


Comments on  
“October 2011 Groundwater Sampling Report – Final,  
Brown & Bryant Superfund Site, Arvin, California,”  
Prepared for US Army Corps of Engineers by  
Eco & Associates, Orange, CA, dated June 8, 2012

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September 15, 2012

On September 6, 2012 DTSC announced on its Envirostor website that it had posted the “October 2011 Groundwater Sampling Report – Final, Brown & Bryant Superfund Site, Arvin, California,” Contract no. W912PP-10-D-0014, Task Order no. 0010, Prepared for US Army Corps of Engineers by Eco & Associates, Orange, CA, dated June 8, 2012 [available at: [http://www.envirostor.dtsc.ca.gov/regulators/deliverable\\_documents/3814330875/120608%20-%20Final%20October%202011%20Groundwater%20Sampling%20Report%5B1%5D.pdf](http://www.envirostor.dtsc.ca.gov/regulators/deliverable_documents/3814330875/120608%20-%20Final%20October%202011%20Groundwater%20Sampling%20Report%5B1%5D.pdf) ]

Provided herein are our comments on that final groundwater sampling report for the October 2011 sampling event.

The Introduction to the final report states on page 1:

*“This report provides a summary of the October 2011 groundwater sampling event conducted at the former Brown & Bryant, Inc. (B&B) Superfund Site (hereafter, referred to as the “Site”) located in the City of Arvin, Kern County, California (Figure 1).”*

The report contains sections that discuss: site background information, summary of previous investigations, summary of site geology and hydrogeology, sampling well description, well construction and groundwater depths, BarCad system, and well maintenance activities. With the exception of the BarCad system and well maintenance activities, each of those aspects of groundwater sampling at the B&B Site has been discussed in previous reports submitted to CBA by the TAG advisor. The comments below focus on the BarCad groundwater sampling system, well maintenance, sampling and analysis scope, and findings and conclusion aspects of the June 8, 2012 report.

The BarCad groundwater sampling system discussion on page 5 of the report states:

*“2.6 BarCad® System*

*The BarCad system is a groundwater sampling instrument designed for permanent installation at a fixed elevation in groundwater monitoring wells. The BarCad system is made up of the following:*

- *BarCad unit, which consists of a ceramic porous filter (approximately 1.5 inches in diameter and 16 inches long).*
- *One-inch-diameter polyvinyl chloride (PVC) stinger pipe connecting the BarCad unit to the top of the well.*

- *Stainless steel probe with polyethylene tubing leading up the inside of the PVC stinger pipe to the well head.*

*The well head is attached to the top of the PVC riser tube from the BarCad unit. The well head assembly consists of an airtight Swagelok® fitting for the polyethylene tubing to exit the interior of the PVC stinger pipe and a quick-connect fitting to connect the pressurized inert gas supply.*

*The BarCad groundwater sampling system works by applying pressurized inert gas (nitrogen) to the inside of the PVC stinger pipe, which in turn pressurizes the water column inside the BarCad unit and drives the existing water into the stainless steel probe and up the polyethylene tubing to the surface. Subsequently, the inert gas displaces all of the water in the BarCad unit and PVC stinger pipe through the stainless steel probe and polyethylene tubing and purges the BarCad system of all existing water. After the system has been purged, inert gas pressure is removed from the BarCad system to allow groundwater to flow into the BarCad unit. Inert gas pressure is then reapplied, and the resulting water can be collected for laboratory analysis.*

*One well volume of groundwater is purged (completely) from the BarCad reservoir in a single purge event. After the reservoir has been emptied of groundwater and the nitrogen pressure is released, the BarCad reservoir again opens to the aquifer allowing fresh groundwater to infill the BarCad reservoir. During groundwater purging at the Site, groundwater is purged from the BarCad reservoir three times. The initial purge removes all possible stagnant water from the BarCad reservoir. The second purge is expected to rinse initial groundwater from the reservoir and tubing. The groundwater removed during the fourth purge is anticipated to be representative of the adjoining aquifer. This groundwater is collected and submitted for chemical analyses. The pH, temperature, and conductivity measurements of each well volume purged (one reservoir volume) are anticipated to be similar. Due to the nature of the BarCad system, these measurements are not required to ensure that representative formation water is being collected.”*

From this description it is our conclusion that if properly conducted, this groundwater sampling approach has the potential to collect samples that are representative of the groundwater in the vicinity of the well.

The well maintenance activity discussion on pages 5 and 6 includes the following:

*“2.7 Well Maintenance Activities*

*“Well maintenance was performed on A-zone and B-zone wells on May 26, 2011 and in November 2011 (November 14 through 17, 2011). These activities consisted of the following:*

- *Cleaning, repairing, or replacing well heads, caps, and rings*
- *Repairing or replacing concrete pads*
- *Repairing or replacing well risers, and painting the external well system as indicated on the attached maintenance list for the A-zone and B-zone wells*
- *Repairing, replacing or installing bollards*
- *Providing new locks for well head caps*

The discussion of the scope of groundwater sampling and analysis that begins on page 6 states:

*“3.0 Scope of Sampling and Analysis*

*The objective of the sampling and analysis effort was to assess the possible presence and concentration of COCs in groundwater in both the A- and B-zones beneath the Site and the adjoining properties.”*

*Table 1 lists all of the monitoring wells used in this study. Groundwater was sampled in thirteen of twenty-five wells in the A-zone. At the remaining twelve wells, the groundwater was not measured as it was below the BarCad elevation or there was insufficient recharge of water to sample following well purging. Twenty-three wells are included in sampling for the B-zone. All of these wells were sampled.*

*The locations of A- & B-zone wells are shown on Figure 2.*

*One of the off-Site wells, EPAS-4 (A-zone), is located upgradient of the contaminant plume. The remaining well locations are within the plume, cross-gradient of, or downgradient from the known contaminant plume.*

*The groundwater was observed to be deeper than the BarCad elevation at ten of the A-zone wells. These wells were not sampled. An additional four wells recharged too slowly to sample (AMW-2P, EPAS-1, PWA-6, & WA-8). These wells will continue to be monitored regularly. During future sampling events, when the water elevation may be higher, the wells that were not sampled during this sampling event will be sampled.*

*During the October 2011 sampling event, the collected groundwater samples were tested for the seven COCs as well as any other constituents reported for each analytical method. The COCs and test methods are provided in the following table:” (See report for that table. The report provides details on analytical methods and related issues, including QA/QC.)*

There is need examine the past sampling records for all the wells in the A-zone to identify those wells from which samples could not be obtained owing to lack of water and to examine their locations relative to the position of the water table/level in the A-zone. It is important to understand why each of those wells did not contain sufficient water to be sampled and what that reveals regarding the ability to remove pollutants from that part of the A-zone. Further, the sampling record and groundwater levels need to be examined in greater detail to determine if additional, deeper BarCad wells are needed in some of the areas of the A-zone.

The “7.0 Findings and Conclusions” section of the report of this sampling event begins on page 11. Figures included in the report’s Appendix present contours of the concentrations of the COCs in the groundwater in October 2011. However, those figures need to be examined to determine if there is a sufficient number of wells in each zone to develop reliable COC concentration contours.

The data obtained in the October 2011 groundwater sampling shows that the concentrations of several of the COCs are sufficient to represent a threat to human health if the water were used for domestic water supply. Also it appears that the concentrations of several of the COCs are sufficient to potentially pose a threat to the Arvin municipal water supply water quality. However, from the data presented, we conclude that the measured COCs are not present in

sufficient concentrations at locations that represent an immediate threat to the City of Arvin water supply wells. The results of the October 2011 sampling event further support the need to promptly remediate the polluted groundwater under the B&B site and to the southwest of the site because of the long-term potential for polluted groundwater associated with the B&B site to be drawn into the municipal well(s).

The discussion on page 12 of chloroform as a contaminant of concern in the A-zone perpetuates an error upon which we have commented previously, i.e., stating that the groundwater remediation goal for chloroform is 80 ug/L. As discussed in our previous reports, the level of chloroform pollution of groundwater allowed by the CVRWQCB is a few ug/L, not 80 ug/L. The 80 ug/L level is the concentration of trihalomethanes allowed in disinfected drinking water and has been established based on considerations beyond human health; it is known that that concentration in drinking water is associated with a significant cancer risk.

The discussion beginning on page 13 of chloroform as a contaminant of concern in the B-zone states:

*“Figure 9 shows the isoconcentration map for chloroform in the B-zone. It shows a high concentration to the south and southeast of the site. All reported concentrations for chloroform are below its regulatory limit used for this project—100 µg/L.”*

Where is a 100 ug/L limit for chloroform established in B&B site documents? That value appears to be the drinking water limit that used to be allowed for trihalomethanes in drinking water before the US EPA decreased the limit to 80 ug/L. As noted above, the 80 ug/L level in drinking water is associated with a discernible cancer risk.