CONFERENCE CALL NOTES

SUBJECT: ISCO 5A Alternative  
DATE of CALL: Monday 10/19/09  
PARTICIPANTS:  
- Dante Rodriguez, Steve Acree (EPA); Randy Kellerman, Bill Breedlove (CH2M Hill); Bruce Pivetz (Shaw)  
- Larry Bone (Dow), Pat Gobb (Newfields)  
- John Dudley, Erich Weaver, Jude Francis (URS)  
- Safouh Sayed (DTSC)

Jude. Less intensive ISCO (cost effective, less intrusive). Operate over longer period of time, try to get same amount of mass. Reliance on more biodegradation. Direct push injection option too, not mentioned in tech memo, mentioned in response to comments. Limit number of pushes each time, but cover whole source area over 3 or 4 years. This would rely less on biodegradation. Unknowns include rate of injection, assume conservatively would take 3 weeks. Mobilize 2 rigs, one with CPT and one with chemicals. Bruce has done both approaches (fixed point and temporary points), tends to like direct push because you can vary the spacing. Can use different oxidant volumes and concentrations at different points too. We could limit our permanent installation to the SVE stuff. Or we could do some limited permanent points, in the highest concentration areas.

The basic chemistry is that you are breaking down contaminants into CO$_2$ and H$_2$O. Bill - another way to improve reaction is to dilute the oxidant, put in more volume, which pushes it out further and extends radius of remediation. Use up less of the oxidant nearby, get better bang for buck. Fenton’s can plug-up pores, with gas bubbles, and produce higher heat. The amount of heat depends on the concentration; at 50% concentration, we would boil the subsurface. Pilot testing would determine the demand of the formation.

Dissolved oxygen presence. Jude - literature says higher DO levels are found surrounding the radius of remediation. Can monitor DO and bacterial counts. Bill – can look at rate of DO consumption. Bruce – good approach, are able to make indirect counts/estimates of biodegradation rate.

Groundwater monitoring. John – still no routine monitoring, but long record of stable plume. Erich – ROD recognized that biodegradation is effectively remediating the plume from Del Amo. John – details not worked out, but is specific item in Order to include routine groundwater monitoring.

Biodegradation. Bruce - kill off some microbes in oxidation reaction area. Won’t kill off all of them – areas where they will still survive and thrive. And that’s only in certain zone that lessens the further out you get and the oxidant concentration decreases. Erich – have done basic biodegradation studies. Dante – SVE project had them too. Bruce – what is the situation here with flow paths and heterogeneity? Jude – they are low permeability zones, and injection will be a challenge. Interbedded silts, sands, fines. Erich – similar stratigraphy on west and east sides of site. Vertical contamination distribution is limited, which helps.
Jude will add the temporary injection option into the FS addendum, including additional cost estimates.

Overall impression: EPA tech support (Ada, Hill) say that the temporary points approach will solve a lot of the issues with the radius of remediation limitation that you would have with only fixed points. Agreed that you could have limited permanent wells in highest source area, the heart of each contamination area. With temporary points you can vary injection locations. Might be an issue with the Donnelly property – may want more permanent points there?