# MONITORING WELL SYSTEM EVALUATION AND PROPOSED A-ZONE AND B-ZONE GROUNDWATER EXTRACTION WELLS

**•FINAL•**

**Brown & Bryant Superfund Site**
**Arvin, California**

**Prepared for:**
**U.S. Army Corps of Engineers**
**Albuquerque District**
**Albuquerque, New Mexico**

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Environmental Excellence

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## ABBREVIATIONS, ACRONYMS, & SYMBOLS

| | |
|---|---|
| µg/L | micrograms per liter |
| 1,2,3-TCP | 1,2,3-trichloropropane |
| 1,2-DCP | 1,2-dichloropropane |
| 1,3-DCP | 1,3-dichloropropane |
| B&B | Brown & Bryant, Inc. |
| bgs | below ground surface |
| COC | chemical of concern |
| DBCP | 1,2-dibromo-3-chloropropane |
| Eco | Eco & Associates, Inc. |
| EDB | ethylene dibromide |
| gpm | gallons per minute |
| MCL | maximum containment level |
| mg/L | milligrams per liter |
| NPL | National Priorities List |
| PVC | polyvinyl chloride |
| RCRA | Resource and Conservation Recovery Act |
| USACE | United States Army Corps of Engineers |
| USEPA | Unites States Environmental Protection Agency |

# EVALUATION OF MONITORING WELL SYSTEM AND PROPOSED A-ZONE AND B-ZONE GROUNDWATER EXTRACTION WELLS

**•FINAL•**

**Brown & Bryant Superfund Site**
**Arvin, California**

## 1.0 INTRODUCTION

This report provides the technical specification and design analysis to be used for the construction of the A-Zone groundwater recovery system 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).

This report also provides recommendations for the placement of groundwater extraction wells to be utilized for the de-watering of the A-zone aquifer beneath and adjacent to the Site.

Eco & Associates, Inc. (Eco) was retained by the United States Army Corps of Engineers (USACE) under Contract No. W912PP-09-P-0033 to perform this work.

## 2.0 BACKGROUND

The B&B Arvin facility is located at 600 South Derby Street in the city of Arvin, California. It is located approximately 18 miles southeast of the City of Bakersfield. The Site is located on the east side of Arvin in a light industrial and commercial area. Residential properties are located west of the Site and agricultural fields are located west of the Site.

The B&B facility operated as a pesticide reformulator and custom applicator facility from 1960 to 1989. The facility formulated agricultural chemicals including pesticides, herbicides, fumigants, and fertilizers, for sale to the local farming community between 1960 and 1968. In 1981, the facility was licensed under the Resource and Conservation Recovery Act (RCRA) as a hazardous waste transporter. Contamination of soil and groundwater resulted from inadequate procedural controls, chemical spills during operations, and leaks from a surface wastewater pond and sumps. The largest releases on Site were from the wastewater pond, a sump area, and a dinoseb spill area (United States Environmental Protection Agency [USEPA], 1993a).

A wastewater pond formerly located in the southwest portion of the Site was originally excavated as an unlined earthen pond in 1960. The pond was used to collect run-off water from the yard and from two sumps (since excavated). The pond was also used to collect rinse water from rinsing tanks used for fumigants. Excess pond water and rain water runoff also collected in a topographically low area east and south of the pond. In addition, ponded water from precipitation and irrigation from the east occasionally breached the pond's berm in the southeast corner and drained into the pond. The pond was double lined with a synthetic liner in November 1979. The liner and underlying impacted soil were excavated in August 1987. Approximately 640 cubic yards of soil that showed visible signs of contamination were removed from the pond at that time. The depths of this excavation ranged from approximately one and one-half feet on the sides to five feet on the bottom (USEPA 1993a).

In 1960, an unlined earthen sump was constructed in the center of the Site. The sump was used to collect wash water from a pad where equipment and tanks used for liquid fertilizers and fumigants were washed. Water from the sump was drained to the pond through an underground pipeline. In 1980, the sump was replaced with two double lined sumps, and two lined sand traps were installed west of the pond. Dinoseb was stored in a smaller tank storage area along the eastern fence, just north of the pond. In 1983, there was a significant dinoseb spill in this area. As a result, the soil and groundwater underlying this portion of the Site has been reported with the highest concentrations of dinoseb. USEPA excavated highly contaminated soil from this area in the mid 1990s (USEPA, 1993a).

In 1989, the Site was listed on the National Priorities List (NPL). In the same year, all operations at the Site ceased. Subsequently, various emergency and removal actions were initiated to minimize or eliminate immediate threats to human health and the environment (USEPA 1993b).

Currently, the Site is vacant. A warehouse is located on the property. The property is secured by a chain-link fence and paved with asphalt. The asphalt acts as a RCRA cap in the southern portion of the Site and a non-RCRA cap in the northern portion.

## 2.1 PREVIOUS INVESTIGATIONS

The Site has been the subject of several investigations to assess the nature and extent of contamination in the soil and groundwater underlying the Site and within the immediate Site vicinity. Based on the available documents, the Site investigations were conducted under two separate operable units: OU-1 and OU-2.

The study area for the OU-1 investigations included surface soil, the unsaturated A-zone, and the A-zone groundwater. The A-zone includes unsaturated soils below ground surface (bgs), which may vary in thickness from 65 to 85 feet, and the first water-bearing unit, the A-zone groundwater. The depth to the saturated zone generally varies between 65 and 75 feet bgs. The base of the A-zone is a thin sandy clay layer between 75 and 85 feet bgs. The A-zone groundwater occurs beneath the entire Site but pinches out between 500 and 600 feet south of the Site, 200 feet east of the Site, and 300 feet west of the Site.

The study area for the OU-2 investigation included the unsaturated zone beneath the A-zone aquifer and the B-zone aquifer. The B-zone includes unsaturated soil beneath the A-zone and the second lowest water-bearing unit (B-zone groundwater) at 140 to 165 feet bgs. The B-zone extends to at least 250 feet bgs and ends at a clay layer (known as the Corcoran Clay) that confines the drinking water aquifer (the C-zone) beneath it. The Corcoran Clay, also locally known as the "Blue Clay" or the "E-Clay", is a member of the Tulare Formation. The Corcoran

Clay is the predominant aquitard separating the semi-confined water-bearing layers above it and the confined aquifer beneath. It is a regionally extensive lacustrine deposit of low permeability (Johnson et al 1968) ranging in thickness from 20 feet to over 100 feet. Based on the driller's log for Arvin City Well No. 1, it is estimated that the Corcoran Clay layer in the area of the Site is at least 27 feet thick.

Subsurface investigations conducted onsite to date have confirmed the presence of a number of potentially hazardous substances in the groundwater. Fifty-six organic compounds were found within A-zone groundwater samples and 11 were found in B-zone groundwater samples. The primary chemicals of concern (COCs) are the following:

- Dinoseb
- Chloroform
- 1,2-Dibromo-3-chloropropane (DBCP)
- 1,2-Dichloropropane (1,2-DCP)
- 1,3-Dichloropropane (1,3-DCP)
- 1,2,3-Trichloropropane (1,2,3-TCP)
- Ethylene dibromide (EDB)

Dinoseb, an herbicide, has been detected at concentrations up to 15,000 milligrams per liter (mg/L) in groundwater samples collected from monitoring wells completed in the A-zone. Dinoseb is a contact herbicide commonly used for post-emergence weed control in a variety of crops. The maximum contaminant level (MCL) for dinoseb in drinking water is 7 micrograms per liter (µg/L).

Chloroform has been reported in A-zone groundwater at concentrations up to 200 µg/L since 2000. The MCL for chloroform in drinking water is 80 µg/L (for total trihalomethanes). Chloroform has historically been used as a solvent, reagent in organic synthesis, and anesthetic.

DBCP, a pesticide, has been reported in A-zone groundwater at concentrations up to 1,980 µg/L since 2000. Its MCL in drinking water is 0.2 µg/L.

1,2-DCP, a soil fumigant and solvent, has been reported in A-zone groundwater at concentrations up to 140,000 µg/L since 2000. Its MCL in drinking water is 5 µg/L.

1,3-DCP, a soil fumigant and solvent, has been reported in A-zone groundwater at concentrations up to 163 µg/L since 2000. Its MCL in drinking water is 0.5 µg/L.

1,2,3-TCP, a solvent and fumigant, has been reported in A-zone groundwater at concentrations up to 8,700 µg/L since 2000. The MCL for 1,2,3-TCP is 0.5 µg/L.

EDB, a fumigant, has been reported in A-zone groundwater at concentrations up to 300 µg/L since 2000. Its MCL in drinking water is 0.05 µg/L.

The contaminants in the perched aquifer pose a threat to the underlying unconfined regional aquifer (B-zone) and the C-zone aquifer that is used for municipal drinking water. Public and private wells within 3 miles of the Site provide drinking water to approximately 15,000 people and irrigate 19,600 acres of cropland. City of Arvin Well #1 (CW-1) is located approximately 1,500 feet from the Site (USEPA 1993b). This well is currently out of operation.

The most recent groundwater monitoring event conducted at the Site was in April 2009. This sampling event included the 44 A-zone and B-zone groundwater monitoring wells (Figure 2). Groundwater depths and surface elevations obtained during this event are provided on

Table 1, and depicted on Figures 3 and 4. The contaminant concentrations reported in the wells sampled are summarized on Tables 2 through 5. The aerial extent of these contaminants is depicted in Figures 5 through 19.

## 2.2 SITE GEOLOGY AND HYDROGEOLOGY

The subject Site is underlain with an alluvial deposit of alternating layers and mixtures of unconsolidated sands, silts, and clay. Soil underlying the Site to a depth of 80 feet generally consists of silty fine sand to fine sandy silt. Clean, well-graded sand lenses and seams of silty clay occur locally within these soils. The soils are generally thinly interbedded, with textural changes occurring every few vertical inches. These textural changes are also believed to occur laterally.

As noted in Section 2.1, the Site geology has been divided into two zones: the A-zone and the B-zone. The A-zone includes unsaturated soil at 65 to 75 feet bgs and includes the first water bearing unit, the A-zone groundwater. The depth to the saturated zone (see groundwater depths in Table 1) varied between 69 and 88 feet bgs in April 2009. The base of the A-zone is a thin sandy clay layer between 75 and 85 feet bgs. The clay layer and the A-zone groundwater occur beneath the entire Site but terminate (pinch out) within 640 feet south of the Site, 560 feet east of the Site, and 500 feet west of the Site.

The B-zone includes unsaturated soil beneath the A-zone and the second lowest water-bearing unit (B-zone groundwater) at 140 to 165 feet bgs. The B-zone extends to at least 250 feet bgs and ends at a clay layer known as the Corcoran Clay that confines the drinking water aquifer beneath it. The thickness of this clay layer beneath the Site is unknown.

Groundwater in the A-zone flows in a generally southern direction, with some mounding of the water table observed extending southward from the southwest corner of the Site. The saturated thickness of the A-zone groundwater ranges from 0 to 10 feet. The groundwater velocity in the A-zone has been estimated at 53 feet per year. A slug test conducted within the southern portion of the existing RCRA cap in 1999 suggested that a yield of less than 100 gallons per day could be expected for wells in the A-zone (Morrison Knudson 1999). Aquifer testing of the three on-Site extraction wells showed a groundwater yield of approximately 1/4 gallon per minute (gpm).

The B-zone groundwater comprises a series of water-bearing units. Wells in the B-zone were installed in the water-bearing units located at approximately 145 feet bgs and 170 feet bgs. The direction of flow in the water-bearing unit at 170 feet bgs is to the south, and the gradient is flat (0.0004). Permeabilities are much higher than for the A-zone groundwater. Past pump tests for the water-bearing unit at 170 feet bgs indicated that wells could be pumped at 7 gpm for an extended period (Morrison Knudson, 1999).

## 2.3 WELL DESCRIPTION

The 44 groundwater monitoring wells at the Site and on the adjoining properties were constructed between 1984 and 2009 and installed at locations designed to assess the extent of the contaminant plume, contaminant concentrations, and aquifer characteristics. A list of the groundwater monitoring wells is provided in Table 1. Figure 2 shows the location of these wells.

Twenty-five of the Site's wells are screened within the A-zone aquifer, and 19 are screened within the B-zone aquifer. Eleven of the A-zone wells listed on Table 1 were not sampled in April 2009 as a result of being dry or becoming dry following purging. The city well was also

not sampled due to its removal from operation in December 2007 (the well's pump was removed by the Arvin-Edison Water District).

The wells (shown on Figure 2) are spaced widely within the known contaminant plume and along portions of the plume's perimeter. These wells are currently used to delineate the on-Site and off-Site extent of the seven COCs listed in Section 2.1 of this report.

## 3.0 OBJECTIVES

The first objective of this study was to determine a groundwater monitoring well configuration to be used for long term monitoring of groundwater in both A- and B-zone aquifers. The rationale and recommendations for groundwater wells to be utilized for monitoring activities, and those to be abandoned, are provided in Section 7.0.

The second objective of this study was to assess optimum locations for extraction wells to be used for dewatering of the A-zone beneath and immediately adjacent to the Site. The intent of dewatering the A-zone is to reduce further lateral migration of contaminants from the Site, and reduce downward migration of contaminants from the A-zone to the B-zone (and ultimately the C-zone aquifer utilized as a local drinking water source).

## 4.0 APPROACH

The initial approach used to meet the objectives described above included using the existing contaminant concentration data from A-zone wells to perform a trend analysis of the COCs. This data was used to assess where contaminant concentrations were increasing and decreasing. It was also used to assess the period required for natural attenuation to reduce the contaminant concentrations below their respective MCLs.

The contaminant concentrations, contaminant trends, and aquifer characteristics were used to assess optimum locations for groundwater extraction wells (See Section 6.0). As noted above, these wells would be used to de-water the A-zone aquifer beneath and adjacent to the Site.

The contaminant trends were also used, in conjunction with well spacing and well construction, to verify the usefulness of A-zone and B-zone wells in future monitoring programs. Wells recommended for removal are provided following this assessment (see Section 7.0).

## 5.0 GROUNDWATER CONTAMINANT TRENDS

### 5.1 DATA COMPILATION AND STATISTICAL ANALYSES

#### *5.1.1 A-ZONE*

All of the existing groundwater contaminant data collected from the Site's A-zone groundwater monitoring wells were compiled, tabulated, reviewed, and used to statistically evaluate the groundwater contaminant trends at selected A-zone wells. A summary of the compiled data is presented in Table 2, which includes analytical data collected between 1987 and 2007 for all of the wells sampled. The city well (CW-1), located southwest of the Site, was not included in the analysis.

The analysis used to assess the contaminant trends in the underlying A-zone aquifer assumes that natural attenuation is occurring. Natural attenuation refers to a number of naturally occurring processes that degrade contaminants and limit their movement in the subsurface. Natural attenuation processes can control contaminant movement and concentrations in

environmental media, including soil, sediment, air, surface water, and groundwater. Levels of COCs underlying the Site were evaluated in accordance with EPA guidance provided in OSWER Directive 9200.4-17P Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites (EPA, 1999). This evaluation allows for natural processes that include dilution, dispersion, sorption, precipitation, volatilization, biodegradation, biotransformation, and abiotic degradation/transformation.

Due to the irregular nature of the sampling dates, no seasonality behavior could be ascertained and, therefore, no statistical tests for seasonality were applied. Assuming the absence of any seasonal effect on the process of natural attenuation in the A-zone aquifer, a non-parametric statistical test (Mann-Kendall) was applied to assess contaminant trends. Besides utilizing the Mann-Kendall test, a simple regression analysis was also performed. The statistical significance of the presence of a trend, if any, was determined using the S- and t-statistics respectively. Time in years needed for the COCs to decrease below MCLs was calculated using this data.

### *5.1.2 B-ZONE*

All of the existing groundwater contaminant data collected from the Site's B-zone groundwater monitoring wells were compiled, tabulated, reviewed, and used to statistically evaluate the groundwater contaminant trends at selected B-zone wells. A summary of the compiled data is presented in Table 3, which includes analytical data collected between 1987 and 2009. Note that not all of the wells have data for this period.

The analysis used to assess the contaminant trends in the underlying B-zone aquifer assumes that natural attenuation is occurring.

Due to non-periodic nature of the sampling, no seasonality behavior could be ascertained and, therefore, no statistical tests for seasonality were applied. Assuming the absence of any seasonal effect on the process of natural attenuation in the B-zone aquifer, a non-parametric statistical test (Mann-Kendall) was applied to assess contaminant trends. Besides utilizing the Mann-Kendall test, a simple regression analysis was also performed. The statistical significance of the presence of a trend, if any, was determined using the S- and t-statistics respectively.

## 5.2 TREND ANALYSIS

### *5.2.1 A-ZONE DATA EXAMINATION*

The A-Zone dataset contains analytical data from 25 wells collected between September 1987 and April 2009. Groundwater collected from fourteen wells during this period (WA-1, WA-2, WA-3, WA-4, WA-5, WA-8, WA-9, PWA-3, PWA-5, PWA-6, PWA-7, AP-1, AP-2, and EPAS-4) has been reported with no detectable COCs, or with COC concentrations reported as being close to respective MCLs. Therefore, the COCs at these locations should not pose any risk to human health. As such, the data collected from these wells was not included within the statistical analysis presented below.

Although there is a subsurface RCRA impoundment on the Site, the statistical analysis was conducted with the assumption that there is no continuing release of contaminants from the Site. The RCRA cap over the former release areas is preventing or significantly reducing the downward migration of contaminants from impacted soil to the underlying A-zone aquifer.

There were periods when some wells were not sampled or did not yet exist. Some wells have only been sampled for the last 7 years, and some have only been sampled intermittently. In all, the irregularity of data poses a certain difficulty in researching chemical concentration

trends. Due to the irregularity of data, four of the wells (EPAS-1, PWA-1, PWA-2, and PWA-4) were not included within the statistical analyses.

As indicated above, data from 18 of the wells was not utilized during this study. Data from seven wells (AMW-1P, AMW-2P, AP-4, WA-6, WA-7, EPAS-2, and EPAS-3) were utilized to assess the COC trends via the statistical analyses described below. The statistical significance of the trends found for each of the seven wells is provided in the summary table (Table 6) for the A-zone.

#### *5.2.2 B-ZONE DATA EXAMINATION*

The B-Zone dataset contains analytical data from 21 wells collected between September 1987 and April 2009. Groundwater collected from eleven wells during this period (WB2-3, WB2-4, PWB-1, PWB-3, PWB-5, PWB-6, PWB-8, PWB-9, PWB-10, PWB-11, CW-1) has been reported with no detectable COCs, or with COC concentrations below respective MCLs. Therefore, the COCs at these locations should not pose any risk to human health. As such, the data collected from these wells was not included within the statistical analysis presented below.

There were periods when some wells were not sampled or did not yet exist. Some wells have only been sampled for the last few (1-3) years, and some have only been intermittently sampled. Due to the insufficiency of data, COCs could not be analyzed statistically for three of the wells (PWB-7, PWB-7A and PWB-12) that have been reported with contaminant concentrations exceeding their respective MCLs.

The data from seven wells (AR-1, AMW-4R, AMW-3R, WB2-1, WB2-2, PWB-2 and PWB-4) were used to assess the COC trends via the statistical analyses described below. The statistical significance of the trends found for each of the seven wells is provided in the summary table (Table 7) for the B-zone.

#### *5.2.3 QUANTITATIVE ANALYSIS*

**Mann-Kendall Test** – The most robust and the least demanding statistical test for the determination of a trend is the Mann-Kendall test. For less than 40 data points, the S-statistic can be simply computed. The null hypothesis (a hypothesis that might be falsified on the basis of observed data) of no trend can be tested against the alternative hypothesis of negative trend by comparing the computed S with the table value of Smax (Gilbert 1987). A negative magnitude of S indicates the possibility of decreasing contaminant trend, while a positive value of S indicates an increasing contaminant trend.

To quantitatively conduct the test as recommended by EPA guidance documents, the level of significance was selected to be 0.2, or 20 percent. In statistics, a result is referred to as statistically significant if it is unlikely to have occurred by chance. The amount of evidence required to accept that an event is unlikely to have arisen by chance is known as the significance level. Such results are informally referred to as 'statistically significant'. The lower the significance level, the stronger the evidence required.

**Regression Analysis** – Since the level of measurement of the concentration and the time are ratio and interval, linear regression became a possible candidate for a trend analysis. In addition to the presence of a trend, regression analysis provides quantitative results for the slope, intercept, and best fit. The formula for the concentration of a chemical as a function of time is given below.

$$C(t) = C_0 e^{-kt}$$

Where C(*t*) is a level of concentration of a chemical at time (t), Co is a level of initial concentration, and k is the first order decay coefficient. This theoretical model assumes that the exponential decay argument is linear in t. Higher order corrections may modify the regression analysis by demanding a non-linear regression approximation instead of a logarithmic linear regression used according to the requirements given by EPA guidance documents (EPA, 1999).

The actual regression analysis is performed on the Log C(*t*) and t. A t-test of significance is conducted to ascertain statistical significance of found trend. To be consistent with a Mann-Kendall test, the t-test is conducted at a level of significance of $\alpha = 0.2$ (20 percent). As a forecast, the time of disappearance of a chemical in years counting from the year 2010 is estimated. Based on the above analysis, a conclusion is drawn whether a given chemical at a given well location poses any danger. See Table 7, Summary of Trend Analysis (B-Zone).

### 5.2.4 A-ZONE RESULTS

Data collected to date shows the presence of the seven COCs in the seven wells utilized for this study. Of these COCs, only 2 to 4 (dinoseb, 1,2-DCP, 1,2,3-TCP, and/or DBCP) are being reported in groundwater at significant concentrations. These chemicals were utilized as part of this study. Scatter diagrams of these chemicals concentrations are depicted on Chart 1. To show the extent of COCs at these 7 wells, the overall distribution of the mean contaminant level for the period between September 1987 and April 2009 is provided on Chart 2. Due to the elevated concentrations of 1,2-DCP, Dinoseb, and 1,2,3-TCP, these COCs were the main focus of this study. All wells except one, AMW-2P, show decreasing trends of chemical contamination levels. Well AMW-2P has been dry for several years, which may be the cause of unexpected behavior of contamination levels in it (see Table 6 and Appendix A).

There are instances where the applied two tests, a Mann-Kendall test and a t-test of the slope significance, do not seem to agree. For example, 1,2,3-TCP at AMW-2P well has no trend according to a Mann-Kendall test, but is increasing according to regression analysis. Since the null hypothesis of no-trend was tested against the alternative hypothesis of the negative trend using the Mann-Kendall test, the high value of the test statistic S allowed the study to accept the no-trend hypothesis, instead of simply rejecting the alternative scenario. Had the study tested for an increasing trend, there would have been total agreement with the result of the regression analysis.

In cases when regression was found to be significant, a theoretical value was calculated for the number of years it would take for a given chemical to attenuate below its MCL. This forecast is entered in the last column of the summary table (Table 6).

### 5.2.5 B-ZONE RESULTS

To show the distribution of COCs at the seven wells used during this analysis, the mean contaminant level was determined for each COC for the period between September 1987 and April 2009 (see Chart 3).This distribution is important for determining the spread of COCs across the Site. Closer examination of the Chart indicates that the highest presence of COCs are reported at the well locations PWB-7 and PWB-4. The lowest presence of COCs among the wells showing some presence of contamination are found at the locations of the wells AMW-3R and AR-1.

Due to the elevated concentrations of 1,2-DCP, Dinoseb, 1,2,3-TCP and DBCP, these COCs were preferentially used during this study. The concentrations of these four COCs exceeded MCLs, or were very close to the MCLs.

The contaminants 1,2-DCP and Dinoseb show increasing trend at some well locations. However, low R2 values (coefficient of determination) for these wells indicate a poor linear correlation of the contamination levels and time. Moreover, in most of those cases, the data exhibit a declining trend after the year 2000.

The statistical analysis of the Zone-B contamination indicates the insignificant presence of four chemicals: 1,2-DCP, 1,2,3-TCP, Dinoseb and DBCP. However, their contamination levels are close to the respective MCLs. Appendix B presents the statistical analyses data for the B-Zone.

## 6.0 EVALUATION OF A-ZONE EXTRACTION WELL LOCATIONS

The purpose of the A-zone extraction wells is to dewater the A zone aquifer so that it reduces the migration of contaminants laterally, and vertically from the A zone to the B zone. For this objective, four large diameter sump wells will be installed.

The extraction well locations were established by evaluating several factors, including groundwater production rates, elevated contaminant concentration locations within the A-Zone, locations where contaminants from the A-zone may be migrating to B-zone, and the results of the trend analyses. The following sections provide an evaluation of these factors

### 6.1 GROUNDWATER PRODUCTION RATES

During the last groundwater sampling event conducted in April 2009, ten of the groundwater wells within the A-zone had no measureable groundwater. Based on this data, the A-zone aquifer in these areas was reported as having been naturally dewatered as a result of lower than anticipated rainfall and associated infiltrations rates. The remaining wells were noted to have water thicknesses ranging between 1.49 to 11.62 feet. The last column of Table 8 provides the measured thickness of groundwater within the A-zone wells. Note that this assumes that each groundwater well terminates at the bottom of the A-zone aquifer.

In determining the portion of the A-zone with the highest anticipated production rates, the portions of the A-zone aquifer containing the thickest groundwater column were reviewed. The calculated groundwater column thicknesses are plotted on Figure 19 for review. As noted on this figure, the thickest groundwater column appears to be located immediately south of the Site, within the immediate vicinity of EPAS-2 and EPAS-3. Due to the thickness of groundwater in this area, the extraction rates are anticipated to be greater here relative to other on-Site and off-Site areas.

### 6.2 ELEVATED CONTAMINANT CONCENTRATION LOCATIONS

During extraction activities, it is considered most advantageous to extract groundwater from locations containing the highest contaminant concentrations. The highest contaminant concentrations reported in A-Zone groundwater samples collected in April 2009 were generally reported in the monitoring wells located immediately south and west of the Site's RCRA cap (Wells PWA-1, EPAS-1, EPAS-2, EPAS-3, and PWA-2). Figures 5 through 10 show the COC concentrations in these wells. These wells have historically been reported with elevated contaminant concentrations (Table 2). As noted on these figures, the contaminant concentrations decrease significantly away from these wells.

In terms of removing groundwater with the highest contaminant concentrations, the ideal extraction well locations would be within the immediate vicinity of EPAS-1, EPAS-3, and PWA-2.

## 6.3 APPARENT INFILTRATION AREAS FROM A-ZONE TO B-ZONE

Based on historic and recent groundwater contaminant data, COCs within the A-Zone are migrating into the underlying B-zone. The location of these suspected migration routes, whether man-made or natural, can only roughly be interpreted from data collected to date. The infiltration point to the B-Zone aquifer is assumed to be within the immediate vicinity of the B-Zone wells containing the highest contaminant concentrations. As noted on Figures 12 through 18, these areas appear to include:

1. vicinity of WA-6 and AMW-4R, or between these two wells; and
2. vicinity of AMW-1P

Note that the B-zone wells AMW-3R and AMW-4R are screened at least partly into the A-zone (80 and 60 foot screen intervals, respectively). The well screens at these two locations are potentially acting as groundwater conduits between the A-zone and B-zone.

In order to reduce or eliminate groundwater infiltration from the A-Zone to the B-Zone, the infiltrations points would require removal (such as removing a leaking well) and/or the A-Zone aquifer at this location would need to be de-watered. The removal of AMW-3R and AMW-4R is recommended in Section 7.0. As part of the A-Zone de-watering effort, the extraction wells will preferentially be placed by apparent infiltration areas. The ideal extraction well locations for this purpose are considered to be within the immediate vicinity of WA-6 and AMW-1P.

## 6.4 TREND ANALYSIS

The projected future contaminant trends were modeled statistically (via computer programs) with analytical data collected to date (see Section 5.0). The trend analysis conducted for the seven A-zone wells reported with elevated contaminant concentrations (AMW-1P, AMW-2P, AP-4, EPAS-2, EPAS-3, WA-6, and WA-7) show that contaminant concentrations are anticipated to naturally attenuate to levels less than MCLs within the 8 to 30 years at well locations AMW-1P and EPAS-2 (see Table 6). Longer natural attenuation times (11 to 92 years) are reported for one or more of the COCs at well locations EPAS-3, WA-6, and WA-7. The statistical data did not allow for a projected time of contaminant reduction (below MCLs) for AMW-2P and AP-4 (currently dry wells).

Due to the lengthy period in which natural attenuation is estimated, the areas adjoining EPAS-3, WA-6, and WA-7 are considered ideal places to dewater in order to assist in the removal of elevated contaminant concentrations at these locations.

## 6.5 RECOMMENDED A-ZONE EXTRACTION WELL LOCATIONS

Based on the evaluation presented above, the most advantageous extraction well locations (see Figure 19) are as follows:

1. Centered between PWA-1, WA-6, and EPAS-1
2. Between EPAS-1 and EPAS-2
3. Between EPAS-2 and EPAS-3
4. Centered between EPAS-3, PWA-2, and WA-1

These four extractions wells are spaced approximately 170 feet apart at locations considered best suited to remove the greatest volumes of groundwater from the A-Zone aquifer. The increased extraction rates are intended, in part, to assist in the relatively rapid de-watering of the A-Zone. These extraction well locations are also situated in areas reported with the

highest contaminant concentrations in the A-Zone aquifer. Extracting from these areas would result in the greatest reduction of contaminant mass within the A-Zone aquifer. Extraction well locations Nos. 1, 3, and 4 (Figure 19) are also intended to reduce the infiltration of groundwater from the A-Zone to the B-Zone, which is suspected of occurring near these wells.

Recommended construction details for the extraction wells are provided on Figure 20. The maximum depth of the extraction wells will be approximately 85 feet. This depth will be re-evaluated in the field at the time of extraction well installation, and will be based on the depth of the sandy clay that underlies the A-zone aquifer. The boring diameter for the well, anticipated being between 4 and 8 feet, will be provided in a separate design. The 6-inch diameter Schedule 80 polyvinyl chloride (PVC) well placed in this boring will contain 15 feet of well screen (0.02" slots). The annulus between the well screen and boring walls will be filled with pea gravel. Note that a 1-inch diameter piezometer will also be placed within the well boring. This piezometer will be used to assess the groundwater depth during groundwater extraction activities without having to disturb the extraction well setup. The upper portion of the well boring will be sealed in manner similar to that of other on-Site groundwater wells (per County and State requirements). The well shall be secured with a locking cap within a flush-mounted well box that is protected on each side with bollards placed within concrete.

## 7.0 IDENTIFYING MONITORING WELLS FOR LONG TERM MONITORING

The RI/FS for Operable Unit 2 recommended long term monitoring of both A-zone and B-zone groundwater wells. In the Record of Decision for Operable Unit 2, the long term monitoring of these wells has been approved.

There are currently a total of 44 monitoring wells within the Site and Site vicinity used to monitor the groundwater within A-zone and B-zone aquifers. Some of the wells are currently dry and some are identified as providing duplicative and/or questionable data due to their construction and/or locations. An additional 10 wells are located within and adjacent to the Site, which are not used. These include five groundwater monitoring wells, three extraction wells, and two injection wells.

To identify a set of monitoring wells best suited to monitor the groundwater, several factors were identified and used. These factors included 1) long term analytical data record, 2) well location and usefulness in assessing contaminant extent, and 3) well construction. A ranking of these factors was used to assess each on-Site and off-Site well. A summary of this ranking is provided on Table 9.

The long-term analytical data record provides chemical level trends needed to assess the attenuation rates, migration routes, and migration rates. The continued addition of analytical data to the existing dataset is considered essential for the accurate assessment of these factors. A number of the on-Site wells have very short or no records of groundwater analytical data. Such wells are ranked low due to their providing no or little data useful for assessing groundwater contaminant attenuation rates, migration routes, and migration rates.

The physical locations of all monitoring wells were assessed in terms of their position within and immediately adjacent to the known contaminant plume. Very closely spaced wells, as noted on Table 9, were ranked relatively low. As an example, wells MW-1 through MW-4 are considered duplicative of what is already achieved at that location by the adjoining well AMW-1P.

Monitoring well records were reviewed to assess whether well construction or subsequent damage has rendered the well as not useful, or as a possible migration route between the A-zone and underlying B-zone. Well AMW-3R, for example, is noted to have 80 feet of screen that potentially could be transmitting groundwater from the A-zone to the B-zone. As such, this well was given a relatively low ranking. Note that where construction details could not be found, the well was given a median ranking (3 of 5).

Based on a review of each on-Site well and their final ranking (Table 9), the following wells are not considered useful for long term monitoring and are recommended for removal.

| WELLS RECOMMENDED FOR REMOVAL | | |
|---|---|---|
| EW-1 | MW-1 | AP-5 |
| EW-2 | MW-2 | PWA-4 |
| EW-3 | MW-3 | PWA-5 |
| IW-1 | MW-4 | AMW-3R |
| IW-2 | AP-2 | AMW-4R |

As noted above, eight of the existing A-zone wells (AP-2, AP-5, PWA-4, PWA-5, and MW-1 through MW-4) are recommended for removal. The data record for AP-2 is sparse (frequently dry), and the construction of this well is unknown. As such, this well was not considered beneficial to the long term monitoring program. AP-5 is located within 6 feet of an existing A-zone well (WA-3), and is thus considered duplicative for monitoring of that portion of the A-zone. Well PWA-4, located within the immediate vicinity of EPAS-1, is also considered duplicative for monitoring that portion of the A-zone. Well PWA-5 has been dry since installation (eastern well past limits of A-zone aquifer), and serves no purpose in the future monitoring program. Monitoring wells MW-1 through MW-4 were part of a preliminary groundwater extraction investigation, and not been used since the investigation. Due to the absence of past monitoring data and the existing adjoining well AMW-1P, these wells are not considered beneficial to the future monitoring program.

The two B-zone wells recommended for removal (AMW-3R and AMW-4R) were screened at least partly into the A-zone. The well screens at these two locations may be acting as a groundwater conduit between the A-zone and B-zone. In order to reduce the migration of elevated contaminant concentrations between the A-zone and B-zone, the removal of these two wells is recommended.

Wells EW-1, EW-2, EW-3, IW-1, and IW-2 were also part of the preliminary groundwater extraction investigation noted above. Due to the poor outcome of this investigation, it is recommended that these wells also be considered for removal.

## 8.0 LONG TERM MONITORING AND SAMPLING

The continued collection of analytical data from the remaining on-Site A-zone and B-Zone wells is considered essential for the future assessment of contaminants beneath and adjacent to the Site. It is recommended that wells that have been reported with contaminant concentrations greater than their respective MCLs in the last 5 years be sampled twice annually. Each on-Site well, including those with no detectable contaminant concentrations,

should be sampled during one of these sampling events. The groundwater sampling activities must be conducted in accordance with the approved Sampling and Analyses Plan (Eco, 2007) and associated Health and Safety Plan

Maintenance of the groundwater wells must be conducted immediately following each groundwater sampling event (at least twice annually). At a minimum, the maintenance items listed below should be conducted as needed during maintenance activities. The items necessary to perform these repairs will be collected prior to sampling activities and maintained with the sampling equipment.

| Well Maintenance Checklist |
|---|
| Clear vegetation, debris, and soil piles away from well |
| Replace/repair broken/old lock to riser |
| Replace/repair broken locking well cap (at top of PVC riser) |
| Replace/clean well cover bolts (flush-mounted well covers) |
| Clean well box threads |
| Replace/repair rubber seal for flush-mounted well covers |
| Replace broken/lost Barcad cap or stopper |
| Paint well cover as needed |
| Paint bollards as needed |
| Paint well riser as needed |
| Repair concrete apron as needed |
| Repair damaged bollards |
| Replace or add well ID tag as needed |

A checklist including the above items will be used during maintenance activities to document the repairs made at each well. Repairs that could not be conducted will also be recorded. This checklist will be appended to each sampling report in order to alert the next sampling team of required well maintenance items. The O&M plan will be developed with all requirements for all well maintenance items.

If significantly more repair is required at a well than anticipated, such as the replacement of a Barcad system, the USACE will immediately be notified and provisions will be made to correct the deficiency.

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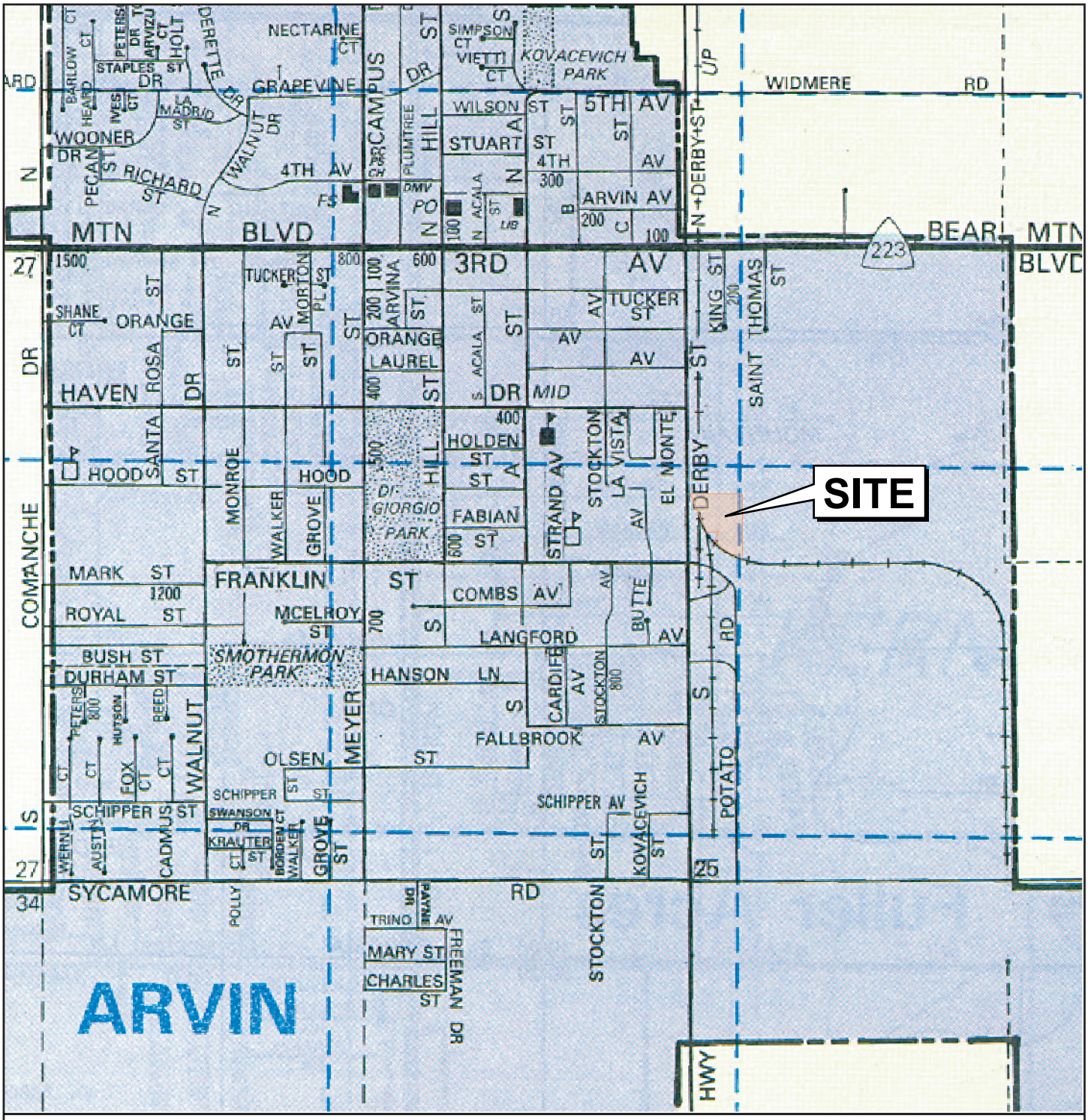
# FIGURES

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**SITE LOCATION MAP**
Brown & Bryant Superfund Site
600 South Derby Street
Arvin, California

Project No.: Eco-09-350 | Dated May 2010

FIGURE: 1

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**WELL LOCATIONS**
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Arvin, CA

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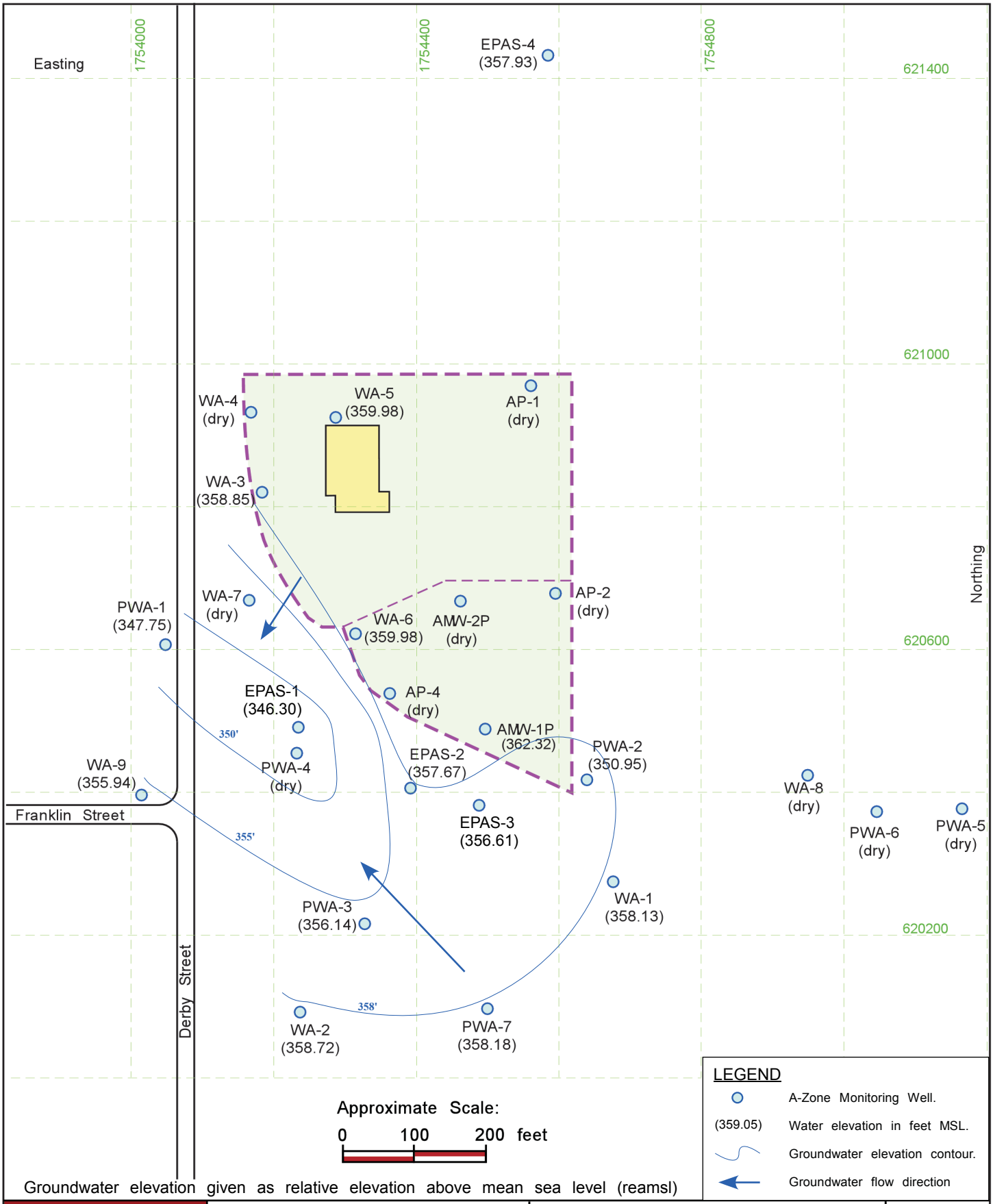
FIGURE: 2




Groundwater elevation given as relative elevation above mean sea level (reamsl)

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**PIEZOMETRIC SURFACE**
**A-ZONE**
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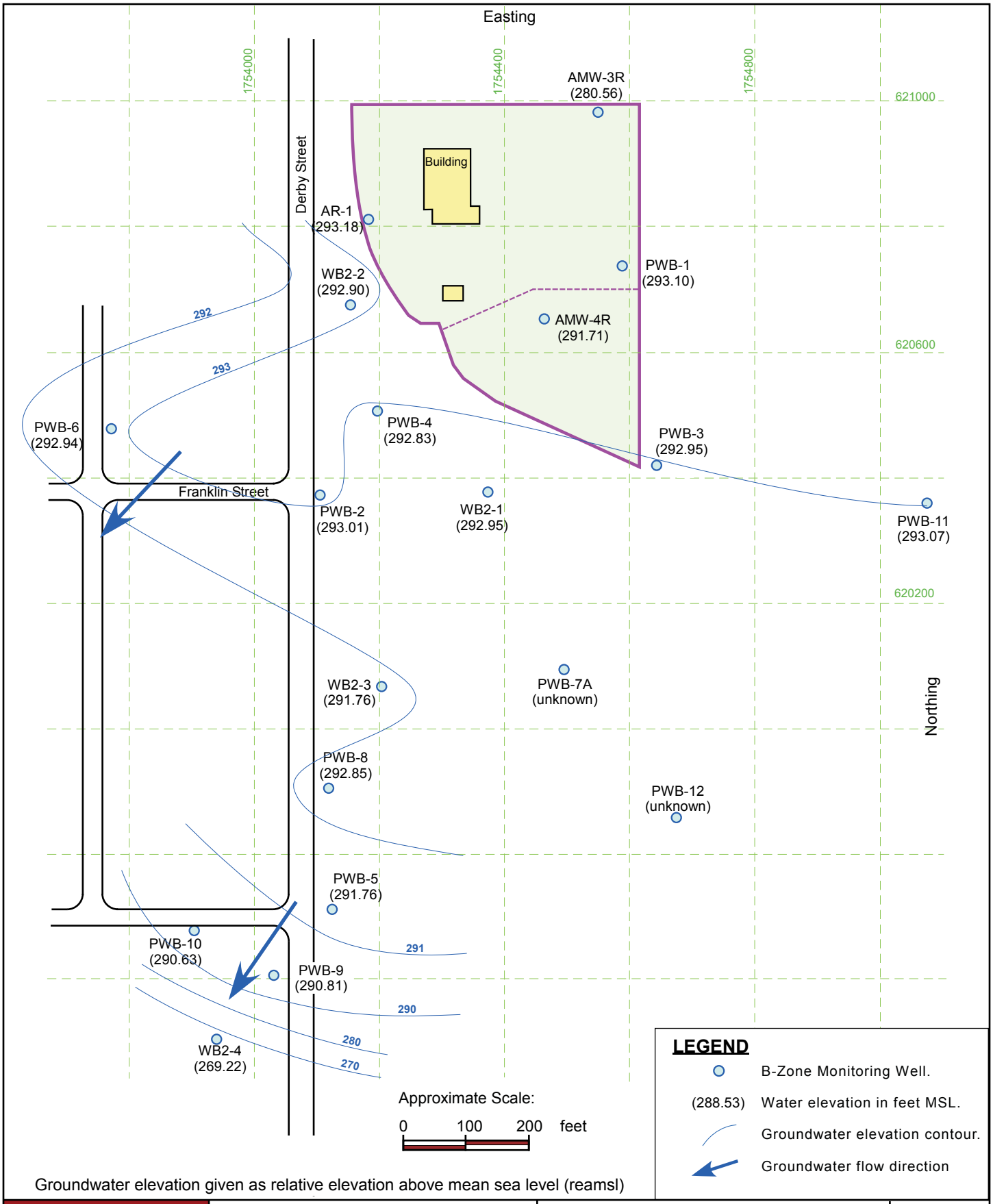
FIGURE: 3




Groundwater elevation given as relative elevation above mean sea level (reamsl)

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**PIEZOMETRIC SURFACE**
**B-ZONE**
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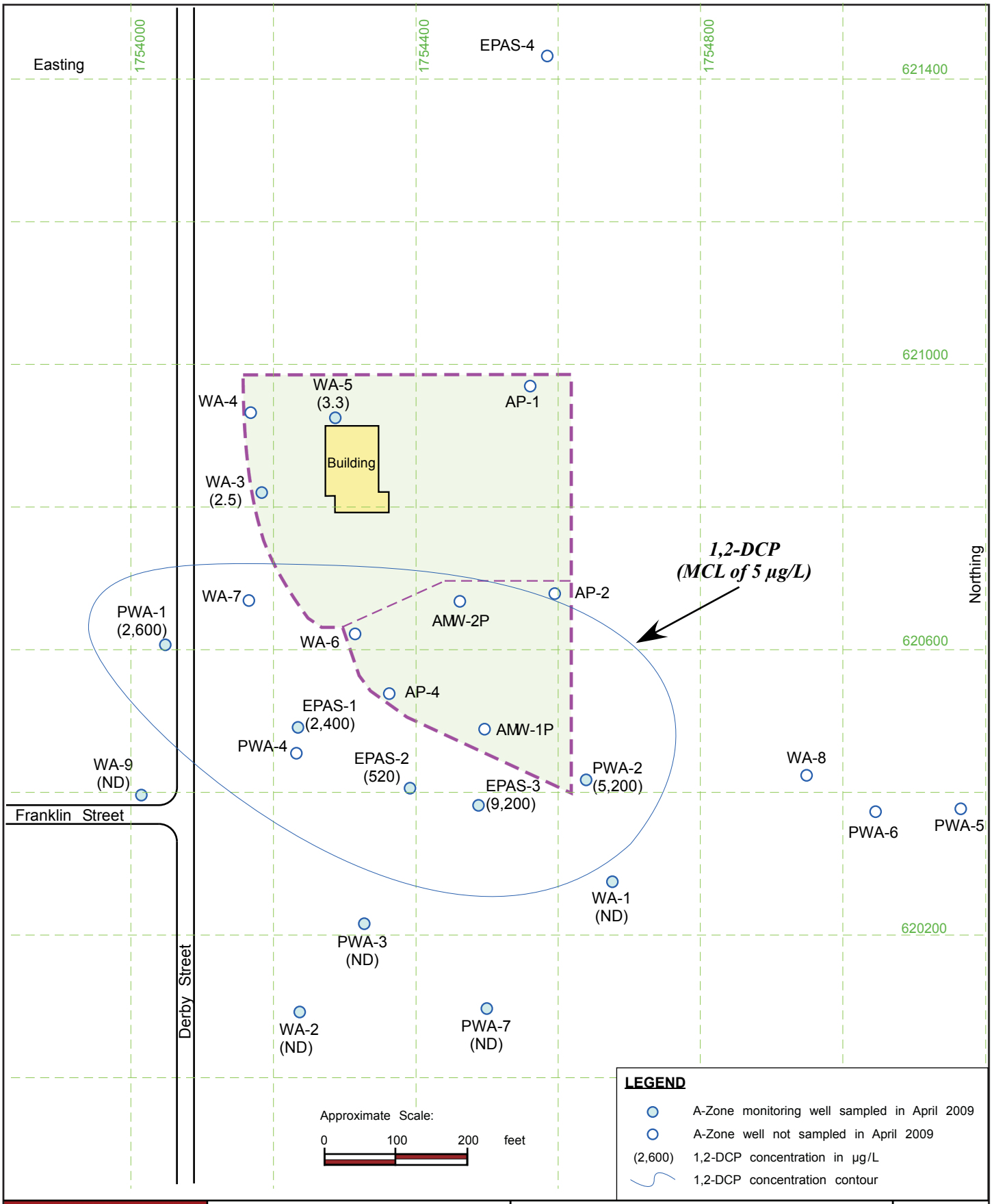
FIGURE: 4

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**1,2-DCP IN GROUNDWATER**
**A-ZONE**

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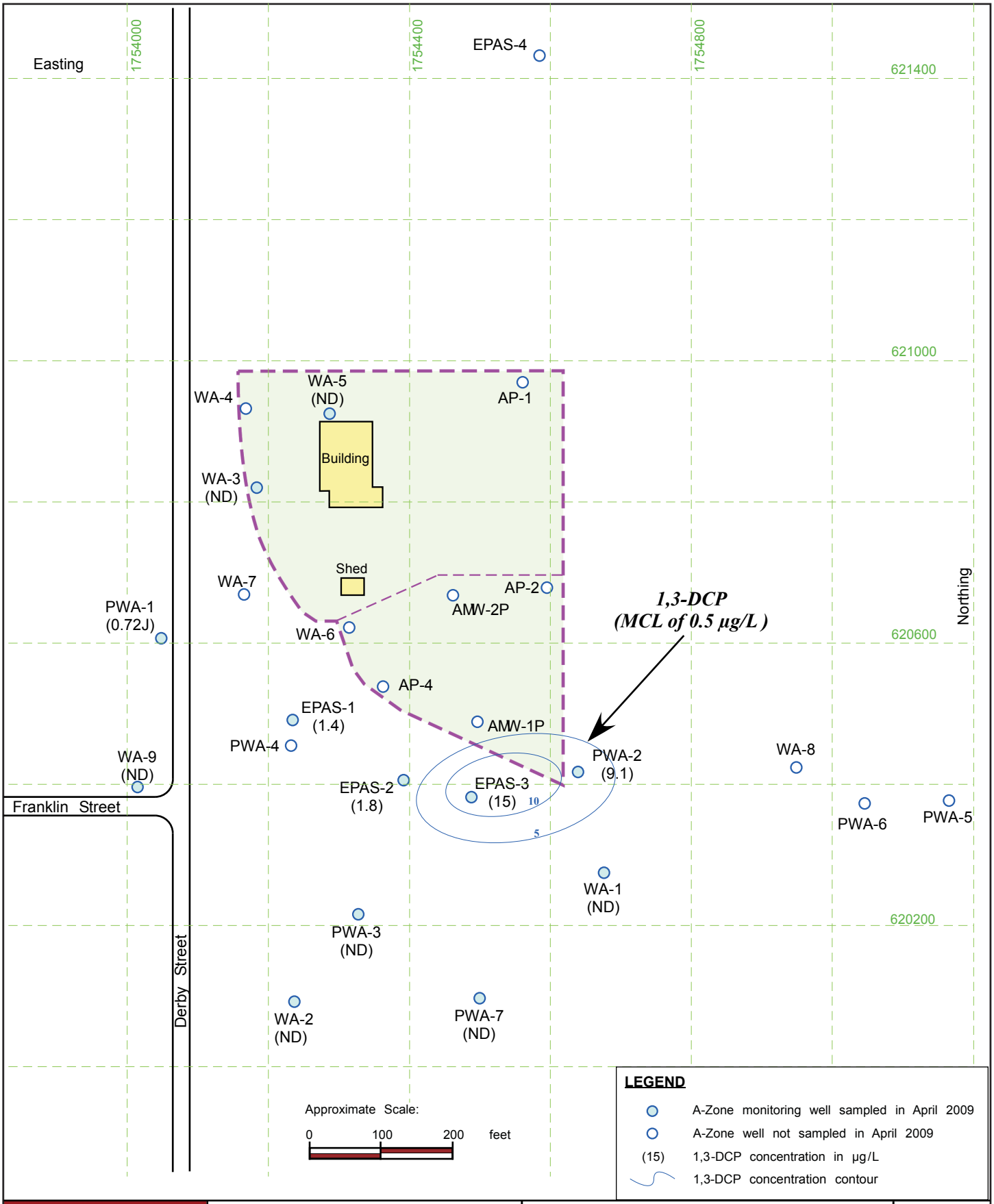
FIGURE: 5

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**1,3-DCP IN GROUNDWATER A-ZONE**

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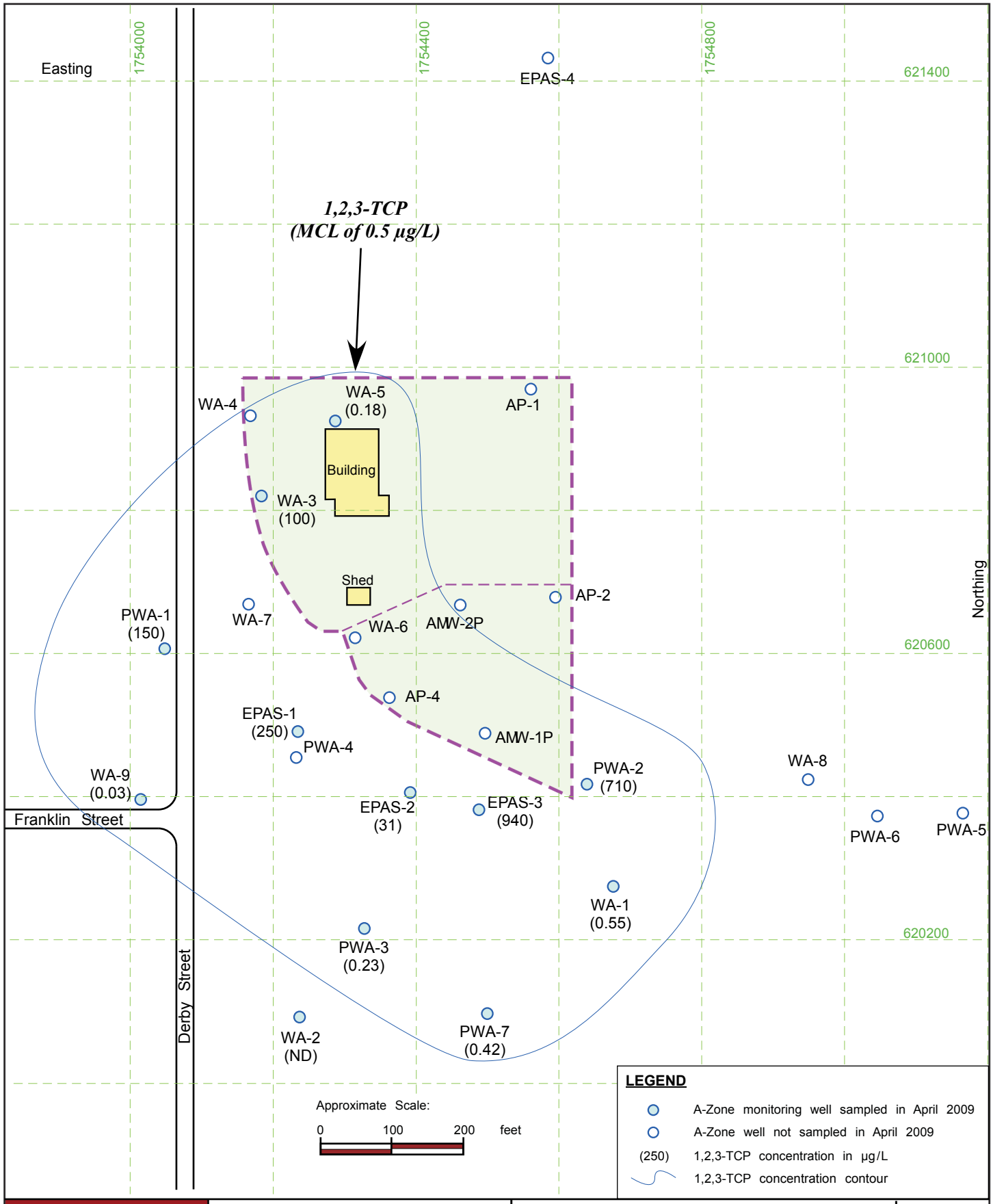
FIGURE: 6

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**1,2,3-TCP IN GROUNDWATER A-ZONE**

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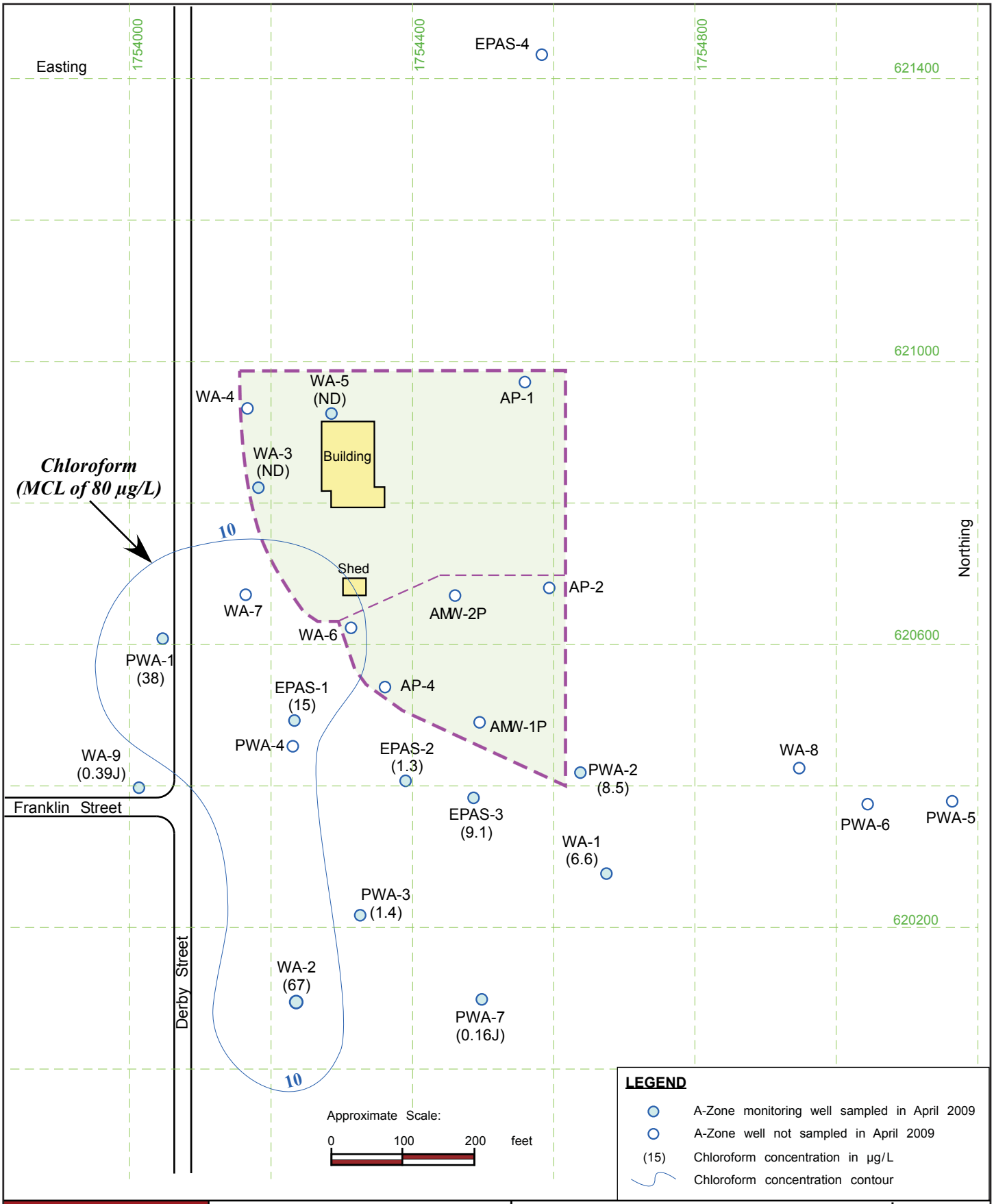
FIGURE: 7

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**CHLOROFORM IN GROUNDWATER A-ZONE**

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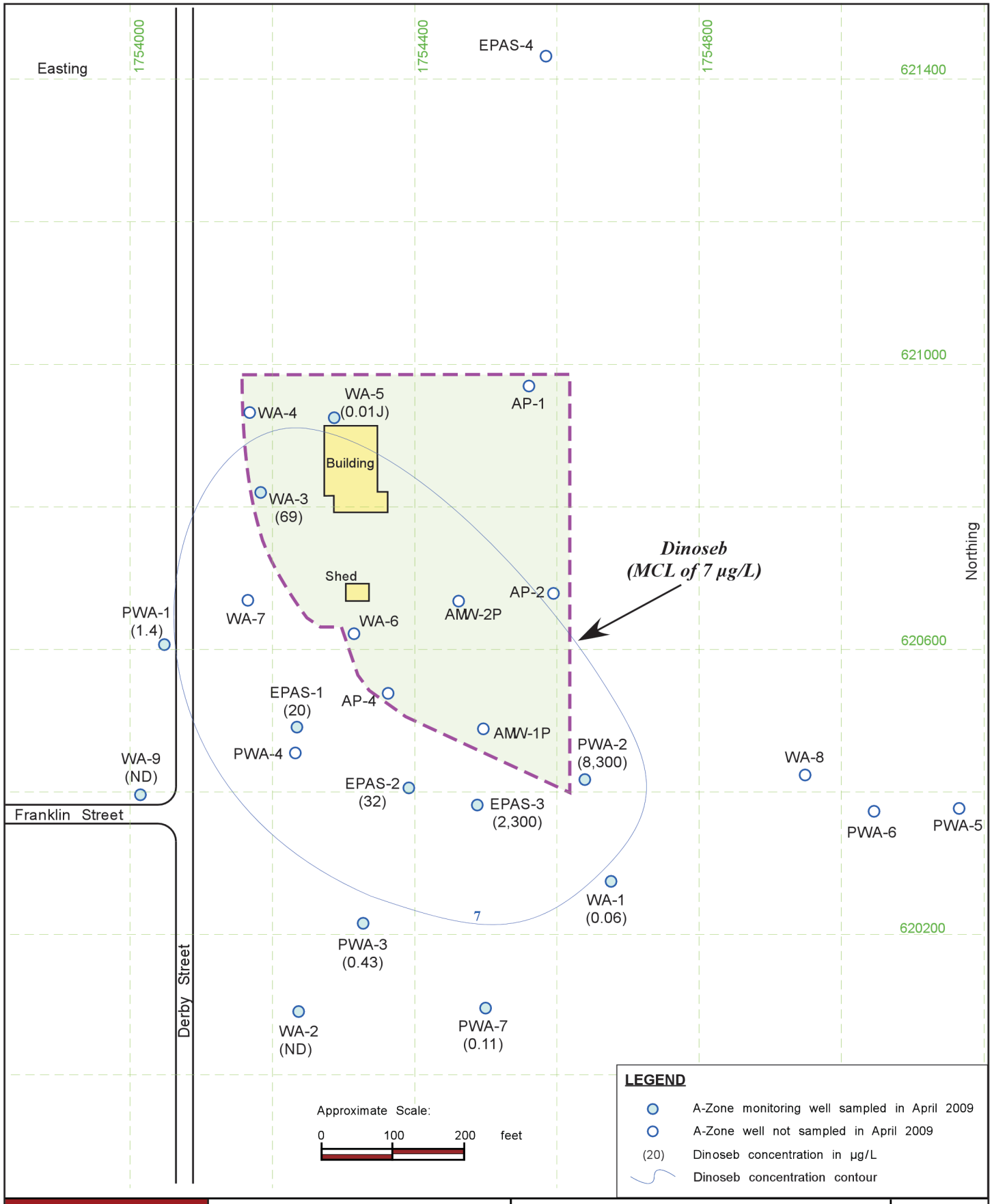
FIGURE: 8

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**DINOSEB IN GROUNDWATER A-ZONE**

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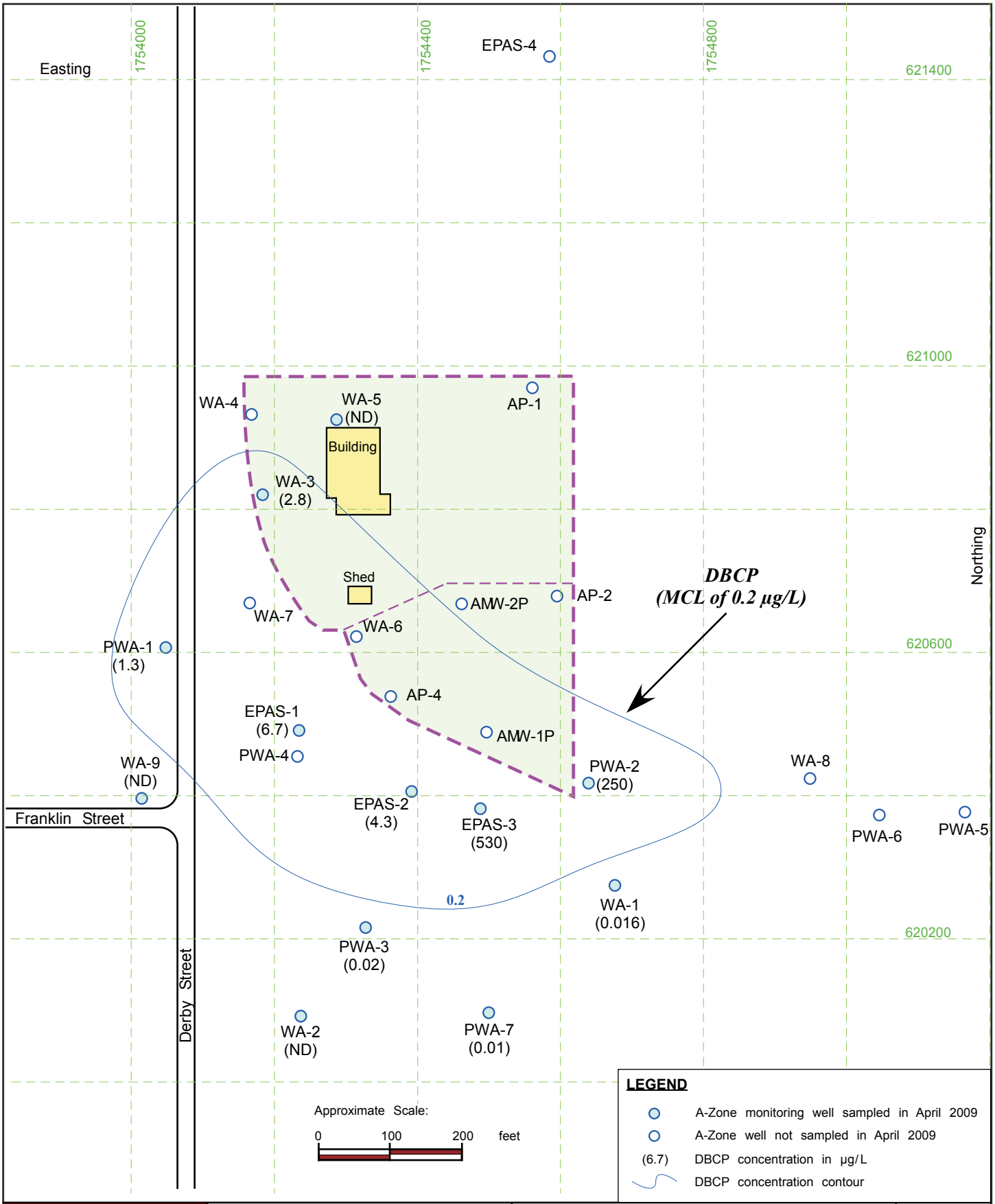
FIGURE: 9

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**DBCP IN GROUNDWATER A-ZONE**

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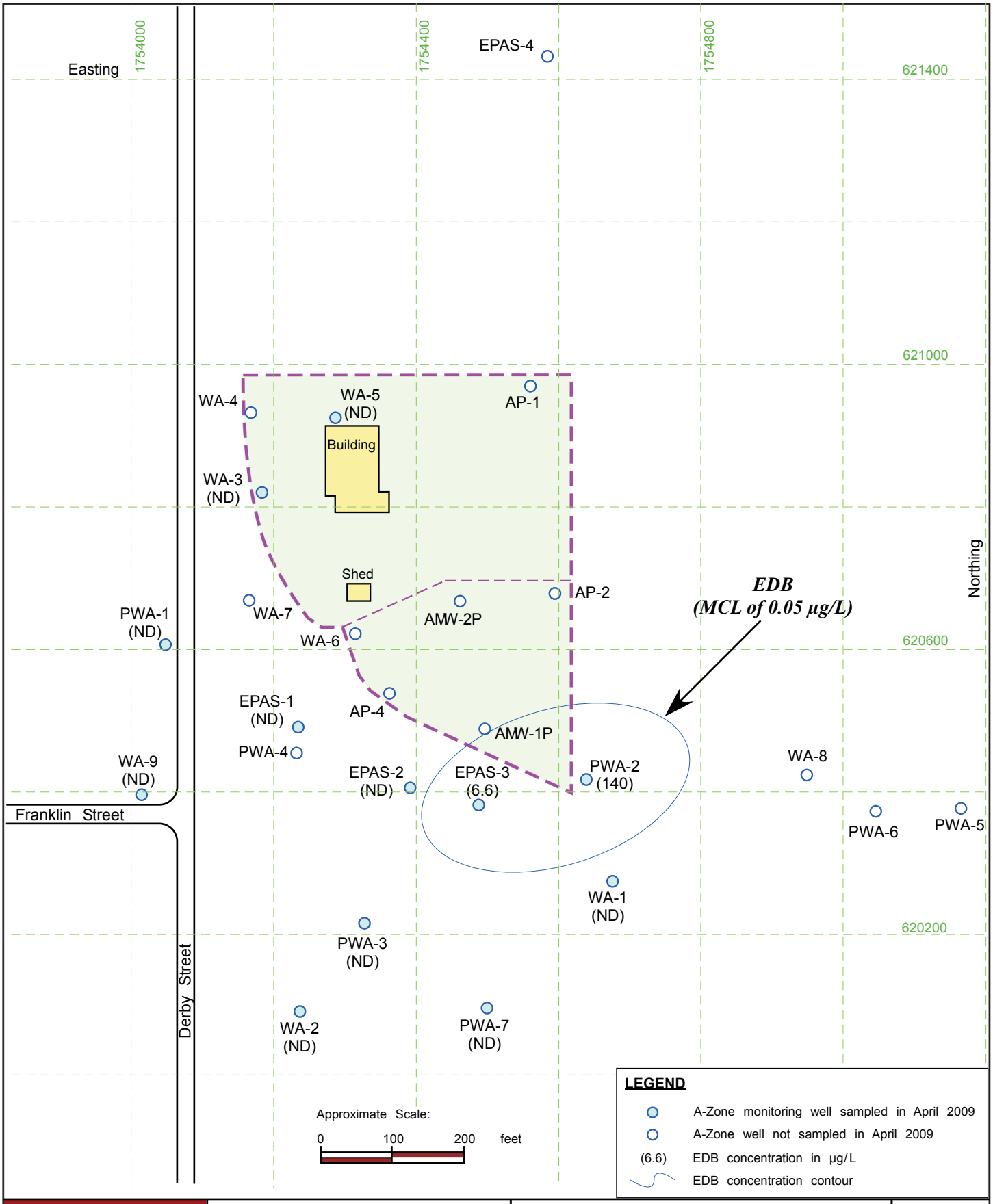
FIGURE: 10

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**EDB IN GROUNDWATER A-ZONE**

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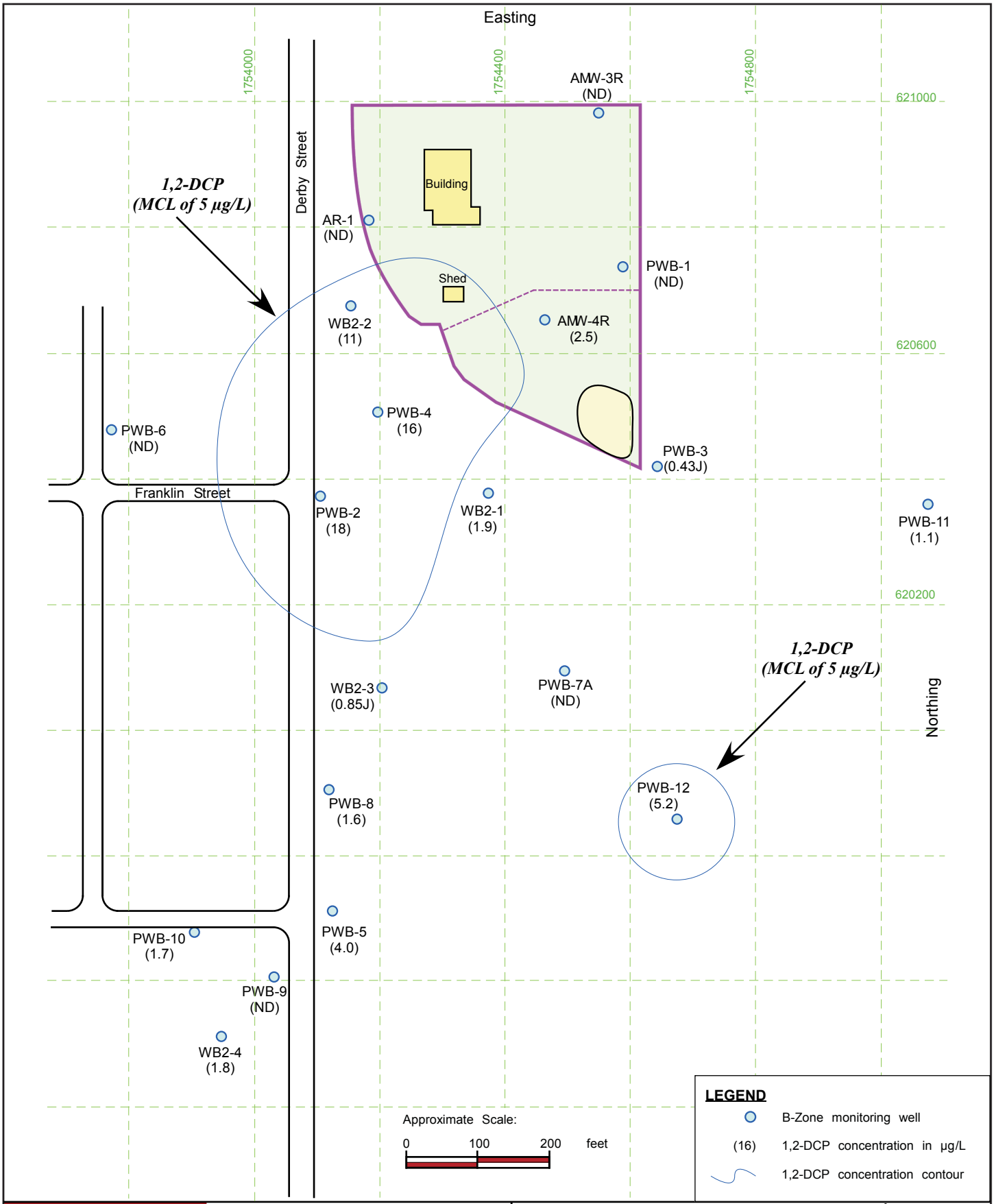
Dated May 2010

FIGURE: 11

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**1,2-DCP IN GROUNDWATER B-ZONE**

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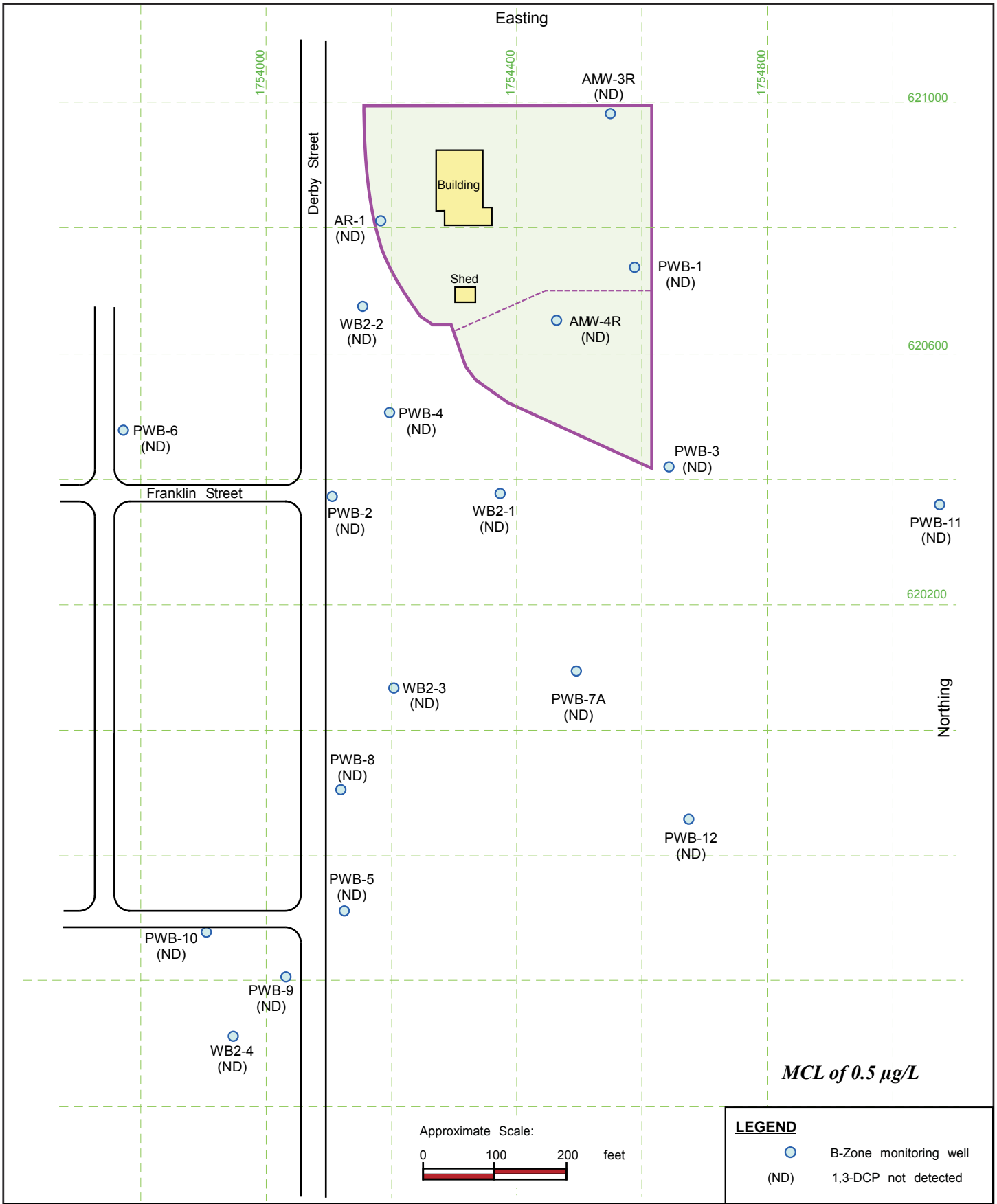
FIGURE: 12

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**1,3-DCP IN GROUNDWATER B-ZONE**

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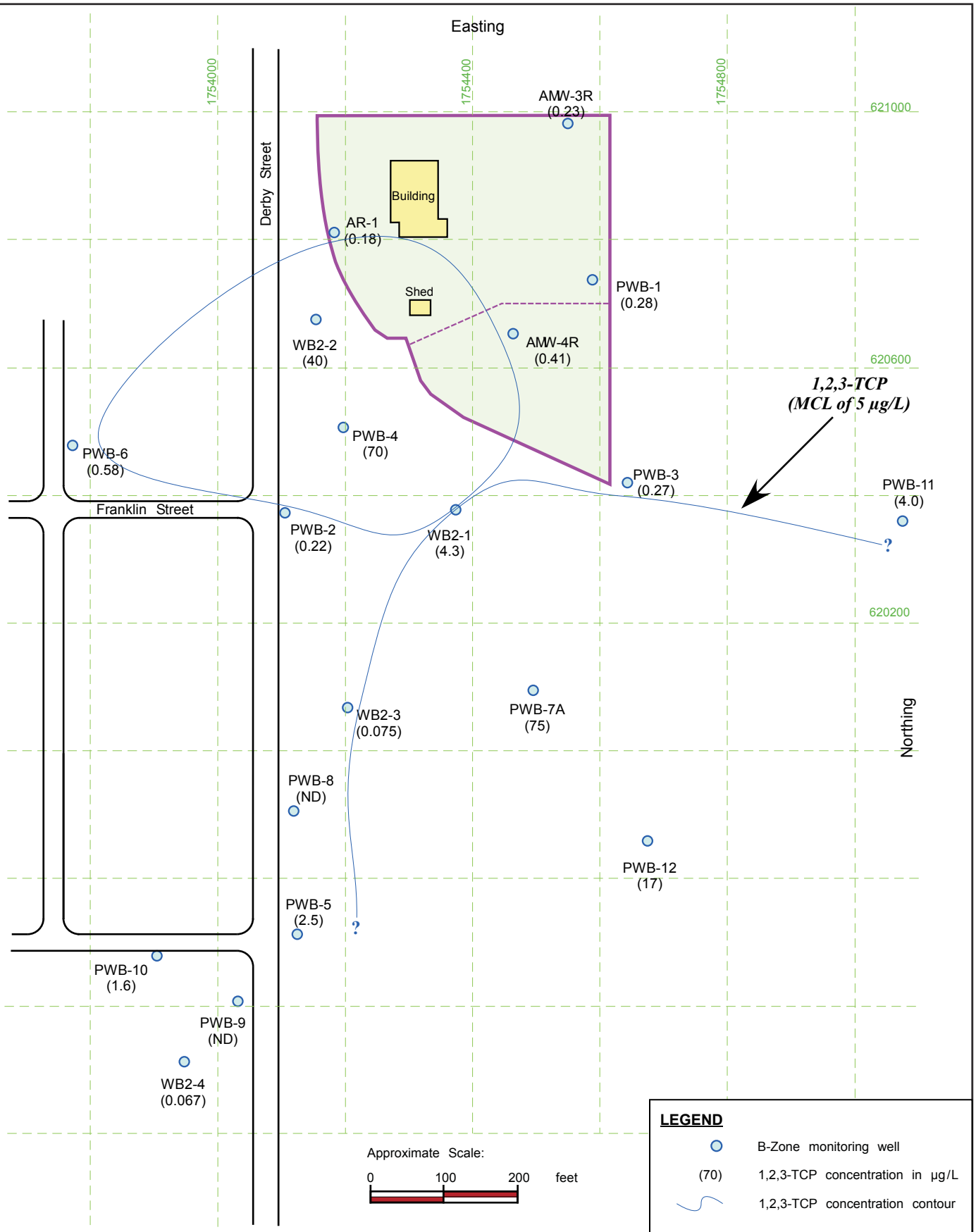
FIGURE: 13

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**1,2,3-TCP IN GROUNDWATER B-ZONE**

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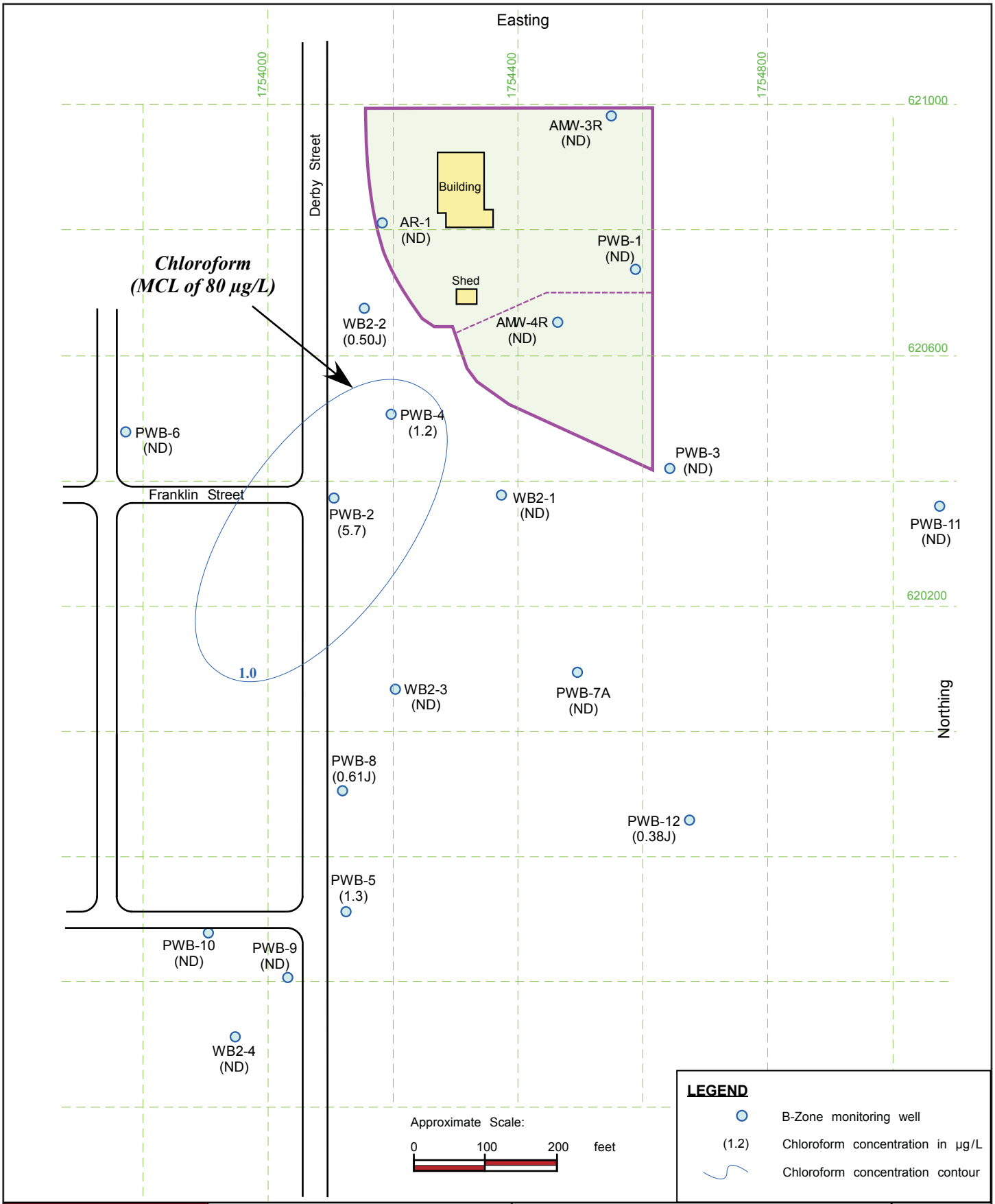
FIGURE: 14

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**CHLOROFORM IN GROUNDWATER B-ZONE**

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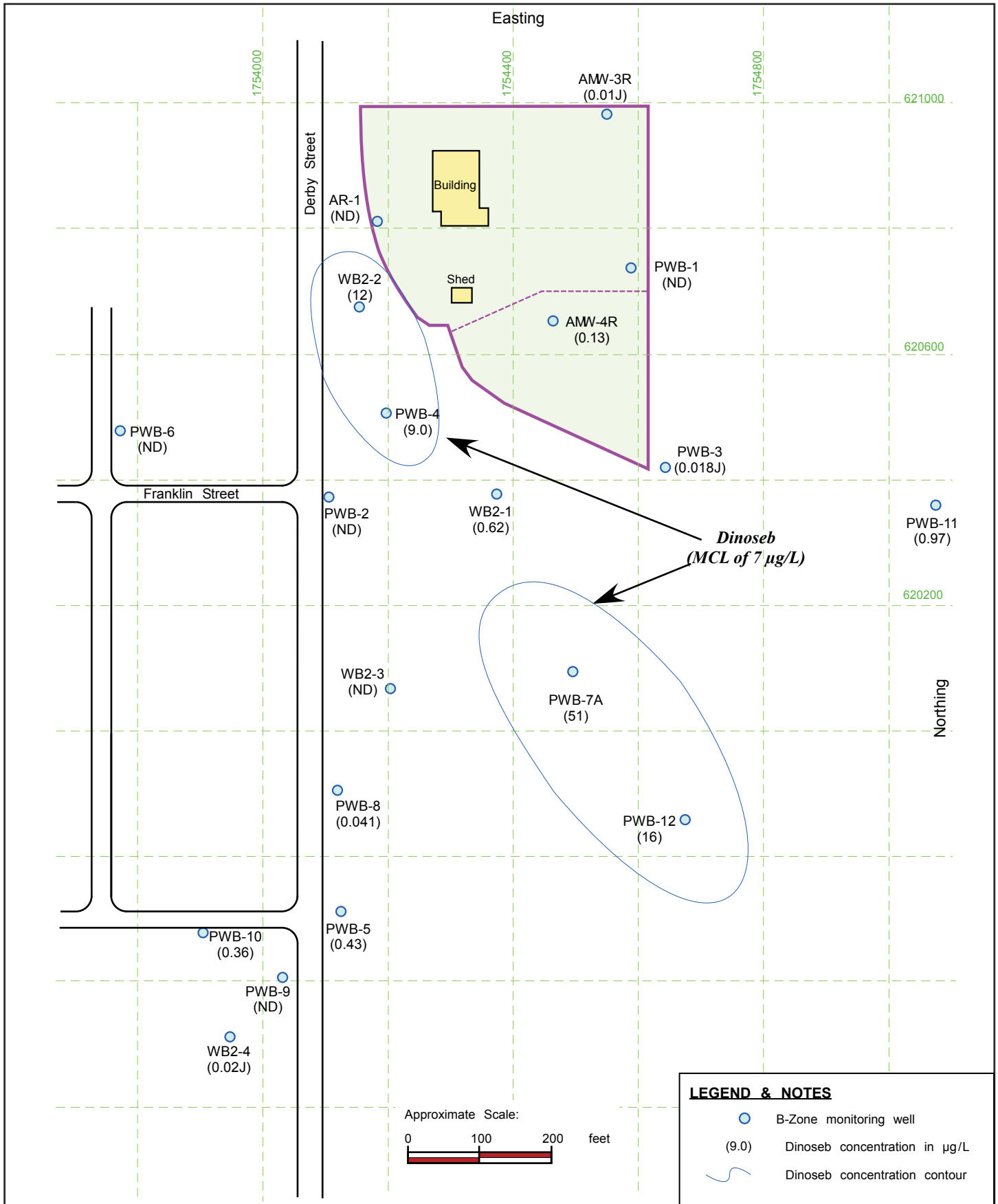
FIGURE: 15

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**DINOSEB IN GROUNDWATER B-ZONE**

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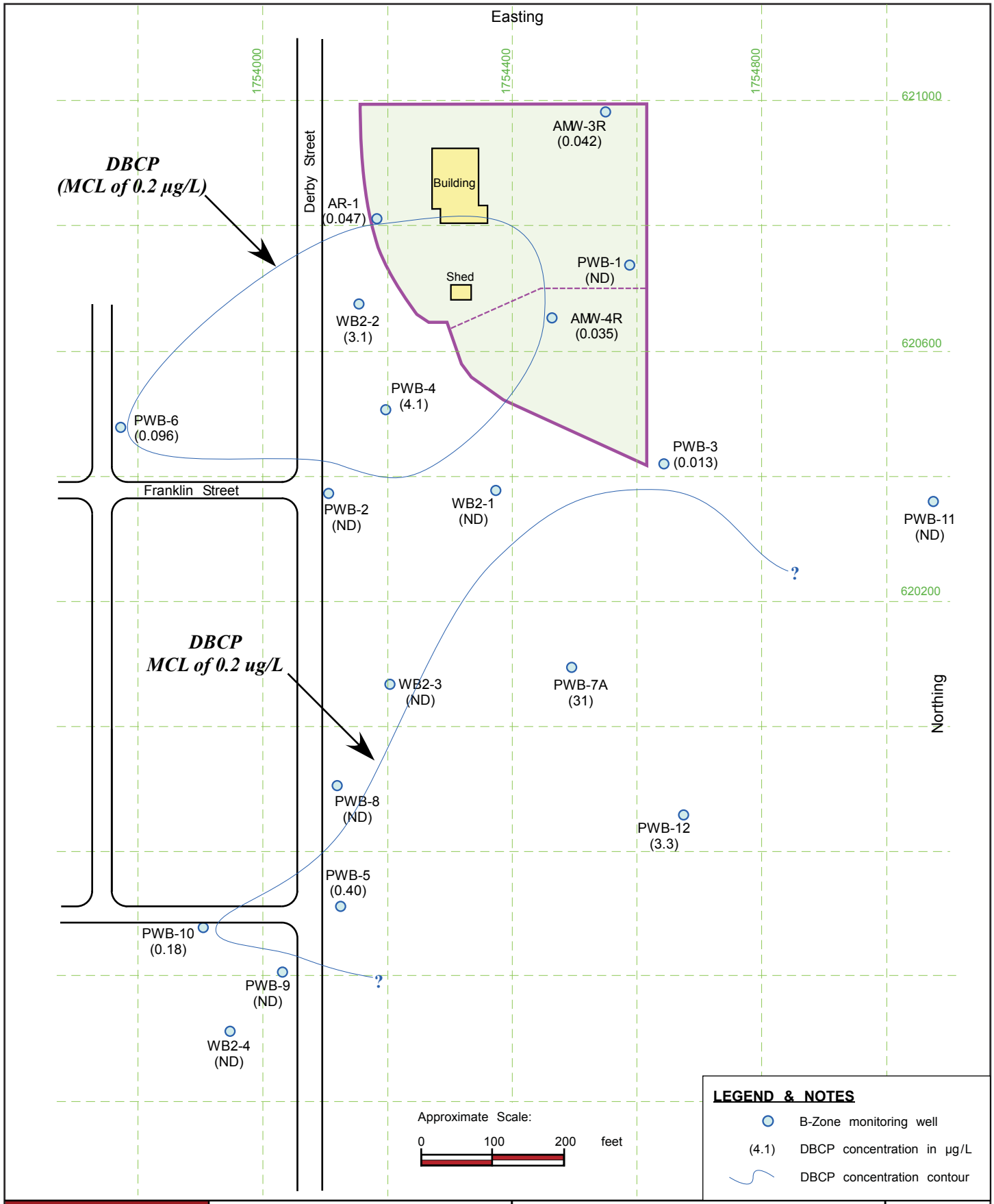
FIGURE: 16

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**DBCP IN GROUNDWATER B-ZONE**

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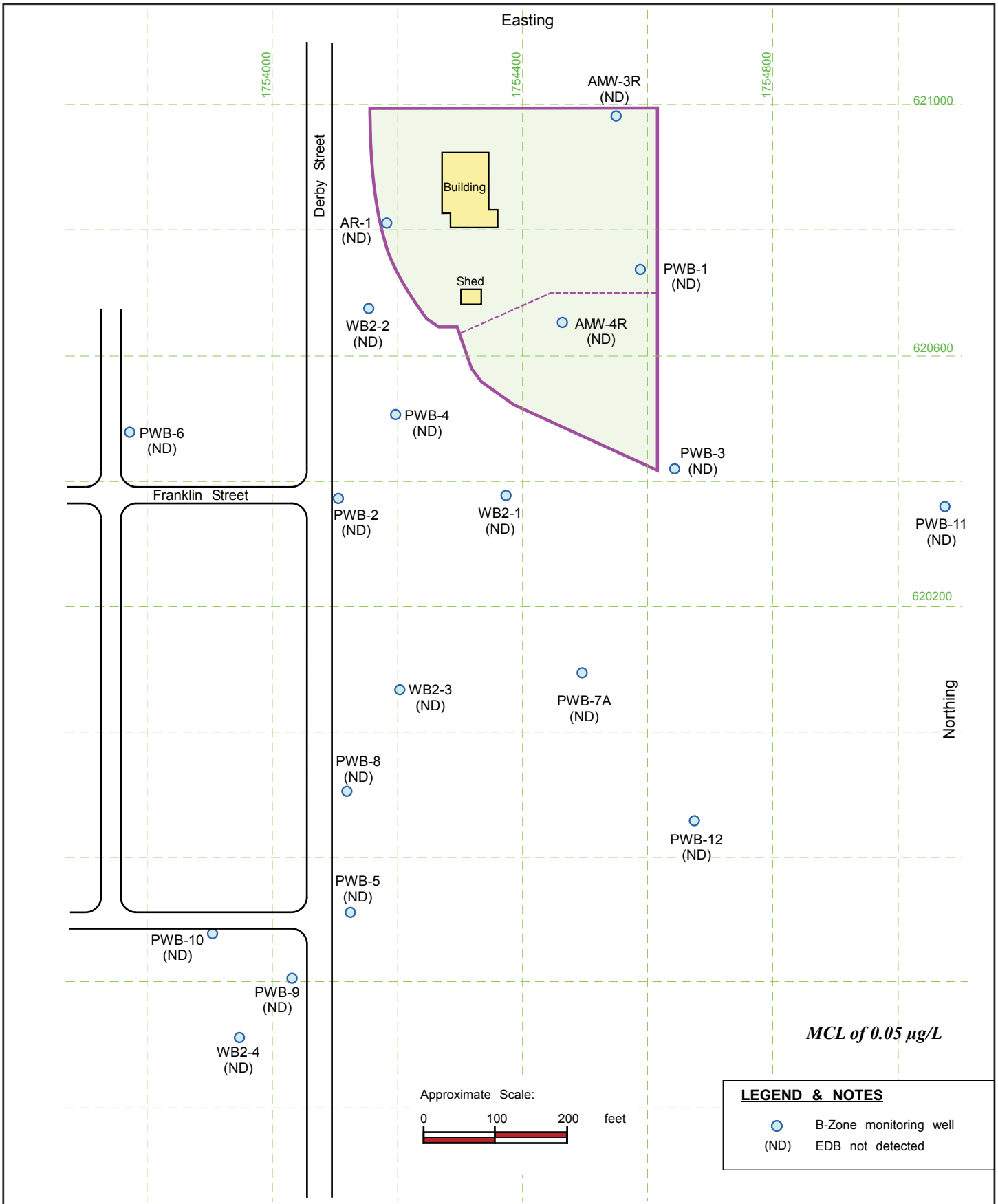
FIGURE: 17

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**EDB IN GROUNDWATER B-ZONE**

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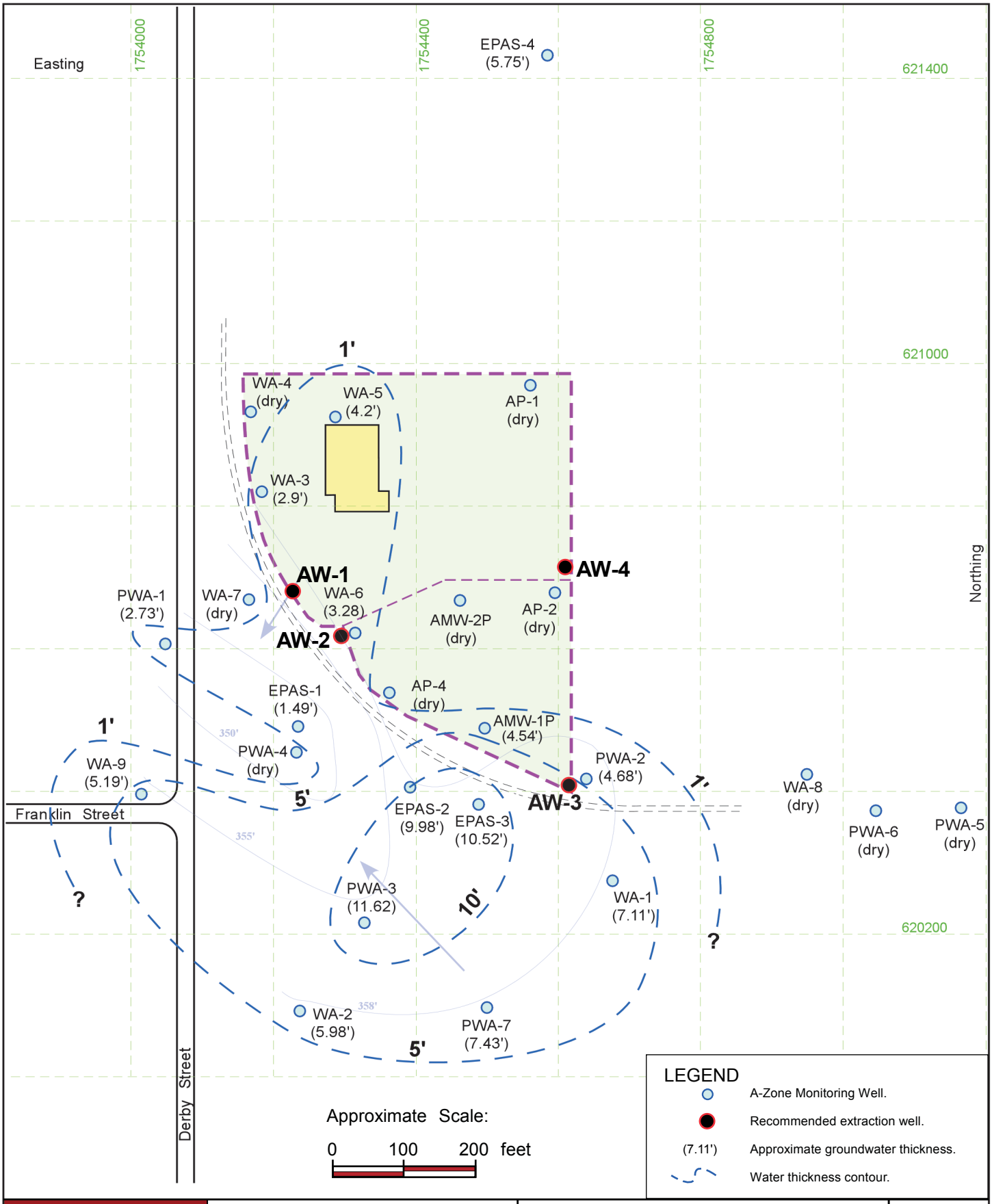
FIGURE: 18

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**GROUNDWATER THICKNESSES IN THE A-ZONE**

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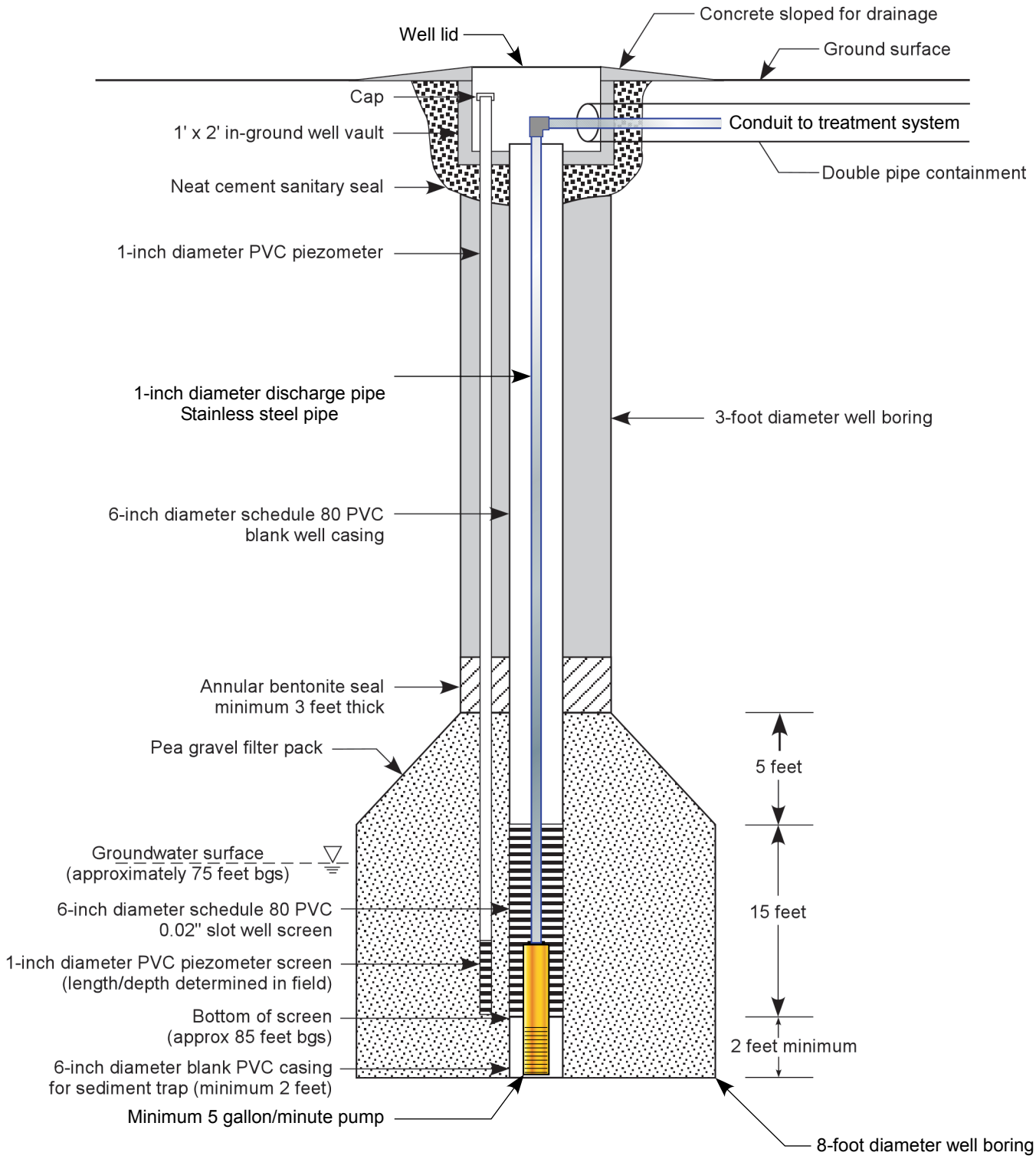
FIGURE: 19




*CONCEPTUAL SCHEMATIC - NOT TO SCALE*

| | | | |
|---|---|---|---|
| Environmental Excellence | Eco & Associates, Inc.<br>1855 W. Katella Avenue, Suite 340<br>Orange, California 92867<br>Phone: 714.289.0995 FAX: 714.289.0965 | **GROUNDWATER EXTRACTION WELL CONSTRUCTION DETAIL**<br>Brown & Bryant, Arvin, California<br>Project No.: Eco-09-350 Dated May 2010 | FIGURE:<br>20 |

# Tables

**TABLE 1**
**Groundwater Well Depths and Elevations**

**April 2009**

| Well ID | Well Depth (ft btc) | Well Screen Interval (ft bgs) | Well Diameter (inches) | Depth to Groundwater (ft btc) | Casing Elevation (reamsl) | Groundwater Elevation (reamsl) |
|---|---|---|---|---|---|---|
| **A-ZONE WELLS** | | | | | | |
| AMW-1P | 70.7 | 60.8-70.8 | 4 | 73.46 | 435.78 | 362.32 |
| AMW-2P | 75.3 | 63.6-73.6 | 4 | Dry | 433.75 | Dry |
| AP-1 | 71.15 | 59.5-69.5 | 4 | Dry | 434.67 | Dry |
| AP-2 | NR | NR | 4 | Dry | 435.35 | Dry |
| AP-4 | 75.19 | 60-70 | 4 | Dry | 436.04 | Dry |
| WA-1 | 78.5 | 63-78 | 4 | 71.39 | 429.52 | 358.13 |
| WA-2 | 75.5 | 63-73 | 4 | 69.52 | 428.24 | 358.72 |
| WA-3 | 80.08 | 68-78 | 4 | 77.18 | 436.03 | 358.85 |
| WA-4 | 78.58 | 66-76 | 4 | Dry | 436.88 | Dry |
| WA-5 | 80± | 67-77 | 4 | 75.83 | 435.81 | 359.98 |
| WA-6 | 78.1 | 64-74 | 4 | 74.82 | 434.9 | 360.08 |
| WA-7 | 79 | 66-76 | 4 | Dry | 434.75 | Dry |
| WA-8 | 71.6 | 61-71 | 4 | Dry | 433.25 | Dry |
| WA-9 | 78.5 | 68-78 | 4 | 73.31 | 429.25 | 355.94 |
| EPAS-1 | 88.75 | NR | 4 | 87.26 | 433.56 | 346.3 |
| EPAS-2 | 86.2 | 64-84 | 4 | 76.22 | 433.89 | 357.67 |
| EPAS-3 | 86.3 | 64-86 | 4 | 75.78 | 432.39 | 356.61 |
| EPAS-4 | 84.2 | 62-82 | 4 | 78.45 | 436.38 | 357.93 |
| PWA-1 | 85.05 | 65-85 | 4 | 82.32 | 430.07 | 347.75 |
| PWA-2 | 84.3 | 64-84 | 4 | 79.62 | 430.57 | 350.95 |
| PWA-3 | 84.9 | 64.5-84.5 | 4 | 73.28 | 429.42 | 356.14 |
| PWA-4 | 84.65 | 64.5-84.5 | 4 | Dry | 429.82 | Dry |
| PWA-5 | 84.65 | 64.5-84.5 | 4 | Dry | 430.32 | Dry |
| PWA-6 | 76.05 | 63-83 | 4 | Dry | 430.25 | Dry |
| PWA-7 | 78.27 | 58-78 | 4 | 70.84 | 429.02 | 358.18 |
| **B-ZONE WELLS** | | | | | | |
| AMW-3R* | 197.4 | 121.5-201.5 | 4 | 153.24 | 433.8 | 280.56 |
| AMW-4R* | 200+ | 138-198 | 4 | 143.21 | 434.92 | 291.71 |
| AR-1 | 186.4 | 140-186 | 4 | 142.06 | 435.24 | 293.18 |
| WB2-1 | 186 | 169.5-179.5 | 4 | 140.13 | 432.38 | 292.25 |
| WB2-2 | 180.85 | 168-178 | 4 | 142.04 | 434.94 | 292.9 |
| WB2-3 | 186.5 | 172-182 | 4 | 136.37 | 428.13 | 291.76 |
| WB2-4 | 180 | 168-178 | 4 | 156.19 | 425.41 | 269.22 |
| PWB-1 | 186.2 | 166-186 | 4 | 140.73 | 433.83 | 293.1 |
| PWB-2 | 160.2 | 140-160 | 4 | 137.51 | 430.52 | 293.01 |
| PWB-3 | 164.9 | 144.5-164.5 | 4 | 137.72 | 430.67 | 292.95 |
| PWB-4 | 164.55 | 144.5-164.5 | 4 | 137.95 | 430.78 | 292.83 |
| PWB-5 | 164.9 | 144.5-164.5 | 4 | 135.71 | 427.47 | 291.76 |
| PWB-6 | 159.29 | 139-159 | 4 | 135.54 | 428.48 | 292.94 |
| PWB-7A | 160.5 | 140-160 | 4 | 136.04 | Unknown | Unknown |

**TABLE 1 - continued**
**Groundwater Well Depths and Elevations**

**April 2009**

| Well ID | Well Depth (ft btc) | Well Screen Interval (ft bgs) | Well Diameter (inches) | Depth to Groundwater (ft btc) | Casing Elevation (reamsl) | Groundwater Elevation (reamsl) |
|---|---|---|---|---|---|---|
| PWB-8 | 161.29 | 141-161 | 4 | 134.55 | 427.4 | 292.85 |
| PWB-9 | 158.6 | 138-158 | 4 | 135.12 | 425.93 | 290.81 |
| PWB-10 | 159.78 | 139-159 | 4 | 133.81 | 424.44 | 290.63 |
| PWB-11 | 163.7 | 145-165 | 4 | 137.4 | 430.47 | 293.07 |
| PWB-12 | 160.5 | 140-160 | 4 | 134.38 | Unknown | Unknown |
| **C-ZONE WELL** | | | | | | |
| CW-1 | 730 | 350-700 ** | Unknown | Unknown | 424.11 | NA |

# TABLE 2
## Chemicals of Concern in A-Zone Groundwater - Selected Parameters (more listed starting May 1997)

| Well ID | Chemical | DATE SAMPLED AND CONCENTRATIONS (µg/L) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | MCL (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sep-87 | Oct-87 | Dec-87 | Feb-88 | Mar-88 | Apr/ May-90 | Jan-91 | Apr-91 | Jun/ Aug-91 | Dec-91 | Apr-92 | Jul-92 | Dec-92 | Aug-94 | Mar-95 | Nov-95 | Nov-96 | May-97 | Jan-98 | Jul-98 | Jul-00 | Nov-00 | Mar-01 | Jul-01 | Oct-01 | Feb-02 | May-02 | Jul-02 | Oct-02 | Feb-03 | May-03 | Aug-03 | Jan-04 | Aug-07 | Apr-08 | Apr-09 | |
| AMW-1P | 1,2-DCP | 64,000 | 63,000 | | | | 30,000 | 29,000 | 31,500 | 25,000 | 19,000 | 9,800 | | 15,000 | 4,700 | 5,050 | 1,000 | 700 | 500 | 670 | 110 | 112 | 188 | 168 | 254 | 322 | 2,300 | 4100 | 5100 | 5700 | 6200 | 6300 | 6000 | 2700 | NS | NS | NS | 5 |
| | 1,3-DCP | 950 | 1,000 | | | | 620 | 550 | 485 | 670 | 600 | 390 | | 360 | 130 | 135 | 18 | 9 LJ | 5 J | 6 L | 1 | – | – | – | – | – | – | – | – | – | – | – | – | – | NS | NS | NS | — |
| | Chloroform | -1,000 | -1,000 | | | | – | – | 52 | 38 | 35 | 18 | | 22 | 12 | 10 | 2 L | – | – | 1 L | – | – | – | – | – | – | – | – | – | – | – | – | – | 15 f,L | NS | NS | NS | 100* |
| | DBCP | 30 | 660 | | | | 380 | 694 | 400 | 170 | 180 | 64 | | 140 | 48 | 54 | 13 | 10 | 10 J | 4.8 | ? | – | 17 | 1.27 | – | – | 12 | 62 | 130 | 160 | 180 G+,H+ | 220 | – | 85 | NS | NS | NS | 0.2 |
| | Dinoseb | 21,000 | 3,800 | | | | | 16,350 | 13,100 | 6,700 | 35,000 | 34,000 | 40,000 | 51,000 | 28,000 | 83,000 | 42,000 J | 830 | 1,600 J | 15.0 | ? | 432 | 474 | 497 | 547 | 1,710 | 4,300 | 4400 | 5000 I | R | 5500 K | 4200 | 15000 | 6700 K | NS | NS | NS | 7 |
| | EDB | 10 | 720 | | | | 1200 | 1,564 | 1,300 | 605 | 930 | 380 | | 30 | 150 | 86 | 19 | 11 | 2.9 J | 13.8 | ? | 1.26 | 0.15 | 1.32 | 2.3 | 0.83 | 4.2 | 18 | 32 G+ | 75 | 56 G+ | 51 | 49 G+,C-,K | 35 | NS | NS | NS | 0.05 |
| | 1,2,3-TCP | 10,000 | 10,000 | | | | 7,300 | 6,800 | 6,350 | 11,000 | 9,000 | 6,900 | | 5,900 | 5,700 | 8,250 | 1,900 | 980 | 840 | 450 | 40 | 36 | 50 | 34 | 75 | 87 | 320 | 430 | 830 | 750 | 1100 | 1000 | 1300 | 430 | NS | NS | NS | 5 |
| AMW-2P | 1,2-DCP | 110,000 | 82,000 | | | | | 76,000 | 86,000 | 89,000 | 81,000 | 48,000 | | 50,000 | 67,000 | 88,000 | 84,000 | 110,000 | 73,000 | 51,000 | 77,000 | 46,500 | 68,900 | 62,800 | 105,000 | 56,200 | 130,000 | 16000 | 38000 | 100,000 | 92000 | 100000 | 140000 G+ | 120000 | NS | NS | NS | 5 |
| | 1,3-DCP | -500 | 200 | | | | | 70 | 73 | 78 | 84 | 45 | | 52 | 94 | 100 | 96 | 88 | 110 | 50 L | 96 | – | 68 | 102 | 163 | – | – | – | – | – | – | – | – | – | NS | NS | NS | — |
| | Chloroform | 1,900 | 1,500 | | | | | 955 | 1,100 | 1,100 | 855 | 435 | | 390 | 350 | 520 | 560 | 340 | 240 | 110 L | 320 | 164 | 207 | 161 | 197 | 191J | – | 570 J | – | 230 L | – | – | – | 1500 L,f | NS | NS | NS | 100* |
| | DBCP | -0.1 | 440 | | | | | 453 | 320 | 388 | 485 | 268 | | 150 | 325 | 350 | 335 | 420 | 320 J | 96 | ? | 118 | 186 | 188 | 307 | 300J | 370 | 540 | 270 | 540 | 620 H+ | 670 | – | 630 G- | NS | NS | NS | 0.2 |
| | Dinoseb | 20,000 | 930 | | | | | 49 | – | 21 | 440 | 240 | 190 | 3,000 | 485 | 1,100 | 1,085 J | 200 | 330 | 85 | ? | 274 | 220 | 180 | 200 | 250 | 520 | 470 | NS | R | 450 | 720 | 1000 | 600 K | NS | NS | NS | 7 |
| | EDB | 22 | 130 | | | | | 1.4 | 67 | 2 | 2 | 1 | | 51 | 1 | – | – | – | 0.053 J | 21 | ? | 0.208 | 0.280 | 0.13 | – | – | – | – | 0.029 | – | – | – | – | 0.380 | NS | NS | NS | 0.05 |
| | 1,2,3-TCP | 4,800 | 5,000 | | | | | 3,400 | 4,100 | 3,000 | 3,900 | 1,700 | | 1,300 | 2,450 | 3,500 | 3,250 | 3,800 | 3,800 | 1,400 | 3,800 | 1,610 | 1,970 | 2,420 | 3,920 | 5,940 | 7,000 | 8700 | 3400 | 4600 | 6500 | 5800 | 8700 L,G+ | 6100 | NS | NS | NS | 5 |
| AP-1 | 1,2-DCP | | | 2 | | 1 | – | – | – | – | – | – | | 1 | 0.9 | 0.7J | 0.7 L | 0.4 L | 11.0 | | – | 172 | 8 | – | – | 1.2 J | 1.2 | 1.0 | 0.91 L | 2 H- | 0.96 L | 1.2 | 0.76 G+,L | 0.46L | NS | NS | NS | 5 |
| | 1,3-DCP | | | -1 | | -1 | – | – | – | – | – | – | | 1 | – | – | – | – | – | | – | – | – | – | – | – | – | – | – | – | – | – | – | – | NS | NS | NS | — |
| | Chloroform | | | -1 | | -1 | – | – | – | – | – | – | | – | – | – | – | – | 6.0 | | – | – | – | – | – | – | – | – | – | – | 0.078 L | 0.15 O,f,L | – | 0.15 L,f | NS | NS | NS | 100* |
| | DBCP | | | -0.02 | | -0.02 | – | 0.01 | – | – | – | – | | – | – | – | – | – | – | | ? | – | – | – | – | – | 0.045 | 0.13 | 0.24 | 0.22 | 0.22 | 0.22 | 0.12 | 0.07 | NS | NS | NS | 0.2 |
| | Dinoseb | | | -0.5 | | -0.5 | – | 45 | – | 0.3 | 8 | – | | 11 | NS | – | 1.2 J | – | NS | | ? | 2.14 | 1.44 | 0.81 | 1.13 | 13.3 | 4.5 | 2.4 | 7.0 I | R | 4.7 | 2.5 I, j-, H- | 3.1 I,f | 4.5 | NS | NS | NS | 7 |
| | EDB | | | -0.02 | | -0.02 | | | | | | | | | | | | | | | | – | – | – | – | – | – | – | – | – | – | – | – | – | NS | NS | NS | 0.05 |
| | 1,2,3-TCP | | | 8 | | 5 | 3 | – | 1 | – | 1 | – | | 1 | 0.9 | 0.5J | 1.0 | 1.0 | 2.0 | | 3.0 | 5.7 | – | – | – | 11 | 9.0 | 19 | 18 | 16 | 18 | 22 | 13 G+ | 7 | NS | NS | NS | 5 |
| AP-2 | 1,2-DCP | | | | 72 | 32 | – | 8 | 8 | 10 | – | 22 | | 7 | 7 | 8 | 6 | 3 | 4.0 | 3.0 | 3.7 | NS | NS | NS | NS | NS | NS | 2.5 | 2.4 | 2.6 | 2.5 | 2.5 | 2.3 | 2.7 | NS | NS | NS | 5 |
| | 1,3-DCP | | | | -1 | -1 | | | | | | | | | | | | | | | | NS | NS | NS | NS | NS | NS | – | – | – | – | – | – | – | NS | NS | NS | — |
| | Chloroform | | | | 14 | 12 | 6 | – | 3 | 4 | 5 | 5 | | 4 | – | 3 | 4 | 3 | 2.0 | 2.0 | 3.3 | NS | NS | NS | NS | NS | NS | 1.3 | 1.1 | 1.2 | 1.0 | 0.83 O, L | 0.64 L | 0.90L | NS | NS | NS | 100* |
| | DBCP | | | | 0.4 | 1 | – | 1.8 | 3 | 1 | 2 | 1 | | – | 0.3 | 0.2 | 0.2 | 0.09 P | 0.079 | – | ? | NS | NS | NS | NS | NS | NS | 0.01J | 0.013 | 0.0062 L | 0.0071 L | – | 0.027 | – | NS | NS | NS | 0.2 |
| | Dinoseb | | | | -0.5 | -0.5 | – | – | 310 | | 0.4 | – | | – | – | NS | 0.4 J | – | R | – | ? | NS | NS | NS | NS | NS | NS | – | – | R | 0.82 | 0.27 I, j-, H- | 2.7 | 2.2 | NS | NS | NS | 7 |
| | EDB | | | | 0.3 | 1 | | | | | | | | | | | | | | 9.5 | 9.5 | NS | NS | NS | NS | NS | NS | – | – | – | – | – | – | – | NS | NS | NS | 0.05 |
| | 1,2,3-TCP | | | | 9 | 9 | 7 | 8 | 8 | 9 | 8 | 8 | | 5 | 6 | 5 | 4.0 | 3.0 | 3.0 | 2.0 | 4.6 | NS | NS | NS | NS | NS | NS | 1.9 | 1.4 | 2.0 | 2.3 | 2.1 | 2.5 | 2.0 | NS | NS | NS | 5 |
| AP-3 | 1,2-DCP | | | | 110 | 81 | 64 | 36 | 22 | 28 | 48 | 86 | | 3,200 | 2,800 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | 5 |
| | 1,3-DCP | | | | 1 | 1 | – | – | – | – | – | – | | 21 | 36 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | — |
| | Chloroform | | | | -1 | -1 | – | – | – | – | 1 | 1 | | 18 | 6 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | 100* |
| | DBCP | | | | 1.2 | 12 | – | 6.2 | 6.5 | 2.5 | 20 | 61 | | 620 | 300 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | 0.2 |
| | Dinoseb | | | | 33 | 29 | – | – | – | 16 | 230 | 13 | | 9,000 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | 7 |
| | EDB | | | | 0.9 | 2.3 | 4 | 4 | 0.9 | 0.9 | 3.5 | 3.5 | | 5 | 550 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | 0.05 |
| | 1,2,3-TCP | | | | 80 | 70 | 11 | 16 | 16 | 16.5 | 33 | 47 | | 370 | 520 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | 5 |
| AP-4 | 1,2-DCP | | | 22,000 | | 18,000 | 8,800 | 8,700 | 9,400 | 9,800 | 13,000 | 11,000 | | 15,000 | 9,700 | 17,000 | 39,000 | 110,000 J | 23,000 | 53,000 | 44,000 | 22,600 | 25,600 | 28,600 | 40,900 | 39,900 | 20,000 | 17000 | 18000 | 17000 H- | 3200 | 2200 | 3400 G+ | 1400 | NS | NS | NS | 5 |
| | 1,3-DCP | | | -500 | | -500 | 9 | 11 | 11 | 12 | 14 | 15 | | 36 | 22 | 25 | 47 | 73 J | 23 | 39 L | 34 | – | 21 | 26 | 43 | 53.0 | – | – | – | – | – | – | – | – | NS | NS | NS | — |
| | Chloroform | | | -500 | | -500 | – | – | – | – | – | – | | 74 | 60 | 83 | 150 | 800 J | 140 | 150 L | 230 | 85 | 114 | 81 | 103 | 82.0 | – | 86 J | – | – | – | 23 L, f | – | 9.0 L,f | NS | NS | NS | 100* |
| | DBCP | | | 7 | | 57 | 11 | 15 | 42 | 18 | 30 | 57 | | 24 | 52 | 33 | 160 | 190 J | 74 J | 71 | ? | 53 | – | 34 | 60 | 37.0 | 24 | 29 | 24 | 23 | 8.1 | 3.7 | – | 2.8 | NS | NS | NS | 0.2 |
| | Dinoseb | | | -0.5 | | 2.3 | – | – | – | 1 | 18 | 10 | | 26 | NS | NS | 1,700 J | 180 J | 180 | 4.2 | ? | 123 | – | 98.8 | 66.9 | 84.5 | 35 | 5.2 | 46 I | R | 9.3 | 3.3 I, j-, H- | 17 | 4.7 K | NS | NS | NS | 7 |
| | EDB | | | 5 | | 16 | – | – | 2 | 0.3 | | | | 24 | 30 | 5J | 8 L | 4 J | 4 J | 50 | ? | 0.845 | – | 0.10 | 0.24 | 0.47 | – | – | 0.28 | 0.28 | – | – | – | – | NS | NS | NS | 0.05 |
| | 1,2,3-TCP | | | 670 | | 900 | 410 | 390 | 400 | 490 | 500 | 460 | | 540 | 510 | 890 | 1,900 | 6,100 J | 1,400 | 2,200 | 2,500 | 1,130 | 1,160 | 1,350 | 2010.0 | 1670.0 | 800 J | 860 J | 990 L | 920 | 190 L | 99 L | 250 G+ | 70 | NS | NS | NS | 5 |
| EPAS-1 | 1,2-DCP | | | | | | | | | | | | | | | | | | | | | | | | | | | 4900 | 4900 | 8000 H- | 9000 | 6300 | 7500 | 6400 | 6700 | 5400 | 2,400 | 5 |
| | 1,3-DCP | | | | | | | | | | | | | | | | | | | | | | | | | | | – | – | – | – | – | – | – | 2.20 | 3.1 | 1.4 | — |
| | Chloroform | | | | | | | | | | | | | | | | | | | | | | | | | | | 47 J | 65 L | 92 L | 110 L | 97 L, f | 75 L | 110 L,f | 51.0 | 31 | 15 | 100* |
| | DBCP | | | | | | | | | | | | | | | | | | | | | | | | | | | 17 | 11 | 18 | 17 | 21 | – | 13 | 9.8 | 9.7 | 6.7 | 0.2 |
| | Dinoseb | | | | | | | | | | | | | | | | | | | | | | | | | | | 6.3 | NS | R | 27 | 25 I, j-, H- | 60 | 42 K | 27 | 25 | 20 | 7 |
| | EDB | | | | | | | | | | | | | | | | | | | | | | | | | | | – | – | – | – | – | 0.086 I | – | 0.038 | – | ND | 0.05 |
| | 1,2,3-TCP | | | | | | | | | | | | | | | | | | | | | | | | | | | 500 | 470 | 590 | 540 | 470 | 680 | 410L | 400 | 320 | 250 | 5 |
| EPAS-2 | 1,2-DCP | | | | | | 3,700 | – | – | 7,400 | 9,700 | 9,600 | | 13,000 | 15,500 | 18,000 | 18,000 | 25,500 | 48,000 | 49,000 | 21,000 | 5,980 | 6,390 | 6,640 | 7,330 | 9,680 | 9,300 | 6500 | 5400 | 4900 | 3900 | 3600 | 2400 G+ | 960 | 110 | 100 | 520 | 5 |
| | 1,3-DCP | | | | | | 11 | 36 | 27 | 21 | 25 | 34 | | 44 | 42 | 43 | 44 | 30 | 92 | 58 L | 28 | – | – | – | – | 16.0 | – | – | – | – | – | – | – | – | 0.22J | – | 1.8 | — |
| | Chloroform | | | | | | 21 | – | 38 | 42 | 51 | 60 | | 78 | 86 | 96 | 91 | 76 | 160 | 130 L | 66 | 29 | 23 | 20 | 20 | 21.0 | 22 J | – | – | 11 L,p | – | 41 L, f | – | 7.4 L,f | 0.67J | 0.58J | 1.3 | 100* |
| | DBCP | | | | | | 38 | 166 | 92 | 60 | 56 | 74 | | 62 | 72 | 77 | 80 | 110 | 100 J | 77 | ? | 18 | 17 | 17 | 16 | 15.0 | 9.1 | 8.8 | 9.6 | 9.9 | 11 H+ | 9.4 | – | 5.0 | 7.2 | 9.5 | 4.3 | 0.2 |
| | Dinoseb | | | | | | – | – | 310 | 140 | 800 | 1,050 | | 1,600 | 1,500 | 11,000 | 12,000 J | 710 | 2500 J | 67 | ? | 894 | 955 | 597 | 435 | 741.0 | 240 | 180 | 270 I | R | 190 | 230 I, j-,H- | 160 p | 80K | 16 | 23 | 32 | 7 |
| | EDB | | | | | | 3 | 51 | 22 | 15 | 38 | 62 | | 19 | 67 | 64 | 85 | 34 | 26 J | 66 | ? | 3.89 | 0.35 | 3.86 | 2.2 | 3.96 | 0.63 | 0.55 | 0.84 | 0.99 | 0.86 | 0.60 | 0.43 K | – | 0.01J | – | ND | 0.05 |
| | 1,2,3-TCP | | | | | | 170 | 520 | 440 | 420 | 500 | 600 | | 640 | 860 | 800 | 900 | 745 | 2,400 | 1,650 | 860 | 350 | 260 | 257 | 289 | 390 | 280 | 140 J | – | 170 | 170 L | 150 L | 130 G+,L | 52 | 10.0 | 25 | 31 | 5 |
| EPAS-3 | 1,2-DCP | | | | | | 44,000 | 34,000 | 33,000 | 38,000 | 37,000 | 34,000 | | 35,000 | 38,000 | 29,000 | 43,000 | 86,000 | 46,000 | 35,000 | 38,000 | 30,700 | 28,600 | 28,200 | 33,400 | 31,600 | 14,000 | 27000 | 22000 | 23000 | 1400 | 8100 | 4300 C- | 6400 | 10000 | 10000 | 9,200 | 5 |
| | 1,3-DCP | | | | | | 200 | 200 | 180 | 220 | 200 | 180 | | 180 | 170 | 200 | 180 | 150 | 170 | 110 L | 150 | – | 64 | 63 | 106 | 86.0 | – | – | – | – | – | 24 L | – | – | 21.0 | 19.0 | 15 | — |
| | Chloroform | | | | | | 28 | – | 22 | 26 | 32 | 31 | | 27 | 40 | 36 | 36 | 26 | 44 | 23 L | 39 | 31 | 28 | 24 | – | 24.0 | – | – | – | – | – | 41 L,f | – | – | 11 | 9.8 | 9.1 | 100* |
| | DBCP | | | | | | 11,000 | 10,550 | 17,000 | 4,400 | 5,200 | 5,100 | | 4,100 | 4,000 | 2,900 | 7,500 | 3,300 | 2,200 J | 817 | ? | 1,300 | – | 1240 | 1980 | 1,200 | 590 | 1200 | 1200 | 1200 | 110 G+,H+ | 460 | – | 380 | 1100 | 680 | 530 | 0.2 |
| | Dinoseb | | | | | | – | 411 | 664 | 680 | 1,100 | 1,000 | | 3,900 | 2,700 | 17,000 | 6,400 J | 1,600 | 4900 J | 110 | ? | 1,520 | 2,980 | 4,000 | 2,930 | 2,900 | 1,800 | 2200 | 3800 I | R | 240 | 1300 | 960 | 1300K | 2000 | 2900 | 2,300 | 7 |
| | EDB | | | | | | 36 | 68 | 214 | 34 | 78 | 32 | | 27 | 46 | 41 | 42 | 41 | 40 J | 66 | ? | 35.9 | 31.3 | 24.2 | 30.8 | 34.1 | 7.4 | 21 | 33 G+ | 55 G+ | 11 G+ | 23 G+ | 11 C-,K | 8 | 17.0 | 10.00 | 6.6 | 0.05 |
| | 1,2,3-TCP | | | | | | 2,700 | 2,100 | 2,200 | 2,700 | 2,200 | 2,500 | | 2,400 | 4,000 | 3,500 | 5,900 | 3,900 | 4,900 | 2,500 | 3,400 | 2,260 | 1,930 | 2,340 | 2,800 | 2,710 | 1,300 | 2000 | 1800 L | 1900 | 180 | 720 | 410 C-,L | 640 | 1400 | 1600 | 940 | 5 |
| EPAS-4 | 1,2-DCP | | | | | | – | – | – | – | 2 | 1 | | 2 | 2 | 2 | – | – | 0.5 J | 0.5 L | – | 91.0 | – | – | – | – | – | – | – | 0.78 L | – | – | – | – | – | NS | NS | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | – | – | NS | NS | — |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | 0.13 L,f | – | NS | NS | 100* |
| | DBCP | | | | | | | | | | | | | | | | | | 0.017 J | – | ? | 10 | – | – | – | – | – | – | – | – | – | – | – | – | – | NS | NS | 0.2 |
| | Dinoseb | | | | | | – | – | 0.2 | – | – | – | | – | – | – | – | – | R | – | ? | 1.61 | – | – | – | – | – | – | – | R | – | – | – | – | – | NS | NS | 7 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | – | – | NS | NS | 0.05 |
| | 1,2,3-TCP | | | | | | – | – | – | – | – | – | | 1 | 3 | 3 | – | – | 2.0 | 1.0 | – | 5.8 | – | – | – | – | – | – | – | – | – | – | – | 0.18L | – | NS | NS | 5 |

## TABLE 2 - continued
## Chemicals of Concern in A-Zone Groundwater - Selected Parameters (more listed starting May 1997)

| Well ID | Chemical | DATE SAMPLED AND CONCENTRATIONS (µg/L) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | MCL (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sep-87 | Oct-87 | Dec-87 | Feb-88 | Mar-88 | Apr/ May-90 | Jan-91 | Apr-91 | Jun/ Aug-91 | Dec-91 | Apr-92 | Jul-92 | Dec-92 | Aug-94 | Mar-95 | Nov-95 | Nov-96 | May-97 | Jan-98 | Jul-98 | Jul-00 | Nov-00 | Mar-01 | Jul-01 | Oct-01 | Feb-02 | May-02 | Jul-02 | Oct-02 | Feb-03 | May-03 | Aug-03 | Jan-04 | Aug-07 | Apr-08 | Apr-09 | |
| WA-1 | 1,2-DCP | | | | | | NS | NS | NS | NS | NS | | 2 | 2.0 | 12 | 0.9 | 0.6 L | 0.08 LJ | 2.0 | 1200 | 4.5 | 62 | 24 | 116 | 97 | 5.2 | 2.8 | 0.97 J | 0.64 L | 0.31 L,H- | 0.32 L | 0.48 L | 0.36 L | 1 | 1.1 | – | ND | 5 |
| | 1,3-DCP | | | | | | NS | NS | NS | NS | NS | | – | – | 0.2 | – | – | – | – | 11 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | — |
| | Chloroform | | | | | | | | | | | | | | | – | – | – | 0.2 J | 1.5 | – | – | – | – | – | – | 0.11 J | – | – | – | – | 0.12 O,f,L | – | 0.31 f,L | 1.6 | 8.3 | 6.6 | 100* |
| | DBCP | | | | | | NS | NS | NS | NS | NS | | 0.8 | – | 10 | 0.6 | 0.31 | 0.28 | 1.7 J | 196 | ? | – | – | 10 | – | 1.7 J | 0.40 | 0.18 | 0.17 | 0.10 | 0.17 | 0.14 | 0.091 | 0.490 | 0.16 | 0.024 | 0.016 | 0.2 |
| | Dinoseb | | | | | | NS | NS | NS | NS | NS | | 7 | NS | 160 | 2.0 | – | – | – | 116 | ? | 14.6 | 31.5 | 143 | 137 | 9.5 | 4.4 | 0.97 | 0.94 I | R | 1.1 | 0.70 I, ,j-,H- | 1.3 f,I | 3.7 | 0.59 | 0.20 | 0.06 | 7 |
| | EDB | | | | | | NS | NS | NS | NS | NS | | – | – | 2 | 0.05 | 0.03 L | 0.13 | 0.81 J | 149 | ? | 0.800 | 1.28 | 7.55 | 7.4 | 2.480 | 0.36 | 0.20 | 0.14 | 0.093 | 0.083 | 0.047 | 0.029 I | 1.000 | – | – | ND | 0.05 |
| | 1,2,3-TCP | | | | | | NS | NS | NS | NS | NS | 4 | 7 | 10 | 15 | 7.0 | 4.0 | 5.0 | 10 | 460 | 7.5 | 5.6 | 6.4 | 26 | 29 | 8.2 | 15 | 13 | 12 | 5.6 | 2.4 | 2.1 | 4.0 | 5.9 | 1.6 | 0.67 | 0.55 | 5 |
| WA-2 | 1,2-DCP | | | | | | NS | NS | NS | NS | NS | – | – | 0.3 | 0.3 | 0.3 | 0.4 L | – | 5.0 | 0.3 L | – | 7.3 | – | – | – | – | 0.23 J | 0.23 J | – | – | – | – | – | – | – | – | – | ND | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | — |
| | Chloroform | | | | | | NS | NS | NS | NS | NS | 275 | 330 | 240 | 200 | 230 | 310 | 160 J | 230 | 150 | 210 | 189 | 187 | 169 | 213 | 180.0 | 170 | 190 | 87 | 200 | 50 | 33 | 20 G+ | 15 | 92 | 45 | 67 | 100* |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | 0.2 |
| | Dinoseb | | | | | | NS | NS | NS | NS | NS | – | – | – | – | – | 1.5 J | – | R | – | ? | – | – | – | – | – | – | – | – | R | – | – | – | – | – | – | – | ND | 7 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | 0.05 |
| | 1,2,3-TCP | | | | | | NS | NS | NS | NS | NS | – | – | – | – | – | – | 0.2 LJ | – | – | – | – | – | – | – | – | – | – | – | – | – | 0.22 O, L | – | 0.26L | – | – | ND | 5 |
| WA-3 | 1,2-DCP | | | | | | NS | NS | NS | NS | NS | 41 | 37 | 29 | 12 | 12 | 11 | 7.0 | 7.0 | 9.0 | 7.8 | 7.4 | 5.3 | – | 5.3 | 5.9 | 6.1 | 5.5 | 6.0 | 5.1 | 5.1 | 7.6 | 7.4 | 5.1 | 5.4 | 4.3 | 2.5 | 5 |
| | 1,3-DCP | | | | | | NS | NS | NS | NS | NS | – | – | – | – | – | 0.2 L | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | — |
| | Chloroform | | | | | | NS | NS | NS | NS | NS | 1.0 | 1.0 | 0.9 | – | – | 0.9 L | 0.7 | 0.6 J | 0.6 L | 0.8L | – | – | – | – | – | 0.76 J | 1.0 | 0.98 L | 0.80 L | 0.65 L | 0.99 L | 0.96 L | 1.2 f,L | 0.65J | 0.52J | ND | 100* |
| | DBCP | | | | | | NS | NS | NS | NS | NS | – | – | – | 0.04 | – | 0.02 L | 0.01 | 0.018 J | – | ? | – | – | 0.71 | – | – | 2.0 | 2.1 | 1.8 | 1.7 | 1.9 | 1.7 | 2.6 | 2.0 | 4.5 | 5.4 | 2.8 | 0.2 |
| | Dinoseb | | | | | | NS | NS | NS | NS | NS | – | – | 2 | – | – | – | – | – | – | ? | 1.49 | 2.19 | 4.49 | 7.5 | 10.4 | 19 | 9.9 | 7.7 I | R | 7.9 | 4.0 I, j-,H- | 14 I, f | 21 | 80 | 110 | 69 | 7 |
| | EDB | | | | | | | | | | | | | | | | | | | 3.2 | ? | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | 0.05 |
| | 1,2,3-TCP | | | | | | NS | NS | NS | NS | NS | 6.0 | 7.0 | 8.0 | 12.0 | 7.0 | 7.0 | 9.0 | 8.0 | 11.0 | 15.0 | 24 | 28 | – | – | 72.0 | 82 | 84.00 | 56 RE | 92 | 75 | 100 RE G+, C- | 140 | 86 | 190 | 170 | 100 | 5 |
| WA-4 | 1,2-DCP | | | | | | NS | NS | NS | NS | NS | | 5.0 | 4.0 | 6.0 | 4.0 | 5.0 | 5.0 | 4.0 | 2.0 | 3.1 | – | – | – | – | – | 3.3 | 4.4 | 3.8 | 4.1 H- | 3.8 | 3.8 | 3.9 | 3.0 | NS | NS | NS | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | – | NS | NS | NS | — |
| | Chloroform | | | | | | NS | NS | NS | NS | NS | | – | 0.3 | – | – | 0.3 L | – | – | | – | – | – | – | – | – | 0.12 J | 0.16 J | 0.26 L | 1.0 L | 0.15 L | 0.23 O, L | 0.17 L | 0.25 L,f | NS | NS | NS | 100* |
| | DBCP | | | | | | NS | NS | NS | NS | NS | | – | – | – | – | 0.03 L | – | – | – | ? | – | – | – | – | – | – | – | – | – | – | – | – | 0.33L | NS | NS | NS | 0.2 |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | R | – | – | – | – | NS | NS | NS | 7 |
| | EDB | | | | | | NS | NS | NS | NS | NS | | – | – | – | 0.3 | – | – | – | – | ? | – | – | – | – | – | – | – | – | – | – | – | – | – | NS | NS | NS | 0.05 |
| | 1,2,3-TCP | | | | | | NS | NS | NS | NS | NS | | – | – | 0.8 | 0.3 | – | 0.4 LJ | – | | – | – | – | – | – | – | 0.13 J | 0.20 J | – | – | – | – | 0.17 L | 0.20L | NS | NS | NS | 5 |
| WA-5 | 1,2-DCP | | | | | | NS | NS | NS | NS | NS | | 2.0 | 1.0 | 2.0 | 1.0 | 0.6 L | 0.7 LJ | 0.6 | 0.9 L | – | – | – | – | – | – | 1.2 | 0.88 J | 1.1 | 1.5 | 1.9 | 2.1 | 2.3 | 2.2 | 2.9 | 3.1 | 3.3 | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | — |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | 0.13 J | – | 0.11 L | 0.36 L | 0.14 L | 0.23 O,f,L | 0.15 L | 0.25 f,L | 0.17J | 0.15J | ND | 100* |
| | DBCP | | | | | | NS | NS | NS | NS | NS | | – | – | – | – | – | 0.02 JP | – | – | ? | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | 0.2 |
| | Dinoseb | | | | | | NS | NS | NS | NS | NS | | – | – | – | 1.2 | – | – | R | – | ? | – | – | – | – | – | – | – | – | R | – | – | – | – | – | 0.01J | 0.01J | 7 |
| | EDB | | | | | | | | | | | | | | | | | | | 0.2 | ? | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | 0.05 |
| | 1,2,3-TCP | | | | | | NS | NS | NS | NS | NS | | – | 0.8 | 0.5 | 0.5 | 1.0 | – | – | 0.7 L | – | – | – | – | – | – | 0.66 J | 0.61 J | 0.39 L | 0.45 L | 0.35 L | 0.19 O, L | 0.38 L | 0.27L | – | 0.085 | 0.18 | 5 |
| WA-6 | 1,2-DCP | | | | | | NS | NS | NS | NS | NS | 100,000 | 91,000 | 90,000 | 50,000 | 140,000 | 100,000 | 360 J | 20,000 | 35,000 | 36,000 | 4,760 | 8,930 | 7,770 | 13,100 | 20,700 | 11,000 | 11000 | 8600 | 15000 | 6100 | 7800 | 23000 G+ | 40000 | 27000 | 17000 | NS | 5 |
| | 1,3-DCP | | | | | | NS | NS | NS | NS | NS | 90 | 80 | 85 | 59 | 96 | 77 | – | 16 | 16 L | 18 | – | – | – | 9.1 | 12.0 | – | – | – | – | – | – | – | – | 8.1 | 7.4 | NS | — |
| | Chloroform | | | | | | NS | NS | NS | NS | NS | 1,200 | 810 | 900 | 450 | 1,700 | 1,300 | 11 J | 290 | 240 L | 450 | 53 | 81 | 60 | 106 | 155.0 | 91 J | 95 J | – | 160 L | 42 L | 59 L, f | – | 200 f,L | 85 | 48 | NS | 100* |
| | DBCP | | | | | | NS | NS | NS | NS | NS | 365 | 160 | 190 | 140 | 320 | 200 | 7 J | 82 J | 60 | ? | 9.3 | 16 | 19 | 33 | 34.0 | 24 | 29 | 39 | 52 | 64 | 72 | – | 110 G- | 130 | 140 | NS | 0.2 |
| | Dinoseb | | | | | | NS | NS | NS | NS | NS | 420 | 360 | 2,800 | 1,100 | 2,800 | 3,100 J | 1.4 | R | 170 | ? | 58.2 | 89.4 | 75.1 | 86.2 | 137.0 | 77 | 92 | 51 I | R | 28 K | 30 I, j-, H- | 180 | 200 K | 150 | 180 | NS | 7 |
| | EDB | | | | | | NS | NS | NS | NS | NS | 5 | 3 | 120 | 2 | 3J | 2 L | – | 0.23 J | 45 | ? | 0.038 | – | – | – | 0.17 | – | – | – | – | – | – | – | – | 0.10 | 0.15 | NS | 0.05 |
| | 1,2,3-TCP | | | | | | NS | NS | NS | NS | NS | 3,700 | 2,500 | 3,100 | 2,800 | 6,100 | 5,600 | 51 J | 1,000 | 1,200 | 1,900 | 260 | 349 | 345 | 660 | 946 J | 610 | 430 J | 560 L | 920 | 700 | 980 | 2300 L,G+ | 2900 | 3000 | 2200 | NS | 5 |
| WA-7 | 1,2-DCP | | | | | | NS | NS | NS | NS | NS | 24,000 | 28,000 | 22,000 | 15,000 | 17,000 | 18,000 | 27,000 | 8,100 | 15,000 | 18,000 | 10,300 | 15,500 | 14,300 | 14,600 | 19,600 | 18,000 | 4900 | 11000 | 9500 H- | 8300 | 6500 | 10000 G+ | 5700 | NS | NS | NS | 5 |
| | 1,3-DCP | | | | | | NS | NS | NS | NS | NS | 6 | 5 | 6 | 3 | 3 | 3 | 4 LJ | 3 J | – | 3.3 | – | – | – | – | 5.5 | – | – | – | – | – | – | – | – | NS | NS | NS | — |
| | Chloroform | | | | | | NS | NS | NS | NS | NS | 180 | 185 | 180 | 97 | 76 | 98 | 130 | 57 | 94 L | 110 | 119 | – | 119 | 113.0 | 132.0 | 160 J | 27 J | 78 L | 68 L | – | 75 L,f | 73 L,G+ | 58 f,L | NS | NS | NS | 100* |
| | DBCP | | | | | | NS | NS | NS | NS | NS | 38 | 30 | 31 | 15 | 8 | 9 L | 21 | 74 | 7.1 | ? | 5.9 | 11 | 8.2 | 9.8 | 11.0 | 9.1 | 8.5 | 8.6 | 0.19 | 7.5 | 4.6 | – | 4.1 | NS | NS | NS | 0.2 |
| | Dinoseb | | | | | | NS | NS | NS | NS | NS | 7 | 7 | 220 | – | – | 1 J | 0.2 J | R | – | ? | 9.4 | 10.8 | 9.89 | 6.60 | 8.4 | 7.4 | 5.2 | 2.9 I | R | 3.0 | 1.6 I, j-, H- | 2.5 | 2.4 K | NS | NS | NS | 7 |
| | EDB | | | | | | NS | NS | NS | NS | NS | – | – | 12 | – | – | – | – | – | 9.3 | ? | – | – | – | – | – | – | – | – | 0.015 L | – | – | – | – | NS | NS | NS | 0.05 |
| | 1,2,3-TCP | | | | | | NS | NS | NS | NS | NS | 540 | 590 | 580 | 480 | 385 | 370 | 420 | 380 | 330 | 440 | 283 | 302 | 282 | 318 | 308 J | 350 J | 240 | 220 L | 250 | 210 L | 180 L | 300 L,G+ | 150L | NS | NS | NS | 5 |
| WA-8 | 1,2-DCP | | | | | | NS | NS | NS | NS | NS | 4.0 | 3.0 | 3.0 | 4.0 | 9.0 | 9.0 | – | 7.0 | 4.0 | 6.2 | 44 | 38 | – | – | – | 1.2 | 0.53 J | 0.45 L | 0.47 L,H- | 0.26 L | – | 0.29 G+,L | 0.23L | NS | NS | NS | 5 |
| | 1,3-DCP | | | | | | NS | NS | NS | NS | NS | – | – | – | 0.2 | 0.5 | 0.5 L | 0.5 LJ | 0.4J | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | NS | NS | NS | — |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | 0.14 O, f, L | – | 0.13 L,f | NS | NS | NS | 100* |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | – | NS | NS | NS | 0.2 |
| | Dinoseb | | | | | | NS | NS | NS | NS | NS | – | – | – | – | 54 | 58 J | 13.9 J | 13.9J | 16 | ? | 13.5 | 26.5 | 50.3 | 36.0 | 8.9 | 11 | 15 | 180 I | R | 36 | 20 I, j-, H- | 71 | 62 K | NS | NS | NS | 7 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | – | NS | NS | NS | 0.05 |
| | 1,2,3-TCP | | | | | | NS | NS | NS | NS | NS | 14 | 15 | 16 | 22 | 26 | 39 | 35 | 40 | 24 | 33 | 20 | 22 | 19 | 35.0 | 10.0 | 9.0 | 4.7 | 2.7 | 5.4 | 3.9 | 3.3 | 4.4 G+ | 2.9 | NS | NS | NS | 5 |
| WA-9 | 1,2-DCP | | | | | | NS | NS | NS | NS | NS | 16 | 23 | 20 | 17.5 | 16 | 18 | 12 | 0.6J | 7.0 | 8.9 | 7.3 | – | – | – | 1.6 J | 2.6 | 0.85 J | 0.35L | – | – | – | 0.66 L | 0.11L | – | – | ND | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | — |
| | Chloroform | | | | | | NS | NS | NS | NS | NS | 27 | 31 | 25 | 15.5 | 12 | 9.0 | 6.0 | – | 4.0 | 4.6 | – | – | – | – | 1.5 J | 1.9 | 1.4 | 1.0 | 0.92 L | 0.62 L | 0.86 L | 1.3 | 0.62L | 0.98J | 0.51J | 0.39J | 100* |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | 0.2 |
| | Dinoseb | | | | | | NS | NS | NS | NS | NS | 1.0 | – | – | – | – | – | – | R | – | ? | – | 31.6 | – | – | – | – | – | – | R | – | – | – | – | – | – | – | ND | 7 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | 0.05 |
| | 1,2,3-TCP | | | | | | NS | NS | NS | NS | NS | – | – | 1.0 | 1.5 | 1.0 | 2.0 | 2.0 | – | 2.0 | 2.9 | – | – | – | – | – | 1.2 | 0.20 J | – | – | – | – | – | – | – | – | 0.049 | 0.03 | 5 |
| PWA-1 | 1,2-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 600 | 1200 | 1100 | 1500 H- | 1600 | 1600 | 1900 G+ | 2300 | 3100 | 3300 | 2,600 | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.21 J | – | – | – | – | – | – | – | 0.74J | 0.67J | 0.72J | — |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 8.9 | 19 J | 20 L | 22L | 26 L | 32 L, f | 32 L,G+ | 36L | 36 | 39 | 38 | 100* |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.17 | 0.25 | 0.39 | 0.42 | 0.61 | 0.62 | 0.71 | 1.10 | 1.6 | 2.8 | 1.3 | 0.2 |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | R | – | – | – | – | 1.2 | 1.5 | 1.4 | 7 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | ND | 0.05 |
| | 1,2,3-TCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 92 | 130 | 90 L | 170 | 140 | 140 | 210 G+ | 160 | 180 | 160 | 150 | 5 |

## TABLE 2 - continued
## Chemicals of Concern in A-Zone Groundwater - Selected Parameters (more listed starting May 1997)

| Well ID | Chemical | DATE SAMPLED AND CONCENTRATIONS (µg/L) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | MCL (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sep-87 | Oct-87 | Dec-87 | Feb-88 | Mar-88 | Apr/ May-90 | Jan-91 | Apr-91 | Jun/ Aug-91 | Dec-91 | Apr-92 | Jul-92 | Dec-92 | Aug-94 | Mar-95 | Nov-95 | Nov-96 | May-97 | Jan-98 | Jul-98 | Jul-00 | Nov-00 | Mar-01 | Jul-01 | Oct-01 | Feb-02 | May-02 | Jul-02 | Oct-02 | Feb-03 | May-03 | Aug-03 | Jan-04 | Aug-07 | Apr-08 | Apr-09 | |
| PWA-2 | 1,2-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 740 | 990 | 1000 | 1700 | 2200 | 2500 | 4300 G+ | 7300 | 5200 | 6300 | 5,200 | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | 19L | 12 | 12 | 9.1 | — |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 1.7 J | – | – | – | – | 20 L, f | – | 30 L,f | 7.5 | 9.2 | 8.5 | 100* |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 38 | 45 | 58 | 87 | 71 G+,H+ | 100 | – | 310 G+ | 300 | 610 | 250 | 0.2 |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 1,200 | 1300 | 1900 I | R | 7200 K | 4100 | 15000 | 13000 K | 4600 | 6600 | 8,300 | 7 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 67 | 66.0 | 120 | 140 | 110 G+ | 110 | 120 C-,K | 140 G+ | 150 | 300 | 140 | 0.05 |
| | 1,2,3-TCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 79 | 72 J | 100 p | 140 | 190 | 190 | 430 L,G+ | 840 | 910 | 1400 | 710.00 | 5 |
| PWA-3 | 1,2-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 170 | 98.00 | 57 | 25 H- | 0.26 L | 0.79 L | – | – | 1.2 | – | ND | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | 0.18 J | – | – | – | – | – | – | – | – | ND | — |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 1.5 J | 1.6 | 3.5 L | 3.4 | 0.34 L | 1.1 | 0.78 G+,L | 0.24 f,L | 1.7 | 1.1 | 1.4 | 100* |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.72 | 0.73 | 0.54 | 6.2 | – | – | – | – | 0.018 | – | 0.02 | 0.2 |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 13 | 9.5 | 8.1 I | R | – | – | – | – | 0.52 | 0.81 | 0.43 | 7 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.058 | 0.017 J | 0.048 | – | – | – | – | – | – | – | ND | 0.05 |
| | 1,2,3-TCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 15 | 8.4 | 4.1 L | 1.8 | – | – | – | – | – | 0.17 | 0.23 | 5 |
| PWA-4 | 1,2-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 3,400 | 5900 | NS | NS | NS | NS | NS | 9800.0 | 3000 | 2400 | NS | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | NS | NS | NS | NS | NS | – | 3.1 | 2.6 | NS | — |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 27 J | 46 J | NS | NS | NS | NS | NS | 170 L,f | 13 | 9.2 | NS | 100* |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 8.2 | 11 | NS | NS | NS | NS | NS | 15.0 | 8.3 | 5.5 | NS | 0.2 |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 73 | – | NS | NS | NS | NS | NS | 160 K | 70 | 70 | NS | 7 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.37 | 0.50 | NS | NS | NS | NS | NS | – | 0.05 | 0.055 | NS | 0.05 |
| | 1,2,3-TCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 230 | 280 | NS | NS | NS | NS | NS | 390L | 210 | 180 | NS | 5 |
| PWA-6 | 1,2-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | NS | NS | NS | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | NS | NS | NS | — |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.16 O,f,L,G+ | – | 0.14 f,L | NS | NS | NS | 100* |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | NS | NS | NS | 0.2 |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 11 I, j-,H- | 3.2 f, I | 0.25 K | NS | NS | NS | 7 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | NS | NS | NS | 0.05 |
| | 1,2,3-TCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 3.5 G+ | 3.1 | 1.7 | NS | NS | NS | 5 |
| PWA-7 | 1,2-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | ND | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | ND | — |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | 0.17 O, L | 0.41 L | 0.15 f,L | 0.16J | 0.16J | ND | 100* |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | 0.01 | 0.2 |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | 0.01J | 0.10 | 0.11 | 7 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | ND | 0.05 |
| | 1,2,3-TCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 3.8 | 0.20 O, L | 0.15 L | 0.086L | – | 0.27 | 0.42 | 5 |

Notes:
-- indicates that the analyte was not detected.
1,2-DCP = 1,2-Dichloropropane
1,3-DCP = 1,3-Dichloropropane
DBCP = 1,2-Dibromo-3-chloropropane (See Appendix B for analysis value used.)
EDB = Ethylene dibromide, also called 1,2-Dibromoethane (8260 analysis value used) (From July 2000, EPA 504 analysis value used.)
1,2,3-TCP = 1,2,3-Trichloropropane
? = EDB, DBCP, and dinoseb data not available by 2/23/99.
(-) = Less than; numerical value is limit of detection for that compound.
NA = Not analyzed since the well did not exist at this particular time.
NS = Well not sampled for this compound. In most cases it means that the well was not sampled either because the well was dry at the time of sampling or there was a problem with well.
PWA-7 was installed on February 2003.
RE = Re-analysis
+ = High Bias Indicator
- = Low Bias Indicator
B = Analyte is found in the associated blank as well as in the sample.
C = This sample was analyzed beyond the EPA recommended holding time.
f = Method Blanks
F = Contaminated due to carryover from preceding analysis.
G = Surrogate Recovery
H = MS/MSD (Matrix Spike/Matrix Spike Duplicate) Recovery
I = MS/MSD (Matrix Spike/Matrix Spike Duplicate) RPD (Relative Percent Difference)
j = LCS (Laboratory Control Sample) Recovery
J = Estimated value (laboratory qualifier) for various causes.
K = LCS ( Laboratory Control Sample) RPD (Relative Percent Difference)
L = Data below the required reporting limit.
O = Trip Blank [Field QC (Quality Control)]
p = Field Duplicate [Field QC (Quality Control)]
P = High % difference between 1st and 2nd column.
R = Results rejected during QA/QC (Quality Assurance/Quality Control) due to lab problems.
MCL = Maximum Contaminant Level
µg/L = Micrograms per liter
--- = no MCL data found or given.
* = Total trihalomethanes (sum of bromodichloromethane, dibromochloromethane, bromoform, and chloroform)
Other VOCs (acetone, chloromethane, chlorobenzene, methylene chloride, tetrachloroethene,toluene) are occasionally detected at low concentrations. See Table 4.
Prior to July 2002 the qualifiers were extracted from the laboratory report . After and including July 2002 the qualifiers are conformable to the Automated Data Review from the Data Validation Report.

References:
Data source: Hargis+Associates, Inc. (data collected between 9/87 and 3/88), U.S EPA (data collected between 4&5/90 and 12/92), Ecology and Environment, Inc. (between 8/94 and 7/98), Panacea, Inc. (between 7/00 and 8/07), Eco & Associates, Inc. (from 4/08 to present).
Electronic file obtained from Ralph Lambert of Ecology and Environment, Inc., file name ALLCHEM.XLS.

**TABLE 3**
**Chemicals of Concern in B-Zone Groundwater**

| Well ID | Chemical | DATE SAMPLED AND CONCENTRATIONS (µg/L) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | MCL (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sep-87 | Oct-87 | Feb-88 | Mar-88 | Jan-91 | Apr-91 | Jul-91 | Dec-91 | Apr-92 | Jul-92 | Aug-94 | Mar-95 | Nov-95 | Nov-96 | May-97 | Jan-98 | Jul-98 | Jul-00 | Nov-00 | Mar-01 | Jul-01 | Oct-01 | Feb-02 | May-02 | Jul-02 | Oct-02 | Feb-03 | May-03 | Aug-03 | Jan-04 | Aug-07 | Apr-08 | Apr-09 | |
| AR-1 | 1,2-DCP | | | 18 | 16 | 12 | 10 | 8 | 6 | 5 | 4 | NS | 3 | 62 | 3 | 3.0 J | 2 | 5.1 | – | – | – | – | 2.5 J | 1.5 | 1.3 | 1.0 | 1.0 | 1.3 | 1.3 G+ | 0.93 L | 1.1 | – | 0.47J | ND | 5 |
| | 1,3-DCP | | | -1 | -1 | – | – | – | – | – | – | NS | – | 0.2 L | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | — |
| | 1,2,3-TCP | | | -1 | -1 | – | – | – | – | – | – | NS | – | 7 | – | 0.3 JL | – | 1.2 | – | – | – | – | – | 0.56 J | 0.44 J | – | 0.34 L | 0.54 L | 0.49 O,L,G+ | 0.37 L | 0.70L | – | 0.41 | 0.18 | 5 |
| | Chloroform | | | -1 | -1 | – | – | – | – | – | – | NS | – | 0.3 L | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 0.13 O,L,G+ | 0.089 L | 0.46 O,f,L | 0.14J | 0.35J | ND | 100* |
| | Dinoseb | | | -0.5 | -0.05 | – | – | – | – | – | – | – | – | – | – | 0.2 J | NA | ? | – | – | – | – | – | – | – | – | R | – | – | – | – | 0.01J | – | ND | 7 |
| | DBCP | | | -0.02 | -0.02 | – | – | – | – | – | – | NS | – | 12 | 0.01 JP | – | – | ? | – | – | – | – | – | – | – | – | – | 0.0059 L | – | – | – | – | 0.021 | 0.047 | 0.2 |
| | EDB | | | -0.02 | -0.02 | – | – | – | – | – | – | NS | 0.2J | 0.31 | – | – | – | ? | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | 0.05 |
| AMW-3R | 1,2-DCP | 5 | 3 | | | 0.7 | 0.6 | 0.9 | 2 | 1 | 0.7 | 4 | 2 | 8 | 3 | 1 | 1 | – | 13 | – | – | – | – | 1.6 | 1.9 | 2.6 G+ | 2.0 | 1.3 | 1.7 | 2.1 | 1.2 | 1.3 | 0.41J | ND | 5 |
| | 1,3-DCP | -1 | 3 | | | | | | | | | | | | | | | | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | — |
| | 1,2,3-TCP | -1 | 8 | | | – | – | – | – | – | – | 0.4 | – | 1 | 0.9 JL | – | | – | – | – | – | – | – | 0.36 J | 0.38 J | 0.31G+,L | 0.36 L | 0.34 L | 0.43 O,L | 0.60 j-,K,L | 0.39L | – | 0.35 | 0.23 | 5 |
| | Chloroform | -1 | -1 | | | | | | | | | | | | | | | | – | – | – | – | – | – | 0.088 J | 0.18 O,H+,L,G+ | 0.22 L | 0.17 L | 0.25 O,L | 0.35 L | 0.47 O,f,L | 0.18J | 0.21J | ND | 100* |
| | Dinoseb | -0.05 | -0.05 | | | | 0.4 | – | – | – | – | – | – | – | – | 0.22 J | – | ? | – | – | – | – | – | – | – | – | R | – | – | – | – | – | – | 0.01J | 7 |
| | DBCP | -0.1 | -0.01 | | | – | – | – | – | – | – | – | – | 1.9 | 0.02 JP | – | | ? | – | – | – | – | – | – | – | – | – | – | – | – | – | 0.014 | 0.029 | 0.042 | 0.2 |
| | EDB | -0.02 | 0.02 | | | – | – | – | – | – | – | 2 | – | 0.03 L | – | – | – | ? | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | 0.05 |
| AMW-4R | 1,2-DCP | 6 | 4 | | | 1 | 2 | 3 | 4 | 2.7 | 6 | 2 | 330 | 39 | 0.4 JL | 340 | 210 | 6.6 F | – | 11 | 34 | 47 | 45 | 36 | 2.0 | 3.2 G+ | 2.5 | 4.5 | 3.5 | – | 1.7 | – | 7.2 | 2.5 | 5 |
| | 1,3-DCP | -1 | -1 | | | | | | | | | | | | | | | | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | — |
| | 1,2,3-TCP | -1 | -1 | | | – | – | – | – | – | – | 0.2 | 0.4J | 3 | – | – | – | 4.6 F | – | – | – | – | 1.3 J | 1.2 | 0.27 J | 0.30 G+,L | 0.38 L | – | – | – | 0.67L | – | 0.80 | 0.41 | 5 |
| | Chloroform | -1 | 1 | | | – | – | – | – | – | – | – | 4 | 0.2 L | – | 3 | 5 | – | – | – | – | – | – | 0.47 J | 0.17 J | 0.32 O,H+,L,G+ | 0.18 L | 0.22 L | 0.17 O,L | – | 0.43 O,f,L | 0.19J | 0.30J | ND | 100* |
| | Dinoseb | -0.05 | -0.05 | | | – | – | – | – | – | – | – | – | – | – | 0.22 JP | – | ? | 4.76 | – | – | – | – | – | – | – | R | – | – | – | – | 0.03 | – | 0.13 | 7 |
| | DBCP | -0.1 | -0.01 | | | – | – | – | – | – | – | 0.03 | 0.05 | 7 | 0.02 JP | – | | ? | – | – | 0.03 | – | – | 0.075 | 0.017 | 0.017 | 0.021 | 0.013 | – | – | – | 0.014 | – | 0.035 | 0.2 |
| | EDB | -0.02 | 0.03 | | | – | – | – | – | – | – | 0.8 | – | – | | – | – | ? | – | – | – | – | – | – | – | 0.011 L | – | – | – | – | – | – | – | ND | 0.05 |
| WB2-1 | 1,2-DCP | | | | | NS | NS | NS | NS | 1700 | 890 | 5 | 3 | 4 | 5 | 8 | 18 | 93 | 34 | 44 | 47 | 62 | 72 | 86 | 87 | 110 | 120 | 88 | 64 | 53 | 38.0 | 22 | 1.5 | 1.9 | 5 |
| | 1,3-DCP | | | | | NS | NS | 60 | NS | 1 | 1 | | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | — |
| | 1,2,3-TCP | | | | | NS | NS | NS | NS | 72 | 60.5 | 1 | 0.7J | 0.9 L | 0.8 JL | 1 | 8 | 52 | 110 | 143 | 153 | 311 | 283 | 330 | 320 | 330 | 480 | 280 | 240 | 250 | 140 | 110 | 23 | 4.3 | 5 |
| | Chloroform | | | | | NS | NS | NS | NS | – | – | – | – | 0.4 L | 0.28 J | 0.2 J | 1 | 3.9 | – | – | – | – | 1.5 J | 2.0 J | 1.9 J | 2.0 L | 2.0 L | 1.4 L | 1.8 L | 3.4 L | 2.7 L,f | 0.90J | – | ND | 100* |
| | Dinoseb | | | | | NS | NS | NS | NS | 4 | 3.5 | – | 0.2 | – | – | – | 7.9 | ? | 18.2 | 20 | 22.1 | 20.8 | 22.7 | 32 | 45 | 69 | R | 78 I | 39 K, j- | 58 l, f | 28 I | 39 | 5.4 | 0.62 | 7 |
| | DBCP | | | | | NS | NS | NS | NS | 30 | 27 | 0.1 | – | 0.4 | 0.28 J | 0.3 | 2.5 | ? | – | – | 0.24 | – | – | 0.34 | 0.077 | 0.093 | 0.079 | – | 0.045 | 2.1 p,G+ | 0.035 K | 0.011 | 0.053 | ND | 0.2 |
| | EDB | | | | | NS | NS | NS | NS | – | 0.6 | 1 | – | – | – | – | 0.6 | ? | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | 0.05 |
| WB2-2 | 1,2-DCP | | | | | NS | NS | NS | NS | 47 | 40 | 17 | 11 | 8 | 60 | 4 | 5 | 23 | – | – | – | – | 3.4 J | 2.8 | 0.83 J | 1.2 G+ | 5.2 | 7.0 | 19 | 18 | 17.0 | 20 | 20 | 11 | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | — |
| | 1,2,3-TCP | | | | | NS | NS | NS | NS | 19 | 19 | 21 | 20 | 17 | – | 2 | – | – | – | – | – | – | 3.4 J | 0.75 J | 0.17 J | 0.58 G+,L | 8.5 | 21 | 44 | 42 | 40 | 58 | 48 | 40 | 5 |
| | Chloroform | | | | | NS | NS | NS | NS | – | – | – | – | 0.8 L | – | – | 0.1 L | – | – | – | – | – | – | – | – | – | 0.15 L | 0.18 L | 0.60 O, L | 0.46 L | 0.70 O,f,L | 0.65J | 0.64J | 0.50J | 100* |
| | Dinoseb | | | | | NS | NS | NS | NS | 2 | 8 | – | 0.5 | – | – | – | – | ? | – | 0.15 J | – | – | – | – | – | – | R | 2.9 I | 6.5 K,j- | 5.8 | 4.6 I | 10 | 6.5 | 12 | 7 |
| | DBCP | | | | | NS | NS | NS | NS | 7 | 7 | 5 | 4.5 | 5.6 | 0.75 J | 0.3 | – | ? | – | – | 0.122 | – | – | 0.040 | – | 0.10 | 1.2 | 3.0 | 6.7 | 4.9 | 4.7 | 4.8 | 5.0 | 3.1 | 0.2 |
| | EDB | | | | | NS | NS | NS | NS | – | – | – | – | – | 0.07 | 0.1 | – | ? | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | 0.05 |
| WB2-3 | 1,2-DCP | | | | | NS | NS | NS | NS | 0.8 | 0.8 | 9 | 13 | 6 | 12 JL | 15 | 14 | – | – | – | – | – | 4.1 J | 3.5 | 3.9 | 4.2 | 4.0 | 4.3 | 2.2 | – | 2.1 | 0.52J | 2.0 | 0.85J | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | — |
| | 1,2,3-TCP | | | | | NS | NS | NS | NS | – | – | – | 0.5 | – | – | 0.7 J | – | 2.6 | – | – | – | – | – | 0.29 J | 0.22 J | – | – | – | – | – | – | – | 0.035 | 0.075 | 5 |
| | Chloroform | | | | | NS | NS | NS | NS | – | – | 7 | 6 | 9 | – | 6 | 7 | 7 | – | 9 | 9.2 | 9.9 | 10 | 11 | 9.4 | 9.9 | 6.5 | 5.1 | 2.1 | 1.7J | 1.2 O,f | – | – | ND | 100* |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | 0.32 | R | – | 0.57 K,p,j- | – | – | 0.03 | – | 0.08 | 7 |
| | DBCP | | | | | NS | NS | NS | NS | – | – | | | | 004 J | 0.04 J | – | ? | – | – | 0.03 | – | – | 0.016 | 0.0097J | 0.0066 L | 0.0054 L | – | – | – | – | – | – | – | ND | 0.2 |
| | EDB | | | | | NS | NS | NS | NS | – | – | 0.2 | 0.2 | 0.11 | 0.1 | 0.1J | – | ? | – | – | 0.03 | – | – | 0.029 | 0.023 | 0.019 L | – | – | – | – | – | – | – | – | ND | 0.05 |
| WB2-4 | 1,2-DCP | | | | | NS | NS | NS | NS | | 0.3 | 0.6 | – | 0.2 L | – | – | 0.4 L | – | – | – | – | – | – | – | – | – | – | 0.22 L | – | 0.34 G+,L | 0.31L | 1.1 | 1.2 | 1.8 | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | — |
| | 1,2,3-TCP | | | | | | | | | | | | | | | | 1 | – | – | – | – | – | – | 0.2 J | – | – | – | – | – | – | – | – | 0.042 | 0.067 | 5 |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 0.16J | ND | 100* |
| | Dinoseb | | | | | | | | | | | | | | | | 26 | ? | – | – | – | – | – | – | – | – | R | – | – | – | – | – | – | 0.02J | 7 |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | 0.055 | – | – | 0.097 | ND | 0.2 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | ND | 0.05 |
| PWB-1 | 1,2-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 1.1 | 1.1 | 1.1 | 2.2 | 1.1 | 0.77 L | 1.0 | 0.62L | – | 0.79J | ND | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | ND | — |
| | 1,2,3-TCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.33 J | 0.40 J | 1.3 | 1.3 | 0.48 L | 0.35 O, L | 0.31 j-,K,L | – | – | 0.37 | 0.28 | 5 |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.72 J | – | – | – | – | – | 0.17 L | 0.25 O,f,L | – | – | ND | 100* |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | 0.63 p | R | – | – | – | – | 0.06 | 0.01J | ND | 7 |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | 0.0080J | 0.22 | 0.19 | 0.017 | – | – | – | – | – | ND | 0.2 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | ND | 0.05 |
| PWB-2 | 1,2-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 2.2 | 2.9 | 4.1 G+ | 1.3 | 6.8 | 8.1 | 11 | 16.0 | 21 | 26 | 18 | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | ND | — |
| | 1,2,3-TCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | 0.48J | 0.20 | 0.22 | 5 |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 4.1 | 4.7 | 7.2 G+,H+ | 1.7 | 6.8 | 6.7 | 7.6 | 9.8 | 9.2 | 9.5 | 5.7 | 100* |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | R | – | – | – | – | 0.01J | – | ND | 7 |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | ND | 0.2 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | ND | 0.05 |

**TABLE 3 - continued**
**Chemicals of Concern in B-Zone Groundwater**

| Well ID | Chemical | DATE SAMPLED AND CONCENTRATIONS (µg/L) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | MCL (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sep-87 | Oct-87 | Feb-88 | Mar-88 | Jan-91 | Apr-91 | Jul-91 | Dec-91 | Apr-92 | Jul-92 | Aug-94 | Mar-95 | Nov-95 | Nov-96 | May-97 | Jan-98 | Jul-98 | Jul-00 | Nov-00 | Mar-01 | Jul-01 | Oct-01 | Feb-02 | May-02 | Jul-02 | Oct-02 | Feb-03 | May-03 | Aug-03 | Jan-04 | Aug-07 | Apr-08 | Apr-09 | |
| PWB-3 | 1,2-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 2.5 | 3.0 | 3.4 | 3.1 | 0.69 L | 0.54 L | – | 0.44L | 0.68J | – | 0.43J | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | ND | — |
| | 1,2,3-TCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 1.4 | 6.1 | 7.2 | 6.2 | 0.64 L | 1.0 O, L | – | 0.53L | 0.46J | 0.32 | 0.27 | 5 |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | 0.11 J | 0.15 O,L | 0.083 L | – | – | – | – | – | – | ND | 100* |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | 0.87 | 0.80 | R | – | – | – | – | 0.07 | 0.02J | 0.018J | 7 |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.13 | 1.2 | 1.2 | 1.3 | 0.090 | 0.040 | 0.06 | – | 0.034 | 0.036 | 0.013 | 0.2 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.10 | – | – | – | – | – | – | – | – | – | ND | 0.05 |
| PWB-4 | 1,2-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 50 | 37 | 74 G+ | 80 | 64 | 72 | 110 E | 80.0 | 47 | 31 | 16 | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | ND | — |
| | 1,2,3-TCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 160 | 130 | 200 G+ | 210 H+ | 200 | 220 | 350 E | 290 | 340 | 140 | 70 | 5 |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 1.5 | 1.5 J | 1.6 G+,H+,L | 2.0 L | 1.5 L | 1.6 L | 2.1 | 5.1 L,f | 4.1 | 2.1 | 1.2 | 100* |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 15 | 19 | 21 | R | 39 I | 33 K, j- | 61 | 36 I | 50 | 30 | 9.0 | 7 |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 31 | 32 | 29 G+ | 44 | 40 | 36 | 41 | 16 K | 2.6 | 3.1 | 4.1 | 0.2 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | 4.9 C-,p | – | – | – | ND | 0.05 |
| PWB-5 | 1,2-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 2.5 | 2.1 | 0.79 L | 2.3 | 1.9 | 2.9 G+ | 2.7 | 2.7 | 4.7 | 3.7 | 4.0 | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | ND | — |
| | 1,2,3-TCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.19 J | – | – | – | – | – | – | – | – | 1.2 | 2.5 | 5 |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.19 J | 0.20 J | – | 0.25 L | 0.27 L | 0.64 O,L,G+ | 0.41 L | 0.84 O,f,L | 1.3 | 0.94J | 1.3 | 100* |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | R | – | – | – | – | 0.08 | 0.03 | 0.43 | 7 |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | 0.013 K | 0.059 | 0.024 | 0.40 | 0.2 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | 0.013 L | – | – | – | – | – | – | – | ND | 0.05 |
| PWB-6 | 1,2-DCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | ND | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | ND | — |
| | 1,2,3-TCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | 0.089 | 0.58 | 5 |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | 0.29 O,f,L | – | – | ND | 100* |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | ND | 7 |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | 0.67 | 0.096 | 0.2 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | ND | 0.05 |
| PWB-7 | 1,2-DCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 930 | NS | NS | NS | NS | NS | NS | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | NS | NS | NS | NS | NS | NS | — |
| | 1,2,3-TCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 110 | NS | NS | NS | NS | NS | NS | 5 |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 8.1 L | NS | NS | NS | NS | NS | NS | 100* |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | NS | NS | NS | NS | NS | NS | 7 |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 130 | NS | NS | NS | NS | NS | NS | 0.2 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | NS | NS | NS | NS | NS | NS | 0.05 |
| PWB-7A | 1,2-DCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 12 | 50 | ND | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | ND | — |
| | 1,2,3-TCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 37 | 44.0 | 75 | 5 |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.44J | 0.73J | ND | 100* |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 31 | 37 | 51 | 7 |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 24 | 16 | 31 | 0.2 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | 0.017J | ND | 0.05 |
| PWB-8 | 1,2-DCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 4.0 | 2.9 | 3.6 | 2.3 | 0.95J | 0.87J | 1.6 | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | | – | – | – | – | ND | — |
| | 1,2,3-TCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.73 L | 0.76 O,L | 0.67 L | 0.26L | – | 0.06 | ND | 5 |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.091 L | 0.091 O,p,L | 0.091 L | 0.29 O,f,L | – | 0.19J | 0.61J | 100* |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | 0.1 | 0.01J | 0.041 | 7 |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | ND | 0.2 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.070 | – | 0.025 | – | – | – | ND | 0.05 |
| PWB-9 | 1,2-DCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | 0.48J | ND | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | ND | — |
| | 1,2,3-TCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | 0.091 | ND | 5 |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 2.3 | 2.9 | 2.9 | 2.5 | 2.2 | 3.1 | ND | 100* |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | 0.06 | 0.02J | ND | 7 |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | 0.031 | – | – | 0.011 | ND | 0.2 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | ND | 0.05 |
| PWB-10 | 1,2-DCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.20 L | – | 0.31 L | 0.30L | 1.0 | 5.7 | 1.7 | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | ND | — |
| | 1,2,3-TCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | 13.0 | 1.6 | 5 |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 4.3 | 4.9 | 4.6 | 5.3 | 7.2 | 7.7 | ND | 100* |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | 0.02J | 1.9 | 0.36 | 7 |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | 0.007J | 5.1 | 0.18 | 0.2 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | ND | 0.05 |

**TABLE 3 - continued**
**Chemicals of Concern in B-Zone Groundwater**

| Well ID | Chemical | DATE SAMPLED AND CONCENTRATIONS (µg/L) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | MCL (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sep-87 | Oct-87 | Feb-88 | Mar-88 | Jan-91 | Apr-91 | Jul-91 | Dec-91 | Apr-92 | Jul-92 | Aug-94 | Mar-95 | Nov-95 | Nov-96 | May-97 | Jan-98 | Jul-98 | Jul-00 | Nov-00 | Mar-01 | Jul-01 | Oct-01 | Feb-02 | May-02 | Jul-02 | Oct-02 | Feb-03 | May-03 | Aug-03 | Jan-04 | Aug-07 | Apr-08 | Apr-09 | |
| PWB-11 | 1,2-DCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.27 L | 0.39 L | – | 0.19J | 0.53J | 1.1 | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | ND | — |
| | 1,2,3-TCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.18 O, L | 0.16 K, j-, L | – | – | 1.2 | 4.0 | 5 |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.12 O, L | – | 0.28 O,f,L | – | – | ND | 100* |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | 0.02J | 0.12 | 0.97 | 7 |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | 0.067 | ND | 0.2 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | ND | 0.05 |
| PWB-12 | 1,2-DCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 6 | 4.8 | 5.2 | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | ND | — |
| | 1,2,3-TCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 17 | 17 | 17 | 5 |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.38J | 0.54J | 0.38J | 100* |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 9.2 | 9.4 | 16.0 | 7 |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 3.3 | 4.0 | 2.1 | 0.2 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | AN | AN | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.017J | – | ND | 0.05 |
| CW-1 | 1,2-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | – | – | NS | NS | 5 |
| | 1,3-DCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | – | – | NS | NS | — |
| | 1,2,3-TCP | | | | | | | | | | | | – | – | – | – | 1 | poor data | – | – | – | – | – | 0.18 J | – | – | – | – | – | – | – | – | NS | NS | 5 |
| | Chloroform | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | 0.27 O,L,G+ | – | – | – | NS | NS | 100* |
| | Dinoseb | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | 0.29 | R | – | – | – | – | 0.02J | NS | NS | 7 |
| | DBCP | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | – | – | NS | NS | 0.2 |
| | EDB | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | – | – | – | – | – | – | – | – | – | – | – | – | – | – | NS | NS | 0.05 |

Notes:
The following wells were installed in February 2003: PWB-6, PWB-7, PWB-8, PWB-9, & PWB-10 .
-- indicates that the analyte was not detected
1,2-DCP = 1,2-Dichloropropane
1,3-DCP = 1,3-Dichloropropane
DBCP = 1,2-Dibromo-3-chloropropane (See Appendix B for analysis value used)
EDB = Ethylene dibromide, also called 1,2-Dibromoethane (8260 analysis value used) (From July 2000, EPA 504 analysis value used)
1,2,3-TCP = 1,2,3-Trichloropropane
(-) = Less than; numberical value is Limit of detection for that compound.
? = EDB, DBCP, and dinoseb data not available by 2/23/99.
J = Estimated value (laboratory qualifier) for various causes.
NA = Not analyzed since the well did not exist at the time of sampling.
NS = Well not sampled for this compound. In most cases it means that the well was not sampled either because the well was dry at the time of sampling or there was a problem with well.
RE = Re-analysis
+ = High Bias Indicator
- = Low Bias Indicator
C = This sample was analyzed beyond the EPA recommended holding time.
E = Extraction to analysis was beyond the EPA recommended holding time.
f = Method Blanks
F = Contaminated due to carryover from preceding analysis.
G = Surrogate Recovery
H = MS/MSD ( Matrix Spike/Matrix Spike Duplicate) Recovery
I = MS/MSD (Matrix Spike/Matrix Spike Duplicate) RPD (Relative Percent Difference)
j = LCS (Laboratory Control Sample) Recovery
K = LCS (Laboratory Control Sample) RPD (Relative Percent Difference)
L = Data below the required reporting limit.
O = Trip Blank [Field QC (Quality Control)]
p = Field Duplicate [Field QC (Quality Control)]
P = High % difference between 1st and 2nd column.
MCL = maximum contaminant level
µg/L = micrograms per liter
--- = no MCL data found or given
* = Total trihalomethanes (sum of bromodichloromethane, dibromochloromethane, bromoform, and chloroform)
Other VOCs (acetone, methylene chloride, chloromethane, toluene) are occasionally detected at low concentrations. See Table 5.
Prior to July 2002 the qualifiers were extracted from the laboratory report . After and including July 2002 the qualifiers are conformable to the Automated Data Review from the Data Validation Report.

References:
Data source: Hargis+Associates, Inc. (data collected between 9/87 and 3/88), U.S EPA (data collected between 1/91 and 12/92), Ecology and Environment, Inc. (between 8/94 and 7/98), Panacea, Inc. (between 7/00 and 8/07), Eco & Associates, Inc. (from 4/08 to present).
Electronic file obtained from Ralph Lambert of Ecology and Environment, Inc., file name ALLCHEM.XLS.

# TABLE 4
## Detected VOCs in A-Zone Groundwater

| Well ID | Chemical | DATE SAMPLED AND CONCENTRATIONS (µg/L) | | | | MCL µg/L |
|---|---|---|---|---|---|---|
| | | Jan-04 | Aug-07 | Apr-08 | Apr-09 | |
| AMW-1P | Methylene chloride | 6.2L | NS | NS | NS | 5 |
| | Carbon tetrachloride | 0.060L | NS | NS | NS | 5 |
| | Methylene chloride | 0.083L | NS | NS | NS | 5 |
| | Tetrachloroethene | 0.13L | NS | NS | NS | 5 |
| AP-1 | Toluene | 0.51L | NS | NS | NS | 1,000 |
| | Carbon tetrachloride | 0.27L | NS | NS | NS | 5 |
| | Tetrachloroethene | 1.1 | NS | NS | NS | 5 |
| AP-2 | Toluene | 1.1 | NS | NS | NS | 1,000 |
| AP-4 | Methylene chloride | 3.7L | NS | NS | NS | 5 |
| | Carbon tetrachloride | 0.078L | 0.078L | — | ND | 5 |
| | Chloromethane | 0.30L | 0.30L | — | ND | — |
| | Bromodichloromethane | — | — | 0.39J | ND | 100* |
| | Methyl tert-butyl ether | — | — | 2.5 | ND | — |
| WA-1 | Tetrachloroethene | 0.17L | 0.17L | — | ND | 5 |
| | Bromodichloromethane | 0.23L | 1.4 | 0.67J | 1.2 | 100* |
| | Methylene chloride | 0.080L | 0.66JB | 0.40J | ND | 5 |
| WA-2 | Toluene | 0.40L | — | — | ND | 1,000 |
| | Chloromethane | 2.3L | — | — | ND | — |
| | Carbon tetrachloride | — | 0.17J | — | ND | 5 |
| | Methylene chloride | 0.33L | 0.38J | — | ND | 5 |
| WA-3 | Tetrachloroethene | 0.61L | 0.62J | 0.64 | ND | 5 |
| | Carbon tetrachloride | 0.077L | NS | — | NS | 5 |
| | 1,1-Dichloroethene | 0.30L | NS | — | NS | 7 |
| WA-4 | Toluene | 0.75L | NS | — | NS | 1,000 |
| | Carbon tetrachloride | 0.12L | — | — | ND | 5 |
| | Chloromethane | 0.19L | — | — | ND | — |
| | 1,1-Dichloroethene | 1.6 | 1.1 | 1.1 | 1.3 | 7 |
| WA-5 | Tetrachloroethene | 0.29L | 0.29J | 0.32J | ND | 5 |
| | Methylene chloride | 92L | 12 | 7.0 | NS | 5 |
| | 1,1,2-Trichloroethane | — | 1.9 | 1.6 | NS | 5 |
| | 1,1-Dichloroethane | — | 5.8 | 3.1 | NS | — |
| | 1,1-Dichloropropene | — | 1.4 | 0.71J | NS | — |
| | 1,2-Dichlorobenzene | — | 1.0 | — | NS | 600 |
| | 1,2-Dichloroethane | — | 30.0 | 23.0 | NS | 5 |
| | 1,3-Dichlorobenzene | — | 0.51J | — | NS | — |
| | 1,4-Dichlorobenzene | — | 0.60J | — | NS | 75 |
| | Acetone | — | 1.3JB | — | NS | — |
| | Benzene | — | 6.6 | 3.2 | NS | 5 |
| | Carbon tetrachloride | — | 0.20J | — | NS | 5 |
| | Chlorobenzene | — | 4.9 | 2.5 | NS | 100 |
| | Chloromethane | — | 0.32J | — | NS | — |
| | cis-1,3-Dichloropropene | — | 1.3 | 1.4 | NS | — |
| | m,p-Xylene | — | 0.23J | — | NS | 10,000** |
| | o-Xylene | — | 3.4 | 1.2 | NS | 10,000** |
| | Tetrachloroethene | — | 1.3 | 0.58J | NS | 5 |
| | Toluene | — | 0.56J | 0.25J | NS | 1,000 |
| | Trans-1,3-Dichloropropene | — | — | 0.78J | NS | — |
| | Trichloroethene | — | 0.23J | — | NS | 5 |
| WA-6 | Vinyl chloride | — | 0.42J | — | NS | 2 |
| WA-7 | Methylene chloride | 18L | NS | — | NS | 5 |
| | Acetone | 2.1L | NS | — | NS | — |
| | Methylene chloride | 0.065L | NS | — | NS | 5 |
| WA-8 | Toluene | 0.52L | NS | — | NS | 1,000 |
| | Toluene | 1.3 | — | — | ND | 1,000 |
| WA-9 | Methylene chloride | — | 0.53JB | — | ND | 5 |
| | Acetone | — | — | 1.7J | ND | — |
| | Methylene chloride | 4.5L | 1.2 | 0.93J | 0.76J | 5 |
| | 1,1- Dichloroethane | — | 2.3 | 2.4 | 2.5 | — |
| | 1,1-Dichloropropene | — | 1.8 | 1.9 | ND | — |
| | 1,2- Dichloroethane | — | 2.8 | 3.2 | 3.6 | 5 |
| | Tetrachloroethene | — | 0.54J | 0.58J | ND | 5 |
| | Toluene | 3.6L | — | — | ND | 1,000 |
| PWA-1 | Trichloroethene | — | 0.20J | 0.18J | ND | 5 |
| | 1,1,2- Trichloroethane | — | 1.1 | 1.2 | 1.0 | 5 |
| | 1,1- Dichloroethane | — | 0.67J | — | 0.69J | — |
| | 1,1-Dichloropropene | — | 0.60J | 0.76J | ND | — |
| | 1,2-Dichlorobenzene | — | 0.52J | — | 0.56J | 600 |
| | 1,2-Dichloroethane | — | 12.0 | 11.0 | 9.5 | 5 |
| | Benzene | — | 0.72J | 1.4 | 1.5 | 5 |
| | Chlorobenzene | — | 1.4 | 2.2 | 1.2 | 100 |
| | cis-1,3-Dichloropropene | — | 0.79J | 1.1 | ND | — |
| | m,p-Xylene | — | — | 0.35J | ND | 10,000** |
| | o-Xylene | — | — | 0.28J | ND | 10,000** |
| | Tetrachloroethene | — | 0.18J | 0.29J | ND | 5 |
| | Toluene | — | — | 0.25J | ND | 1,000 |
| | trans-1,3-Dichloropropene | — | 0.54J | 1.0 | ND | — |
| PWA-2 | Methylene chloride | 12L | 0.44J | — | ND | 5 |
| PWA-3 | Toluene | 0.81L | — | — | ND | 1,000 |

## TABLE 4 - continued
## Detected VOCs in A-Zone Groundwater

| Well ID | Chemical | DATE SAMPLED AND CONCENTRATIONS (µg/L) | | | | MCL µg/L |
|---|---|---|---|---|---|---|
| | | Jan-04 | Aug-07 | Apr-08 | Apr-09 | |
| | 1,1,2- Trichloroethane | — | 0.34J | 0.23J | ND | 5 |
| | 1,1- Dichloroethane | — | 0.69J | — | ND | — |
| | 1,1-Dichloropropene | — | 0.21J | — | ND | — |
| | 1,2- Dichloroethane | — | 4.7 | 3.4 | ND | 5 |
| | Methylene chloride | — | 1.5 | — | ND | 5 |
| | Naphthalene | — | 1.3 | — | ND | — |
| PWA-4 | Tetrachloroethene | — | 0.64J | 0.51J | ND | 5 |
| | Methylene chloride | 0.067L | NS | NS | NS | 5 |
| PWA-6 | Toluene | 0.44L | NS | NS | NS | 1,000 |
| | Hexachlorobutadiene | 0.19 f,L | — | — | ND | — |
| | Naphthalene | 0.20 f,L | — | — | ND | — |
| | Toluene | 0.59L | — | — | ND | 1,000 |
| | 1,2,3-Trichlorobenzene | 0.19 f,L | — | — | ND | — |
| PWA-7 | 1,2,4-Trichlorobenzene | 0.12 f,L | — | — | ND | 70 |
| | 1,1,2- Trichloroethane | – | 0.38J | 0.40J | ND | 5 |
| | 1,1- Dichloroethane | – | 2.2 | 1.5 | 0.84J | — |
| | 1,1-Dichloropropene | – | 0.48J | 0.56J | ND | — |
| | 1,2- Dichloroethane | – | 9.1 | 6.9 | 3.2 | 5 |
| | Acetone | – | 15B | — | 22 | — |
| | Benzene | – | 1.5 | 1.2 | 0.66J | 5 |
| | Chlorobenzene | – | 0.91J | 0.93J | 0.49J | 100 |
| | Methylene chloride | 31L | 3.9 B | 1.7 | 0.84J | 5 |
| | cis-1,3-Dichloropropene | – | 0.51J | — | ND | — |
| | Tetrachloroethene | – | 0.94J | 1.0 | ND | 5 |
| | Toluene | – | 0.17J | 0.22J | ND | 1,000 |
| | trans-1,3-Dichloropropene | – | 0.25J | — | ND | — |
| EPAS-1 | Vinyl chloride | – | 0.64J | — | ND | 2 |
| | Methylene chloride | 3.2L | — | — | ND | 5 |
| | Toluene | 5.2L | — | — | ND | 1,000 |
| | 1,2- Dichloroethane | – | 0.22J | — | 1.3 | 5 |
| EPAS-2 | Acetone | – | 1.7JB | — | ND | — |
| | 1,1,2- Trichloroethane | – | 2.8 | 2.8 | 2.5 | 5 |
| | 1,1- Dichloroethane | – | 2.0 | 1.7 | 1.7 | — |
| | 1,1-Dichloropropene | – | 2.0 | 2.0 | 2.1 | — |
| | 1,2- Dichloroethane | – | 11 | 10 | 9.5 | 5 |
| | 1,3-Dichlorobenzene | – | 0.42J | — | 0.41J | — |
| | 1,4- Dichlorobenzene | – | 0.23J | — | ND | 75 |
| | Benzene | – | 2.5 | 2.5 | 2.5 | 5 |
| | Chlorobenzene | – | 3.6 | 3.6 | 3.6 | 100 |
| | cis- 1,3-Dichloropropene | – | 0.62J | — | ND | — |
| | Methylene chloride | 16L | 1.5 | — | 1.1 | 5 |
| | m,p-Xylene | – | 0.29J | — | ND | 10,000** |
| | o-Xylene | – | 0.27J | — | ND | 10,000** |
| | Tetrachloroethene | – | 0.38J | 0.57J | ND | 5 |
| | Toluene | – | 0.39J | 0.45J | 0.34J | 1,000 |
| | trans-1,3-Dichloropropene | – | 0.20J | — | ND | — |
| | Trichloroethene | – | 0.28J | — | ND | 5 |
| EPAS-3 | Vinyl chloride | – | 0.54J | — | ND | 2 |
| | Chloromethane | 0.22L | — | — | NS | — |
| | Freon113 | 0.084L | — | — | NS | — |
| | Hexachlorobutadiene | 0.20L | — | — | NS | — |
| | Naphthalene | 0.19L | — | — | NS | — |
| | 1,2,3-Trichlorobenzene | 0.19L | — | — | NS | — |
| EPAS-4 | 1,2,4-Trichlorobenzene | 0.11L | — | — | NS | 70 |

Notes:
B = The Analytes were found in a method blank, as well as in the sample.
L = data below the required reporting limit
J = estimated value (laboratory qualifier) for various causes
f = Method Blanks
MCL = Maximum Contaminant Level
µg/L = micrograms per liter
--- = no MCL data found or given
* total trihalomethanes (sum of bromodichloromethane, dibromochloromethane, bromoform, and chloroform.)
** MCL reported is for total xylenes (sum of o-xylene, m-xylene, and p-xylene).

**TABLE 5**
**Detected VOCs in B-Zone Groundwater**

| Well ID | Chemical | DATE SAMPLED AND CONCENTRATIONS (µg/L) | | | | MCL µg/L |
|---|---|---|---|---|---|---|
| | | Jan-04 | Aug-07 | Apr-08 | Apr-09 | |
| CW-1 | Acetone | NS | – | NS | NS | — |
| | Chloromethane | 0.14L | – | NS | NS | — |
| AR-1 | Carbon tetrachloride | 0.86L | 2.8 | 8.6 | 7.9 | 5 |
| | Tetrachloroethene | – | 0.20J | 0.67J | ND | 5 |
| PWB-1 | Carbon tetrachloride | – | – | 0.19J | ND | 5 |
| PWB-2 | Other VOCs | | | | ND | |
| PWB-3 | Acetone | 2.1L,f | – | – | ND | — |
| | Methylene chloride | 0.097 O,L | – | – | ND | 5 |
| | Toluene | 0.40 O,L | – | – | ND | 1,000 |
| PWB-4 | Naphthalene | 1.1L | – | - | ND | — |
| | Toluene | 0.85 O,L | – | - | ND | 1,000 |
| | Methylene chloride | | | | 0.56BJ | 5 |
| | Tetrachloroethene | – | 0.17J | - | ND | 5 |
| PWB-5 | Other VOCs | | | | ND | |
| PWB-6 | Toluene | 0.16 O,L | – | – | ND | 1,000 |
| PWB-7A | 2-Butanone | NS | 2.7J | – | ND | — |
| PWB-8 | Toluene | 0.18 O,L | – | – | ND | 1,000 |
| PWB-9 | Other VOCs | | | | ND | |
| PWB-10 | Acetone | 2.4L | – | – | ND | — |
| | Benzene | 0.19L | – | – | ND | 5 |
| | 1,1-Dichloroethane | 0.043L | – | – | ND | — |
| | cis-1,3-Dichloropropene | | – | 0.51J | ND | — |
| | trans-1,3-Dichloropropene | | – | 0.18J | ND | — |
| | Methylene chloride | 0.079 O,L | – | – | ND | 5 |
| | Carbon tetrachloride | | | | 5 | 5 |
| | Toluene | 0.19 O,L | – | – | ND | 1,000 |
| PWB-11 | Toluene | 0.14 O,L | – | – | ND | 1,000 |
| PWB-12 | Acetone | NS | 11 | – | ND | — |
| | Carbon disulfide | | – | 0.24J | 0.28J | — |
| | 2-Butanone | NS | 650 | 82 | 21 | — |
| | 4-Methyl-2-pentanone | NS | 2.6 | 5.6J | 3.8J | — |
| AMW-3R | Carbon tetrachloride | 4.6 | 2.9 | 7.2 | 6.3 | 5 |
| | Tetrachloroethene | 0.35L | 0.18J | 0.41J | ND | 5 |
| | Trichloroethene | 0.086L | – | – | ND | 5 |
| AMW-4R | 1,2-Dichloroethane | – | – | 0.17J | ND | 5 |
| | Tetrachloroethene | – | – | 0.41J | ND | 5 |
| | Toluene | 0.58 O,L | – | – | ND | 1,000 |
| | Carbon tetrachloride | – | 3.9 | 4.2 | 4.4 | 5 |
| WB2-1 | Tetrachloroethene | – | 0.21J | – | ND | 5 |
| WB2-2 | Carbon tetrachloride | – | 0.40J | 1.8 | 1.2 | 5 |
| WB2-3 | Acetone | – | | 2.2J | ND | — |
| | Methylene chloride | 1.4 O | – | 1.3B | 0.57BJ | 5 |
| | Methyl tert-butyl ether | 0.16L | – | – | ND | — |
| | Toluene | 0.60L | – | – | ND | 1,000 |
| WB2-4 | Toluene | 0.80L | – | – | ND | 1,000 |

Notes:
L = Data below the required reporting limit  O = Trip Blank [Field QC (Quality Control)]  f = Method Blanks  MCL = Maximum Contaminant Level
— = no MCL data found or given  µg/L = micrograms per liter

**TABLE 6**
**Summary of Trend analysis**
**A-Zone**

| Well No. | Chemical | TREND ANALYSIS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Mann-Kendall Test | | | Regression | | | | | | | |
| | | S-Statistic | Conclusion | CV | Trend | First Order Decay Rate, k (µg/L*Day) | Intercept (µg/L) | $R^2$ (%) | t-statistic | P-Value | Statistical Significance (α=0.2) | Projected time of Dropping Below MCL (yrs counting from 2010) |
| AMW-1P | 1,2-DCP | -148 | Decreasing | | Decreasing | 0.0006291 | 13.20776339 | 0.38 | 5.513479375 | 7.69226E-06 | YES | 17 |
| | Dinoseb | -48 | Decreasing | | Decreasing | 0.0004462 | 10.58349161 | 0.19 | 3.71392029 | 0.001028912 | YES | 30 |
| | 1,2,3-TCP | -192 | Decreasing | | Decreasing | 0.0007524 | 14.63536123 | 0.55 | 7.25913634 | 8.29418E-08 | YES | 8 |
| AMW-2P | 1,2-DCP | 28 | No Trend | 0.4 | Decreasing | 0.0000113 | 5.044559035 | 0.23 | -0.243625506 | 0.809432924 | NO | |
| | Dinoseb | 25 | No Trend | 3.0 | Decreasing | 0.0000844 | 3.900356427 | 1.46 | -0.583376182 | 0.565317344 | NO | |
| | 1,2,3-TCP | 111 | No Trend | 0.5 | Increasing | -0.0000895 | 2.179704455 | 10.60 | 1.755382301 | 0.090971409 | YES | N/A |
| AP-4 | 1,2-DCP | -6 | No Trend | 0.96 | Decreasing | 0.0000628 | 5.153621527 | 0.02 | -0.646625843 | 0.523333417 | NO | |
| | 1,2,3-TCP | 10 | No Trend | 1.1 | Decreasing | 0.0000207 | 3.183681571 | 0.17 | -0.213738329 | 0.832356975 | NO | |
| EPAS-2 | 1,2-DCP | -193 | Decreasing | | Decreasing | 0.0005301 | 12.13034513 | 44.84 | -4.597356003 | 9.72993E-05 | YES | 28 |
| | Dinoseb | -167 | Decreasing | | Decreasing | 0.0005446 | 11.19077049 | 40.77 | -4.064754273 | 0.000447317 | YES | 11 |
| | 1,2,3-TCP | -206 | Decreasing | | Decreasing | 0.0004368 | 9.307044611 | 50.29 | -5.226059111 | 1.65988E-05 | YES | 16 |
| EPAS-3 | 1,2-DCP | -265 | Decreasing | | Decreasing | 0.0002739 | 8.6537386 | 40.71 | 8.802337258 | 1.48643E-09 | YES | 76 |
| | DBCP | -298 | Decreasing | | Decreasing | 0.0004759 | 10.72942698 | 70.04 | 10.97175372 | 4.77843E-11 | YES | 44 |
| | Dinoseb | 50 | No Trend | 1.2 | Decreasing | 0.0000670 | 2.180735355 | 1.65 | 1.336579795 | 0.193397518 | NO | |
| | 1,2,3-TCP | -198 | Decreasing | | Decreasing | 0.0001947 | 6.342282123 | 27.82 | 6.798668858 | 2.19633E-07 | YES | 75 |
| WA-6 | 1,2-DCP | -84 | Decreasing | | Decreasing | 0.0003288 | 9.501760278 | 17.15 | -2.181841565 | 0.039594894 | YES | 61 |
| | Dinoseb | -53 | Decreasing | | Decreasing | 0.00044709 | 9.281961114 | 18.98 | -2.164759105 | 0.042676722 | YES | 11 |
| | 1,2,3-TCP | -26 | Decreasing | | Decreasing | 0.0001504 | 5.441184722 | 4.81 | -1.08 | 0.29 | NO | 92 |
| WA-7 | 1,2-DCP | -137 | Decreasing | | Decreasing | 0.0002397 | 7.900570357 | 48.62 | -4.45803845 | 0.000217341 | YES | 82 |
| | 1,2,3-TCP | -189 | Decreasing | | Decreasing | 0.0002256 | 6.063050223 | 78.86 | -8.85171965 | 1.56746E-08 | YES | 42 |

Notes:
CV = co-efficient of variation
µg/L/Day = micrograms per liter per day
µg/L - micrograms per liter
$R^2$ = co-efficient of determination
α = level of sign

1,2-DCP = 1,2-dichloropropane
1,2,3-TCP = 1,2,3-trichloropropane
DBCP = 1,2-dibromo-3-chloropropane

**TABLE 7**
**Summary of Trend Analysis**
**B-Zone**

| Well No. | Chemical | TREND ANALYSIS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Mann-Kendall Test | | Regression | | | | | | | |
| | | S-Statistic | Conclusion | Trend | $R^2$ | First Order Decay Rate, k/ln(10) (µg/L* Day) | Intercept (µg/L) | t-statistic | P-Value | Statistical Significance (α=0.05) | Projected time of Dropping Below MCL (yrs counting from 2010) |
| AR-1 | 1,2-DCP | -223 | Decreasing | Decreasing | 70.74 | 3481.513053 | 37434.76212 | -7.293330739 | 2.64524E-07 | YES | 0 |
| AMW-3R | 1,2-DCP | 9 | No Trend | Inconclusive | 0.89 | 1.49231E-05 | 0.771511518 | -0.453465389 | 0.654463156 | NO | N/A |
| AMW-4R | 1,2-DCP | 6 | No Trend | Inconclusive | 0.64 | -2.82868E-05 | -0.120111897 | 0.41033019 | 0.684925518 | NO | N/A |
| WB2-1 | 1,2-DCP | 13 | No Trend | Inconclusive | 6.75 | 0.000118836 | 5.892643346 | -1.290572901 | 0.209675276 | NO | N/A |
| | 1,2,3-TCP | 97 | Increasing | Increasing | 18.90 | -0.000261901 | -7.988833282 | 2.31552124 | 0.02985343 | YES | |
| | Dinoseb | 70 | Increasing | Inconclusive | 9.41 | -0.000125729 | -3.520375999 | 1.328495721 | 0.20157353 | NO | N/A |
| | DBCP | -80 | Decreasing | Decreasing | 54.03 | 0.000400022 | 14.11121421 | -4.198838571 | 0.000774719 | YES | 0 |
| WB2-2 | 1,2-DCP | -19 | No Trend | Inconclusive | 6.15 | 6.7732E-05 | 3.479737945 | -1.116088272 | 0.278301213 | NO | N/A |
| | 1,2,3-TCP | 48 | Increasing | Inconclusive | 1.21 | -4.36278E-05 | -0.594107701 | 0.442707034 | 0.663904286 | NO | N/A |
| | Dinoseb | 26 | Increasing | Inconclusive | 18.30 | -0.000114114 | -3.727705709 | 1.419731572 | 0.18938256 | NO | N/A |
| | DBCP | -17 | No Trend | Inconclusive | 0.72 | 3.18E-05 | 1.416418885 | -0.340644885 | 0.73780264 | NO | N/A |
| PWB-2 | 1,2-DCP | 45 | Increasing | Increasing | 62.57 | -0.000358677 | -12.81741811 | 3.87865861 | 0.003739045 | YES | |
| PWB-4 | 1,2-DCP | -10 | No Trend | Decreasing | 49.60 | 0.000174841 | 8.398102163 | -2.976083998 | 0.015548094 | YES | 12 |
| | 1,2,3-TCP | 10 | No Trend | Inconclusive | 11.53 | 7.22408E-05 | 5.038768353 | -1.08276256 | 0.307068645 | NO | N/A |
| | Dinoseb | 5 | No trend | Inconclusive | 1.83 | 3.48004E-05 | 2.765495257 | -0.386382085 | 0.709287325 | NO | N/A |
| | DBCP | -19 | Decreasing | Decreasing | 87.95 | 0.000476124 | 19.39821466 | -8.104474645 | 1.99523E-05 | YES | 7 |

**TABLE 8**
**A-Zone Groundwater Aquifer Thicknesses**

**April 2009**

| Well ID | Well Depth (feet btc) | Well Screen Interval (feet bgs) | Depth To Groundwater (feet btc) | Groundwater Thickness (feet) |
|---|---|---|---|---|
| AMW-1P | 75.00± | 60.8-70.8 | 73.46 | 4.54 |
| AMW-2P | 75.3 | 63.6-73.6 | Dry | Dry |
| AP-1 | 71.15 | 59.5-69.5 | Dry | Dry |
| AP-2 | NR | NR | Dry | Dry |
| AP-4 | 75.19 | 60-70 | Dry | Dry |
| WA-1 | 78.5 | 63-78 | 71.39 | 7.11 |
| WA-2 | 75.5 | 63-73 | 69.52 | 5.98 |
| WA-3 | 80.08 | 68-78 | 77.18 | 2.9 |
| WA-4 | 78.58 | 66-76 | Dry | Dry |
| WA-5 | 80± | 67-77 | 75.83 | 4.2 |
| WA-6 | 78.1 | 64-74 | 74.82 | 3.28 |
| WA-7 | 79 | 66-76 | Dry | Dry |
| WA-8 | 71.6 | 61-71 | Dry | Dry |
| WA-9 | 78.5 | 68-78 | 73.31 | 5.19 |
| EPAS-1 | 88.75 | NR | 87.26 | 1.49 |
| EPAS-2 | 86.2 | 64-84 | 76.22 | 9.98 |
| EPAS-3 | 86.3 | 64-86 | 75.78 | 10.52 |
| EPAS-4 | 84.2 | 62-82 | 78.45 | 5.75 |
| PWA-1 | 85.05 | 65-85 | 82.32 | 2.73 |
| PWA-2 | 84.3 | 64-84 | 79.62 | 4.68 |
| PWA-3 | 84.9 | 64.5-84.5 | 73.28 | 11.62 |
| PWA-4 | 84.65 | 64.5-84.5 | Dry | Dry |
| PWA-5 | 84.65 | 64.5-84.5 | Dry | Dry |
| PWA-6 | 76.05 | 63-83 | Dry | Dry |
| PWA-7 | 78.27 | 58-78 | 70.84 | 7.43 |

Notes:
btc = below top of casing.
bgs = below ground surface (from well construction diagrams).

**TABLE 9**
**Well Ranking Summary**
**Brown and Bryant, Arvin, California**

| Well ID | Purpose | Well Ranking (1-5) | | | | Comments |
|---|---|---|---|---|---|---|
| | | Data Record[1] | Well Location[2] | Well Construction[3] | Total Ranking4[4] | |
| EW-1 | Extraction Well | 1 | 1 | 3 | 5 | No data record. Slow infiltration area. Well details unknown. |
| EW-2 | Extraction Well | 1 | 1 | 3 | 5 | No data record. Slow infiltration area. Well details unknown. |
| EW-3 | Extraction Well | 1 | 1 | 3 | 5 | No data record. Slow infiltration area. Well details unknown. |
| IW-1 | Injection Well | 1 | 1 | 3 | 5 | No data record. Well details unknown. |
| IW-2 | Injection Well | 1 | 1 | 3 | 5 | No data record. Well details unknown. |
| MW-1 | Monitoring well | 1 | 1 | 3 | 5 | No data record. Adjacent to AMW-1P. Well details unknown. |
| MW-2 | Monitoring well | 1 | 1 | 3 | 5 | No data record. Adjacent to AMW-1P. Well details unknown. |
| MW-3 | Monitoring well | 1 | 1 | 3 | 5 | No data record. Adjacent to AMW-1P. Well details unknown. |
| MW-4 | Monitoring well | 1 | 1 | 3 | 5 | No data record. Adjacent to AMW-1P. Well details unknown. |
| AMW-1P | A-Zone Monitoring Well | 4 | 4 | 4 | 12 | Data record 1987-2004. Dry since 2007. |
| AMW-2P | A-Zone Monitoring Well | 4 | 4 | 4 | 12 | Data record 1987-2004. Dry since 2007. |
| AP-1 | A-Zone Monitoring Well | 5 | 5 | 4 | 14 | Data record 1987-2009 |
| AP-2 | A-Zone Monitoring Well | 3 | 5 | 3 | 11 | Dry since 2007. No data since 2004. Well details unknown. |
| AP-4 | A-Zone Monitoring Well | 4 | 5 | 4 | 13 | Dry since 2007. No data since Jan. 2004 |
| AP-5 | A-Zone Monitoring Well | 1 | 1 | 4 | 6 | No data record. Located adjacent to WA-3 & AR-1. |
| WA-1 | A-Zone Monitoring Well | 5 | 5 | 4 | 14 | Data record 1992-2009 |
| WA-2 | A-Zone Monitoring Well | 5 | 5 | 4 | 14 | Data record 1992-2009 |
| WA-3 | A-Zone Monitoring Well | 5 | 5 | 4 | 14 | Data record 1992-2009 |
| WA-4 | A-Zone Monitoring Well | 4 | 5 | 4 | 13 | Data record 1992-2004. Dry since 2007. |
| WA-5 | A-Zone Monitoring Well | 5 | 5 | 4 | 14 | Data record 1992-2009 |
| WA-6 | A-Zone Monitoring Well | 5 | 5 | 4 | 14 | Data record 1992-2008. Dry in 2009. |
| WA-7 | A-Zone Monitoring Well | 4 | 5 | 4 | 13 | Data record 1992-2004. Dry since 2007. |
| WA-8 | A-Zone Monitoring Well | 4 | 4 | 4 | 12 | Data record 1992-2004. Dry since 2007. |
| WA-9 | A-Zone Monitoring Well | 5 | 5 | 4 | 14 | Data record 1992-2009 |
| EPAS-1 | A-Zone Monitoring Well | 4 | 5 | 3 | 12 | Data record 2002-2009. Well details unknown. |
| EPAS-2 | A-Zone Monitoring Well | 5 | 5 | 4 | 14 | Data record 1990-2009 |
| EPAS-3 | A-Zone Monitoring Well | 5 | 5 | 4 | 14 | Data record 1990-2009 |
| EPAS-4 | A-Zone Monitoring Well | 4 | 3 | 4 | 11 | Data record 1990-2007. Dry since 2008. |
| PWA-1 | A-Zone Monitoring Well | 4 | 5 | 5 | 14 | Data record 2002-2009 |
| PWA-2 | A-Zone Monitoring Well | 5 | 5 | 5 | 15 | PWA-2 replaced AP-3. Data record 1988-1994 & 2002-2009. |
| PWA-3 | A-Zone Monitoring Well | 4 | 5 | 5 | 14 | Data record 2002-2009 |
| PWA-4 | A-Zone Monitoring Well | 3 | 4 | 5 | 12 | Spotty data record due to dry conditions. |
| PWA-5 | A-Zone Monitoring Well | 1 | 1 | 4 | 6 | Dry well since 2002 |
| PWA-6 | A-Zone Monitoring Well | 4 | 4 | 5 | 13 | Data record 2003-2009 |
| PWA-7 | A-Zone Monitoring Well | 4 | 5 | 5 | 14 | Data record 2003-2009 |
| AMW-3R | B-Zone Monitoring Well | 5 | 4 | 2 | 11 | Data record 1987-2009. Well screen length (80') not ideal. |
| AMW-4R | B-Zone Monitoring Well | 5 | 5 | 2 | 12 | Data record 1987-2009. Well screen length (60') not ideal. |
| AR-1 | B-Zone Monitoring Well | 5 | 5 | 4 | 14 | Data record 1988-2009 |
| WB2-1 | B-Zone Monitoring Well | 5 | 5 | 4 | 14 | Data record 1991-2009 |
| WB2-2 | B-Zone Monitoring Well | 5 | 5 | 4 | 14 | Data record 1992-2009 |

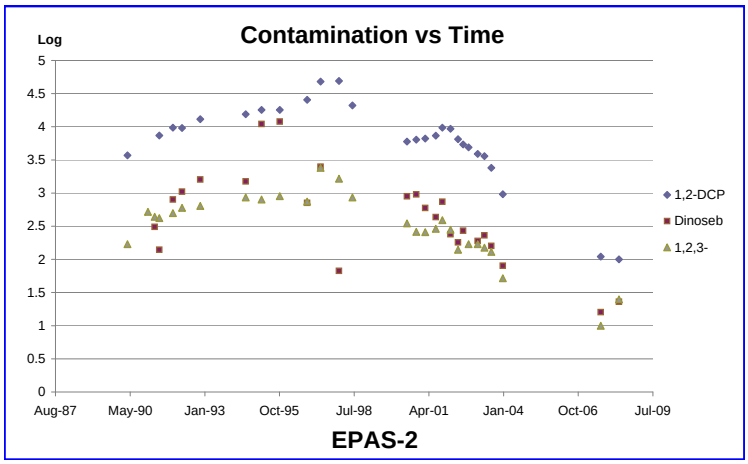
**TABLE 9 - continued**
**Well Ranking Summary**
**Brown and Bryant, Arvin, California**

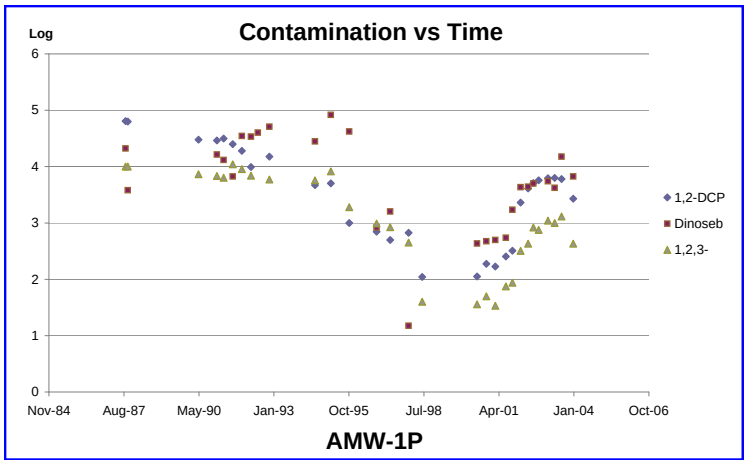
| Well ID | Purpose | Well Ranking (1-5) | | | | Comments |
|---|---|---|---|---|---|---|
| | | Data Record[1] | Well Location[2] | Well Construction[3] | Total Ranking4[4] | |
| WB2-3 | B-Zone Monitoring Well | 5 | 5 | 4 | 14 | Data record 1992-2009 |
| WB2-4 | B-Zone Monitoring Well | 5 | 5 | 4 | 14 | Data record 1992-2009 |
| PWB-1 | B-Zone Monitoring Well | 4 | 5 | 5 | 14 | Data record 2002-2009 |
| PWB-2 | B-Zone Monitoring Well | 4 | 5 | 5 | 14 | Data record 2002-2009 |
| PWB-3 | B-Zone Monitoring Well | 4 | 5 | 5 | 14 | Data record 2002-2009 |
| PWB-4 | B-Zone Monitoring Well | 4 | 5 | 5 | 14 | Data record 2002-2009 |
| PWB-5 | B-Zone Monitoring Well | 4 | 5 | 5 | 13 | Data record 2003-2009 |
| PWB-6 | B-Zone Monitoring Well | 4 | 4 | 5 | 13 | Data record 2003-2009 |
| PWB-7A | B-Zone Monitoring Well | 4 | 5 | 5 | 14 | Data record 2003-2009 |
| PWB-8 | B-Zone Monitoring Well | 4 | 5 | 5 | 14 | Data record 2004-2009 |
| PWB-9 | B-Zone Monitoring Well | 4 | 4 | 5 | 13 | Data record 2004-2009 |
| PWB-10 | B-Zone Monitoring Well | 4 | 5 | 5 | 14 | Data record 2004-2009 |
| PWB-11 | B-Zone Monitoring Well | 4 | 5 | 5 | 14 | Data record 2004-2009 |
| PWB-12 | B-Zone Monitoring Well | 3 | 5 | 5 | 13 | Data record 2007-2009 |
| PWB-13 | B-Zone Monitoring Well | 3 | 5 | 5 | 13 | Data record 2008-2009 |

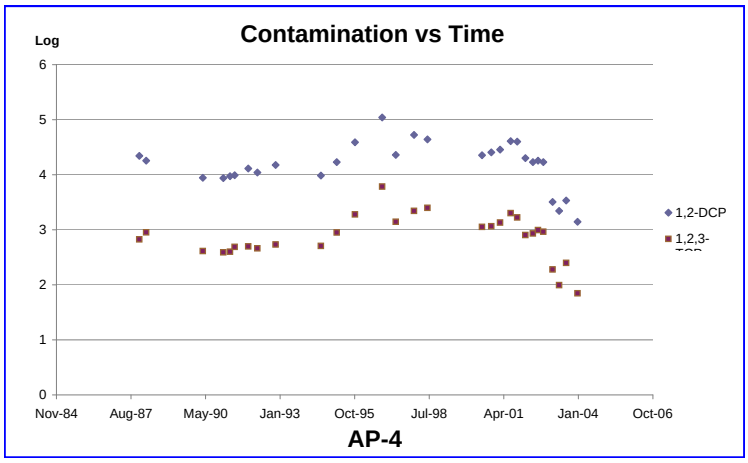
Notes:
1 - Wells with higher ranking have a longer and more complete data record.
2 - Wells with higher ranking are widely spaced and contribute well to assessing the overall contaminant extent.
3 - Wells with higher ranking are considered to be well constructed (good screen and seal placement). Rankings are as follows: 1) well not useable due to defects or construction is known to contribute to contaminant migration from A-zone to B-zone, 2) well is suspected of contributing to contaminant migration from A-zone to B-zone, 3) well construction not known, 4) well construction appears adequate, 5) well construction is known to be well done.
4 - Wells with a ranking totaling less than 10 are not considered an asset to the groundwater monitoring program. It is recommended that wells with rankings greater than 10 be utilized for continued monitoring.

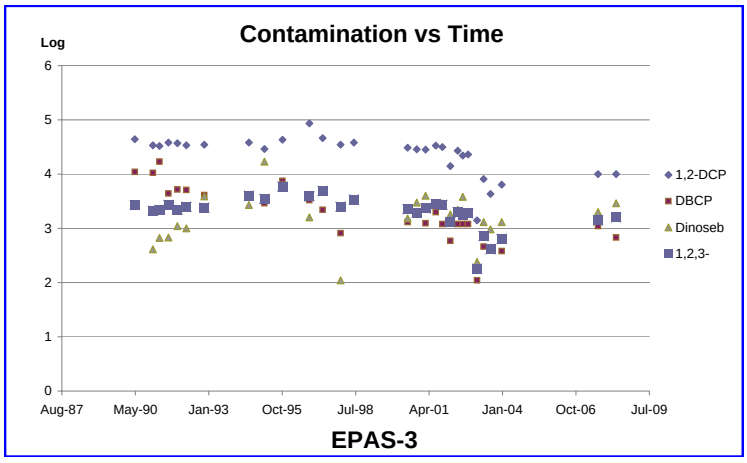
# CHARTS

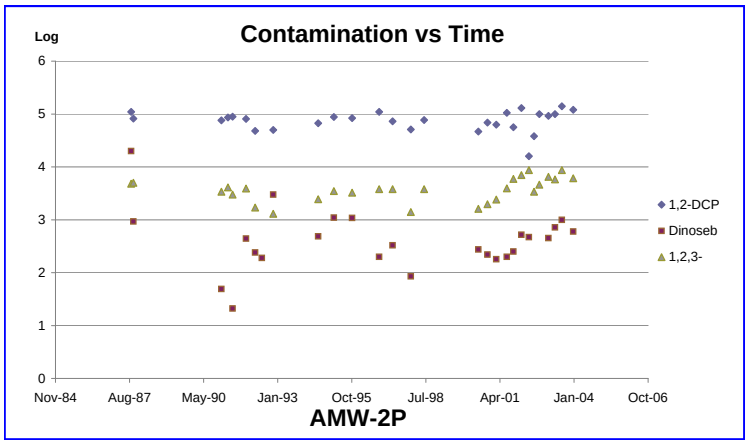
# CHART 1
## Contamination Versus Time in Seven Wells

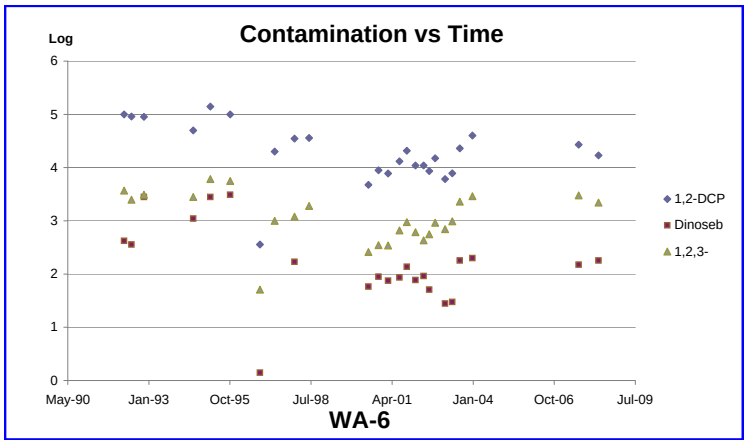


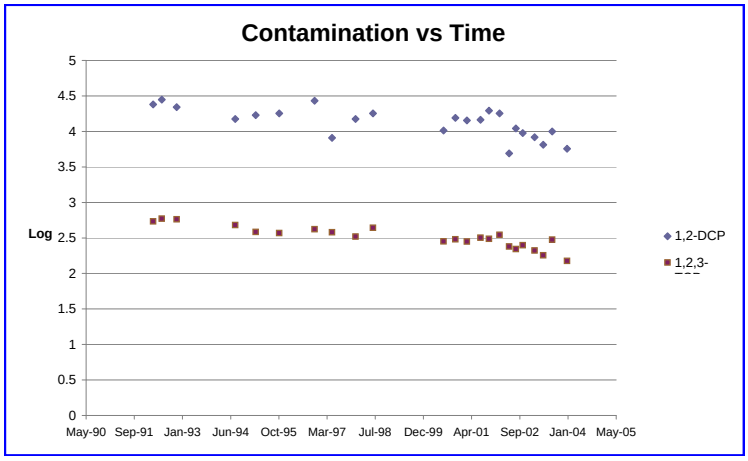



# CHART 2
## Mean Contaminant Levels (1987-2009) (A-Zone)

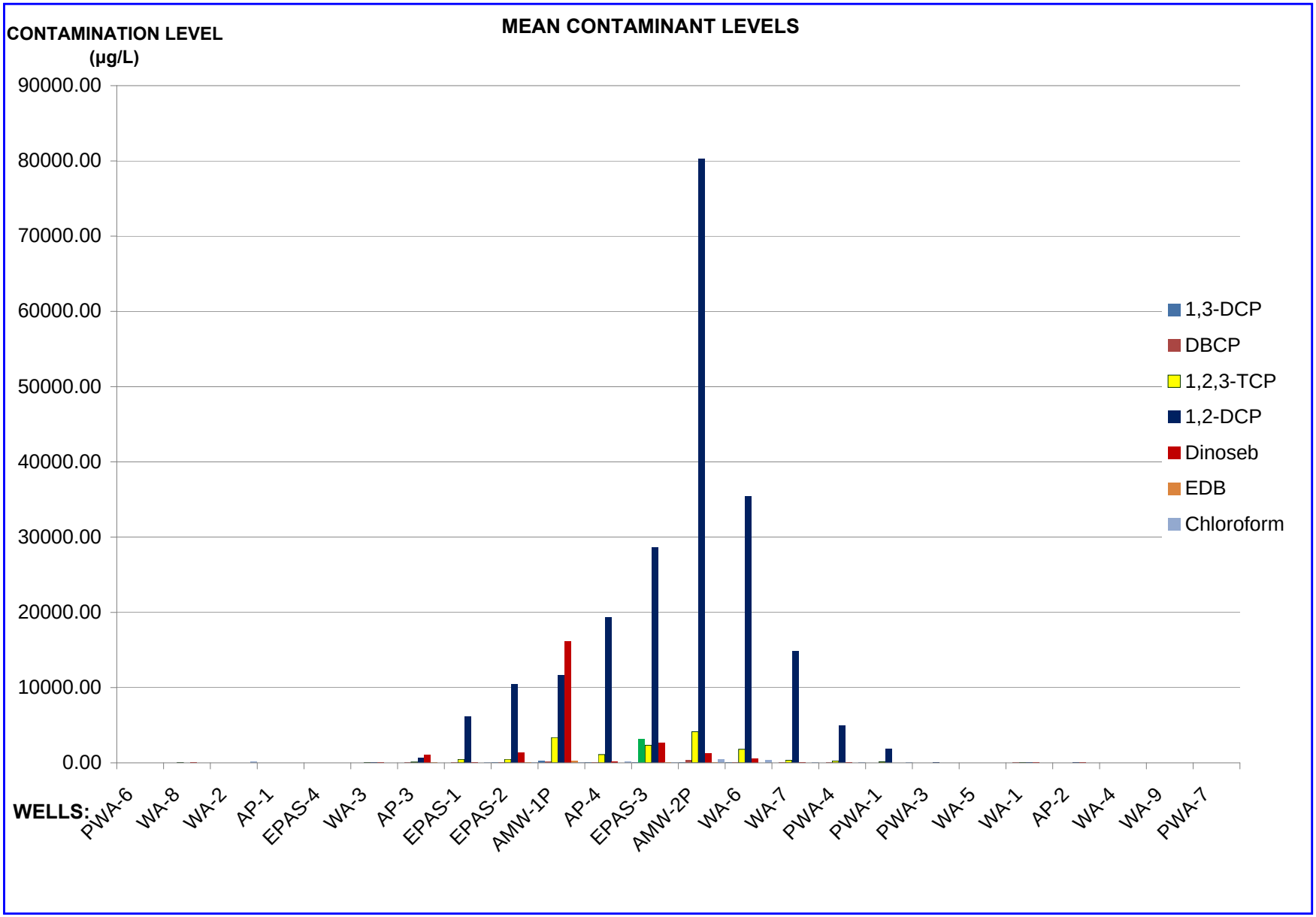
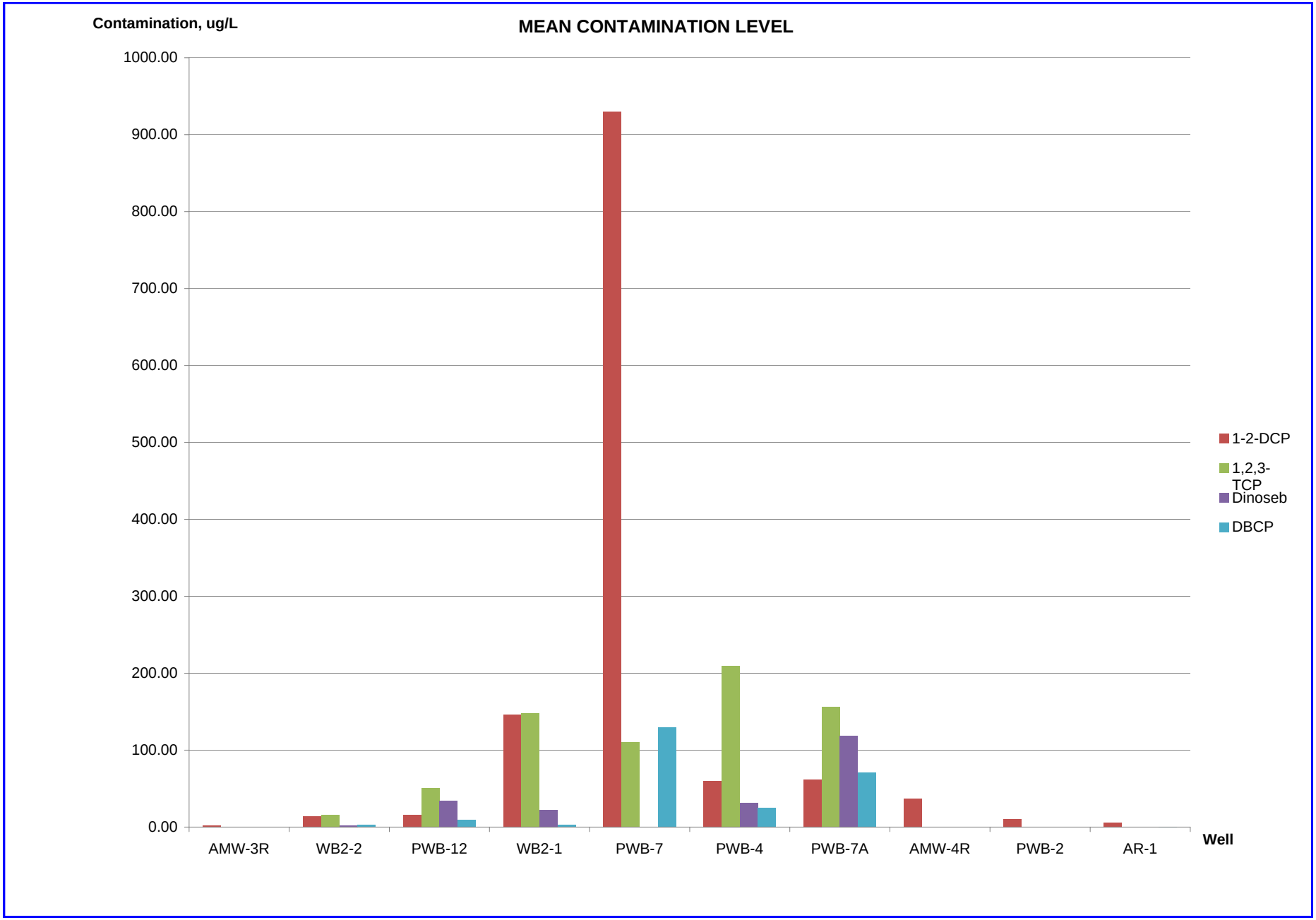


**CHART 3**
**Mean Contaminant Levels (1987-2009) (B-Zone)**



# APPENDIX A

## STATISTICAL ANALYSES DATA
## A-ZONE

# APPENDIX A
## Statistical Analyses Data - A-Zone

| EPAS-2 | | | |
|---|---|---|---|
| Date | 1,2-DCP | Dinoseb | 1,2,3-TCP |
| Apr-90 | 3.568201724 | | 2.230448921 |
| Jan-91 | | | 2.716003344 |
| Apr-91 | | 2.491361694 | 2.643452676 |
| Jun-91 | 3.86923172 | 2.146128036 | 2.62324929 |
| Dec-91 | 3.986771734 | 2.903089987 | 2.698970004 |
| Apr-92 | 3.982271233 | 3.021189299 | 2.77815125 |
| Dec-92 | 4.113943352 | 3.204119983 | 2.806179974 |
| Aug-94 | 4.190331698 | 3.176091259 | 2.934498451 |
| Mar-95 | 4.255272505 | 4.041392685 | 2.903089987 |
| Nov-95 | 4.255272505 | 4.079181246 | 2.954242509 |
| Nov-96 | 4.40654018 | 2.851258349 | 2.872156273 |
| May-97 | 4.681241237 | 3.397940009 | 3.380211242 |
| Jan-98 | 4.69019608 | 1.826074803 | 3.217483944 |
| Jul-98 | 4.322219295 | | 2.934498451 |
| Jul-00 | 3.776701184 | 2.951337519 | 2.544068044 |
| Nov-00 | 3.805500858 | 2.980003372 | 2.414973348 |
| Mar-01 | 3.822168079 | 2.775974331 | 2.409933123 |
| Jul-01 | 3.865103975 | 2.638489257 | 2.460897843 |
| Oct-01 | 3.985875357 | 2.869818208 | 2.591064607 |
| Feb-02 | 3.968482949 | 2.380211242 | 2.447158031 |
| May-02 | 3.812913357 | 2.255272505 | 2.146128036 |
| Jul-02 | 3.73239376 | 2.431363764 | |
| Oct-02 | 3.69019608 | | 2.230448921 |
| Feb-03 | 3.591064607 | 2.278753601 | 2.230448921 |
| May-03 | 3.556302501 | 2.361727836 | 2.176091259 |
| Aug-03 | 3.380211242 | 2.204119983 | 2.113943352 |
| Jan-04 | 2.982271233 | 1.903089987 | 1.716003344 |
| Aug-07 | 2.041392685 | 1.204119983 | 1 |
| Apr-08 | 2 | 1.361727836 | 1.397940009 |
| Apr-09 | 2.716003344 | 1.505149978 | 1.491361694 |

| AMW-1P | | | |
|---|---|---|---|
| Date | 1,2-DCP | Dinoseb | 1,2,3-TCP |
| Sep-87 | 4.806179974 | 4.322219295 | 4 |
| Oct-87 | 4.799340549 | 3.579783597 | 4 |
| May-90 | 4.477121255 | | 3.86332286 |
| Jan-91 | 4.462397998 | 4.213517757 | 3.832508913 |
| Apr-91 | 4.498310554 | 4.117271296 | 3.802773725 |
| Aug-91 | 4.397940009 | 3.826074803 | 4.041392685 |
| Dec-91 | 4.278753601 | 4.544068044 | 3.954242509 |
| Apr-92 | 3.991226076 | 4.531478917 | 3.838849091 |
| Jul-92 | | 4.602059991 | |
| Dec-92 | 4.176091259 | 4.707570176 | 3.770852012 |
| Aug-94 | 3.672097858 | 4.447158031 | 3.755874856 |
| Mar-95 | 3.703291378 | 4.919078092 | 3.916453949 |
| Nov-95 | 3 | 4.62324929 | 3.278753601 |
| Nov-96 | 2.84509804 | 2.919078092 | 2.991226076 |
| May-97 | 2.698970004 | 3.204119983 | 2.924279286 |
| Jan-98 | 2.826074803 | 1.176091259 | 2.653212514 |
| Jul-98 | 2.041392685 | | 1.602059991 |
| Jul-00 | 2.049218023 | 2.635483747 | 1.556302501 |
| Nov-00 | 2.274157849 | 2.675778342 | 1.698970004 |
| Mar-01 | 2.225309282 | 2.696356389 | 1.531478917 |
| Jul-01 | 2.404833717 | 2.737987326 | 1.875061263 |
| Oct-01 | 2.507855872 | 3.23299611 | 1.939519253 |
| Feb-02 | 3.361727836 | 3.633468456 | 2.505149978 |
| May-02 | 3.612783857 | 3.643452676 | 2.633468456 |
| Jul-02 | 3.707570176 | 3.698970004 | 2.919078092 |
| Oct-02 | 3.755874856 | | 2.875061263 |
| Feb-03 | 3.792391689 | 3.740362689 | 3.041392685 |
| May-03 | 3.799340549 | 3.62324929 | 3 |
| Aug-03 | 3.77815125 | 4.176091259 | 3.113943352 |
| Jan-04 | 3.431363764 | 3.826074803 | 2.633468456 |

| AP-4 | | |
|---|---|---|
| Date | 1,2-DCP | 1,2,3-TCP |
| Dec-87 | 4.342422681 | 2.826074803 |
| Mar-88 | 4.255272505 | 2.954242509 |
| Apr-90 | 3.944482672 | 2.612783857 |
| Jan-91 | 3.939519253 | 2.591064607 |
| Apr-91 | 3.973127854 | 2.602059991 |
| Jun-91 | 3.991226076 | 2.69019608 |
| Dec-91 | 4.113943352 | 2.698970004 |
| Apr-92 | 4.041392685 | 2.662757832 |
| Dec-92 | 4.176091259 | 2.73239376 |
| Aug-94 | 3.986771734 | 2.707570176 |
| Mar-95 | 4.230448921 | 2.949390007 |
| Nov-95 | 4.591064607 | 3.278753601 |
| Nov-96 | 5.041392685 | 3.785329835 |
| May-97 | 4.361727836 | 3.146128036 |
| Jan-98 | 4.72427587 | 3.342422681 |
| Jul-98 | 4.643452676 | 3.397940009 |
| Jul-00 | 4.354108439 | 3.053078443 |
| Nov-00 | 4.408239965 | 3.064457989 |
| Mar-01 | 4.456366033 | 3.130333768 |
| Jul-01 | 4.611723308 | 3.303196057 |
| Oct-01 | 4.600972896 | 3.222716471 |
| Feb-02 | 4.301029996 | 2.903089987 |
| May-02 | 4.230448921 | 2.934498451 |
| Jul-02 | 4.255272505 | 2.995635195 |
| Oct-02 | 4.230448921 | 2.963787827 |
| Feb-03 | 3.505149978 | 2.278753601 |
| May-03 | 3.342422681 | 1.995635195 |
| Aug-03 | 3.531478917 | 2.397940009 |
| Jan-04 | 3.146128036 | 1.84509804 |

| EPAS-3 | | | | |
|---|---|---|---|---|
| Date | 1,2-DCP | DBCP | Dinoseb | 1,2,3-TCP |
| May-90 | 4.643452676 | 4.041392685 | | 3.431363764 |
| Jan-91 | 4.531478917 | 4.02325246 | 2.613841822 | 3.322219295 |
| Apr-91 | 4.51851394 | 4.230448921 | 2.822168079 | 3.342422681 |
| Aug-91 | 4.579783597 | 3.643452676 | 2.832508913 | 3.431363764 |
| Dec-91 | 4.568201724 | 3.716003344 | 3.041392685 | 3.342422681 |
| Apr-92 | 4.531478917 | 3.707570176 | 3 | 3.397940009 |
| Jul-92 | | | | |
| Dec-92 | 4.544068044 | 3.612783857 | 3.591064607 | 3.380211242 |
| Aug-94 | 4.579783597 | 3.602059991 | 3.431363764 | 3.602059991 |
| Mar-95 | 4.462397998 | 3.462397998 | 4.230448921 | 3.544068044 |
| Nov-95 | 4.633468456 | 3.875061263 | 3.806179974 | 3.770852012 |
| Nov-96 | 4.934498451 | 3.51851394 | 3.204119983 | 3.591064607 |
| May-97 | 4.662757832 | 3.342422681 | 3.69019608 | 3.69019608 |
| Jan-98 | 4.544068044 | 2.912222057 | 2.041392685 | 3.397940009 |
| Jul-98 | 4.579783597 | | | 3.531478917 |
| Jul-00 | 4.487138375 | 3.113943352 | 3.181843588 | 3.354108439 |
| Nov-00 | 4.456366033 | | 3.474216264 | 3.285557309 |
| Mar-01 | 4.450249108 | 3.093421685 | 3.602059991 | 3.369215857 |
| Jul-01 | 4.523746467 | 3.29666519 | 3.46686762 | 3.447158031 |
| Oct-01 | 4.499687083 | 3.079181246 | 3.462397998 | 3.432969291 |
| Feb-02 | 4.146128036 | 2.770852012 | 3.255272505 | 3.113943352 |
| May-02 | 4.431363764 | 3.079181246 | 3.342422681 | 3.301029996 |
| Jul-02 | 4.342422681 | 3.079181246 | 3.579783597 | 3.255272505 |
| Oct-02 | 4.361727836 | 3.079181246 | | 3.278753601 |
| Feb-03 | 3.146128036 | 2.041392685 | 2.380211242 | 2.255272505 |
| May-03 | 3.908485019 | 2.662757832 | 3.113943352 | 2.857332496 |
| Aug-03 | 3.633468456 | | 2.982271233 | 2.612783857 |
| Jan-04 | 3.806179974 | 2.579783597 | 3.113943352 | 2.806179974 |
| Aug-07 | 4 | 3.041392685 | 3.301029996 | 3.146128036 |
| Apr-08 | 4 | 2.832508913 | 3.462397998 | 3.204119983 |
| Apr-09 | 3.963787827 | 2.72427587 | 3.361727836 | 2.973127854 |

| AMW-2P | | | |
|---|---|---|---|
| Date | 1,2-DCP | Dinoseb | 1,2,3-TCP |
| Sep-87 | 5.041392685 | 4.301029996 | 3.681241237 |
| Oct-87 | 4.913813852 | 2.968482949 | 3.698970004 |
| Jan-91 | 4.880813592 | 1.69019608 | 3.531478917 |
| Apr-91 | 4.934498451 | | 3.612783857 |
| Jun-91 | 4.949390007 | 1.322219295 | 3.477121255 |
| Dec-91 | 4.908485019 | 2.643452676 | 3.591064607 |
| Apr-92 | 4.681241237 | 2.380211242 | 3.230448921 |
| Jul-92 | | 2.278753601 | |
| Dec-92 | 4.698970004 | 3.477121255 | 3.113943352 |
| Aug-94 | 4.826074803 | 2.685741739 | 3.389166084 |
| Mar-95 | 4.944482672 | 3.041392685 | 3.544068044 |
| Nov-95 | 4.924279286 | 3.035429738 | 3.511883361 |
| Nov-96 | 5.041392685 | 2.301029996 | 3.579783597 |
| May-97 | 4.86332286 | 2.51851394 | 3.579783597 |
| Jan-98 | 4.707570176 | 1.929418926 | 3.146128036 |
| Jul-98 | 4.886490725 | | 3.579783597 |
| Jul-00 | 4.667452953 | 2.437750563 | 3.206825876 |
| Nov-00 | 4.838219222 | 2.342422681 | 3.294466226 |
| Mar-01 | 4.797959644 | 2.255272505 | 3.383815366 |
| Jul-01 | 5.021189299 | 2.301029996 | 3.593286067 |
| Oct-01 | 4.749736316 | 2.397940009 | 3.773786445 |
| Feb-02 | 5.113943352 | 2.716003344 | 3.84509804 |
| May-02 | 4.204119983 | 2.672097858 | 3.939519253 |
| Jul-02 | 4.579783597 | | 3.531478917 |
| Oct-02 | 5 | | 3.662757832 |
| Feb-03 | 4.963787827 | 2.653212514 | 3.812913357 |
| May-03 | 5 | 2.857332496 | 3.763427994 |
| Aug-03 | 5.146128036 | 3 | 3.939519253 |
| Jan-04 | 5.079181246 | 2.77815125 | 3.785329835 |

| WA-6 | | | |
|---|---|---|---|
| Date | 1,2-DCP | Dinoseb | 1,2,3-TCP |
| Apr-92 | 5 | 2.62324929 | 3.568201724 |
| Jul-92 | 4.959041392 | 2.556302501 | 3.397940009 |
| Dec-92 | 4.954242509 | 3.447158031 | 3.491361694 |
| Aug-94 | 4.698970004 | 3.041392685 | 3.447158031 |
| Mar-95 | 5.146128036 | 3.447158031 | 3.785329835 |
| Nov-95 | 5 | 3.491361694 | 3.748188027 |
| Nov-96 | 2.556302501 | 0.146128036 | 1.707570176 |
| May-97 | 4.301029996 | | 3 |
| Jan-98 | 4.544068044 | 2.230448921 | 3.079181246 |
| Jul-98 | 4.556302501 | | 3.278753601 |
| Jul-00 | 3.677606953 | 1.764922985 | 2.414973348 |
| Nov-00 | 3.950851459 | 1.951337519 | 2.542825427 |
| Mar-01 | 3.890421019 | 1.875639937 | 2.537819095 |
| Jul-01 | 4.117271296 | 1.935507266 | 2.819543936 |
| Oct-01 | 4.315970345 | 2.136720567 | 2.975891136 |
| Feb-02 | 4.041392685 | 1.886490725 | 2.785329835 |
| May-02 | 4.041392685 | 1.963787827 | 2.633468456 |
| Jul-02 | 3.934498451 | 1.707570176 | 2.748188027 |
| Oct-02 | 4.176091259 | | 2.963787827 |
| Feb-03 | 3.785329835 | 1.447158031 | 2.84509804 |
| May-03 | 3.892094603 | 1.477121255 | 2.991226076 |
| Aug-03 | 4.361727836 | 2.255272505 | 3.361727836 |
| Jan-04 | 4.602059991 | 2.301029996 | 3.462397998 |
| Aug-07 | 4.431363764 | 2.176091259 | 3.477121255 |
| Apr-08 | 4.230448921 | 2.255272505 | 3.342422681 |

| WA-7 | | |
|---|---|---|
| Date | 1,2-DCP | 1,2,3-TCP |
| Apr-92 | 4.380211242 | 2.73239376 |
| Jul-92 | 4.447158031 | 2.770852012 |
| Dec-92 | 4.342422681 | 2.763427994 |
| Aug-94 | 4.176091259 | 2.681241237 |
| Mar-95 | 4.230448921 | 2.58546073 |
| Nov-95 | 4.255272505 | 2.568201724 |
| Nov-96 | 4.431363764 | 2.62324929 |
| May-97 | 3.908485019 | 2.579783597 |
| Jan-98 | 4.176091259 | 2.51851394 |
| Jul-98 | 4.255272505 | 2.643452676 |
| Jul-00 | 4.012837225 | 2.451786436 |
| Nov-00 | 4.190331698 | 2.480006943 |
| Mar-01 | 4.155336037 | 2.450249108 |
| Jul-01 | 4.164352856 | 2.50242712 |
| Oct-01 | 4.292256071 | 2.488550717 |
| Feb-02 | 4.255272505 | 2.544068044 |
| May-02 | 3.69019608 | 2.380211242 |
| Jul-02 | 4.041392685 | 2.342422681 |
| Oct-02 | 3.977723605 | 2.397940009 |
| Feb-03 | 3.919078092 | 2.322219295 |
| May-03 | 3.812913357 | 2.255272505 |
| Aug-03 | 4 | 2.477121255 |
| Jan-04 | 3.755874856 | 2.176091259 |

# APPENDIX B

## STATISTICAL ANALYSES DATA
## B-ZONE

**APPENDIX B**
**Statistical Analysis Data (B-Zone)**

**AR-1**

| Date | 1,2-DCP |
|---|---|
| Feb-88 | 1.255273 |
| Mar-88 | 1.20412 |
| Jan-91 | 1.079181 |
| Apr-91 | 1 |
| Jul-91 | 0.90309 |
| Dec-91 | 0.778151 |
| Apr-92 | 0.69897 |
| Jul-92 | 0.60206 |
| Mar-95 | 0.477121 |
| Nov-95 | 1.792392 |
| Nov-96 | 0.477121 |
| May-97 | 0.477121 |
| Jan-98 | 0.30103 |
| Jul-98 | 0.70757 |
| Oct-01 | 0.39794 |
| Feb-02 | 0.176091 |
| May-02 | 0.113943 |
| Jul-02 | 0 |
| Oct-02 | 0 |
| Feb-03 | 0.113943 |
| May-03 | 0.113943 |
| Aug-03 | -0.031517 |
| Jan-04 | 0.041393 |
| Apr-08 | -0.327902 |

**AMW-3R**

| Date | 1,2-DCP |
|---|---|
| Sep-87 | 0.69897 |
| Oct-87 | 0.477121 |
| Jan-91 | -0.154902 |
| Apr-91 | -0.221849 |
| Jul-91 | -0.045757 |
| Dec-91 | 0.30103 |
| Apr-92 | 0 |
| Jul-92 | -0.154902 |
| Aug-94 | 0.60206 |
| Mar-95 | 0.30103 |
| Nov-95 | 0.90309 |
| Nov-96 | 0.477121 |
| May-97 | 0 |
| Jan-98 | 0 |
| Jul-00 | 1.113943 |
| Feb-02 | 0.20412 |
| May-02 | 0.278754 |
| Jul-02 | 0.414973 |
| Oct-02 | 0.30103 |
| Feb-03 | 0.113943 |
| May-03 | 0.230449 |
| Aug-03 | 0.322219 |
| Jan-04 | 0.079181 |
| Aug-07 | 0.113943 |
| Apr-08 | -0.387216 |

**AMW-4R**

| Date | 1,2-DCP |
|---|---|
| Sep-87 | 0.778151 |
| Oct-87 | 0.60206 |
| Jan-91 | 0 |
| Apr-91 | 0.30103 |
| Jul-91 | 0.477121 |
| Dec-91 | 0.60206 |
| Apr-92 | 0.431364 |
| Jul-92 | 0.778151 |
| Aug-94 | 0.30103 |
| Mar-95 | 2.518514 |
| Nov-95 | 1.591065 |
| Nov-96 | -0.39794 |
| May-97 | 2.531479 |
| Jan-98 | 2.322219 |
| Jul-98 | 0.819544 |
| Nov-00 | 1.041393 |
| Mar-01 | 1.531479 |
| Jul-01 | 1.672098 |
| Oct-01 | 1.653213 |
| Feb-02 | 1.556303 |
| May-02 | 0.30103 |
| Jul-02 | 0.50515 |
| Oct-02 | 0.39794 |
| Feb-03 | 0.653213 |
| May-03 | 0.544068 |
| Jan-04 | 0.230449 |
| Apr-08 | 0.857332 |
| Apr-09 | 0.39794 |

**WB2-1**

| Date | 1,2-DCP | 1,2,3-TCP | Dinoseb | DBCP |
|---|---|---|---|---|
| Apr-92 | 3.230449 | 1.857332496 | 0.60206 | 1.477121 |
| Jul-92 | 2.94939 | 1.781755375 | 0.544068 | 1.431364 |
| Aug-94 | 0.69897 | 0 | | -1 |
| Mar-95 | 0.477121 | -0.15490196 | -0.69897 | |
| Nov-95 | 0.60206 | -0.045757491 | | -0.39794 |
| Nov-96 | 0.69897 | -0.096910013 | | -0.552842 |
| May-97 | 0.90309 | 0 | | -0.522879 |
| Jan-98 | 1.255273 | 0.903089987 | 0.897627 | 0.39794 |
| Jul-98 | 1.968483 | 1.716003344 | | |
| Jul-00 | 1.531479 | 2.041392685 | 1.260071 | |
| Nov-00 | 1.643453 | 2.155336037 | 1.30103 | |
| Mar-01 | 1.672098 | 2.184691431 | 1.344392 | -0.619789 |
| Jul-01 | 1.792392 | 2.492760389 | 1.318063 | |
| Oct-01 | 1.857332 | 2.451786436 | 1.356026 | |
| Feb-02 | 1.934498 | 2.51851394 | 1.50515 | -0.468521 |
| May-02 | 1.939519 | 2.505149978 | 1.653213 | -1.113509 |
| Jul-02 | 2.041393 | 2.51851394 | 1.838849 | -1.031517 |
| Oct-02 | 2.079181 | 2.681241237 | | -1.102373 |
| Feb-03 | 1.944483 | 2.447158031 | 1.892095 | |
| May-03 | 1.80618 | 2.380211242 | 1.591065 | -1.346787 |
| Aug-03 | 1.724276 | 2.397940009 | 1.763428 | 0.322219 |
| Jan-04 | 1.579784 | 2.146128036 | 1.447158 | -1.455932 |
| Aug-07 | 1.342423 | 2.041392685 | 1.591065 | -1.958607 |
| Apr-08 | 0.176091 | 1.361727836 | 0.732394 | -1.275724 |
| Apr-09 | 0.278754 | 0.633468456 | -0.207608 | |

**WB2-2**

| Date | 1,2,-DCP | 1,2,3-TCP | Dinoseb | DBCP |
|---|---|---|---|---|
| Apr-92 | 1.672098 | 1.278753601 | 0.30103 | 0.845098 |
| Jul-92 | 1.60206 | 1.278753601 | 0.90309 | 0.845098 |
| Aug-94 | 1.230449 | 1.322219295 | | 0.69897 |
| Mar-95 | 1.041393 | 1.301029996 | -0.30103 | 0.653213 |
| Nov-95 | 0.90309 | 1.230448921 | | 0.748188 |
| Nov-96 | 1.778151 | | | -0.124939 |
| May-97 | 0.60206 | 0.301029996 | | -0.522879 |
| Jan-98 | 0.69897 | | | |
| Jul-98 | 1.361728 | | | |
| Jul-00 | | | | |
| Nov-00 | | | -0.823909 | |
| Mar-01 | | | | -0.91364 |
| Jul-01 | | | | |
| Oct-01 | 0.531479 | 0.531478917 | | |
| Feb-02 | 0.447158 | -0.124938737 | | -1.39794 |
| May-02 | -0.080922 | -0.769551079 | | |
| Jul-02 | 0.079181 | -0.236572006 | | -1 |
| Oct-02 | 0.716003 | 0.929418926 | | 0.079181 |
| Feb-03 | 0.845098 | 1.322219295 | 0.462398 | 0.477121 |
| May-03 | 1.278754 | 1.643452676 | 0.812913 | 0.826075 |
| Aug-03 | 1.255273 | 1.62324929 | 0.763428 | 0.690196 |
| Jan-04 | 1.230449 | 1.602059991 | 0.662758 | 0.672098 |
| Aug-07 | 1.30103 | 1.763427994 | 1 | 0.681241 |
| Apr-08 | 1.30103 | 1.681241237 | 0.812913 | 0.69897 |
| Apr-09 | 1.041393 | 1.602059991 | 1.079181 | 0.491362 |

**PWB-2**

| Date | 1,2,-DCP |
|---|---|
| Feb-02 | 0.342423 |
| May-02 | 0.462398 |
| Jul-02 | 0.612784 |
| Oct-02 | 0.113943 |
| Feb-03 | 0.832509 |
| May-03 | 0.908485 |
| Aug-03 | 1.041393 |
| Jan-04 | 1.20412 |
| Aug-07 | 1.322219 |
| Apr-08 | 1.414973 |
| Apr-09 | 1.255273 |

**PWB-4**

| Date | 1,2-DCP | 1,2,3-TCP | Dinoseb | DBCP |
|---|---|---|---|---|
| Feb-02 | 1.69897 | 2.204119983 | 1.176091 | 1.491362 |
| May-02 | 1.568202 | 2.113943352 | 1.278754 | 1.50515 |
| Jul-02 | 1.869232 | 2.301029996 | 1.322219 | 1.462398 |
| Oct-02 | 1.90309 | 2.322219295 | | 1.643453 |
| Feb-03 | 1.80618 | 2.301029996 | 1.591065 | 1.60206 |
| May-03 | 1.857332 | 2.342422681 | 1.518514 | 1.556303 |
| Aug-03 | 2.041393 | 2.544068044 | 1.78533 | 1.612784 |
| Jan-04 | 1.90309 | 2.462397998 | 1.556303 | 1.20412 |
| Aug-07 | 1.672098 | 2.531478917 | 1.69897 | 0.414973 |
| Apr-08 | 1.491362 | 2.146128036 | 1.477121 | 0.491362 |
| Apr-09 | 1.20412 | 1.84509804 | 0.954243 | 0.612784 |