

**GRU DNAPL Team Comments to:  
Upper Floridan Aquifer Well Installation:  
Investigation of the Northwestern Area of former  
Cabot Carbon/Koppers, Inc. Site (September 14, 2010)  
By DNAPL Team,  
April 19, 2011**

**Comments:**

1. Pg. 33, Last Paragraph - The statement that "organic constituents were not detected along the northern boundary" is misleading. Acenaphthene has been detected previously in FW-2, FW-24B and FW-23B along the north boundary before detection limits were raised by Beazer. Before 2008 the detection limit for acenaphthene was about 0.4 µg/L. In 2008 the detection limit was raised to about 1.2 µg/L. The detection limit for the sampling in 2010 was about 5 µg/L, 10-fold higher than earlier years. The raised detection limits obscure the identification of future off site migration of contaminants and understanding of sources and migration pathways. The relationship between historically detected concentrations and evolving MRLs is illustrated in three attached figures. These figures make it clear that early warnings of the arrival of Naphthalene in FW-22B would not have been reported if the current elevated MRL was used historically. GRU made this point in comments on the FTS Comprehensive Groundwater Monitoring Sampling and Analysis Plan on February 12, 2010, where we stated explicitly that the lower MRLs provided a useful early warning on increasing contamination. This is shown by the naphthalene appearance at FW-22B-Z3 that occurred after the Acenaphthene had been detected. The delayed arrival of Naphthalene was a surprise to us because we had anticipated naphthalene would arrive first. We can't be sure that the other sources -- assuming that the organics observed in FW-22B are from the Former N lagoon -- will behave similarly but it established the principle that lower MRLs are helpful. We clearly do not know as much about the fate and transport of contaminants at this site as we would like to and the lower MRLs provide useful information.
2. Pg 20 - FW-30B Zone 1 is a low permeability zone. Flow stopped during secondary well development. Is this due to plugging of Westbay screen or to low formation permeability?
3. Pg 23-24 – Regarding geophysical logs at MW-31BE – what is the interpretation of increased resistivity at approximately 185 ft depth? Note poor core recovery from this interval also. Three of the four resistivity signals increase at 185 ft bgs and that is not what we would expect for a solution channel that contains groundwater.
4. Page 24, Section 4.1.3 Effective Porosity – GeoTrans states that “A hypothesis considered for the significant amount of unconsolidated material encountered in these cores was that the sonic vibrations and down pressure from the rotasonic drilling were breaking the carbonate matrix cement that binds the individual

- grains together.” We believe this hypothesis was substantiated by sonic drilling at the Airport Industrial Park Site in Gainesville, which is one-half mile from the Murphree wellfield. Hydraulic rotary drilling of the Murphree wellfield recovered indurated cores of UFA limestone throughout the wellfield, however during investigation of the nearby Airport Industrial Park Site in May 2007, one-half mile from the wellfield and approximately 3.1 miles from the Koppers Site, a rotasonic-drilled borehole produced oatmeal-like Ocala Limestone core.
5. Pg 26, Second Paragraph - Drawdown effects may have been observed in FW-28B due to pumping of FW-31BE. However, based on comparison of the water level elevations in FW-22B and FW-28B, FW-31BE will not capture groundwater from the area of FW-28B. Figure 4-4 shows that the groundwater elevation in FW-28B (near the northern property boundary) is lower than that in FW-22B (a few feet from the pumping well). If so - groundwater near FW-28B cannot flow toward the pumping well. Therefore, the capture zone shown in Figure 4-6 appears to be incorrect. (Is it possible that data from FW-22B and FW-28B are switched?)
  6. Pg. 26, 2nd Paragraph: It is not possible to determine from inspection of Fig 4-4 that “drawdown effects... were observed within 2 seconds at ...FW-22B” or 45 seconds at FW-27B given the scale of the Figure, which is in hours.
  7. p. 27, Second Paragraph - We concur with the interpretation of the Floridan Aquifer stated here as a "dual-porosity non-homogeneous anisotropic carbonate aquifer" with solution channels and cavities. However, statements on Pg 24, Section 4.13 that describe the Floridan Aquifer as "largely unconsolidated" that behaves "more like a porous media than a fractured media" are not consistent with this interpretation. Solution channels and cavities could not exist in an unconsolidated formation.
  8. Pg 29, Second Paragraph – GeoTrans states that aquifer performance test data from FW-22B and FW-28B indicate “multiple hydrologic boundary effects in the data during early and late time” and that “data are probably more indicative of solution cavities/channels having a similar effect to a leaky aquifer” where “as the drawdown cone propagates out it is intercepting more higher permeability solution channels that are limiting the drawdown that would be projected under porous media conditions”. The aquifer performance test data supports GRU’s conceptual model of preferential flow through solution cavities/channels (with low effective porosity and rapid groundwater flow) rather than the largely unconsolidated porous media model (see comment #7).
  9. Figure 4-6 - On this figure the equipotential lines are draw to slope to the northwest; however no data are plotted on the map to justify these contours and it is unclear from the tables what data this new interpretation is based on. That orientation of the potentiometric surface supports groundwater flow to the northwest at the northwest corner of the site and along the western boundary. This

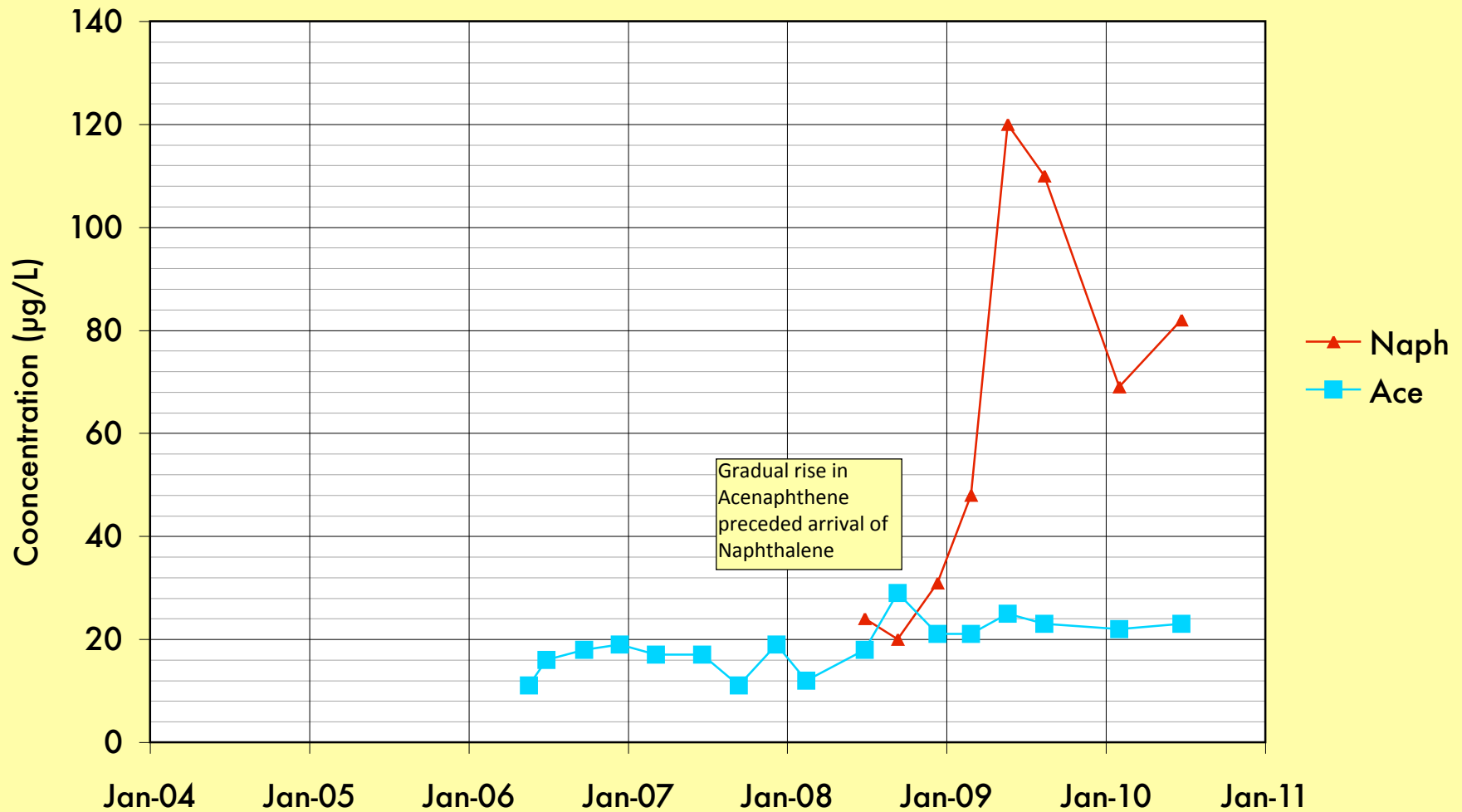
pattern of equipotentials in this area differs from almost every previous equipotential map drawn for the site and from the GeoTrans groundwater flow modeling which showed equipotentials sloping toward the northeast (see GeoTrans Addendum 7 groundwater flow model report, 2004; FTS equipotential maps for 1st Qtr 2006, 4th Qtr 2006, 1st Qtr 2007, 2nd Qtr 2007; GeoTrans equipotential maps for Dec. 2007, Feb. 2008, June 2008, Sept. 2008, May 2009, Aug. 2009 and Nov. 2009, and Figure 1-8, Upper Floridan Aquifer Potentiometric Surface from the Feasibility Study ). The capture zone drawn extends from FW-22B and FW-31BE toward the southeast back to FW-6 and the north lagoon. If one applies extraction at FW-31BE using the historical grain of the potentiometric surface, then the capture zone would extend to the southwest and would not capture contamination at FW-27B or the North Lagoon.

Jim Erickson clarified that the Upper Floridan potentiometric surface presented in Figure 4-6 is based on the (a) potentiometric surface seen historically and (b) groundwater chemistry, and not on measured water levels. GeoTrans used a northerly slope to the potentiometric surface on the west side of the site presented in previous potentiometric maps (we fail to see that northerly trend or the justification for it) and the belief that the contamination seen in FW-22B, FW-27B, and FW-12B is all coming from the area of FW-6 and the Former North Lagoon. We need more justification for that interpretation than the conjecture presented here. In any case the contours presented in Figure 4-6 should be dashed - in their entirety - and the map and accompanying text should make it clear how the contours were generated.

We would like to see more water level monitoring data to verify the capture zone. We suggest that Beazer supplement the figure with one generated using actual measurements from all wells onsite, the measurements being conducted when FW-31BE is being pumped at the expected long-term rate of 23 gpm.

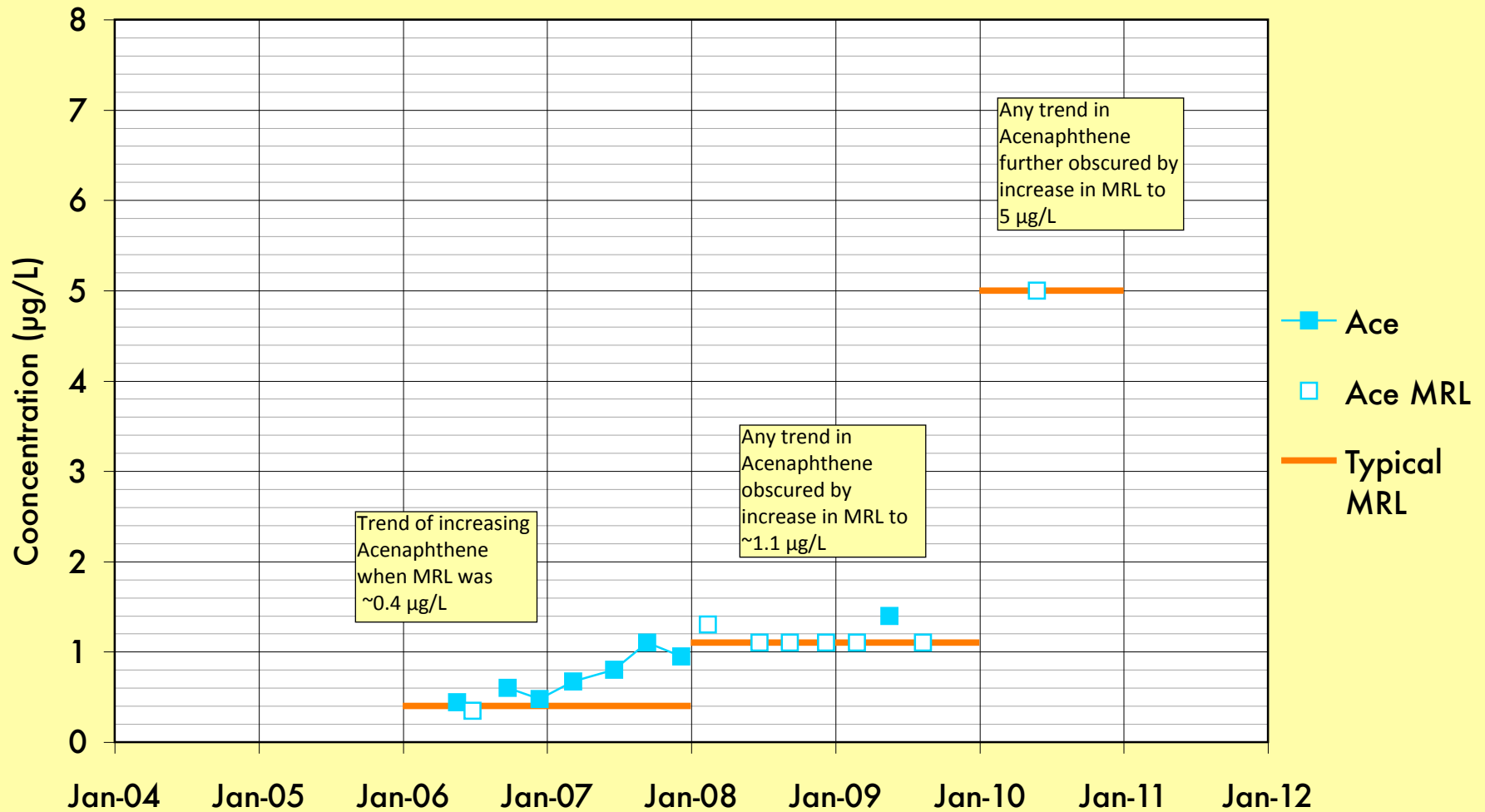
10. Table 2-3: What is reason for increase in bromide concentration during purging of some zones?
11. What is the explanation for the observations creosote odor (ranging from faint to very strong) more or less continuously from 143.5 ft to 266 ft depth while drilling FW-27B. Also see MW-31BE at 188 ft and 196 ft bls and the off-site FW-29C at 364 to 377 ft bgs, i.e., the Avon Park Formation. Does GeoTrans propose to further characterize these findings?

Groundwater at Monitoring Location FW-22B-Z3 at Northwest Property Boundary  
Florida GCTLs Naphthalene=14 µg/L, Acenaphthene=20 µg/L



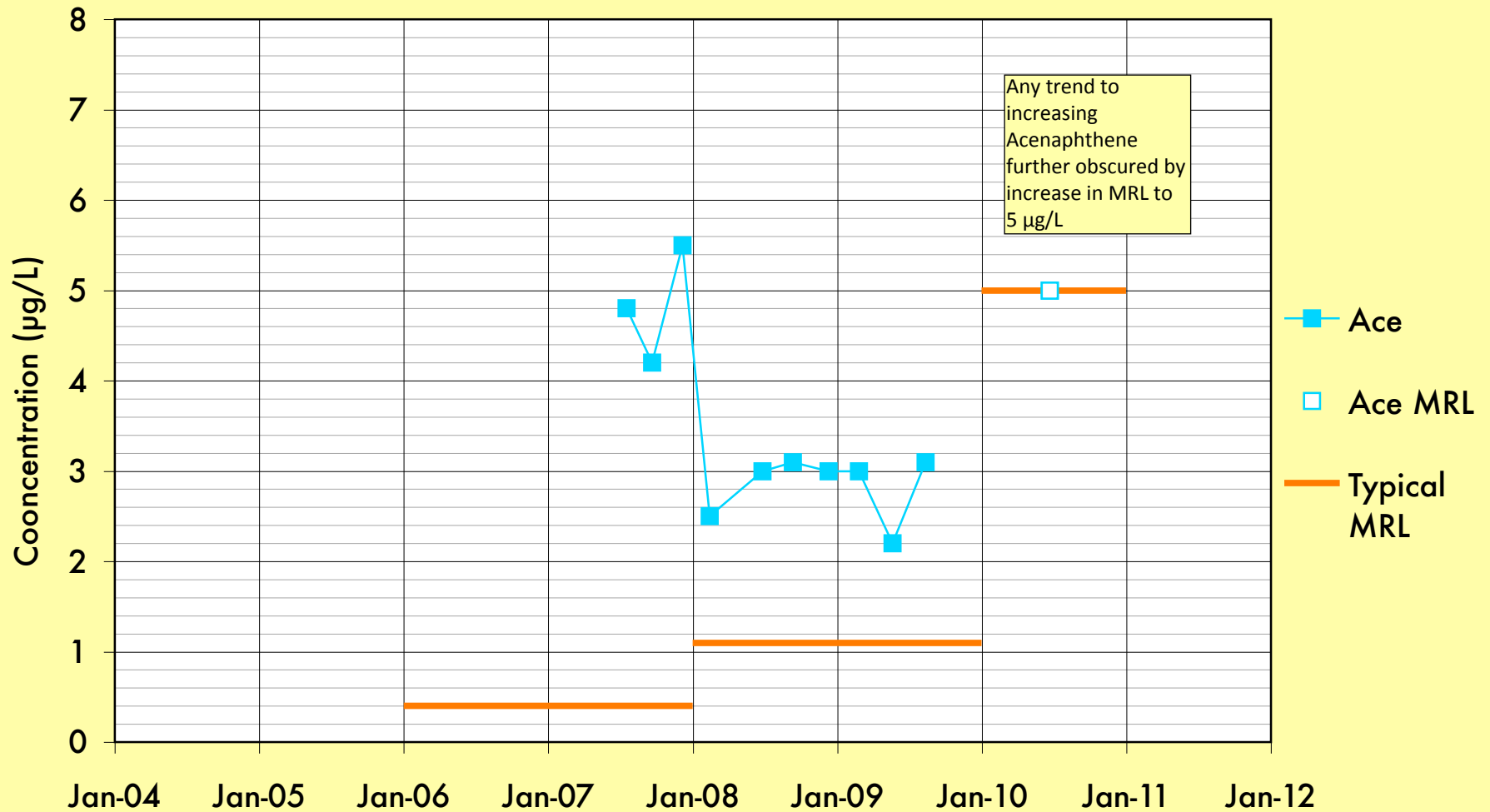
Presence and trend to increasing Acenaphthene gave early-warning of subsequent increase in Naphthalene.

## Groundwater at Monitoring Location FW-23B-Z3 at Northern Property Boundary



Arbitrary increases in the MRL (method reporting limit) for Acenaphthene obscure potential early-warning of subsequent increases in Naphthalene at the property boundary.

### Groundwater at Monitoring Location FW-24B-Z3 at Northwest Property Boundary



Arbitrary increases in the MRL (method reporting limit) for Acenaphthene obscure potential early-warning of subsequent increases in Naphthalene at the property boundary.