

N65928.AR.001193  
NTC ORLANDO  
5090.3a

MINUTES FROM ORLANDO PARTNERING TEAM MEETING ON 10 JULY 2001 NTC  
ORLANDO FL  
7/10/2001  
NAVFAC SOUTHERN

## ORLANDO PARTNERING TEAM - MEETING MINUTES

Date: 10-11 July 2001  
 Location: Orlando  
 Team Leader: David Grabka  
 Recorder: Rick Allen  
 Gatekeeper/Timekeeper: Wayne Hansel  
 Facilitator: Stephanie Fraser-Beekman

<b>OPT MEMBERS:</b>	<b>SUPPORT MEMBERS:</b>	<b>GUESTS:</b>
Rick Allen	Barbara Nwokike	Mike Albert (Tetra Tech)
David Grabka	Nick Ugolini	Valentine Nzengung (U of GA)
Wayne Hansel		Mark Salvetti
Steve McCoy		
Nancy Rodriguez		
Steve Tsangaris		

### HANDOUTS DISCUSSED AT THE MEETING

1. UST/IR Update and Status - July 2001 (Tetra Tech)
2. Action items
3. OU 2 groundwater restriction map
4. Iron, Mn and VOCs maps for OU 2
5. Assembly of Alternatives for OU 2 (groundwater in FS)
6. Proposed Plan for OU 4 (redline/strikeout and corrected versions)
7. OU 4 Phyto Planting Design (shallow/deep/wetland/upland)

### 10 July 2001

#### CHECK-IN

Team checked in. Dave family reunion (too many kids). Stephanie graduation, 110 degrees (but dry heat!). Steve T. birthday boy, busy, tired, baby smiling. Nancy, more credit card problems, 2 wk PR vacation w/family. Wayne shoveling dirt, laying sod, daughter coming home, upcoming family reunion. Steve M travel to SC. 11 days ID, travel to NC golf. Valentine busy traveling, research, new home. Rick, Maine sailing, relaxing at camp. Mark S, kidney stone, paper on OU 4 at Containment Conference. Barbara, kids piano lessons, swimming lessons, inlaws visiting from Africa, trip to NY book club, made the Today show.

#### Action Items

Went through action items (see revised list at end of minutes).

#### OU 4 Pre-Design Review

Topics for discussion:

- (1) overview of remedial action objectives
- (2) summary of origin of the three process options
- (3) review conceptual site model; aspects included in proposed plan
- (4) parking lot issues related to implementation of technologies
- (5) how to expedite schedule

Mark S. led discussion on KMnO<sub>4</sub>/VOCs. FS focused on groundwater; soil PAHs/arsenic exceeded non-residential criteria, DET completed soil excavation so soil meets residential criteria. Short term concerns revolved around exceedances of surface water standards in Lake; long term concerns were groundwater; IRA was designed to reduce gw concentrations so that surface water standards can be achieved. Northern plume (10's of thousands of ppb) needed active technology to reduce concentrations. Southern plume (low hundreds of ppb) has no apparent source area so solution is to use enhanced bio or long term monitoring. Antimony (fire retardants = source?) seems to be stable, not moving or growing, co-mingled with southern plume of VOCs; can pump antimony plume and release to sewer. Pumping for 8+ years would remediate antimony. 100 ppb was felt to be the threshold at which NA could be an effective alternative for further reduction of VOC concentrations. IRA wells need to operate for approx 9 yrs after implementation of full scale KMnO<sub>4</sub> to reduce plume downgradient of source. Treat source area, run IRA, monitor, consider enhanced bioremediation/phyto as a polishing component, can turn IRA back on at any time in the future as appropriate (e.g., 5 yr review).

Valentine led discussion on phyto. NA and phyto studies completed by U of GA. Soil samples were taken along the axis of plume, plus perpendicular to plume along three transects. Most bio activity was observed along shoreline and near shoreline. Deep in aquifer, little or no organic carbon (food source for bugs). When carbon source added to deep soils, NA process can go to completion. So Valentine considered addition of carbon source: veggie oil, HRC, molasses, acetate. Bacteria not selective, bioenhancement seems to be effective. Then, U GA considered phyto source: plants add organic matter, thereby enhancing NA processes. Plants also uptake contaminants along with water; contaminants are degraded in plant tissue. Selected trees should make an impact within two years after planting. At concentrations of 45 ppm, toxicity occurs: should not be a problem at OU 4. A pH of between 5 and 6.5 should be a good range for selected trees. Deep planting is recommended (2 feet or more). Trees can put out roots to depths of up to 20 feet (but not through hard layer at depth of 15 ft +/-). High concentrations of KMnO<sub>4</sub> may be toxic to trees. Backup trees will be available to transplant as necessary. The wetland portion of site will be planted with selected wetland vegetation (willows), increase retention of water in vegetation; install trench parallel to shoreline to intercept contaminants, inducing groundwater flow to trench. Valentine presented recommended areas for deep planting, shallow planting, wetland planting, and backup planting. Willows/poplars will be the selected species. Valentine has worked extensively in TX and GA.

Steve T led discussion on extraction wells converted from UVB wells.

### **Brainstorming – OU 4**

KMnO<sub>4</sub>: Filtration of KMnO<sub>4</sub> out of effluent (accomplished with cartridge filters during pilot to remove manganese dioxide). Carus proposed rotary drum filters for full-scale implementation. Carus has them in Illinois at their facility and they seem to work (used in conjunction with diatomaceous earth). Needs maintenance every 8 to 12 hours. Harding looked at stacked

disks, membranes, but did not work out details with vendors. Talked with Carus in June in Orlando; Carus recommended sand filters; IT Corp fed 30x more permanganate than was generated during OU 4 pilot; sand filters did not work well. Simple frac tank system would permit solids to settle out, but solids don't settle out rapidly. Harding had approx 9 hrs residence time during pilot, did not have significant settlement of solids. May need flocculent to precipitate solids. Solids did not clog aquifer, at least in the time period of the pilot study. Larger settling tank to increase residence time may be the answer. Another solution may be to pre-clean extracted water in Steve T's stripper prior to injection into source area to reduce solids. Harding recommends a much lower concentration of KMnO<sub>4</sub> solution for full scale implementation. Used pleated filters during pilot (useful life approx 3 days) switched to polyester wound filters, got more life out of them. Need to perform bench tests to determine correct parameters for full-scale process. Keep it simple, if possible. PH during pilot test around 7.0. Sludge was disposed of at solid waste rate, not considered hazardous.

Full-scale system will have 6 extraction wells into a single feed system. Clumping permanganate was an occasional problem during pilot. Pilot KMnO<sub>4</sub> concentration was 4 grams per liter at 4 gpm during pilot; recommend significantly lower concentrations during full scale.

Angle drilling a bad idea? May be able to use conventional rotosonic drill rig inside building. May have to remove door for access. Need to measure building, have prospective drillers make site visit to determine feasibility.

Phyto: the manufactured wetland does not have to meet State surface water standards except at the point where the manufactured wetland discharges to Lake. Hard layer will likely prevent roots from penetrating through.

Is a FL-certified nursery required for planting? Don't know.

Use of water from stripper – any restrictions? Can use for irrigation.

How is phyto going to be incorporated into final remedy? It's part of PP, so will be a part of final remedy.

Source area definition – latest technologies for delineation. Membrane (?MIPS?) technology? Harding used Geoprobe for delineation during focused field investigation. It's been 4 years since source delineation, so additional delineation may be appropriate.

Has groundwater modeling been completed for particle tracking for shallow/deep wells? Yes.

What is configuration of Hawthorn (aquitard)? Do we have enough data to define? Does it matter?

What do we expect Carus' involvement to be? The equipment used during the pilot may be OK for full scale, given lower concentrations expected. System needs to be refurbished.

Variable speed well pumps? Needed for full scale? They worked great during pilot. Manual valves may be adequate for full scale.

Schedule: conceptual design? Dependent on final ROD. PP by 9/5. TT will chase the plume.

**Action Item:** Mark S will provide Steve M with summary of earlier Geoprobe work and possible

data gaps. ROD by end of Sept. Phyto: Spring. Engineered wetland, permitting, 11/01. Construction of final solution by CH2M Hill start in October, finished by end of year.

Long term funding: everything funded except OU 2 (may not need active remediation).

What kind of operator attention required for KMnO4 system? Remote should work OK.

What if any or all proposed technologies fail? Oh, ye of little faith!

What is residence time of KMnO4? Dissolves almost immediately.

UIC issues. Do not need a variance.

**Action item:** Dave talk to George Heuler re UIC issues.

### **UST/IR/Transfer Update**

**SA 16** Nick is concerned about soil in ditches at SA 16. Soil is getting hotter where excavation ended. Nick: How far does the excavation need to go? Dave: As far as it takes. **Action Item:** Nick will provide Dave with data so he can evaluate.

**2115** SAR was submitted, need to reinstall 2 wells (destroyed by contractor).

**2080** Need response from FDEP for treatability study (sparge system). **Action item:** Nick will check with Paul and reissue treatability study as necessary.

**7174** Turn off system, monitor for one year. MTBE levels need to continue to be monitored.

**2273** Groundwater contamination has been delineated

**SA 39/40** Dirt will be hauled to OU 1 (not OU 2). Remediation to be performed by Developer.

**SA 18** Additional delineation will take place so that soil can be removed to meet residential criteria

**Transfer** FOST for SA 35 almost ready; OU 2 restricted groundwater area handout; remainder of sites awaiting OPS determination.

**OU 4 Action item:** Dave provide contact with Central District for wetlands permit. Wetlands delineation performed 97-98. **Action item:** Mark S to provide Steve T with wetlands data from OU 4 RI. Steve T wanted to know if OPT was on board with phyto program. Consensus was "yes". We discussed the influence of the manufactured wetland on the groundwater path from source to lake, would probably force plume shallower (sidebar: is lack of contamination in shallow aquifer between source and lake due to natural phyto remediation by existing trees and vegetation?); discussed what plants would be used in trench (willows would be planted west of wetland boundary); is TOC provided by phyto the "right" carbon source to promote NA?; discussed technique of "deep planting", trees to be planted in 2-3 foot deep holes with mulch, would plants survive? (During field trip, Valentine pointed out that the selected species can be planted up to 5 feet deep and that roots will form along entire length of buried "trunk"). Mark S pointed out that in the southern plume, we will be able to evaluate the effectiveness of phyto

since there will be no injection of KMnO<sub>4</sub> in that area. After discussion, we all agreed that phyto was likely going to help polish the groundwater at OU 4.

### **11 July 2001**

**SA 2** There are some indications that ORC is working, but too early to be sure. MW's 10C and 11A were destroyed when City installed utilities. TetraTech recommends reinstall 10C: located in important portion of benzene plume. Do microwells have higher concentrations of VOCs vs. permanent wells? Maybe. DO concentrations still low despite ORC, or perhaps ORC hasn't reached the MW's with low DO. Finished injection Dec/Jan. Last injections occurred Feb 01. Sampling occurring this week. ORC will continue to release for period of approx 6 mos (10% if release occurs during first 2 wks).

**OU 2** assembly of alternatives for OU 2, iron & Mn map, VOC map, organics map. Organics map shows location of northern benzene plume and southern plume (TCE, VC, Benzene). Fe/Mn map shows north plume (collocated with benzene plume) and smaller Fe/Mn plume several hundred feet to the south. Mike explained the five groundwater alternatives being evaluated for the FS (see handout). High metals concentrations are not getting into the off-site ditches, so may be able to monitor surface water (ditches) rather than implementing treatment alternatives. Need to explore less rigorous options for FS to include monitoring, monitored NA.

### **SA 36/39/17 Update**

**SA 36/39** First round report went out last week; NA memo (for SAs 36/39) – need comments from Dave Jenkins, Cliff Casey (Cliff met someone at a conference who does “oil imaging” and can model where the veggie oil is going). Need to establish criteria on determining OPS.

**SA 17** Completed final delineation of VOC plume; Steve T will send out a package soon, next injection scheduled for August, injection depth 34 to 40 feet.

**OU 3** Jim Davis (TtNUS) describe approach to treatability study (conf call). To finalize 7/26. Treatability study proposed implementation only at SA 9. Wayne indicated he thought pilot studies were to be implemented at both sites. If pilot studies move forward at SA 8, will have to plant hybrid poplars in wetland, triggering wetlands permitting issues. Seems to be some doubt as to whether or not the poplars will in fact create a gradient that will induce sufficient flow to funnel/gate. TT also looked at installation of extraction well to create gradient. PRB (permeable reactive barrier) will need to be installed in front of downgradient edge of plume. Will need power at site for pumping well (no power at site). Mark S suggested solar panels, DC pump for extraction; **Action item:** Mark S will provide Jim D with specs on pump, don't know if they're suitable for long term continuous use. **Action item:** Wayne will check to determine whether Developer can provide power. Jim D will check on sizing of solar cells. N Other issues: depth of surficial aquifer? RI data does not specify. DPT investigations during RI up to 25 feet deep. TT assuming PRB will be installed to a depth of approx 20 feet. Hard pan layer at SA 38 at 20 ft bls. Clay layer at SA 39 at depth of 20+ feet. Data gap: how deep is shallowest aquitard? Need for design of PRB – don't want groundwater to flow underneath wall. Considering installation of 2+ soil borings to determine geology prior to wall design/installation. May be helpful to obtain logs for irrigation wells for golf course – may shed light on possible depth to Hawthorn/confining layer. Waterloo has patent on PRB with activated alumina? TT lawyer is looking at existing Waterloo patents to see if patent infringement may be an issue. Dave wanted to know how gradient would change with 1-1/2 gpm pumping rate. Looks like

gradient increases from 0.01 to 0.0375, hydraulic conductivity of 2.7 ft/day, roughly 3 times greater. Dave wants to know footprint, area, depth, of arsenic plume, will calculate how long to pull one pore volume. Wayne still concerned about arsenic approaching Lake Baldwin at SA 8, pointed out that the reason we were considering implementing pilot study at SA 8 was because the arsenic was getting close to lake. Wayne suggested drilling at both sites to determine depth of aquitard – if deep at one site and shallow at other, may want to implement pilot study at shallower site. Decision: TT will drill both sites.

**SA 18** Fe/Mn/Al is becoming an issue with other DEP RPM's. Will have a meeting Friday to determine if there are solutions to resolve secondary standards issues.

**OU 4 PP** OPT went over final version provided by TT, provided comments to Steve

## Tier II Presentation Practice

### Critique/Checkout/Agenda

+’s	Δ’s
Lobsters, steamers	Post it process (OU 4)
OU 4 discussion	HVAC/refrigerator noise
OU 2 discussion	OU 3 treatability study misunderstanding
Phyto tour	Phyto tour
Cards/cake for Steve M's big 5-0 and Steve T's somewhat smaller 3-7.	Low team energy
OU 4 PP changes	Long first day

### *Future Meeting Schedule*

September 5-6, 2001 – Orlando, FL (RAB)

October 23-24, 2001 – Charleston, SC

December 5-6, 2001 – Orlando, FL (RAB)

## ACTION ITEM SUMMARY July 2001

### Action Items (Carryover)

1. Steve T. to schedule conference call next week to discuss permit/variance for KMnO<sub>4</sub> full scale implementation (variance is on FDEP website). (Ongoing)
2. Steve M will conduct vertical delineation across PAH contaminated zone at SA 54 and evaluate residential/nonresidential scenarios to see cost benefit of cleaning up to residential standards. (Ongoing)
3. For SA 16, Tetra Tech needs to put together a plan to address PAHs still left in ditches. (Ongoing)

### Action Items (New)

1. **Mark S** will provide Steve M with summary of earlier Geoprobe work and possible data gaps (OU 4).
2. **Dave** talk to George Heuler re UIC issues (OU 4).
3. **Nick** will provide Dave with data at SA 16 so he can evaluate.
4. Need response from FDEP for treatability study (sparge system) at Bldg 2080. **Nick** will check with Paul and reissue treatability study as necessary.
5. **Dave** provide contact with Central District for wetlands permit (OU 4). Wetlands delineation performed 97-98.
6. **Mark S** to provide Steve T with wetlands data from OU 4 RI.
7. **Mark S** will provide Jim D with specs on DC pump at OU 3 (no power source), don't know if they're suitable for long term continuous use.
8. **Wayne** will check to determine whether Developer can provide power for pump at OU 3.
9. Others??

**ORLANDO PARTNERING TEAM  
AGENDA**

5-6 September 2001 – Orlando, FL

Team Assignments		Support	Expected guests
Team Leader:	Wayne Hansel	Barbara Nwokike	
Recorder:	Rick Allen	Nick Ugolini?	
Gate/Timekeeper:	Steve McCoy		
Facilitator:	Stephanie Fraser-Beekman		
Tier II Link:	Flip Altman		

Time	Subject	Objective	Lead
<b>Wednesday – 5 September 2001</b>			
1:00	Check-In, Action Item Review	Administration	WH
2:00	UST/IR/Transfer Update	Information transfer	SM/WH
3:00	<b>BREAK</b>	Leg stretch	
4:00	SA 36/39/17 update	Information/Discussion	ST
5:00	End of day		
7:00	RAB meeting		

Time	Subject	Objective	Lead
<b>Thursday – 6 September 2001</b>			
8:30	Training	Get smart!	SFB
9:30	SA 18	Information transfer	SM
10:00	<b>BREAK</b>	Recharge batteries	
10:15	OU 4 update/PP	Information transfer	SM/ST
11:15	SA 54	Discussion/decision	SM
11:45	<b>LUNCH</b>		
1:00	OU 2	Information transfer	SM
2:00	OU 3	Information transfer/discussion	SM
3:00	<b>BREAK</b>	Recharge batteries	
3:15	SA 2	Information transfer	SM
3:45	Checkout/ next month's agenda/ (+/-)		ALL
4:45	End of Day		