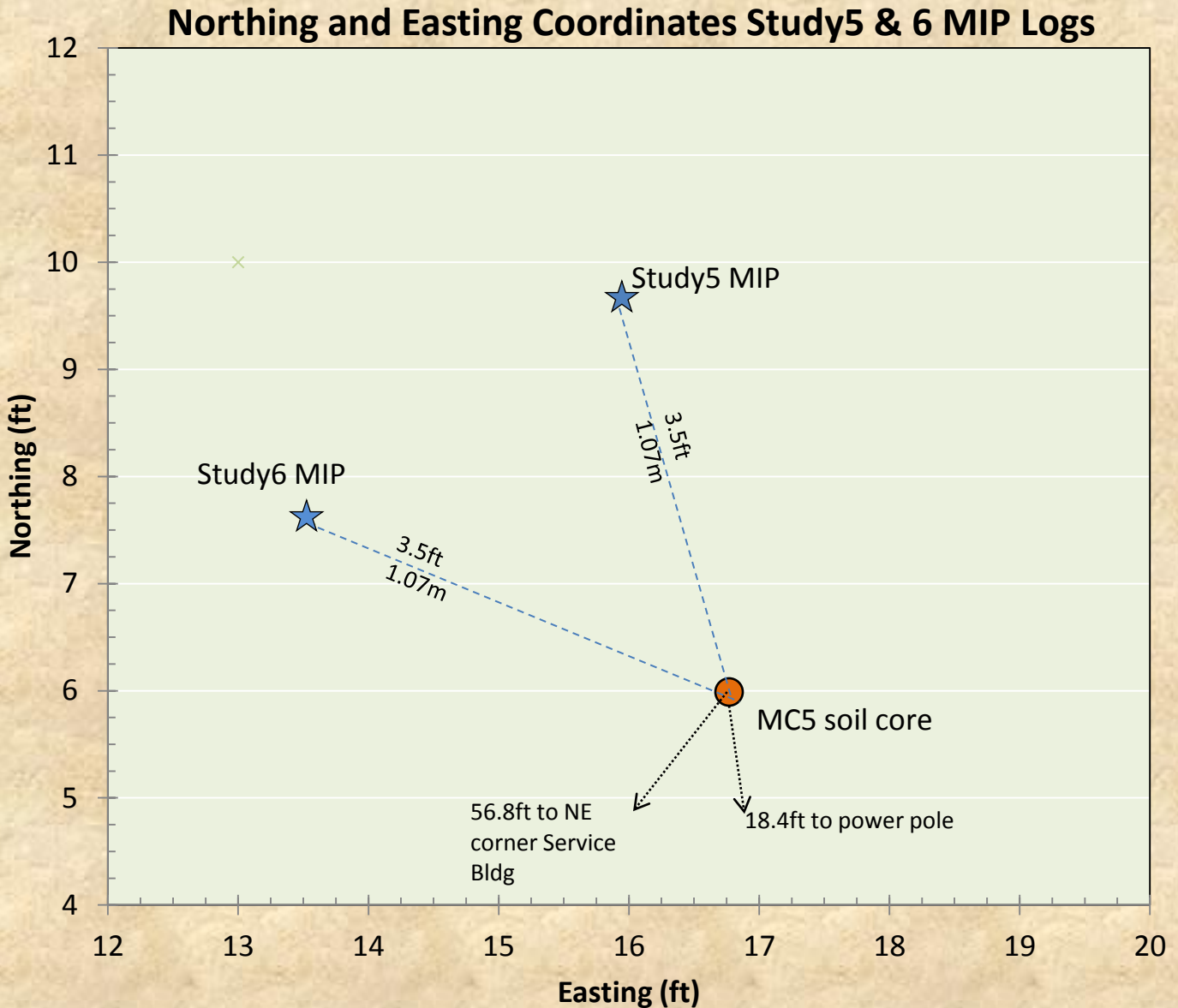
GRO = gasoline range organics  
TPH = total purgeable hydrocarbons

# Field Site Sketch Map

## Petroleum/Gasoline Range Organics

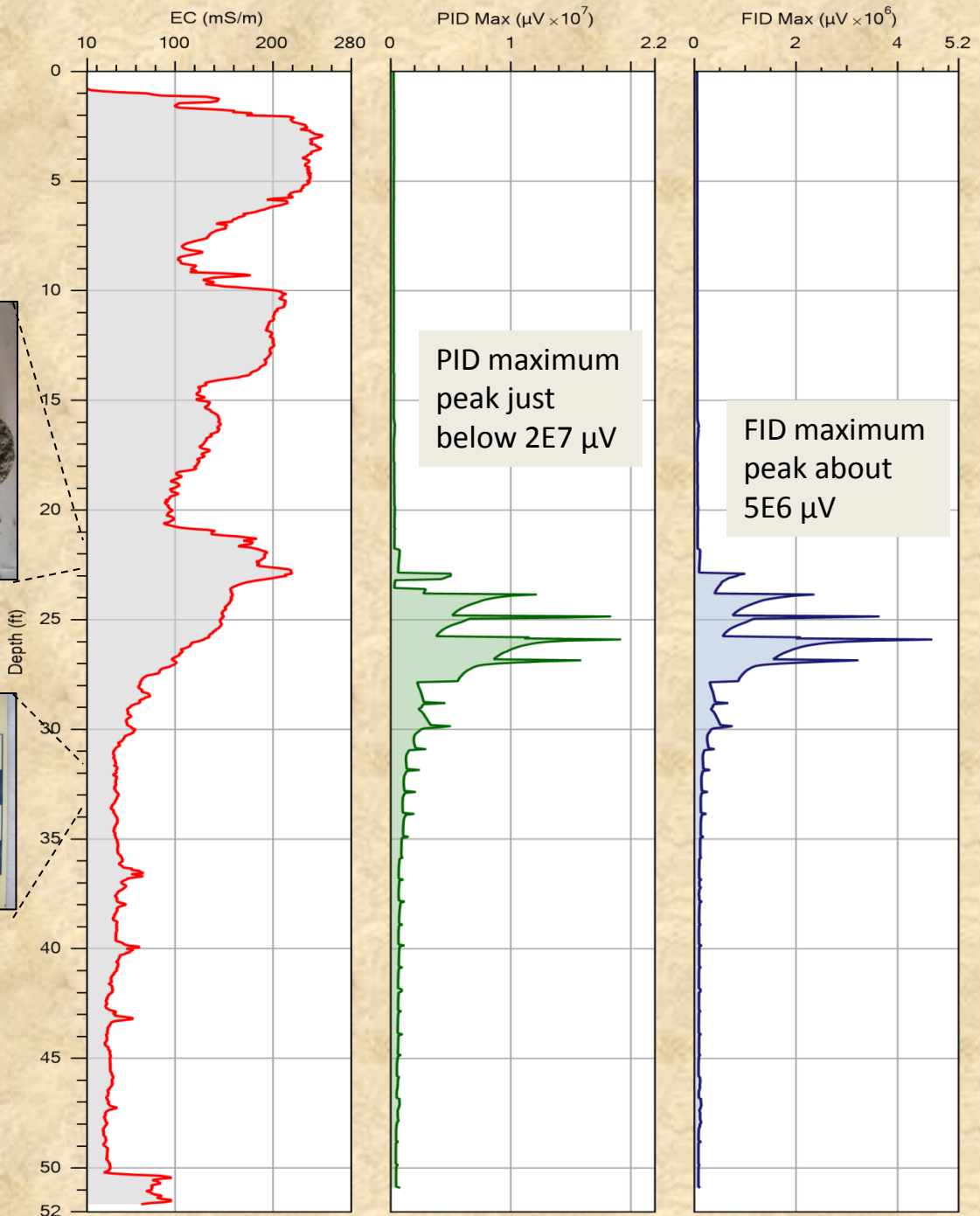


# MIP Study5 & 6 Log Locations Hi-Level GRO Area Sketch Map



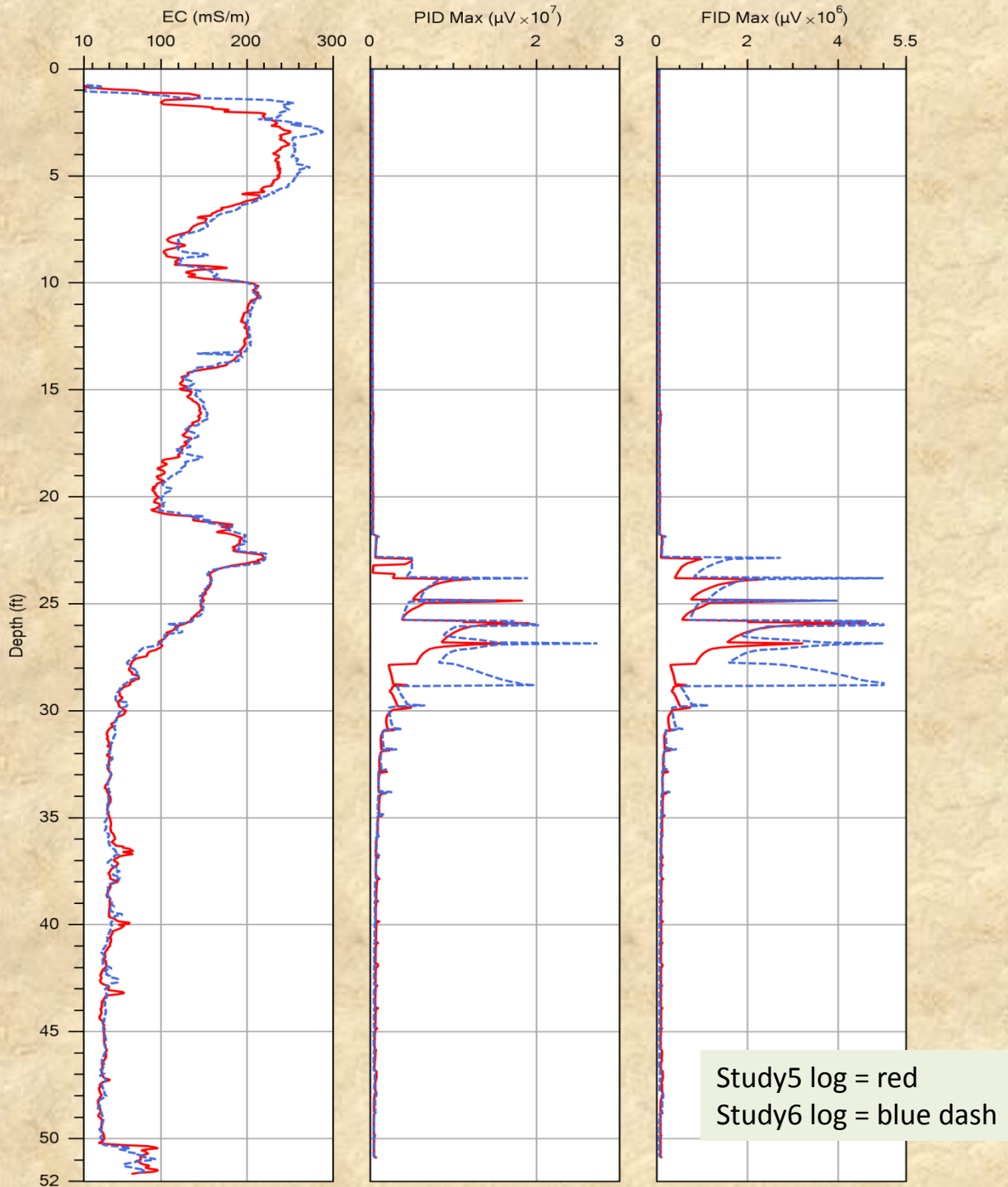


# MIP Log Study5 Location



Both the PID detector (green) and the FID detector (blue) indicate the presence of volatile contaminants between ~22 to 30 feet. The EC across the majority of the contaminated interval (22-27ft) is high (>100mS/m) indicating a fine grained soil. The EC decreases below this interval indicating a transition to coarse grained materials. The MC5 cores confirmed the soil type and changes with depth.

# Overlay of Study5 & 6 MIP Logs



These logs were run one after the other about 3ft (1m) apart. Good overall agreement between the replicate logs indicates moderate to high level VOC contamination between ~22 to 30ft. Small detector peaks below 30ft here may represent carry-over of contaminants in the MIP probe and trunkline system. A heated trunkline was not used for these logs.

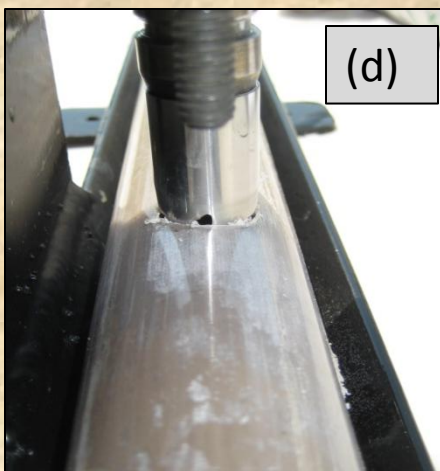
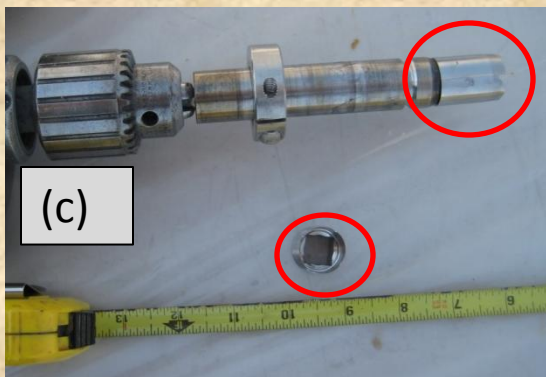
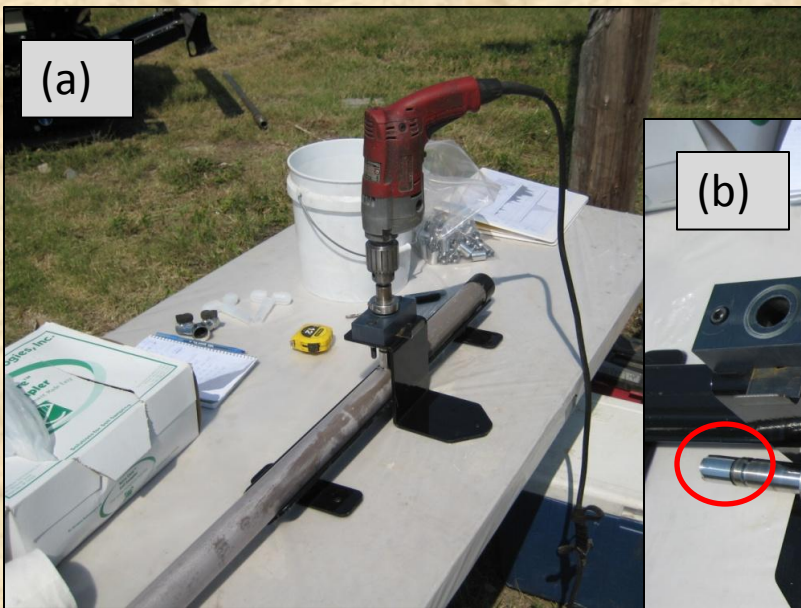
# Macro Core MC5 Soil Sampling for TPH-GRO



MacroCore MC5 closed piston system equipped with a 5ft (1.52m) core barrel and PVC liner was used to collect 4ft (1.22m) long soil cores to a depth of 40ft (12.2m) adjacent to the replicate logs at the high-level GRO area. (See map above)



# Subsampling the MC5 Cores for TPH-GRO



Once the soil cores were collected the PVC liners were placed in a holder (a). Then a drill was used with a small stainless steel **bit** (b & c) to cut a hole in the PVC liner (d). Next a fresh TerraCore™ **tool** (b) (Ennovative inc.) was used to subsample the soil core. This tool provides a volume of soil weighing approximately 5 grams. The subsample is immediately transferred to a tared VOA vial and stored on ice until delivered to the lab for analysis by method 8015D for TPH-GRO. Continental Analytical Services (CAS) Laboratory of Salina, KS performed all analyses. CAS is accredited by the state of KS and the NELAP program.

# MC5 Soil Sample Analytical Results

Sample Number	Sample Depth (ft)	TPH-GRO (mg/kg)
ST5-14	14	ND 20
ST5-16	16	ND 24
ST5-18	18	ND 22
ST5-20	20	ND 22
ST5-22	22	ND 26
ST5-24	24	<b>211</b>
ST5-26	26	<b>310</b>
ST5-28	28	<b>458</b>
ST5-30	30	ND 19
ST5-32	32	ND 18
ST5-34	34	ND 19

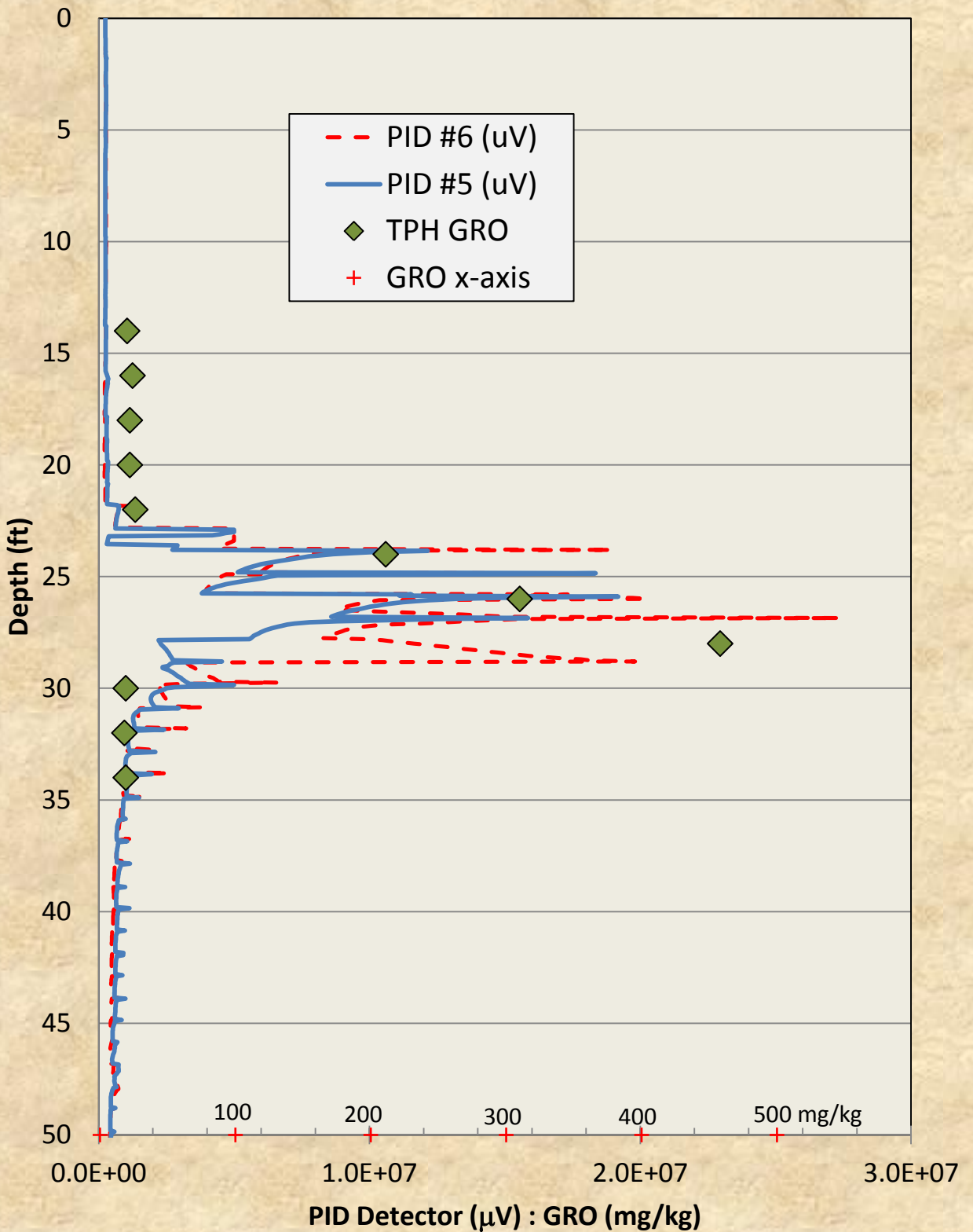
ND = nondetect, the associated number is the method reporting limit for the sample.

A PDF copy of the CAS lab analytical report is available on request.



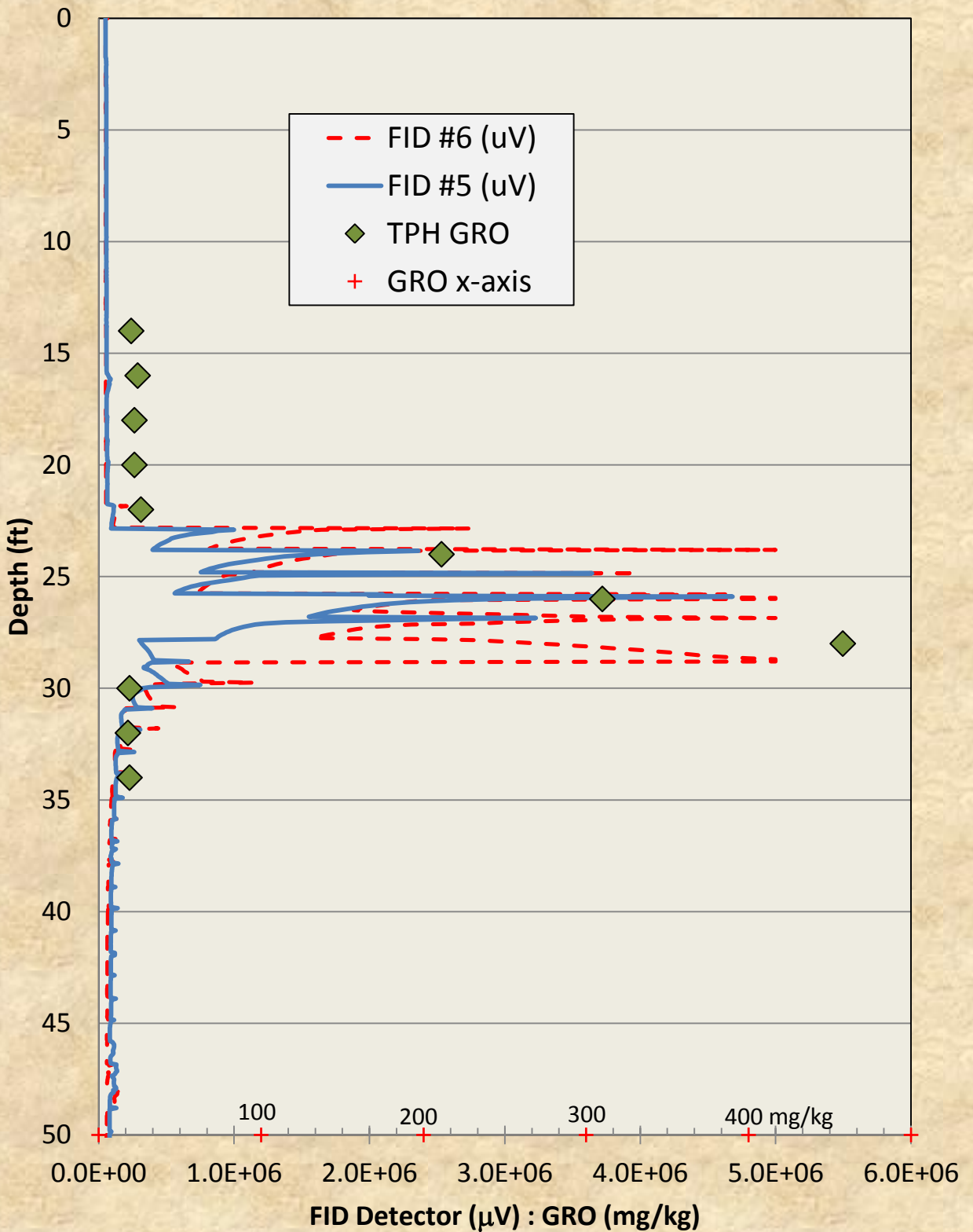


# Study5 & 6 MIP PID Logs with TPH-GRO



Nondetect samples are plotted at their method reporting limit.

## Study5 & 6 MIP FID Logs with TPH-GRO



Nondetect samples are plotted at their method reporting limit.

# Summary: MIP and Hi Level GRO in Soil



- Replicate MIP logs with FID and PID detectors show generally good correspondence in detector response for mid-hi level GRO
- Macro Core MC5 closed piston sampling was used to collect soil cores across the zone of detector response
- Very good correspondence is observed between both the PID and FID detector responses and the GRO analytical results for the soil samples
- The soil GRO results are nondetect over the zones where the MIP detectors display very little or no response above the baseline
- The soil GRO results are positive detect over the interval where the MIP detectors show clear response in the replicate logs
- The MIP system with PID and FID detectors can routinely detect part per million gasoline range organic contamination when maintained and operated properly.
- Soil coring and sub-sampling technique for volatiles analysis can have a substantial impact on analytical results and correspondence between MIP results and soil sample results.



To learn more about the MIP system  
visit

<http://geoprobe.com/mip>

**MIP System Specifications for this Study:**

Probe: Combined MIP-HPT Probe, PN MK6530

GC and Detectors: SRI Model 310C GC equipped  
with 10.6eV PID and FID detectors

MIP Controller Model MP6505

Field Instrument Model FI6000

Carrier Gas: N<sub>2</sub> at 40ml/min

Trunkline equipped with an unheated 0.0625" OD  
x 0.04" ID stainless steel return gas line

