US Environmental Protection Agency

Third Five-Year Review Report
for
Brown and Bryant Superfund Site
Arvin, California

Prepared by: US Army Corps of Engineers
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Prepared for: US Environmental Protection Agency, Region 9
San Francisco, California

September 2011

Five-Year Review Report

Third Five-Year Review Report
for
Brown and Bryant Superfund Site
Arvin
Kern County, California

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List of Acronyms

1,2-DCP	1,2-dichloropropane
1,2,3-TCP	1,2,3-trichloropropane
1,3-DCP	1,3-dichloropropane
ACSD	Arvin Community Services District
ARARs	Applicable or Relevant and Appropriate Requirements
BHHRA	Baseline Human Health Risk Assessment
CDHS	California Department of Health Services
CDPH	California Department of Public Health
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CHHSL	California Human Health Screening Level
COC	Contaminant of Concern
CW	City Well
DBCP	1,2-dibromo-3-chloropropane
DTSC	Department of Toxic Substances Control (State of California)
EDB	Ethylene dibromide
EPA	United States Environmental Protection Agency
FS	Feasibility Study
FYR	Five-Year Review
ICs	Institutional Controls
MAROS	Monitoring and Remediation Optimization System
MCL	Maximum Contaminant Level
µg/L	micrograms per liter [at concentrations relevant to this report, equivalent to parts per billion (ppb)]
MK	Morris Knudson Corporation
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
OEHHA	Office of Environmental Health Hazard Assessment
O&M	Operation and Maintenance
OSWER	Office of Solid Waste and Emergency Response
OU	Operable Unit
OU-1	First OU
OU-2	Second OU
ppb	parts per billion [at concentrations relevant to this report, equivalent to micrograms per liter (µg/L)]
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
TBC	To Be Considered
USACE	US Army Corps of Engineers

Executive Summary

The United States Environmental Protection Agency (EPA) Region 9 has conducted the third five-year review (FYR) of the Brown and Bryant, Inc. (Arvin Facility) Site in Arvin, California. The purpose of this FYR is to determine whether the remedial actions implemented at the site are protective of human health and the environment. This statutory FYR is required because hazardous substances remain on-site above the health risk-based levels determined in the Record of Decision (ROD), thereby preventing unrestricted use and exposure. The methods, findings, and conclusions of the review are documented in this report. In addition, this report summarizes issues identified during the review and includes recommendations and follow-up actions to address them. The triggering action for this review was the completion of the second FYR report on August 22, 2006.

The site is located at 600 South Derby Road in Arvin, California (Figure 1). The site consists of the original Brown and Bryant property occupying two parcels of land, as well as off-property areas underlain by contaminated groundwater.

The Operable Unit (OU) 1 ROD (EPA, 1993) addresses site soils. The OU-1 remedial action includes the following components: removal and consolidation of contaminated soils on the south side of the property under a Resource Conservation and Recovery Act (RCRA) cap, placement of a non-RCRA asphalt cap on the remaining property, institutional controls precluding residential use of the site and ensuring maintenance of the cap, and groundwater monitoring to determine the effectiveness of these measures in preventing infiltration of water into the A-zone groundwater. In 1998 and 1999, contaminated soils were excavated and consolidated beneath RCRA and non-RCRA caps. This FYR addresses the OU-1 remedy.

A second operable unit for the site, OU-2, addresses contaminated groundwater, including the perched zone known as the A-zone aquifer and the deeper B-zone aquifer. The OU-1 ROD originally addressed contamination within the A-zone aquifer. However, during the remedial design of the OU-1 ROD, it was determined that the OU-1 ROD remedy for the A-zone aquifer was not implementable, due to relatively impermeable soils. With the signing of the OU-2 ROD on September 28, 2007, the groundwater component of the OU-1 ROD was transferred to OU-2.

The implemented remedy for OU-1 currently protects human health and the environment, because the impermeable caps prevent exposure to contaminated soil and reduce infiltration of precipitation into the groundwater. In order for the remedy to be protective in the long-term, ICs, as originally identified in the OU-1 ROD, need to be implemented.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name *(from WasteLAN*): Brown & Bryant, Inc. (Arvin Plant)		
EPA ID ((*from WasteLAN*): CAD052384021		
Region: 9	**State: CA**	**City/County: Arvin/Kern**
SITE STATUS		
NPL status: √ Final Deleted Other (specify)		
Remediation status (choose all that apply): Under Construction Operating √ Complete		
Site Wide FYR YES √ NO	**Construction completion date:** 12 / 31 / 1999	
Has site been put into reuse? YES √ NO		
REVIEW STATUS		
Lead agency: √ EPA State Tribe Other Federal Agency ________________________		
Author name: US Army Corps of Engineers		
Author title: Environmental & Munitions Center of Expertise	**Author affiliation: US Army Corps of Engineers**	
Review period: 10 / 19 / 2010 to 08 / 31 / 2011		
Date(s) of site inspection: 12 / 6-7 / 2010		
Type of review:	√ **Statutory** □ Post-SARA Pre-SARA NPL-Removal only Non-NPL Remedial Action Site NPL State/Tribe-lead Regional Discretion	
Review number: 1 (first) 2 (second) √ 3 (third) Other (specify) ___________		
Triggering action: Actual RA On-site Construction at OU #____ Actual RA Start at OU#____ Construction Completion √ Previous Five-Year Review Report Other (specify)		
Triggering action date *(from WasteLAN)*: 08 / 22 / 2006		
Due date *(five years after triggering action date)*: 08 / 22 / 2011		

Five-Year Review Summary Form

Issues:

Institutional controls still need to be implemented.

Recommendations and Follow-up Actions:

Implement institutional controls as specified in OU-1 ROD.

Protectiveness Statement:

The remedy at OU-1 currently protects human health and the environment, because the RCRA Subtitle C containment cap and non-RCRA asphalt cap prevent exposure to contaminated soil, limit infiltration, reducing impacts to the A-zone groundwater. In order for the remedy to be protective in the long-term, institutional controls required by the OU-1 ROD need to be implemented.

Brown and Bryant Site
Arvin, California
Third Five-Year Review Report

I. Introduction

This is the third Five-Year Review (FYR) being performed by the United States Environmental Protection Agency (EPA) for the Brown and Bryant Superfund Site (the site) located in Arvin, California.

The purpose of a FYR is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports. In addition, FYR reports identify issues found during the review, if any, and identify recommendations to address them.

The EPA is preparing this FYR report pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) § 121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA §121(c) states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

The EPA interpreted this requirement further in the NCP; 40 Code of Federal Regulations (CFR) § 300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.*

The purpose and focus of FYRs are further defined in EPA Office of Solid Waste and Emergency Response (OSWER) Directive 9355.7-03B-P (EPA, 2001).

The EPA Region 9 has conducted a review of the remedial actions implemented at the site, 600 South Derby Street, Arvin, CA. This review was conducted between October 2010 and June 2011. This report documents the results of the review. The United States

Army Corps of Engineers (USACE) provided analyses in support of this FYR through an Interagency Agreement with EPA Headquarters.

This is the third FYR for the site. The triggering action for this review was the completion of the second FYR report on August 22, 2006. Statutory review is required for sites where the selected remedy does not allow unrestricted use after the ROD remedial actions are completed and the clean-up goals have been met. The selected remedy for the OU-1 includes consolidation and containment of waste onsite (beneath RCRA cap containment cap, which will restrict unlimited use of the site in the future, even when the completion of the remedial action satisfies the clean-up goals described in the ROD.

The ROD for OU-2 was signed September 28, 2007. Addressing the deeper, regional (B-zone) aquifer affected by site contaminants, as well as the A-zone aquifer (formerly addressed in the ROD for OU-1), the OU-2 ROD is considered the final ROD for groundwater at the site. The major elements of the remedy include:

- Relocation of the Arvin City Well (CW-1);
- Extraction and treatment of groundwater from the shallow A-zone aquifer;
- Monitored natural attenuation; and
- Institutional controls for OU-2

The remedial action objectives (RAOs) for OU-2 are to:

- Remove or control COCs in the A-zone groundwater such that it is no longer a source of contamination to B-zone and C-zone groundwater,
- Restore the B-zone groundwater to its potential beneficial use as a drinking water aquifer, and
- Prevent potential exposure to contaminated groundwater.

The OU-2 remedy has been designed, but not yet constructed.

II. Site Chronology

Table 1: Chronology of Site Events

EVENT	DATE
Initial discovery	1981
State begins limited excavation of pond and sump areas	1987
Brown & Bryant Arvin facility site placed on the NPL	1989
Excavation and disposal of soil and liner	1990
Unilateral administrative order and emergency removal action	1991
First Remedial Investigation/Feasibility Study (RI/FS) report completed	1993
OU-1 ROD signed	1993
Remedial design complete OU-1	1997
Cap construction and related activities complete	1999
First Five Year Review completed	2001
OU-2 RI/FS report completed	2004
Second Five-Year Review completed	2006
Soil vapor study completed	2007
OU-2 ROD signed: OU1 ROD groundwater remedies are deferred to OU-2 ROD.	2007
Tank UN-32 demolished and removed.	2009

III. Background

The Brown and Bryant Arvin Pesticide Reformulation Facility operated as an agricultural distributor facility from 1960 to 1989. This facility stored and distributed agricultural chemicals including Dinoseb and Nemagon. In 1981, the facility was licensed under RCRA as a hazardous waste transporter.

Facility operations at the site have resulted in the discharge of contaminants to the surface and subsurface soils, and certain contaminants have penetrated the groundwater in the shallow perched aquifer and the unsaturated soils below the perched zone. A deeper, regional aquifer has also been impacted. Contamination of soil and groundwater resulted from inadequate procedural controls and chemical spills during operations and leaks from a surface water pond and sumps. Several volatile organic compounds, semi-volatile organic compounds, herbicides, and pesticides were detected in soil samples. The principal contaminants of concern (COCs) are: 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); chloroform; and 2-*sec*-butyl-4,6-dinitrophenol (Dinoseb).

III.A Physical Characteristics

The site is located at 600 South Derby Road in Arvin, Kern County, California approximately 18 miles southeast of the city of Bakersfield. The site consists of the original Brown and Bryant property, as well as an adjacent parcel owned by a third party and off-property areas underlain by contaminated groundwater. The property covers approximately five acres, and is generally a rectangular, fenced, two parcel property that is elongated towards the southeast (see Figure 1). The site is topographically flat with a slightly decreasing grade towards the south.

The property is currently vacant and secured by a chain link fence. An engineered bituminous pavement covers the entire property. The cap is designed as a RCRA cap in the property's southeastern portion and as a non-RCRA cap in the property's northern portion. The structures currently present within the fenced area are groundwater monitoring wells and a vacant warehouse with an attached open metal shed.

The groundwater beneath the site has been divided into three zones. The A-zone consists of the unsaturated soil and perched water underlying the site to a depth of approximately 85 feet below ground surface (bgs), and it has limited lateral extent. The B-zone consists of unsaturated soil and groundwater underlying the site to a depth of at least 250 feet bgs, ending at the top of a thick clay layer within the Tulare Formation (Corcoran Clay). The B-zone groundwater flows in a south-southwesterly direction towards water supply well, CW-1. The C-zone consists of all soil and groundwater beneath the Corcoran Clay. Water supply wells for the City of Arvin are drawing from the C-zone. There are 53 groundwater monitoring wells on the Brown and Bryant property and on the adjoining properties that have been used for collecting site information.

III.B Land and Resource Use

Arvin is primarily an agricultural community and the site is located in a light industrial and commercial area within the city (EPA, 1993). Irrigated agricultural fields lie east of the site. On the north and south there are food packing plants and shipping facilities. The property is bordered on the west by a paved two-lane highway separating the property from a residential area. The residential area contains two schools (Sierra Vista Elementary School and Haven Drive Middle School) and a park (DiGiorgio County Park), located within 0.5 miles of the site. The Morning Star Preschool, at 416 North Hill Street, is located one mile away from the site.

III.C History of Contamination

The largest releases on-site were from a waste pond, a sump area, and a Dinoseb storage area (See Figure 1-5). The waste pond was used to collect runoff water from the yard and from two sumps. The pond was also used to collect rinse water from rinse tanks used for fumigants. Excess pond water and rainwater runoff collected in a topographically low area to the south of the pond. In addition, water collecting on the property from precipitation and irrigation occasionally breached the berm at the southeast corner of the property and drained into the pond. The pond was double-lined with a synthetic liner in November 1979, and the original unlined sump was replaced with two double-lined sumps in 1980. Dinoseb was stored in a smaller tank storage area along the eastern fence line, just north of the pond. In 1983, there was a significant Dinoseb spill in this area.

Past inspections by the Central Valley Regional Water Quality Control Board documented many instances of poor facility operations and maintenance practices (EPA, 2004). These inspections noted an on-site tank holding the chemical Dinoseb and two unlined ponds for pesticide wastes as being potential contaminant release areas. Past inspections also identified that a 25,000-gallon pond had overflowed twice, and an on-site 560,000-gallon tank had leaked. In 1983 soil and groundwater sampling and analysis identified Dinoseb as a COC with maximum concentrations exceeding 7,000,000 micrograms per kilogram in soil. These peak concentrations of Dinoseb impact occurred in a former spill area along the east fence line and beneath a former pond and sump. In 1984, the California Department of Health Services, Toxic Substances Control Program (now DTSC) identified various pesticides in on-site wells, including DBCP, EDB, Dinoseb, 1,2-DCP, and chlorobenzene (EPA, 2004).

In 1989, the site was listed on the National Priorities List (NPL) of Superfund sites. Subsequently various emergency and removal actions were initiated to minimize or eliminate immediate threats to human health and the environment.

III.D Initial Response

From 1983 through 1988, Brown and Bryant conducted several soil and groundwater investigations and remedial actions under CDHS supervision. The most significant work included the installation of 10 monitoring wells and the removal, in 1987, of some heavily contaminated soil beneath the two sumps and waste pond (EPA, 1993). The lined waste pond in the southeast corner of the property was excavated in August 1987 by Brown and Bryant. The pond liner and approximately 640 cubic yards of soil that showed visible signs of contamination were removed. The depths of this excavation ranged from approximately 1.5 feet on the sides to 5 feet near the center (EPA, 2004).

Brown and Bryant hired two engineering firms to conduct soil and groundwater investigations. The soil impacted with COCs was also removed during one of these investigations, and on-site soils were collected and analyzed for organics and trace metals (EPA, 1993). The results of the analyses indicated high concentrations of pesticides in the soil. Generally, contamination was shallow with several areas contaminated with Dinoseb. High concentrations of Dinoseb were detected in soil along the east fence line. Contamination appeared to be most pronounced beneath former chemical handling areas. These areas include a former sump location, former waste pond, and the location of the Dinoseb spill (EPA, 1993).

Following listing of the site on the NPL in 1989, EPA immediately conducted an emergency response assessment and identified two areas needing immediate attention: 1) a Dinoseb spill area, and 2) contaminated groundwater, which appeared to pose an imminent and substantial endangerment to the municipal drinking water. EPA treated the Dinoseb-contaminated soil in the winter of 1991 under its emergency response authorities.

In October 1990, EPA issued general notice letters to two site property owners, Atchison, Topeka and Santa Fe Railway and Southern Pacific Transportation Company (the Railroads). In January 1991, EPA issued the Railroads an administrative order to conduct certain investigations of the groundwater at the site. The work was completed in August of 1992.

III.E Basis for Taking Action

Actions adopted in the ROD for OU-1 were determined to be necessary to prevent human and ecological exposure to contaminated soil, prevent infiltration of precipitation, and protect shallow groundwater from further degradation.

The following chemicals were identified as soil COCs:

<u>Surface (0-1 ft) Soil</u>	<u>Subsurface (0-7 ft) Soil</u>
Dinoseb	1,2-DCP
	1,3-DCP
	DBCP
	1,2,3-TCP
	EDB
	Dinoseb

As part of the 1993 OU-1 RI/FS, EPA conducted a Baseline Human Health Risk Assessment (BHHRA) to evaluate the current and future effects of soil COCs on human health. The BHHRA evaluated the dominant exposure pathway, which was surface soil exposure, and focused on potentially toxic chemicals occurring at frequencies greater than 5% within each of two targeted soil layers (shallow and subsurface). Contaminants occurring at frequencies >5% were then evaluated to determine if existing soil concentrations posed a cancer risk > 10^{-7} and/or a hazard quotient > 0.1.

Only Dinoseb and 1,2-DCP exceeded a frequency of detection of 5% in the shallow soils. However, 1,2 DCP was detected at a relatively low frequency (8%) and the maximum concentration posed a risk equivalent to 10^{-4}, which is within the risk range. All COC's, except Dinoseb, were screened out in subsurface soils due to frequencies of detection < 5%.

Therefore, Dinoseb was the only COC that was determined to significantly contribute to site risk, and incidental ingestion of surface soil was selected as the dominant route of exposure. The exposure assumptions used to develop the BHHRA identified children and young adult trespassers and construction workers as potential receptors. Dinoseb does not appear to be carcinogenic. However, the calculated noncancer hazards indicate that there may be concern for potential adverse health effects.

IV. Operable Unit 1 Remedial Actions

IV.A Remedy Selection

On November 8, 1993, EPA signed the ROD for OU-1. The selected remedy included consolidating Dinoseb-contaminated surface soil on a 1.2 acre portion of the property and constructing a RCRA Subtitle C cap over it; and placing an asphalt (non-RCRA) cover over the remainder of the property. In addition to its primary cleanup goal of preventing exposure to contaminated soils, the asphalt containment cap was selected to prevent infiltration of precipitation and protect shallow groundwater from further degradation.

The OU-1 ROD also provided for implementation of institutional controls (ICs) at the site, consisting of deed restrictions precluding residential use of the site and ensuring that the RCRA cap area is maintained.

IV.B Remedy Implementation

The following activities occurred during implementation of the OU-1 ROD:

- **1998 and 1999 –** As part of the OU-1 remedy, tasks were completed by a USACE contractor, Morrison Knudson Corporation (MK), in the latter part of 1998 and the early part of 1999. At this time, shallow soil samples were collected throughout the site to further assess the extent of impacted soil in areas with known COCs. Existing soil piles comprising approximately 70 cubic yards with elevated COC concentrations resulting from previous activities throughout the site were excavated and consolidated beneath the RCRA cap area. Approximately 570 cubic yards of contaminated asphalt and underlying contaminated soils were moved to the RCRA cap area and compacted. In addition to assessing and consolidating contaminated soil, MK performed the following removals:

- one 1,200-gallon underground storage tank,
- several small on-site structures,
- 200 linear feet of on-site railroad tracks,
- existing underground utilities,
- remaining drums and tanks (except UN-32) on site,
- residual contamination present on the walls and floor of the warehouse.

- **1998 and 1999 –** MK also performed the following actions on site:
  - imported clean soil materials
  - grading and fencing
  - construction of the RCRA and non-RCRA caps over the property.

- **2001-2002 –** The impacted water within the on-site UN-32 tank was removed, treated and discharged into the city sewer system. The sludge within the tank was removed and transported off-site for disposal.

- **2002 –** Under contract to the USACE, the groundwater monitoring contractor, Panacea, replaced the dedicated sampling pumps in the A- and B-zone wells with a BarCad sampling system.

- **2005-2006 –** Soil gas was sampled west of the property to assess the impacts, if any, on nearby homes, businesses, and community facilities. Results showed the presence of some site-related COCs, although all constituents were detected at concentrations below the California Human Health Screening Levels, which are considered thresholds of concern for risks to human health.

- **2009 –** Tank UN-32, which had been verified clean in 2001, was demolished and removed. The tank was removed by cold cutting to a depth of eight inches below the existing grade, after which it was cut into small pieces and hauled off-site for recycling. The footprint of the tank was finished to match the existing RCRA cap surface through placement of a compacted base course and four inch asphalt pavement. Other structures (truck scales, steel post and awning, and wooden structure attached to the warehouse) were also removed. Metal components were sent for recycling, while wood was sent to the county landfill.

IV.C Operation and Maintenance

Maintenance of the RCRA and non-RCRA caps and other ancillary features is necessary for maintaining long-term protectiveness of the OU-1 remedy.

A Post-Closure Site Control Plan was prepared in accordance with the RCRA and other federal regulations as specified in 40 CFR 264 and 40 CFR 258. Portions of this particular plan are considered Operations and Maintenance (O&M) for the OU-1. The Post-Closure Site Plan specified inspection of the following items no less than twice per year and implementation of necessary repairs and maintenance: RCRA cap, non-RCRA cap, fence & gates, wells and bollards, warehouse, tank UN-32, water meter & valve box.

Inspections and necessary repair and maintenance were performed as specified in the post-closure plan for the OU-1 remedy. A summary of the repair and maintenance activities associated with major components of the remedy are described below.

Inspections
Inspections were conducted by USACE representatives and their contractors, with oversight by EPA. The RCRA and non-RCRA caps were inspected for cracks, fissures, intrusion through the asphalt and areas of settlement. Site fence inspections included a walk of the fence perimeter to confirm fence integrity and site security. Wells were inspected to confirm integrity of paint and security of the locks and locking caps. Paint on the well casings was inspected for signs of degradation. Pipe bollards were inspected for damage and paint degradation during the well inspection.

The warehouse building was inspected for any signs of entry. Locks on doors were checked for signs of tampering or damage. The integrity of the roof and walls of the warehouse were inspected. The warehouse was also checked for bird nests. The water meter for municipal water service to the site and the valve boxes were inspected for leaks or damage. The meter was inspected for signs of water usage. Meter reading was recorded and compared to the reading recorded during previous inspections to determine any leakage. Valves were also inspected to verify that they were in the off position.

The site was also inspected for sign postings, debris and trash. Minor repairs and maintenance of items identified by the inspections, such as general debris and trash cleanup, fence and sign maintenance, were performed as necessary.

In May 2009 and October 2009, 3.7 and 5.2 magnitude earthquakes, respectively, occurred near the site. On both occasions, the cap and the groundwater wells were inspected to determine if there were any impacts resulting from these earthquakes or their aftershocks. Throughout this time period, monthly update project conference calls were conducted.

From May 2009 to the present, inspections have been conducted on a nearly monthly basis.

Maintenance/Repairs
On September 10-11, 2007, the RCRA and Non-RCRA caps were surveyed with a 25 foot grid pattern and well points were installed with Global Positioning System (GPS) and USGS Stationing.

In September, 2007, weeds were abated and a slurry seal was applied to the RCRA and non-RCRA caps. All surface cracks and rodent burrows (holes) were filled and repaired with crack sealant prior to slurry seal placement. The fence was repaired in October, and in November, 2007, the USACE found additional cracks that needed to be resealed. The USACE crew re-sealed the existing cracks and rodent burrows in the RCRA and non-RCRA caps in December, 2007, using slurry seal material.

In 2009, further repair work was performed on the caps, including re-grading of the cap surface to avoid ponding, and sealing the remaining asphalt concrete cracks. Tank UN-32 was removed and disposed of off-site. Maintenance activities included inspecting the cap and all wells, and monitoring for surface ponding.

From 2010 through August 2011, maintenance activities included cap inspection, refurbishing/cleaning several groundwater wells, repairing two wells, and placing a new barcad pump on one well. In addition, the northern fence was repaired and a concrete barrier constructed adjacent to the fence. Additional activities planned for 2011 include repairing cracks in the cap, the on-site warehouse, and the perimeter fence. Signs will be replaced and seismic activity will be monitored.

Groundwater has been monitored at the site over the past 22 years. Sampling frequency has varied over the years. Through the early 2000s, quarterly sampling was conducted at many wells in the study area. Since completion of the second FYR, selected monitoring was conducted in August 2007, April 2008, April 2009. All A-zone and B-zone groundwater wells were sampled in April 2011 and subsequent findings were reviewed and assessed.

Table 2, below, shows the Annual OU-1 Operation and Maintenance (O & M) Costs. The 1993 OU-1 ROD estimates for annual cap maintenance and on-going monitoring were $50,000 and $16,000, respectively. The actual costs are, clearly, greater than those projected costs.

Table 2. Annual O & M Expenditures

Dates	Caps	Other[1]
August 2006 – December 2006	$ 1,012.00	$ 18,176.74
January 2007 – December 2007	$ 36,005.05	$ 29,830.30
January 2008 – December 2008	$ 151,184.18	$ 108,943.58
January 2009 – December 2009	$ 6,753.98	$ 184,184.21
January 2010 – December 2010	$ 110,234.59	$ 57,417.06
January 2011 – August 2011	$ 130,150.02	$ 241,909.79

Note: All costs are inclusive of USACE labor, contracts, travel, and fees.
[1]Other includes well maintenance, weed control, warehouse repairs, AST removal, and groundwater monitoring

V. Progress Since the Last Review

V.A Protectiveness Statement from Last Review

The second FYR report contained the following protectiveness statement:

> "The remedy at OU-1 is considered protective in the short-term, and currently protects human health and the environment because the asphalt containment cap limits potentially complete exposure pathways to contaminated soil and groundwater. However, in order for the remedy to be protective in the long-term, the following actions need to be taken:
>
> - performance standards specified in the ROD must be met;
> - ICs, as identified in the OU-1 ROD for the selected remedy, need to be implemented; and
> - on-going groundwater monitoring should be conducted."

V.B Status of Recommendations and Follow-up Actions from the Last Review

The recommendations from the second FYR and status of follow-up actions are as follows:

1. Improve drainage of cap and repair cap cracks and fill/seal animal burrows.

   In 2007, animal burrows were filled and sealed with asphalt, but burrowing continues. Drainage was improved by removal of a berm constructed outside the property fence that had previously been installed by the adjacent property owner to prevent flooding of an unimproved road.

2. Repair barbed wire fencing.

   Since 2007, periodic repairs have been made to the barbed wire fencing.

3. Evaluate Vapor Intrusion Pathway.

   A vapor intrusion evaluation was performed in late 2006 and determined that there were no exceedances of California Human Health Screening Levels in soil vapor on- or off-property (Panacea, 2007). Therefore, no risk was associated with the vapor intrusion pathway under current (as of late 2006) conditions.

4. Replace and seal municipal well CW-1.

   This component of the remedy was incorporated in the OU-2 ROD and will be evaluated when the OU-2 remedy is implemented.

5. Institutional controls need to be fully implemented.

   ICs have not yet been implemented and are needed to ensure long-term protectiveness. Currently, operation and maintenance activities, including access controls and physical repairs, have ensured the protectiveness of the OU1 soils remedy (cap and monitoring).

6. Implement reduced monitoring program.

   Details concerning monitoring frequency and number of wells to be sampled were not explicitly identified in the OU-1 ROD. Since the previous Five-Year Review, select monitoring wells were sampled in August 2007, April 2008, April 2009, and April 2011.

7. Reinstate routine sampling of the site, for a limited subset of wells, generally on an annual basis.

   Details concerning monitoring frequency and number of wells to be sampled were not explicitly identified in the OU-1 ROD. Since the previous Five-Year Review, select monitoring wells were sampled in August 2007, April 2008, April 2009, and April 2011.

8. Consider active A-zone source remediation.

   This component of the remedy was deferred to the OU-2 ROD and will be evaluated when implemented.

9. Remove CW-1 to ensure contamination in the B- and C-zones does not occur.

   This component of the remedy was deferred to the OU-2 ROD and will be evaluated when the OU-2 remedy is implemented.

10. Transfer the shallow zone groundwater remediation to OU-2.

    This recommendation has been carried out, as the shallow zone groundwater remediation is addressed in the OU-2 ROD.

11. Update the current document repository.

    The document repository was updated with some, but not all, recent documents.

VI. Five-Year Review Process

VI.A Administrative Components, Community Notification, Document Review

In support of Bruni Dávila, Region 9 Remedial Project Manager (RPM) for the site, the FYR was carried out by the Environmental and Munitions Center of Expertise, USACE.

This FYR consisted of the following activities: public notification in the Bakersfield Californian (December 3, 2010) and the Spanish language newspaper El Popular (December 17, 2010) that a FYR was underway (Attachment A); a review of relevant documents as listed in Attachment B; interviews with local community members; discussions with the EPA RPM and USACE project personnel; and a site inspection.

A copy of this completed report and an updated fact sheet are available through the EPA Region 9 Superfund Record Center located in San Francisco or from the information repository at the Kern County Library, 201 Campus Drive, Arvin, CA. Notice of the completion of this report will also be announced in the local newspapers.

VI.B Data Review

Groundwater monitoring data were reviewed to evaluate the effectiveness of the RCRA Subtitle C and non-RCRA caps in preventing infiltration of precipitation and protecting shallow groundwater from further degradation. The available monitoring data for the site spans the period from 1987 to April 2009. Though the entire dataset was qualitatively reviewed, the sampling results from October 2002 to April 2009 were quantitatively analyzed to identify trends in contaminant concentrations in both the A- and B-zones. These trends in the concentrations are a line of evidence regarding the performance of the site remedy installed to date. Data were analyzed for five of the most common site-related compounds representative of the mobility and toxicity of the suite of site contaminants. The analysis was conducted using the Mann-Kendall test for trend as implemented in version 2.2 of the Monitoring and Remediation Optimization System (MAROS) software (Groundwater Services Inc., 2006). A detailed discussion of the analyses is provided in Attachment C.

MAROS results are consistent with a conclusion that the cap is limiting dissolution of contaminants in soil beneath the cap. Wells that monitor the integrity and effectiveness of the cap, show that the cap has greatly reduced infiltration and, therefore, impacts on the groundwater. Wells in or adjacent to the cap have exhibited stabilized or decreasing contaminant concentrations. Over time, this reduction in source contributions to groundwater should be reflected in decreasing contaminant concentrations in groundwater downgradient of the cap.

VI.C Site Inspection

The USACE team conducted the site inspection on December 6-7, 2010. The team inspected the asphalt and RCRA capped areas, fencing, on-site warehouse, and monitoring wells. The USACE site manager assisted with the inspection. The inspection included a question-and-answer session concerning site conditions, the cap and well maintenance issues. The site visit also included visits to county offices and to the information repository in Arvin, as well as a visit to the Beale Memorial Library in Bakersfield (site of the previous repository). The list of site visit attendees and complete details of the inspection findings are provided as Attachment D.

The asphalt non-RCRA cap at the site continues to show evidence of cracking in spots, particularly on the northern and western edges, and there has been cracking along the southern and eastern edge of the RCRA-capped area. According to the USACE site manager, cracks have been shown to enlarge over time and attempts to seal these cracks have limited success. Vegetation has taken root in some cracks.

Ponding continues to be a problem in the southeastern and western (west of the warehouse) portion of the non-RCRA asphalt cap. The drainage problems noted during the previous FYR in the southeastern portion of the non-RCRA cap have been mostly corrected, although minor ponding persists. Ponded water on the cap could result in infiltration, should cracks appear in these areas.

Animal burrows, one of which had an exit hole through the asphalt, were noted along the eastern edge of the RCRA cap. However, there was no evidence that the cap liner was breached.

The site fencing, which consists of chain link topped by three strands of barbed wire, was in good condition. The gate for site access at the northern site perimeter was secure, as was the gate to the RCRA-capped area.

Monitoring wells were generally found to be functional, but a number of wells were unsecured (and/or could not be secured), many were unlabelled, and some above-ground completions require painting. Some flush-mount wells have been graded over with sand and gravel, and some have cracked surface pads. Additional descriptions of the conditions of the monitoring wells are provided in Attachment D.

The site inspection included a visit to the site document repository. Although located at the Beale Memorial Library in Bakersfield during the previous FYR site visit, the repository has been moved back to Arvin in the Kern County Library at 201 Campus Drive. A few hard copies of site-related documents were found in the library, but many documents covering recent site activities were not present, including the OU-2 ROD (September 2007), OU-1 Remedial Action Closure Report (July 2000), and recent groundwater monitoring reports. The entire administrative record for the early removal action and for OU-1 through the 1993 ROD was available on microfiche at the Beale Library.

VI.D Interviews

The USACE team interviewed several people regarding the progress at the site. These interviewees included:

John Trino, the owner of Trino Packing & Cold Storage (located south of the property)
Salvador Partida, the co-chair of the Committee for a Better Arvin
Richard Lainhart, the Los Angeles District USACE site manager
Cecilia Horner, the Albuquerque District USACE Technical Lead
Steve Ross, site project manager for California DTSC

Completed interview forms are available as Attachment E.

The local business owner and committee co-chair were disappointed with lack of progress and with infrequent communications from EPA. Although the representative of DTSC had no complaints about progress, he also felt that EPA could do a better job communicating about site activities. He also indicated that close coordination between regulatory agencies (federal, state, and county) would be necessary to ensure effectiveness of future land-use covenants.

The two USACE representatives commented on O&M challenges posed by rodent burrows, cracking of the asphalt caps, and ponding of water on the caps. These problems have not affected performance of the remedy, but continuing routine maintenance is critical to ensuring the future integrity of the cap.

VII. Technical Assessment

VII.A Question A: Is the remedy functioning as intended by the decision documents?

Yes. The RCRA and non-RCRA caps are functioning as intended.

The ROD also specified use of institutional controls consisting of deed restrictions to preclude residential use of the site and to ensure that the RCRA cap area is maintained. ICs have not yet been implemented.

<u>Remedial Action Performance and Operations</u>

The RCRA and non-RCRA caps are functioning as expected, although the condition of the caps has deteriorated in places. Areas of the capped portion of the site have been subjected to cracking and ponding. Several locations have evidence of rodent tunnels around the perimeter of the cap extending under the asphalt cap, although there is no evidence to suggest the cap liner has been breached.

<u>Implementation of Institutional Controls</u>

Section IX of the ROD states that "Institutional controls will be implemented which will consist of deed restrictions precluding residential use of the site and assuring that the RCRA cap area is maintained."

As of this FYR, site access controls are in place, including security fencing around the perimeter of the property, with locked gates at entrances. Signs are posted in English and Spanish stating that this is a hazardous area and entrance is prohibited. Combined with the physical barrier represented by the RCRA cap, these controls currently ensure that exposure to contaminated soil beneath the cap is prevented. However, deed restrictions are needed to ensure that the integrity of the cap is ensured should the property be transferred to new owners.

<u>Early Indicators of Potential Remedy Problems</u>

Installed components of the OU-1 remedial action are functioning as intended.

VII.B Question B: Are the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of remedy selection still valid?

Yes. The reviews of ARARs and risk assumptions are provided in Attachments F and G, respectively.

As part of the 1993 OU-1 RI/FS, a BHHRA was conducted, and Dinoseb was selected as the only contaminant that could significantly contribute to the site risk, with incidental ingestion of surface soil identified as the dominant route of exposure. The exposure assumptions used to develop the BHHRA identified children and young adult trespassers and a construction worker as potential receptors. These assumptions are considered to be conservative and reasonable in evaluating risk for this site since the land use is expected to remain industrial. There have been no changes to these assumptions that could affect the protectiveness of the remedy, and there have been no changes in the toxicity factors for Dinoseb that could affect the protectiveness of the remedy.

Health-based action levels have changed for some of the remaining five COC's. However, with the exception of 1,2-DCP in shallow soils, the human health risk assessment screened out the remaining five soil COCs, based on their limited extent (frequency of detection <5%). Therefore, revisions of the health-based action levels for those COCs do not affect protectiveness of the remedy.

In the case of 1,2-DCP, the 1993 health-based action level of 1.6 mg/kg was revised upward to 4.5 mg/kg (Industrial RSL, 10^{-6}). Since the revised value is less stringent than the 1993 level, the remedy remains protective. Further, all potential exposure pathways for these chemicals have been eliminated by the installation of RCRA- and non-RCRA caps over site soils.

The vapor intrusion pathway was identified as a potential protectiveness issue in the Second Five-Year Review Report. Vapor intrusion was evaluated in the 2004 OU-2 RI/FS, and soil vapor sampling was performed in 2006 to evaluate whether there were complete exposure pathways on- and off-site. All constituents were detected at concentrations below the California Human Health Screening Levels (CHHSLs). Therefore, vapor intrusion does not affect the protectiveness of the remedy.

There has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy.

There have been no changes in the ARARs or "to be considereds" (TBCs) that would affect the protectiveness of the remedy.

The RAO to prevent human and ecological exposure to contaminated soil was attained with installation of the RCRA cap. ICs, as identified in the OU-1 ROD for the selected remedy, need to be implemented to ensure that the response action remains protective of human health and the environment over the long term.

VII.C Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No. There is no other information that calls into question the protectiveness of the remedy. Hypothetically, local earthquakes could contribute to cap cracking thereby increasing costs associated with cap maintenance, as compared with costs estimates in the OU1 ROD. However, assuming proper maintenance, this does not pose a protectiveness issue.

VII.D Technical Assessment Summary

According to the data evaluation, site inspection and interviews, the remedy is functioning as intended by the OU-1 ROD. There have been no changes in the ARARs or TBCs that would affect the protectiveness of the remedy. There have been no changes in the toxicity factors for Dinoseb used in the BHHRA, and there has been no change to the standardized risk assessment methodology that could affect the protectiveness determination of the remedy. There is no other information that calls into question the protectiveness determination of the remedy.

VIII. Issues

Issues for the site are presented in Table 3.

Table 3: Issues

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Institutional controls required by the OU1 ROD, in the form of land use covenants prohibiting residential use and ensuring the integrity of the remedy, have not yet been implemented	.N	Y.

IX. Recommendations and Follow–up Actions

Recommendations and follow-up actions are identified in Table 4, along with the party responsible, oversight agency, and milestone dates.

Table 4: Recommendations and Follow-Up Actions

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
Institutional controls not implemented	Implement institutional controls as specified in OU-1 ROD	EPA/DTSC	EPA/ DTSC	2014	N	Y

In addition to the items above, the following items were identified as recommendations that do not affect protectiveness.

- The information repository at the Kern County library in Arvin is not up-to-date. Efforts should be made to include relevant project reports, especially recent groundwater monitoring reports and the OU-2 ROD.
- Although attempts have been made to file the Survey Plat of RCRA Subtitle C cap with city and county local authorities (consistent with 40 CFR 264.116 and 264.119), neither of these entities wanted to file this information. This matter should be further researched, to determine other options for complying with this regulation.
- Annual surveys of the RCRA Subtitle C cap have not always been completed.

X. Protectiveness Statement

The remedy at OU-1 currently protects human health and the environment, because the RCRA Subtitle C containment cap and non-RCRA asphalt cap prevent exposure to contaminated soil, limit infiltration, reducing impacts to the A-zone groundwater. In order for the remedy to be protective in the long-term, institutional controls required by the OU-1 ROD need to be implemented.

XI. Next Review

The next FYR for the site is required by September 2016, five years from the signature date of this review.

Figures

Figure 1. Site Map

Attachments

US Environmental Protection Agency

Attachment A
Public Notice
for
Brown and Bryant Superfund Site
Arvin, California

Prepared by: **US Army Corps of Engineers**
Environmental and Munitions Center of Expertise
Omaha, Nebraska

Prepared for: **US Environmental Protection Agency, Region 9**
San Francisco, California

September 2011

PUBLIC NOTICE

THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY BEGINS THIRD FIVE-YEAR REVIEW OF CLEANUP AT THE BROWN & BRYANT, INC. (ARVIN PLANT) SUPERFUND SITE

The U.S. Environmental Protection Agency (EPA) has begun the third five-year review of cleanup actions undertaken at the Brown and Bryant Superfund Site (B&B), in Arvin, California. This five-year review is for the Operable Unit 1 (OU-1), which includes the surface and below surface soil down to 65 feet (A-zone soils), and the first groundwater zone located about 65 to 85 feet below ground (A-zone groundwater). Cleanup activities for addressing OU1 soils were completed in 2000. The A-zone groundwater zone was partially addressed by these soil cleanup activities, and will be further addressed with the implementation of future cleanup activities, specified for OU2.

THE REVIEW PROCESS

The purpose of the five-year review is to understand how the constructed remedy is operating and to measure the progress towards meeting the Site's cleanup objectives in order to protect human health and the environment. Because hazardous substances remain onsite above risk based levels that prevent unrestricted use and exposure, EPA will be conducting this review. Specifically, EPA will be looking into the movement or breakdown of site contaminants, the operation of mechanical components, the application of property restrictions, the integrity of the fence and warehouse, changes in scientific knowledge about site contaminants, and changes in exposure pathways and changes in regulations. EPA will be interviewing State regulatory authorities, and interested members of the public.

COMMUNITY INVOLVEMENT

If you have any concerns about the B&B Site, and particularly if you have direct knowledge regarding the operation and maintenance of the as-built remedy, then EPA would like to talk with you. Please contact Bruni Dávila, Project Manager for the Site. When completed, a copy of the final report will be placed in the information repository listed below and will be available on-line at the website given below.

SITE HISTORY

The B&B Site was a pesticide reformulator and custom applicator facility that operated from 1960 to 1989, and is located at 600 South Derby Street, Arvin, Kern County, California. Dinoseb, a common herbicide used for weed control, was one of the main contaminants of concern found in the soil and groundwater. Environmental investigations began in 1981, and in 1989 EPA took a lead cleanup role under the Superfund Program, which began with an emergency response removal action. The original cleanup decision, adopted in 1993, specified consolidation of contaminated surface soil onto the former spill area, covered with a RCRA engineered cap. A non-RCRA asphaltic cap was installed over the remainder of the site. After installation of the cap, wells were added to the existing network of A-zone monitoring wells, to improve the evaluation of the cap effectiveness.

FOR MORE INFORMATION

Please visit EPA's website for the Brown & Bryant Site: **www.epa.gov/region09/brown&bryant.** Or visit the information repositories to review the administrative record or contact EPA representatives.

Information Repositories:

Arvin Branch Library
123 A Street
Arvin, CA 93203
Telephone: (661) 854-5934
Hours: Tue, Wed, Thu: 11 am to 7 pm
Friday – Monday: Closed

U.S. EPA Superfund Records Center
95 Hawthorne Street, Room 403
San Francisco, CA 94105-3901
Telephone: (415) 536-2000
Fax: (415) 764-4963

Contact Information:

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(800) 231-3075 or (415) 972-3242
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CNS#1997682

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BAKERSFIELD CALIFORNIAN

AVISO PÚBLICO
LA AGENCIA DE PROTECCIÓN AMBIENTAL DE LOS ESTADOS UNIDOS
HA COMENZADO LA TERCERA REVISIÓN DE CINCO AÑOS DE LIMPIEZA EN EL SITIO SUPERFUND BROWN & BRYANT

La Agencia de Protección Ambiental de los Estados Unidos (EPA, por sus siglas en inglés) ha comenzado la tercera revisión de cinco años para las acciones de limpieza levados a cabo en el Sitio Superfund Brown & Bryant (B&B), en Arvin, California. Esta revisión de cinco años es para la Unidad Operable 1 (OU1), que incluye las tierras de la superficie y debajo de la superficie hasta 65 pies (tierras de la zona-A), y de la primera zona de agua subterránea ubicado desde 65 hacia 85 pies bajo tierra (agua subterránea de la zona-A). Actividades de limpieza para abordar las tierras de OU1 fueron completados en 2000. El agua subterránea de la zona-A fue parcialmente abordada por estas actividades de limpieza, y serán abordadas por completo cuando comienzan las actividades de limpieza de OU2.

EL PROCESO DE REVISIÓN
El propósito de la revisión de cinco años es para entender como el remedio construido sigue operando, y para medir el progreso hacia llegar a los objetivos de limpieza para el Sitio para proteger la salud humana y el medio ambiente. A raíz de que sustancias peligrosas siguen en el sitio sobre niveles de riesgo que prohíben el uso y exposición sin restricciones, la EPA conducirá esta revisión. Específicamente, la EPA estará investigando el movimiento o descomposición de contaminantes del sitio, la operación de componentes mecánicos, la aplicación de restricciones a propiedades, la integridad de la barda y de la estructura de almacenamiento, cambios en el conocimiento científico sobre los contaminantes del sitio, y cambios en vias de exposición y cambios en reglamentos. La EPA estará entrevistando autoridades regulatorias del Estado y miembros del público que están interesados.

PARTICIPACIÓN COMUNITARIA
Si usted tiene cualquier preocupación sobre el Sitio B&B, y particularmente si tiene conocimiento directo sobre la operación y mantenimiento del remedio tal como está hecho, la EPA gustaría hablar con usted. Por favor póngase en contacto con Bruni Davila, el Gerente del Proyecto para el sitio. Al completarse, una copia del reporte final estará disponible en el depósito de información que esta listada a continuación y estará disponible en-línea en el sitio de internet listado a continuación.

HISTORIA DEL SITIO
El Sitio B&B era una fábrica de reformular pesticidas y de aplicar a medida que operó desde 1960 hasta 1989 y es localizado en 600 South Derby Street, Arvin, Kern County, California. Dinoseb, una herbicida común usada para controlar mala hierba, era uno de los contaminantes de preocupación que se encontró en la tierra y en el agua subterránea. Investigaciones ambientales comenzaron en 1981 y en 1989 la EPA tomo el cargo principal de limpieza bajo el programa Superfund, y que comenzó con una acción de respuesta a emergencias de extracción. La decisión de limpieza original, adoptada en 1993, especifico la consolidación de tierras de la superficie contaminado hacia la antigua área del derrame cubierta con una capa ingenierizada RCRA. Una capa de asfalto sin especificaciones RCRA fue instalada sobre el resto del sitio. Después de la instalación de la capa, pozos fueron agregados a la red actual de pozos de monitoreo de la zona-A, para mejorar la evaluación de la efectividad de la capa.

PARA MÁS INFORMACIÓN
Por favor visite a la página web de la EPA para el sito Brown & Bryant: **http://www.epa.gov/region09/brown&bryant.** O visite el depósito de información para revisar el record administrativo o póngase en contacto con los representantes de la EPA a continuación.

DEPÓSITOS DE INFORMACIÓN
Arvin Branch Library
123 A Street
Arvin, CA 93203
Teléfono: (661) 854-5934
Horas: Mar, Mie, Jue: 11am a 7pm
Viernes - Lunes: Cerrado

U.S. EPA Superfund Records Center
95 Hawthorne Street, Room 403
San Francisco, CA 94105-3901
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US Environmental Protection Agency

Attachment B
List of Documents Reviewed
for
Brown and Bryant Superfund Site
Arvin, California

Prepared by: US Army Corps of Engineers
Environmental and Munitions Center of Expertise
Omaha, Nebraska

Prepared for: US Environmental Protection Agency, Region 9
San Francisco, California

September 2011

Brown and Bryant Superfund Site Five-Year Review

List of Documents Reviewed

Documents

First Operable Unit Record of Decision, Brown and Bryant Superfund Site, Arvin California, US Environmental Protection Agency Region 9, San Francisco, California, November 1993

Closure Report Brown and Bryant Arvin Facility Superfund Site, First Operable Unit Remedial Action, Arvin, California, Morrison Knudsen Corporation, July 2000

Remedial Investigation/Feasibility Study of Remedial Alternatives, Operable Unit No. 2, Brown and Bryant Superfund Site, Arvin, California, Panacea, Inc, June 2004

Second Five-Year Review Report for Brown and Bryant Superfund Site, Arvin, California, US Environmental Protection Agency, Region 9, San Francisco, California, August 2006

Soil Vapor Report, Brown and Bryant Superfund Site, Arvin, California, Panacea, Inc, March 2007

Record of Decision, Brown and Bryant Operable Unit No. 2 Superfund Site, Arvin, CA, US Environmental Protection Agency, Region 9, September 2007

Remedial Action Completion Report, Operable Unit No. 1, Brown and Bryant Superfund Site, Arvin California, US Army Corps of Engineers, March 2009

Public Health Goals for Chemicals in Drinking Water, 1,2,3-Trichloropropane, California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, August 2009

Emerging Contaminant – 1,2,3-Trichloropropane (TCP) Fact Sheet, US Environmental Protection Agency, Office of Solid Waste and Emergency Response, EPA 505-F-09-010, September 2009

August 2007 Groundwater Monitoring Report, Brown and Bryant Superfund Site, Arvin, California, Eco and Associates, Inc., October 2009

Groundwater Information Sheet, 1,2,3-Trichloropropane (TCP), State Water Resources Control Board, Division of Water Quality, GAMA Program, November 2009

April 2009 Groundwater Monitoring Report, Brown and Bryant Superfund Site, Arvin, California, Eco and Associates, Inc., November 2010

Monitoring Wells Review, Brown and Bryant Superfund Site, Arvin California, Eco and Associates, Inc., November 2010

Technical Specifications and Design Analysis, Brown and Bryant Superfund Site, Arvin California, Eco and Associates, Inc., November 2010

Monitoring Wells Installation Report (Four Wells: PWB-13A, PWB-14, PWB-15, and PWB-16), Brown and Bryant Superfund Site, Arvin California, Eco and Associates, Inc., November 2010

Well PWB-13 Groundwater Sampling Report, Brown and Bryant Superfund Site, Arvin California, Eco and Associates, Inc., November 2010

US Environmental Protection Agency

Attachment C
Data Review Memorandum
for
Brown and Bryant Superfund Site
Arvin, California

Prepared by: **US Army Corps of Engineers**
Environmental and Munitions Center of Expertise
Omaha, Nebraska

Prepared for: **US Environmental Protection Agency, Region 9**
San Francisco, California

September 2011

Brown and Bryant Superfund Site Five-Year Review

Data Review Memorandum

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1. INTRODUCTION

The monitoring results gathered over the previous five-year period provide important insight as to the performance of the remedy. This appendix focuses on an assessment of the effectiveness of the RCRA cap in preventing infiltration of precipitation and protecting shallow groundwater from further degradation as determined by an evaluation of trends in the ground water concentrations of several of the contaminants of concern.

2. TREND ANALYSIS METHODOLOGY

2.1 Tools Used

The assessment of data trends was facilitated by the use of the Monitoring and Remediation Optimization System (MAROS) software, version 2.2 (Groundwater Services Inc. for the US Air Force Center of Environmental Excellence, 2006). The MAROS software includes the capability to assess trends in concentrations over time using the non-parametric Mann-Kendall test for trend. In addition, it allows the presentation of concentration versus time plots for individual wells which in turn can be used for qualitative assessment of the trends. As a non-parametric test, the Mann-Kendall analysis is not dependent on having a normal distribution of data, can handle a reasonable number of non-detect results, and can analyze data collected on an irregular basis (as has been the case at the Brown and Bryant site).

The MAROS software identifies trends according to the calculated Mann-Kendall statistic (S) and the coefficient of variation (COV, the standard deviation divided by the mean) and indicates if there is an increasing trend (with 95% confidence), a decreasing trend, a probably increasing trend (90-95% confidence), a probably decreasing trend, a stable trend ($S \leq 0$ and a COV of <1), or no trend ($S > 0$ but confidence less than 90%, or $S<0$ and $COV>1$). MAROS also calculates the total mass, the location of the center of mass, and mass spread in what is termed a “moment analysis.” The results of the moment analyses were reviewed qualitatively for the A- and B-zones to assess overall plume behavior over time.

2.2 Data Used

Contaminant data for A-zone and B-zone wells were obtained from the project EDMS database, which incorporates sampling events from September 2007 through April 2009. Data from 2002 to 2005 were obtained from the MAROS Access database archive file from the previous Five-Year Review report (USEPA, 2006). August 2007 data were obtained from the August 2007 Groundwater Sampling Report (Eco & Associates, Inc., 2009) and were manually entered into the MAROS input spreadsheets. Data summary tables from the April 2009 Groundwater Sampling Report (Eco & Associates, Inc., 2010) are appended to this data review memo.

2.2.1 *Time Period*

Sampling data were available back to 1987; however, data from October 2002 to April 2009 were used in this analysis for two reasons. First, the data cover all of the sampling events since the previous five-year review. Second, MAROS requires a minimum number of data points (4) to perform the statistical analyses. Inclusion of data going back to October 2002 ensured a sufficient number of data points for most wells.

2.2.2 *Contaminants of Concern Chosen for the Analysis*

MAROS allows the simultaneous analysis of up to five contaminants of concern (and, if desired, will help guide the selection of COCs). Of the seven site COCs, five compounds were selected for this analysis: 1,2,3-trichloropropane (1,2,3-TCP), 1,2-dibromo-3-chloropropane (DBCP), ethylene dibromide (EDB), 1,2-dichloropropane (1,2-DCP), and Dinoseb. These represent the most prevalent compounds and include both mobile (e.g., 1,2-DCP) and relatively less mobile (e.g., Dinoseb) compounds at the site. These compounds also cover the range of risks posed by site contaminants.

Two site COCs, 1,3-dichloropropane and chloroform, were not included in the analysis. 1,3-dichloropropane is detected at concentrations orders of magnitude lower than 1,2-DCP, and there is poor risk information available for the compound. Chloroform is a common contaminant at the site, but may be present in samples due to other causes, such as leaks from water supply pipelines or decontamination water, or may be due to lab contamination. Since other compounds approximate the spatial distribution, mobility, and toxicity of chloroform, its exclusion should not alter the conclusions of the analysis.

2.2.3 *Handling of Non-Detectible Concentrations*

The Mann-Kendall analysis can accommodate non-detectible concentrations but requires some estimate of either the method detection limit (MDL) or the reporting limit (RL). Because data are quantified at or above the RL (and estimated between the MDL and the RL), the RL was assigned to non-detects. A proxy value based on the RL, such as the RL or fraction of the RL, is then used in the calculation. For purposes of this analysis, the proxy was one-half the RL.

In many cases, specific reporting limits for the Brown and Bryant data were not identified, but could only be estimated based on low concentration, J-flagged, results. For results prior to 2007 (from the previous five-year review), a uniform detection limit had already been assigned for each of the five compounds that would reflect the likely detection limits for most of the samples in the dataset. For data from 2007 to 2009, actual reporting limits (as given in the EDMS database) or estimated reporting limits (for August 2007) were used. Use of variable detection limits in the analysis introduces the possibility of false trends based on non-detectible concentrations. For example, a well with mostly non-detects could appear to have an increasing or decreasing trend based on changes in the RLs for the samples used in the analysis. A qualitative review of the concentration vs. time results was conducted to ensure that non-detects did not bias trend analysis results.

3. RESULTS

3.1 A-zone

The detailed results of the Mann-Kendall analysis for A-zone wells are provided in Attachments C-1 through C-3 to this memo and are discussed here. Trends are summarized in Attachment C-1 and time-series graphs with Mann-Kendall statistics for individual contaminants and wells exhibiting increasing or decreasing trends are provided in Attachment C-2. Well locations are shown on Figure 1. For a spatial understanding of groundwater flow directions and contaminant distribution in the A-zone, refer to Attachment C-4.

Most wells showed stable to decreasing concentrations of the five compounds assessed, where they were detected above the reporting limit. In particular, wells that historically have had the highest concentrations of contaminants (AMW-1P, AMW-2P, AP-4, EPAS-2, EPAS-3, PWA-2, WA-6, and WA-7) are, with few exceptions, exhibiting stable or decreasing trends. These wells reflect conditions beneath the cap or just off the cap and provide some evidence that the cap is limiting dissolution of contaminants into groundwater. In addition, groundwater elevations have decreased across the site since the previous five-year review, to the point that some wells beneath the cap have gone dry, further limiting the potential for migration of contaminants from the source areas. However, as characterized by Mann-Kendall analysis, increasing concentrations are observed in some wells (see table below).

Well	1,2,3-TCP	DBCP	EDB	1,2-DCP	Dinoseb
AP-2		?			
EPAS-3					√
PWA-1		√		√	
PWA-2	√	√	√	√	
WA-1				√	
WA-3					√
WA-5				√	
WA-6	√	√			

√ Increasing or probably increasing trend from Mann-Kendall analysis
? Increasing trend with limited data and/or influenced by non-detects

Increasing trends noted for 1,2,3-TCP and DBCP at WA-6 probably overstate current conditions. Data for the last four sampling events (2004-2009) show little change and, with additional sampling will likely indicate stable conditions. The same is true for PWA-2 (1,2,3-TCP, DBCP, EDB, and 1,2-DCP) and PWA-1 (DBCP and 1,2-DCP), which have seen increasing trends since 2002 but relatively little change since 2004. EPAS-3, which is approximately 100 feet south of the cap, has seen an increase in Dinoseb. Due to slow movement of groundwater at the site, delayed response to installation of the cap in contaminants downgradient of the cap is not unexpected.

The increasing trend for DBCP at AP-2 is an artifact of a limited dataset influenced by a non-detect. Because this well has not been sampled since the previous five-year review (the well was dry from 2007- 2009), the trend is not considered real or relevant to this five-year review.

Although the Mann-Kendall test characterizes the trend for 1,2-DCP at WA-1 as increasing, the most recent two results are non-detects. The remaining increasing trends (Dinoseb in WA-3 and 1,2-DCP in WA-5) appear to reflect real changes in groundwater. Increasing trends for these wells were also noted in the previous five-year review.

As reflected in the MAROS zeroth moment calculations (Attachment C-3), the total mass of contaminants in the dissolved phase in the A-zone has either remained stable since 2002 (1,2,3-TCP, DBCP, and Dinoseb) or has decreased (EDB and 1,2-DCP). Likewise, the center of mass, as reflected in the distance to the source, has remained stable or is retreating toward the source in the case of EDB. Total mass may have been overestimated for recent sampling events, as a uniform saturated thickness was assumed even though some wells have gone dry. It should also be noted that the moment analysis may be influenced by a decrease in the number of wells monitored between 2004 and 2007. Continuation of the current monitoring program for the next five years would help establish any meaningful changes in plume distribution.

3.2 B-zone

The detailed results of the Mann-Kendall analysis for B-zone wells are provided in Attachments C-5 through C-7 to this memo and are discussed here. For a spatial understanding of contaminant distribution in the B-zone, refer to Attachment C-8. Most wells in the B-zone have low to non-detectible concentrations, and most trends, where trends exist, are stable or declining, as shown in Attachment C-5. Time-series graphs with Mann-Kendall statistics for individual contaminants and wells exhibiting increasing or decreasing trends are provided in Attachment C-6. Increasing concentrations are observed in some wells (see table below).

Well	1,2,3-TCP	DBCP	EDB	1,2-DCP	Dinoseb
PWB-2				√	
PWB-5	?				
PWB-10				√	
PWB-11	√			√	
WB2-2					√
WB2-4				√	

√ Increasing or probably increasing trend from Mann-Kendall analysis

? Increasing trend influenced by non-detects

The previous five-year review noted increasing trends for some contaminants in several wells. These include wells WB2-2 and PWB-4 where concentrations of 1,2,3-TCP, 1,2-DCP, and Dinoseb increased. DBCP also increased in well WB2-2. The only trend that has persisted over the succeeding five years is the trend in WB2-2 for Dinoseb. From January 2004 (previous five-year review) to April 2009, the concentration of Dinoseb has increased from 4.6 µg/L to 12 µg/L. Increasing trends were also noted in the previous five-year review for concentrations of 1,2-DCP in wells WB2-1 and PWB-2 southwest of the property. Dinoseb was also increasing in well WB2-1. Whereas the trends in WB2-1 have not persisted, the trend for 1,2-DCP in PWB-2 is still classified as increasing, though the concentration in April 2009 (18 µg/L) is little changed from January 2004 (16 µg/L).

In addition to increasing trends noted during the previous review, wells PWB-10, PWB-11, and WB2-4 have exhibited increasing trends for 1,2-DCP. For all three wells, though, the concentrations of 1,2-DCP in April 2009 were below 2 μg/L. The only other well exhibiting an increasing trend is PWB-11, in which 1,2,3-TCP has increased since the previous review period. The concentration as of April 2009 was 4 μg/L. These observations suggest some migration of contaminants from the A-zone to the B-zone downgradient of the main capped source zones. In particular, the trends for 1,2-DCP suggest some minor expansion of the plume to the east (PWB-11) and south (PWB-10 and WB2-4). Extrapolation of the trend (as of April 2009) at WB2-4 indicates that the concentration of 1,2-DCP may exceed the MCL of 5 μg/L in late summer 2012.

Although the previous review noted an overall increase of mass of contaminants in the B-zone, there are no clear trends for this five-year review period (see zeroth moment results in Attachment C-7). The centers of mass for the contaminant plumes for the five contaminants were generally stable, with the exception of 1,2-DCP, which has seen a shift to the southwest. MAROS indicates that the plumes for 1,2,3-TCP, DBCP, EDB, and 1,2-DCP have spread since 2002. However, only 1,2,3-TCP shows an appreciable change since 2004. Considerable variability is, in fact, seen from one sampling event to another in the MAROS 2nd moment results. Whether these changes reflect real changes in plume dimensions or are the result of subtle variation along the plume margins is not clear.

4. CONCLUSIONS

MAROS results are consistent with a conclusion that the plumes are relatively stable in the A- and B-zones and that the cap is limiting dissolution of contaminants in soil beneath the cap. Many wells in or adjacent to the cap have seen stabilized or decreasing contaminant concentrations. Over time, this reduction in source contributions to groundwater should be reflected in decreasing contaminant concentrations in groundwater downgradient of the cap.

Figure 1. Well Locations

[Note: The well shown as PW2-4 on the map is incorrectly labeled; it should be WB2-4.]

Data Summary Tables

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

Well No.	Chemical	DATE SAMPLED AND CONCENTRATION (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 (cont')

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

Well No.	Chemical	DATE SAMPLED AND CONCENTRATION (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 (cont')
Chemicals of Concern in A-Zone Groundwater - Selected Parameters (more listed starting May 1997)

Well No.	Chemical	DATE SAMPLED AND CONCENTRATION (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.
? = 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
--- = no MCL data found or given.
* = Total trihalomethanes (sum of bromodichloromethane, dibromochloromethane, bromoform, and chloroform)
MCL = Maximum Contaminant Level
µg/L = Micrograms per liter

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.

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.)
(8260 analysis value used) (From July 2000, EPA 504 analysis value used.)
EDB = Ethylene dibromide, also called 1,2-Dibromoethane
1,2,3-TCP = 1,2,3-Trichloropropane

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 No.	Chemical	DATE SAMPLED AND CONCENTRATION (µg/L)																																	MCL
		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	(µg/L)
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 I, 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 (cont')
Chemicals of Concern in B-Zone Groundwater

Well No.	Chemical	DATE SAMPLED AND CONCENTRATION (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 (cont')
Chemicals of Concern in B-Zone Groundwater

Well No.	Chemical	DATE SAMPLED AND CONCENTRATION (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
(-) = 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. Most NS mean that the well was not sample 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
MCL = maximum contaminant level
µg/L = micrograms per liter
--- = no MCL data found or given
* = Total trihalomethanes (sum of bromodichloromethane, dibromochloromethane, bromoform, and chloroform)

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.

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

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.

Attachment C-1
Mann-Kendall Summary Statistics
for the A-zone

MAROS Mann-Kendall Statistics Summary

Project: Brown & Bryant 3rd FYR

User Name: Mike Bailey

Location: Arvin

State: California

Time Period: 10/1/2002 **to** 4/27/2009

Consolidation Period: No Time Consolidation

Consolidation Type: Median

Duplicate Consolidation: Average

ND Values: 1/2 Detection Limit

J Flag Values : Actual Value

Well	Source/ Tail	Number of Samples	Number of Detects	Coefficient of Variation	Mann-Kendall Statistic	Confidence in Trend	All Samples "ND" ?	Concentration Trend
1,2,3-TRICHLOROPROPANE								
AMW-1P	S	5	5	0.37	0	40.8%	No	S
AMW-2P	S	5	5	0.24	4	75.8%	No	NT
AP-1	T	5	5	0.38	-4	75.8%	No	S
AP-2	T	5	5	0.10	1	50.0%	No	NT
AP-4	S	5	5	1.15	-6	88.3%	No	NT
EPAS-1	T	8	8	0.28	-18	98.4%	No	D
EPAS-2	T	8	8	0.77	-21	99.6%	No	D
EPAS-3	T	8	8	0.60	5	68.3%	No	NT
EPAS-4	T	6	1	0.63	-7	86.4%	No	S
PWA-1	T	8	8	0.15	0	45.2%	No	S
PWA-2	T	8	8	0.68	21	99.6%	No	I
PWA-3	T	8	3	0.64	-12	91.1%	No	PD
PWA-4	T	3	3	0.00	0	0.0%	No	N/A
PWA-7	T	7	6	1.67	-1	50.0%	No	NT
WA-1	T	8	8	0.78	-14	94.6%	No	PD
WA-2	T	8	2	1.02	-12	91.1%	No	PD
WA-3	T	8	8	0.35	10	86.2%	No	NT
WA-4	T	2	2	0.00	0	0.0%	No	N/A
WA-5	T	8	7	0.29	-2	54.8%	No	S
WA-6	T	7	7	0.53	13	96.5%	No	I
WA-7	T	5	5	0.27	-4	75.8%	No	S
WA-8	T	5	5	0.25	-6	88.3%	No	S
WA-9	T	8	2	0.66	-18	98.4%	No	D
1,2-DIBROMO-3-CHLOROPROPANE								
AMW-1P	S	5	4	0.67	-2	59.2%	No	S
AMW-2P	S	5	4	0.56	2	59.2%	No	NT
AP-1	T	5	5	0.41	-7	92.1%	No	PD
AP-2	T	4	3	1.96	6	95.8%	No	I
AP-4	S	5	4	1.08	-8	95.8%	No	D
EPAS-1	T	8	7	0.48	-14	94.6%	No	PD
EPAS-2	T	8	7	0.42	-12	91.1%	No	PD
EPAS-3	T	8	7	0.77	2	54.8%	No	NT
EPAS-4	T	6	0	0.49	-5	76.5%	Yes	ND
PWA-1	T	8	8	0.57	22	99.8%	No	I
PWA-2	T	8	7	0.83	12	91.1%	No	PI
PWA-3	T	6	3	1.01	-8	89.8%	No	NT
PWA-4	T	3	3	0.00	0	0.0%	No	N/A

Project: Brown & Bryant 3rd FYR

User Name: Mike Bailey

Location: Arvin

State: California

Well	Source/ Tail	Number of Samples	Number of Detects	Coefficient of Variation	Mann-Kendall Statistic	Confidence in Trend	All Samples "ND" ?	Concentration Trend
1,2-DIBROMO-3-CHLOROPROPANE								
PWA-7	T	7	1	0.83	-9	88.1%	No	S
WA-1	T	8	8	0.62	10	86.2%	No	NT
WA-2	T	8	0	0.74	-13	92.9%	Yes	ND
WA-3	T	8	8	0.53	9	83.2%	No	NT
WA-4	T	5	1	0.47	-4	75.8%	No	S
WA-5	T	8	0	0.74	-13	92.9%	Yes	ND
WA-6	T	7	6	0.57	13	96.5%	No	I
WA-7	T	5	4	0.71	0	40.8%	No	S
WA-8	T	5	0	0.00	0	40.8%	Yes	ND
WA-9	T	8	0	0.74	-13	92.9%	Yes	ND
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)								
AMW-1P	S	5	5	0.27	-10	99.2%	No	D
AMW-2P	S	5	1	0.46	-4	75.8%	No	S
AP-1	T	5	0	0.00	0	40.8%	Yes	ND
AP-2	T	5	0	0.00	0	40.8%	Yes	ND
AP-4	S	5	1	0.48	4	75.8%	No	NT
EPAS-1	T	3	1	0.00	0	0.0%	No	N/A
EPAS-2	T	8	5	1.06	-15	95.8%	No	D
EPAS-3	T	7	7	0.99	-12	94.9%	No	PD
EPAS-4	T	6	0	0.49	-5	76.5%	Yes	ND
PWA-1	T	8	0	0.74	-13	92.9%	Yes	ND
PWA-2	T	8	8	0.30	18	98.4%	No	I
PWA-3	T	8	0	0.74	-13	92.9%	Yes	ND
PWA-4	T	3	2	0.00	0	0.0%	No	N/A
PWA-7	T	3	0	0.00	0	0.0%	Yes	ND
WA-1	T	8	5	1.48	1	50.0%	No	NT
WA-2	T	8	0	0.74	-13	92.9%	Yes	ND
WA-3	T	8	0	0.74	-13	92.9%	Yes	ND
WA-4	T	5	0	0.00	0	40.8%	Yes	ND
WA-5	T	8	0	0.74	-13	92.9%	Yes	ND
WA-6	T	7	2	0.63	-9	88.1%	No	S
WA-7	T	5	1	0.55	4	75.8%	No	NT
WA-8	T	5	0	0.00	0	40.8%	Yes	ND
WA-9	T	8	0	0.74	-13	92.9%	Yes	ND
1,2-DICHLOROPROPANE								
AMW-1P	S	5	5	0.28	-2	59.2%	No	S
AMW-2P	S	5	5	0.18	5	82.1%	No	NT
AP-1	T	5	5	0.54	-8	95.8%	No	D
AP-2	T	5	5	0.06	-1	50.0%	No	S
AP-4	S	5	5	1.20	-6	88.3%	No	NT
EPAS-1	T	7	7	0.17	-11	93.2%	No	PD
EPAS-2	T	8	8	0.92	-24	99.9%	No	D
EPAS-3	T	8	8	0.71	5	68.3%	No	NT
EPAS-4	T	4	1	0.69	-1	50.0%	No	S
PWA-1	T	8	8	0.32	23	99.9%	No	I
PWA-2	T	8	8	0.47	19	98.9%	No	I
PWA-3	T	8	4	2.04	-8	80.1%	No	NT
PWA-4	T	3	3	0.00	0	0.0%	No	N/A

Project: Brown & Bryant 3rd FYR

User Name: Mike Bailey

Location: Arvin

State: California

Well	Source/ Tail	Number of Samples	Number of Detects	Coefficient of Variation	Mann-Kendall Statistic	Confidence in Trend	All Samples "ND" ?	Concentration Trend
1,2-DICHLOROPROPANE								
PWA-7	T	7	0	0.65	-12	94.9%	Yes	ND
WA-1	T	8	6	0.62	15	95.8%	No	I
WA-2	T	8	0	0.59	-15	95.8%	Yes	ND
WA-3	T	8	8	0.31	-11	88.7%	No	S
WA-4	T	5	5	0.11	-5	82.1%	No	S
WA-5	T	8	8	0.26	26	100.0%	No	I
WA-6	T	7	7	0.61	9	88.1%	No	NT
WA-7	T	5	5	0.23	-4	75.8%	No	S
WA-8	T	5	4	1.31	-4	75.8%	No	NT
WA-9	T	8	2	0.88	-16	96.9%	No	D
DINOSEB								
AMW-1P	S	4	4	0.75	2	62.5%	No	NT
AMW-2P	S	4	4	0.47	2	62.5%	No	NT
AP-1	T	4	4	0.29	0	37.5%	No	S
AP-2	T	4	4	0.47	4	83.3%	No	NT
AP-4	S	4	4	0.72	0	37.5%	No	S
EPAS-1	T	7	7	0.43	-9	88.1%	No	S
EPAS-2	T	7	7	0.84	-13	96.5%	No	D
EPAS-3	T	7	7	0.57	16	99.0%	No	I
EPAS-4	T	5	0	0.55	-4	75.8%	Yes	ND
EW-3	S	2	0	0.00	0	0.0%	Yes	ND
MW-1	S	2	1	0.00	0	0.0%	No	N/A
MW-2	S	2	0	0.00	0	0.0%	Yes	ND
MW-4	S	2	0	0.00	0	0.0%	Yes	ND
PWA-1	T	7	3	0.30	-11	93.2%	No	PD
PWA-2	T	7	7	0.49	1	50.0%	No	NT
PWA-3	T	7	3	0.61	-13	96.5%	No	D
PWA-4	T	3	3	0.00	0	0.0%	No	N/A
PWA-5	T	2	0	0.00	0	0.0%	Yes	ND
PWA-7	T	7	3	0.89	-9	88.1%	No	S
WA-1	T	7	7	2.35	-11	93.2%	No	PD
WA-2	T	7	0	0.93	-12	94.9%	Yes	ND
WA-3	T	7	7	0.96	15	98.5%	No	I
WA-4	T	4	0	0.00	0	37.5%	Yes	ND
WA-5	T	7	2	0.93	-14	97.5%	No	D
WA-6	T	6	6	0.62	8	89.8%	No	NT
WA-7	T	4	4	0.24	-2	62.5%	No	S
WA-8	T	4	4	0.50	2	62.5%	No	NT
WA-9	T	7	0	0.93	-12	94.9%	Yes	ND

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A)-Due to insufficient Data (< 4 sampling events); Source/Tail (S/T)

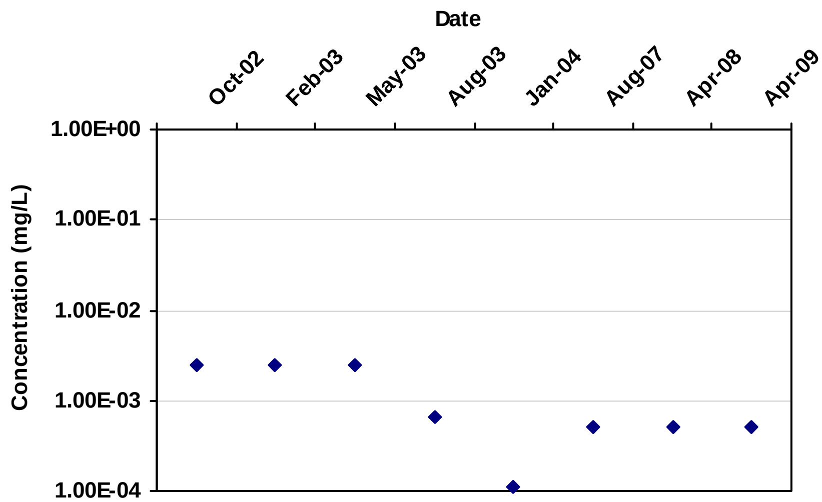
The Number of Samples and Number of Detects shown above are post-consolidation values.

Attachment C-2
Time-Series Charts for the A-zone

MAROS Mann-Kendall Statistics Summary

Well: WA-9
Well Type: T
COC: 1,2-DICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -16

Confidence in Trend: 96.9%

Coefficient of Variation: 0.88

Mann Kendall Concentration Trend: (See Note) D

Data Table:

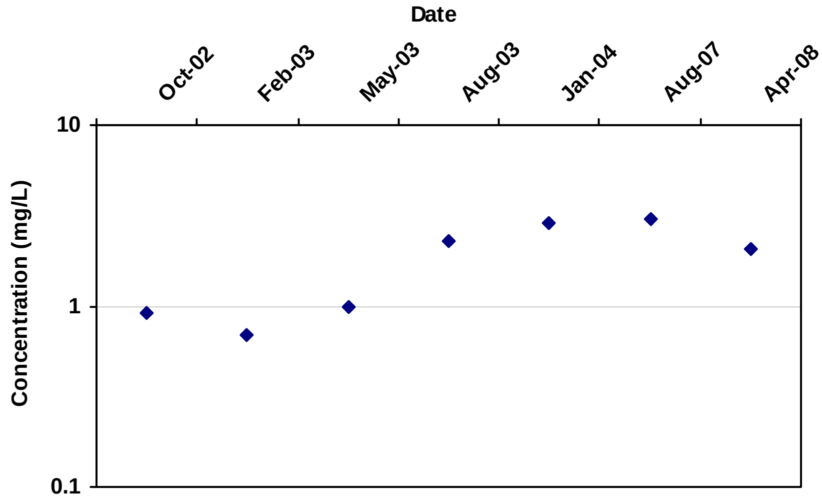
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
WA-9	T	10/1/2002	1,2-DICHLOROPROPANE	2.5E-03	ND	1	0
WA-9	T	2/1/2003	1,2-DICHLOROPROPANE	2.5E-03	ND	1	0
WA-9	T	5/1/2003	1,2-DICHLOROPROPANE	2.5E-03	ND	1	0
WA-9	T	8/1/2003	1,2-DICHLOROPROPANE	6.6E-04		1	1
WA-9	T	1/1/2004	1,2-DICHLOROPROPANE	1.1E-04		1	1
WA-9	T	8/5/2007	1,2-DICHLOROPROPANE	5.0E-04	ND	1	0
WA-9	T	4/21/2008	1,2-DICHLOROPROPANE	5.0E-04	ND	1	0
WA-9	T	4/27/2009	1,2-DICHLOROPROPANE	5.0E-04	ND	1	0

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: WA-6
Well Type: T
COC: 1,2,3-TRICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 13

Confidence in Trend: 96.5%

Coefficient of Variation: 0.53

Mann Kendall Concentration Trend: (See Note) I

Data Table:

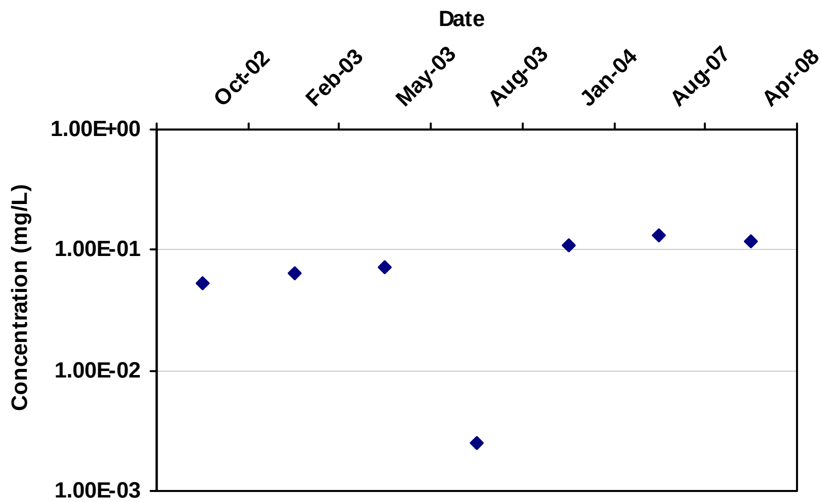
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
WA-6	T	10/1/2002	1,2,3-TRICHLOROPROPANE	9.2E-01		1	1
WA-6	T	2/1/2003	1,2,3-TRICHLOROPROPANE	7.0E-01		1	1
WA-6	T	5/1/2003	1,2,3-TRICHLOROPROPANE	9.8E-01		1	1
WA-6	T	8/1/2003	1,2,3-TRICHLOROPROPANE	2.3E+00		1	1
WA-6	T	1/1/2004	1,2,3-TRICHLOROPROPANE	2.9E+00		1	1
WA-6	T	8/5/2007	1,2,3-TRICHLOROPROPANE	3.0E+00		1	1
WA-6	T	4/21/2008	1,2,3-TRICHLOROPROPANE	2.1E+00		2	2

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: WA-6
Well Type: T
COC: 1,2-DIBROMO-3-CHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 13

Confidence in Trend: 96.5%

Coefficient of Variation: 0.57

Mann Kendall Concentration Trend: (See Note) I

Data Table:

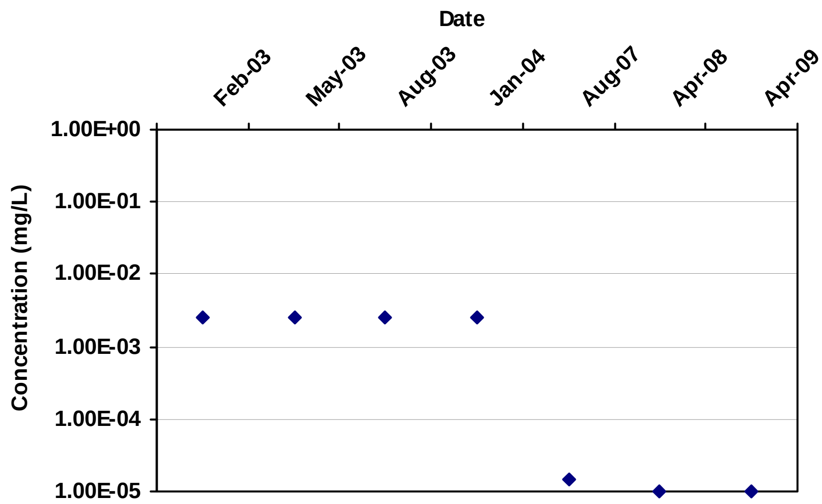
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
WA-6	T	10/1/2002	1,2-DIBROMO-3-CHLOROPROPA	5.2E-02		1	1
WA-6	T	2/1/2003	1,2-DIBROMO-3-CHLOROPROPA	6.4E-02		1	1
WA-6	T	5/1/2003	1,2-DIBROMO-3-CHLOROPROPA	7.2E-02		1	1
WA-6	T	8/1/2003	1,2-DIBROMO-3-CHLOROPROPA	2.5E-03	ND	1	0
WA-6	T	1/1/2004	1,2-DIBROMO-3-CHLOROPROPA	1.1E-01		1	1
WA-6	T	8/5/2007	1,2-DIBROMO-3-CHLOROPROPA	1.3E-01		1	1
WA-6	T	4/21/2008	1,2-DIBROMO-3-CHLOROPROPA	1.2E-01		2	2

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: WA-5
Well Type: T
COC: DINOSEB

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -14

Confidence in Trend: 97.5%

Coefficient of Variation: 0.93

Mann Kendall Concentration Trend: (See Note) D

Data Table:

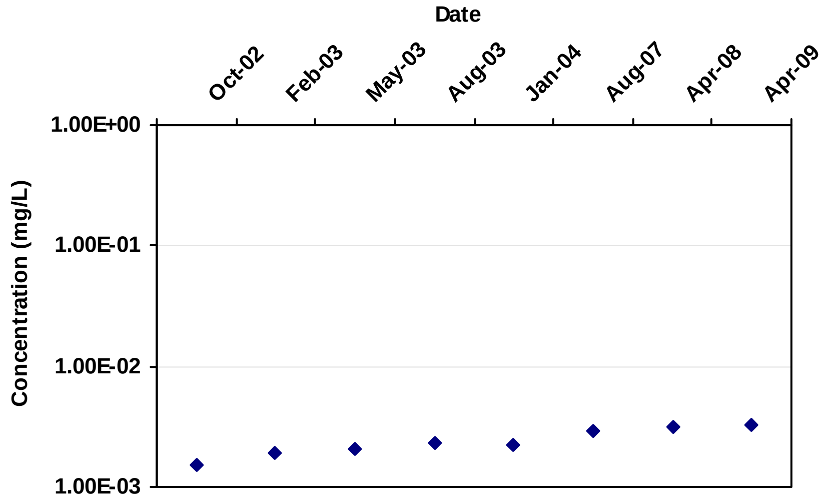
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
WA-5	T	2/1/2003	DINOSEB	2.5E-03	ND	1	0
WA-5	T	5/1/2003	DINOSEB	2.5E-03	ND	2	0
WA-5	T	8/1/2003	DINOSEB	2.5E-03	ND	1	0
WA-5	T	1/1/2004	DINOSEB	2.5E-03	ND	1	0
WA-5	T	8/5/2007	DINOSEB	1.5E-05	ND	1	0
WA-5	T	4/21/2008	DINOSEB	1.0E-05		1	1
WA-5	T	4/27/2009	DINOSEB	1.0E-05		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: WA-5
Well Type: T
COC: 1,2-DICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 26

Confidence in Trend: 100.0%

Coefficient of Variation: 0.26

Mann Kendall Concentration Trend: (See Note) I

Data Table:

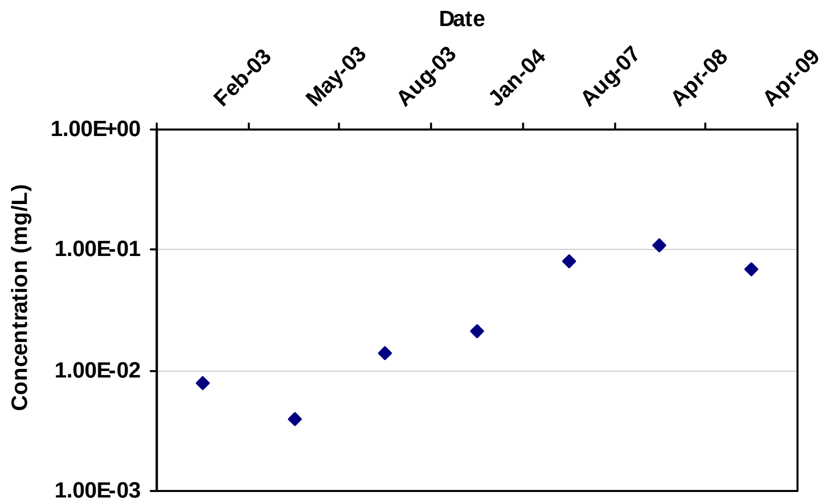
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
WA-5	T	10/1/2002	1,2-DICHLOROPROPANE	1.5E-03		1	1
WA-5	T	2/1/2003	1,2-DICHLOROPROPANE	1.9E-03		1	1
WA-5	T	5/1/2003	1,2-DICHLOROPROPANE	2.1E-03		1	1
WA-5	T	8/1/2003	1,2-DICHLOROPROPANE	2.3E-03		1	1
WA-5	T	1/1/2004	1,2-DICHLOROPROPANE	2.2E-03		1	1
WA-5	T	8/5/2007	1,2-DICHLOROPROPANE	2.9E-03		1	1
WA-5	T	4/21/2008	1,2-DICHLOROPROPANE	3.1E-03		1	1
WA-5	T	4/27/2009	1,2-DICHLOROPROPANE	3.3E-03		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: WA-3
Well Type: T
COC: DINOSEB

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic:
15

Confidence in Trend:
98.5%

Coefficient of Variation:
0.96

Mann Kendall Concentration Trend: (See Note)
I

Data Table:

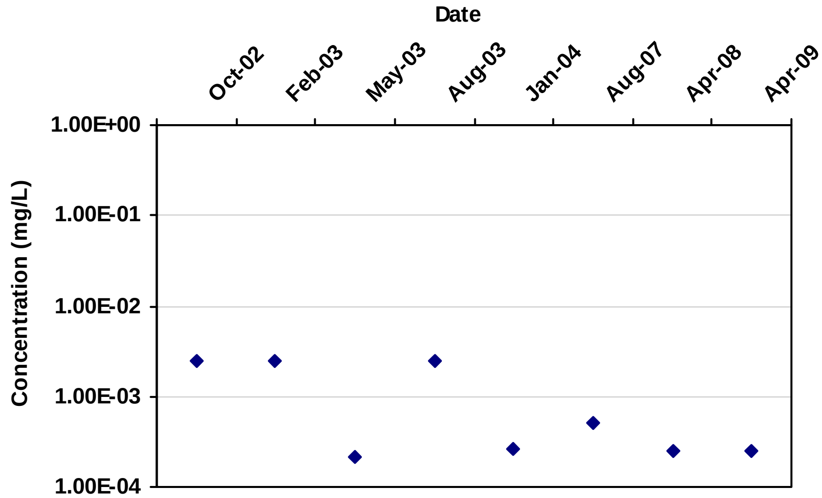
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
WA-3	T	2/1/2003	DINOSEB	7.9E-03		1	1
WA-3	T	5/1/2003	DINOSEB	4.0E-03		2	2
WA-3	T	8/1/2003	DINOSEB	1.4E-02		1	1
WA-3	T	1/1/2004	DINOSEB	2.1E-02		1	1
WA-3	T	8/5/2007	DINOSEB	8.0E-02		1	1
WA-3	T	4/21/2008	DINOSEB	1.1E-01		1	1
WA-3	T	4/27/2009	DINOSEB	6.9E-02		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: WA-2
Well Type: T
COC: 1,2,3-TRICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -12

Confidence in Trend: 91.1%

Coefficient of Variation: 1.02

Mann Kendall Concentration Trend: (See Note) PD

Data Table:

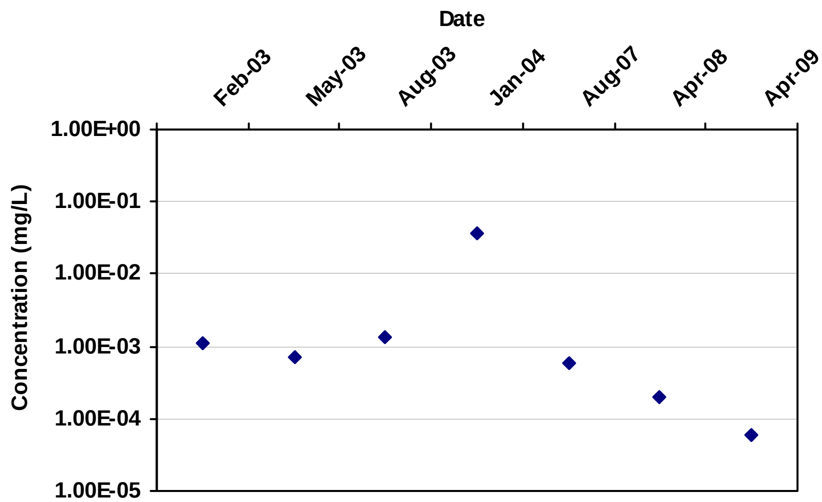
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
WA-2	T	10/1/2002	1,2,3-TRICHLOROPROPANE	2.5E-03	ND	1	0
WA-2	T	2/1/2003	1,2,3-TRICHLOROPROPANE	2.5E-03	ND	1	0
WA-2	T	5/1/2003	1,2,3-TRICHLOROPROPANE	2.2E-04		1	1
WA-2	T	8/1/2003	1,2,3-TRICHLOROPROPANE	2.5E-03	ND	1	0
WA-2	T	1/1/2004	1,2,3-TRICHLOROPROPANE	2.6E-04		1	1
WA-2	T	8/5/2007	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
WA-2	T	4/21/2008	1,2,3-TRICHLOROPROPANE	2.6E-04	ND	2	0
WA-2	T	4/27/2009	1,2,3-TRICHLOROPROPANE	2.6E-04	ND	2	0

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: WA-1
Well Type: T
COC: DINOSEB

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic:

-11

Confidence in Trend:

93.2%

Coefficient of Variation:

2.35

Mann Kendall Concentration Trend: (See Note)

PD

Data Table:

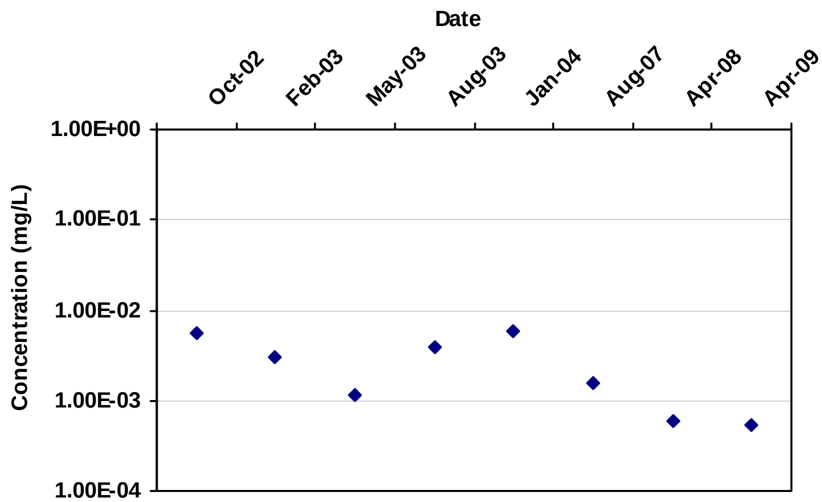
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
WA-1	T	2/1/2003	DINOSEB	1.1E-03		1	1
WA-1	T	5/1/2003	DINOSEB	7.0E-04		1	1
WA-1	T	8/1/2003	DINOSEB	1.3E-03		1	1
WA-1	T	1/1/2004	DINOSEB	3.7E-02		1	1
WA-1	T	8/5/2007	DINOSEB	5.9E-04		1	1
WA-1	T	4/21/2008	DINOSEB	2.0E-04		1	1
WA-1	T	4/27/2009	DINOSEB	6.0E-05		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: WA-1
Well Type: T
COC: 1,2,3-TRICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -14

Confidence in Trend: 94.6%

Coefficient of Variation: 0.78

Mann Kendall Concentration Trend: (See Note) PD

Data Table:

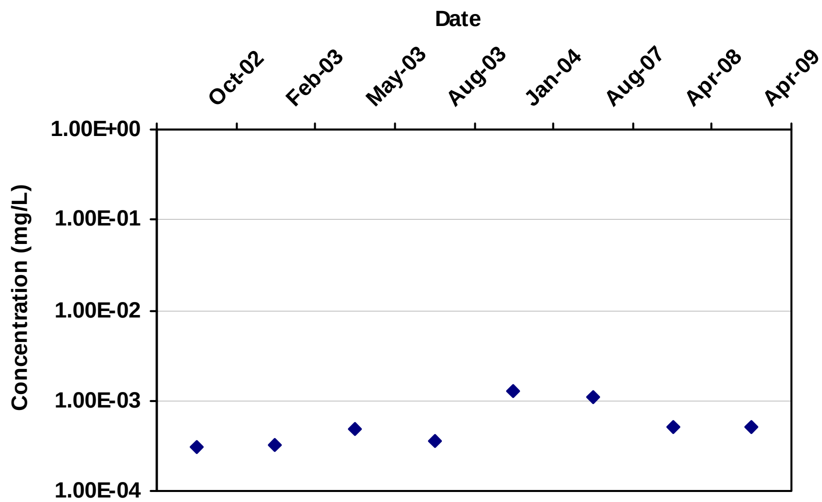
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
WA-1	T	10/1/2002	1,2,3-TRICHLOROPROPANE	5.6E-03		1	1
WA-1	T	2/1/2003	1,2,3-TRICHLOROPROPANE	3.1E-03		2	2
WA-1	T	5/1/2003	1,2,3-TRICHLOROPROPANE	1.2E-03		2	2
WA-1	T	8/1/2003	1,2,3-TRICHLOROPROPANE	4.0E-03		1	1
WA-1	T	1/1/2004	1,2,3-TRICHLOROPROPANE	5.9E-03		1	1
WA-1	T	8/5/2007	1,2,3-TRICHLOROPROPANE	1.6E-03		1	1
WA-1	T	4/21/2008	1,2,3-TRICHLOROPROPANE	5.9E-04		2	1
WA-1	T	4/27/2009	1,2,3-TRICHLOROPROPANE	5.3E-04		2	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: WA-1
Well Type: T
COC: 1,2-DICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic:

15

Confidence in Trend:

95.8%

Coefficient of Variation:

0.62

Mann Kendall Concentration Trend: (See Note)

I

Data Table:

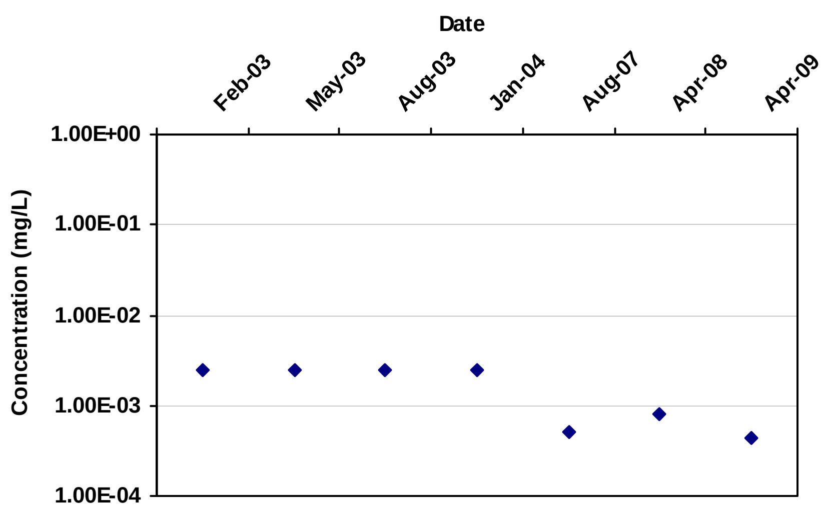
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
WA-1	T	10/1/2002	1,2-DICHLOROPROPANE	3.1E-04		1	1
WA-1	T	2/1/2003	1,2-DICHLOROPROPANE	3.2E-04		1	1
WA-1	T	5/1/2003	1,2-DICHLOROPROPANE	4.8E-04		1	1
WA-1	T	8/1/2003	1,2-DICHLOROPROPANE	3.6E-04		1	1
WA-1	T	1/1/2004	1,2-DICHLOROPROPANE	1.3E-03		1	1
WA-1	T	8/5/2007	1,2-DICHLOROPROPANE	1.1E-03		1	1
WA-1	T	4/21/2008	1,2-DICHLOROPROPANE	5.0E-04	ND	1	0
WA-1	T	4/27/2009	1,2-DICHLOROPROPANE	5.0E-04	ND	1	0

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWA-3
Well Type: T
COC: DINOSEB

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -13

Confidence in Trend: 96.5%

Coefficient of Variation: 0.61

Mann Kendall Concentration Trend: (See Note) D

Data Table:

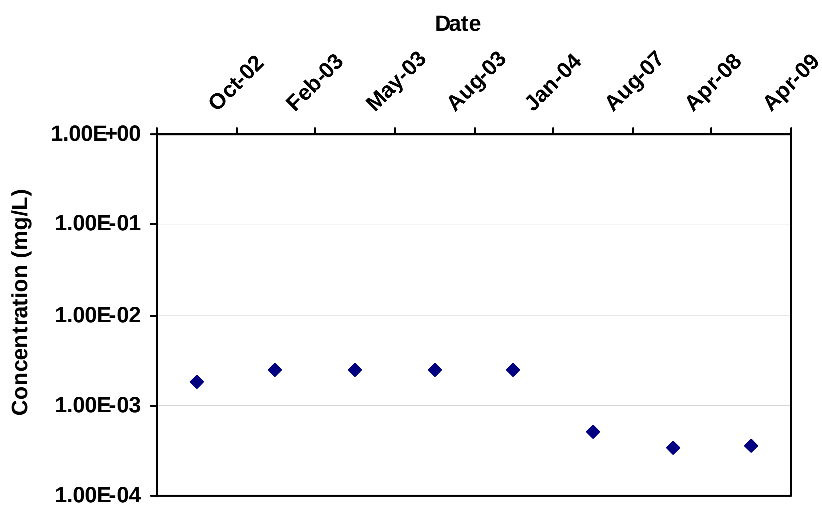
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWA-3	T	2/1/2003	DINOSEB	2.5E-03	ND	1	0
PWA-3	T	5/1/2003	DINOSEB	2.5E-03	ND	1	0
PWA-3	T	8/1/2003	DINOSEB	2.5E-03	ND	1	0
PWA-3	T	1/1/2004	DINOSEB	2.5E-03	ND	1	0
PWA-3	T	8/5/2007	DINOSEB	5.2E-04		1	1
PWA-3	T	4/21/2008	DINOSEB	8.1E-04		1	1
PWA-3	T	4/27/2009	DINOSEB	4.3E-04		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWA-3
Well Type: T
COC: 1,2,3-TRICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic:
-12

Confidence in Trend:
91.1%

Coefficient of Variation:
0.64

Mann Kendall Concentration Trend: (See Note)
PD

Data Table:

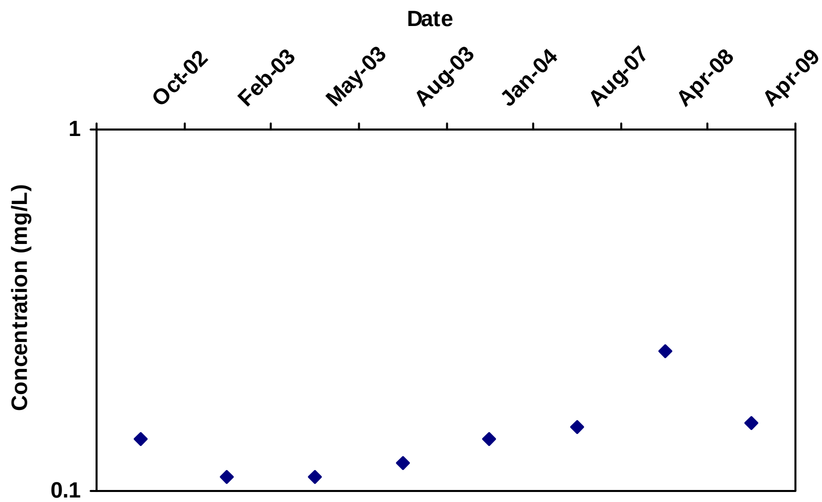
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWA-3	T	10/1/2002	1,2,3-TRICHLOROPROPANE	1.8E-03		1	1
PWA-3	T	2/1/2003	1,2,3-TRICHLOROPROPANE	2.5E-03	ND	1	0
PWA-3	T	5/1/2003	1,2,3-TRICHLOROPROPANE	2.5E-03	ND	1	0
PWA-3	T	8/1/2003	1,2,3-TRICHLOROPROPANE	2.5E-03	ND	1	0
PWA-3	T	1/1/2004	1,2,3-TRICHLOROPROPANE	2.5E-03	ND	1	0
PWA-3	T	8/5/2007	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWA-3	T	4/21/2008	1,2,3-TRICHLOROPROPANE	3.4E-04		2	1
PWA-3	T	4/27/2009	1,2,3-TRICHLOROPROPANE	3.7E-04		2	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWA-2
Well Type: T
COC: 1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 18

Confidence in Trend: 98.4%

Coefficient of Variation: 0.30

Mann Kendall Concentration Trend: (See Note) I

Data Table:

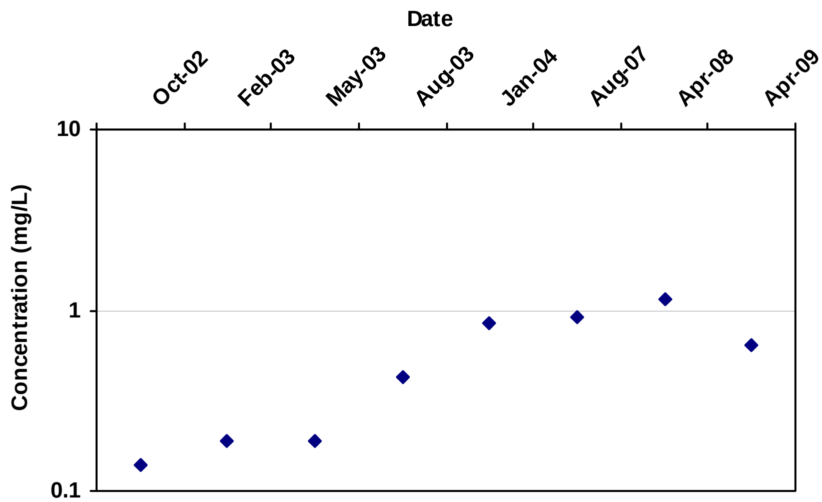
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWA-2	T	10/1/2002	1,2-DIBROMOETHANE (ETHYLE	1.4E-01		1	1
PWA-2	T	2/1/2003	1,2-DIBROMOETHANE (ETHYLE	1.1E-01		1	1
PWA-2	T	5/1/2003	1,2-DIBROMOETHANE (ETHYLE	1.1E-01		1	1
PWA-2	T	8/1/2003	1,2-DIBROMOETHANE (ETHYLE	1.2E-01		1	1
PWA-2	T	1/1/2004	1,2-DIBROMOETHANE (ETHYLE	1.4E-01		1	1
PWA-2	T	8/5/2007	1,2-DIBROMOETHANE (ETHYLE	1.5E-01		1	1
PWA-2	T	4/21/2008	1,2-DIBROMOETHANE (ETHYLE	2.5E-01		2	2
PWA-2	T	4/27/2009	1,2-DIBROMOETHANE (ETHYLE	1.6E-01		2	2

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWA-2
Well Type: T
COC: 1,2,3-TRICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 21

Confidence in Trend: 99.6%

Coefficient of Variation: 0.68

Mann Kendall Concentration Trend: (See Note) I

Data Table:

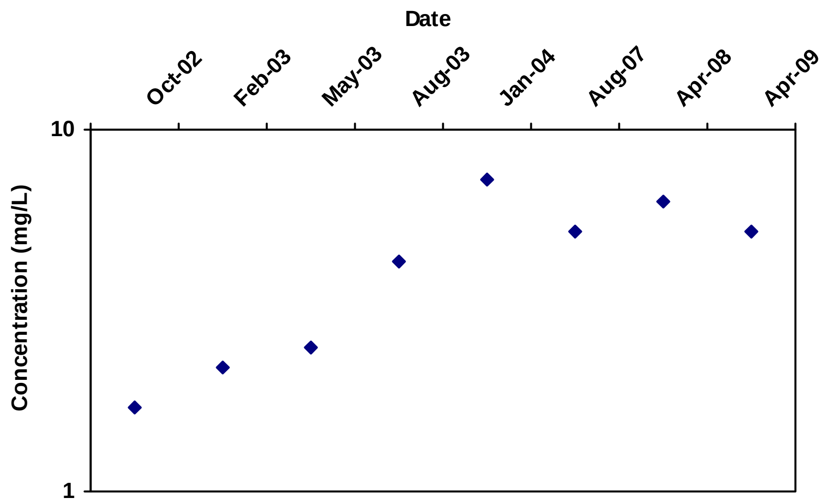
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWA-2	T	10/1/2002	1,2,3-TRICHLOROPROPANE	1.4E-01		1	1
PWA-2	T	2/1/2003	1,2,3-TRICHLOROPROPANE	1.9E-01		1	1
PWA-2	T	5/1/2003	1,2,3-TRICHLOROPROPANE	1.9E-01		1	1
PWA-2	T	8/1/2003	1,2,3-TRICHLOROPROPANE	4.3E-01		1	1
PWA-2	T	1/1/2004	1,2,3-TRICHLOROPROPANE	8.4E-01		1	1
PWA-2	T	8/5/2007	1,2,3-TRICHLOROPROPANE	9.1E-01		1	1
PWA-2	T	4/21/2008	1,2,3-TRICHLOROPROPANE	1.2E+00		2	2
PWA-2	T	4/27/2009	1,2,3-TRICHLOROPROPANE	6.5E-01		2	2

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWA-2
Well Type: T
COC: 1,2-DICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 19

Confidence in Trend: 98.9%

Coefficient of Variation: 0.47

Mann Kendall Concentration Trend: (See Note) I

Data Table:

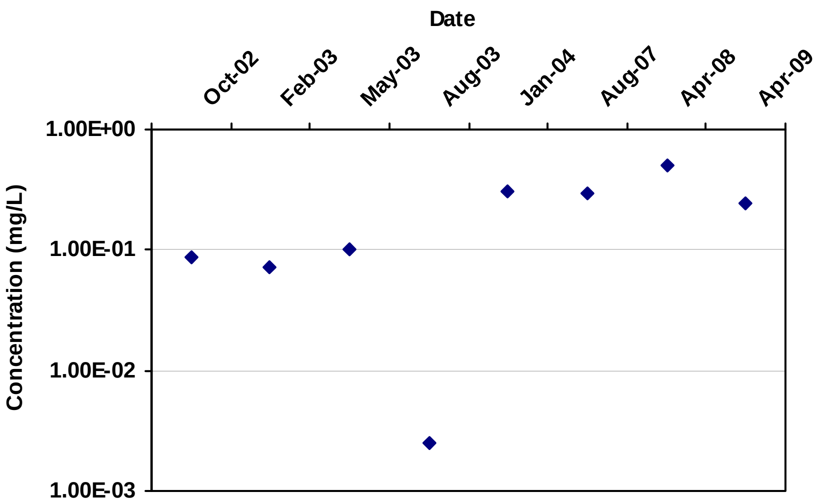
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWA-2	T	10/1/2002	1,2-DICHLOROPROPANE	1.7E+00		1	1
PWA-2	T	2/1/2003	1,2-DICHLOROPROPANE	2.2E+00		1	1
PWA-2	T	5/1/2003	1,2-DICHLOROPROPANE	2.5E+00		1	1
PWA-2	T	8/1/2003	1,2-DICHLOROPROPANE	4.3E+00		1	1
PWA-2	T	1/1/2004	1,2-DICHLOROPROPANE	7.3E+00		1	1
PWA-2	T	8/5/2007	1,2-DICHLOROPROPANE	5.2E+00		1	1
PWA-2	T	4/21/2008	1,2-DICHLOROPROPANE	6.3E+00		1	1
PWA-2	T	4/27/2009	1,2-DICHLOROPROPANE	5.2E+00		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWA-2
Well Type: T
COC: 1,2-DIBROMO-3-CHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 12

Confidence in Trend: 91.1%

Coefficient of Variation: 0.83

Mann Kendall Concentration Trend: (See Note) PI

Data Table:

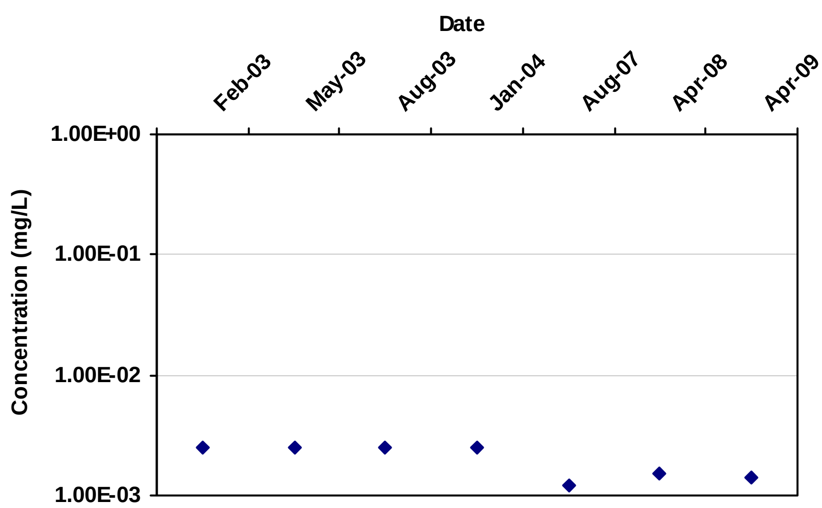
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWA-2	T	10/1/2002	1,2-DIBROMO-3-CHLOROPROPA	8.7E-02		1	1
PWA-2	T	2/1/2003	1,2-DIBROMO-3-CHLOROPROPA	7.1E-02		1	1
PWA-2	T	5/1/2003	1,2-DIBROMO-3-CHLOROPROPA	1.0E-01		1	1
PWA-2	T	8/1/2003	1,2-DIBROMO-3-CHLOROPROPA	2.5E-03	ND	1	0
PWA-2	T	1/1/2004	1,2-DIBROMO-3-CHLOROPROPA	3.1E-01		1	1
PWA-2	T	8/5/2007	1,2-DIBROMO-3-CHLOROPROPA	3.0E-01		1	1
PWA-2	T	4/21/2008	1,2-DIBROMO-3-CHLOROPROPA	5.1E-01		2	2
PWA-2	T	4/27/2009	1,2-DIBROMO-3-CHLOROPROPA	2.4E-01		2	2

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWA-1
Well Type: T
COC: DINOSEB

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -11

Confidence in Trend: 93.2%

Coefficient of Variation: 0.30

Mann Kendall Concentration Trend: (See Note) PD

Data Table:

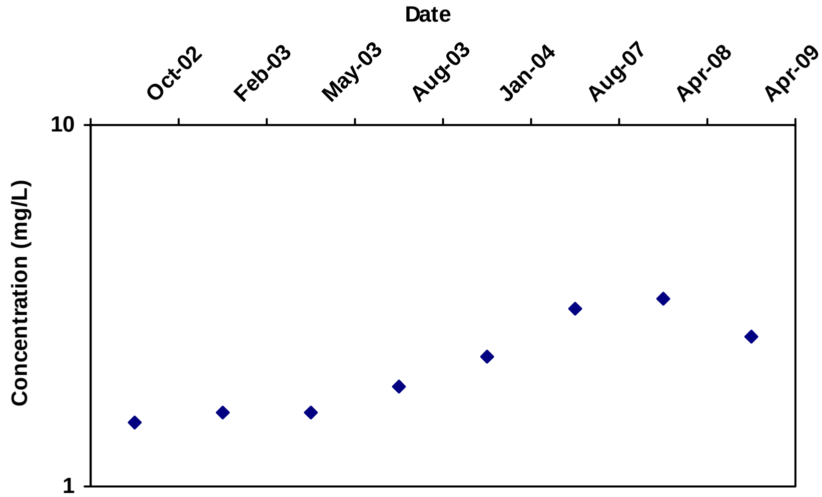
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWA-1	T	2/1/2003	DINOSEB	2.5E-03	ND	1	0
PWA-1	T	5/1/2003	DINOSEB	2.5E-03	ND	1	0
PWA-1	T	8/1/2003	DINOSEB	2.5E-03	ND	1	0
PWA-1	T	1/1/2004	DINOSEB	2.5E-03	ND	1	0
PWA-1	T	8/5/2007	DINOSEB	1.2E-03		1	1
PWA-1	T	4/21/2008	DINOSEB	1.5E-03		1	1
PWA-1	T	4/27/2009	DINOSEB	1.4E-03		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWA-1
Well Type: T
COC: 1,2-DICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 23

Confidence in Trend: 99.9%

Coefficient of Variation: 0.32

Mann Kendall Concentration Trend: (See Note) I

Data Table:

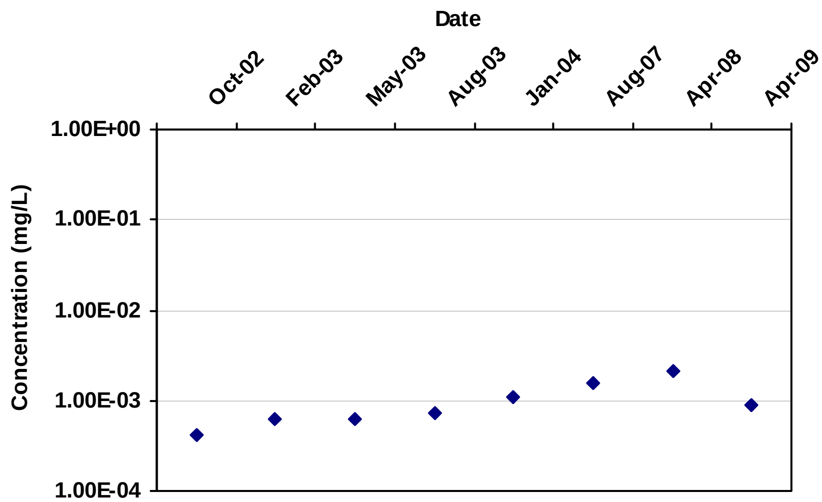
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWA-1	T	10/1/2002	1,2-DICHLOROPROPANE	1.5E+00		1	1
PWA-1	T	2/1/2003	1,2-DICHLOROPROPANE	1.6E+00		1	1
PWA-1	T	5/1/2003	1,2-DICHLOROPROPANE	1.6E+00		1	1
PWA-1	T	8/1/2003	1,2-DICHLOROPROPANE	1.9E+00		1	1
PWA-1	T	1/1/2004	1,2-DICHLOROPROPANE	2.3E+00		1	1
PWA-1	T	8/5/2007	1,2-DICHLOROPROPANE	3.1E+00		1	1
PWA-1	T	4/21/2008	1,2-DICHLOROPROPANE	3.3E+00		1	1
PWA-1	T	4/27/2009	1,2-DICHLOROPROPANE	2.6E+00		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWA-1
Well Type: T
COC: 1,2-DIBROMO-3-CHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 22

Confidence in Trend: 99.8%

Coefficient of Variation: 0.57

Mann Kendall Concentration Trend: (See Note) I

Data Table:

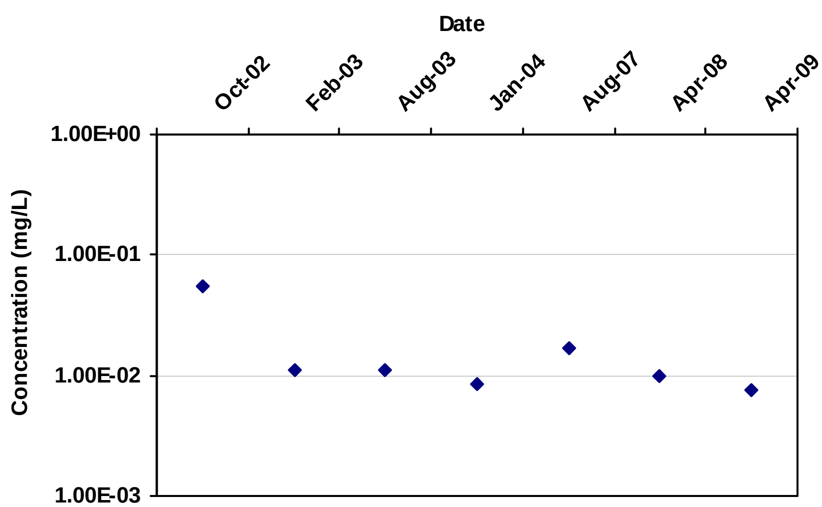
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWA-1	T	10/1/2002	1,2-DIBROMO-3-CHLOROPROPA	4.2E-04		1	1
PWA-1	T	2/1/2003	1,2-DIBROMO-3-CHLOROPROPA	6.1E-04		1	1
PWA-1	T	5/1/2003	1,2-DIBROMO-3-CHLOROPROPA	6.2E-04		1	1
PWA-1	T	8/1/2003	1,2-DIBROMO-3-CHLOROPROPA	7.1E-04		1	1
PWA-1	T	1/1/2004	1,2-DIBROMO-3-CHLOROPROPA	1.1E-03		1	1
PWA-1	T	8/5/2007	1,2-DIBROMO-3-CHLOROPROPA	1.6E-03		1	1
PWA-1	T	4/21/2008	1,2-DIBROMO-3-CHLOROPROPA	2.1E-03		2	2
PWA-1	T	4/27/2009	1,2-DIBROMO-3-CHLOROPROPA	9.0E-04		2	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: EPAS-3
Well Type: T
COC: 1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -12

Confidence in Trend: 94.9%

Coefficient of Variation: 0.99

Mann Kendall Concentration Trend: (See Note) PD

Data Table:

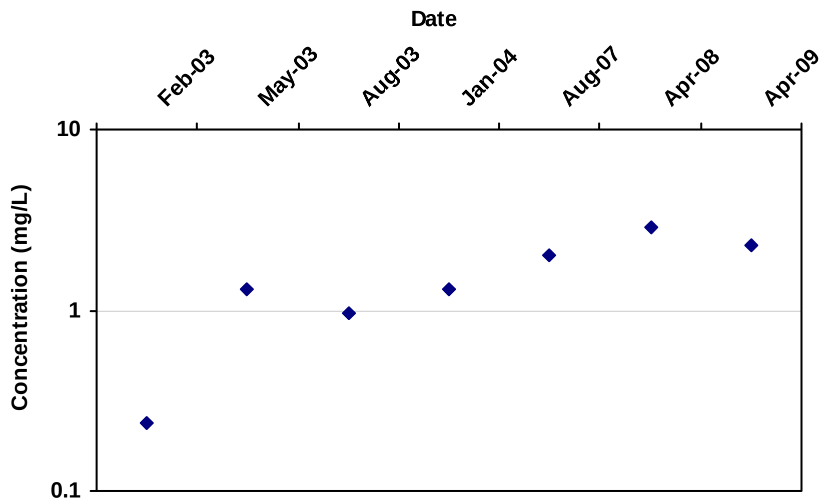
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
EPAS-3	T	10/1/2002	1,2-DIBROMOETHANE (ETHYLE	5.5E-02		1	1
EPAS-3	T	2/1/2003	1,2-DIBROMOETHANE (ETHYLE	1.1E-02		1	1
EPAS-3	T	8/1/2003	1,2-DIBROMOETHANE (ETHYLE	1.1E-02		1	1
EPAS-3	T	1/1/2004	1,2-DIBROMOETHANE (ETHYLE	8.4E-03		1	1
EPAS-3	T	8/5/2007	1,2-DIBROMOETHANE (ETHYLE	1.7E-02		1	1
EPAS-3	T	4/21/2008	1,2-DIBROMOETHANE (ETHYLE	1.0E-02		2	2
EPAS-3	T	4/27/2009	1,2-DIBROMOETHANE (ETHYLE	7.6E-03		2	2

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: EPAS-3
Well Type: T
COC: DINOSEB

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 16

Confidence in Trend: 99.0%

Coefficient of Variation: 0.57

Mann Kendall Concentration Trend: (See Note) I

Data Table:

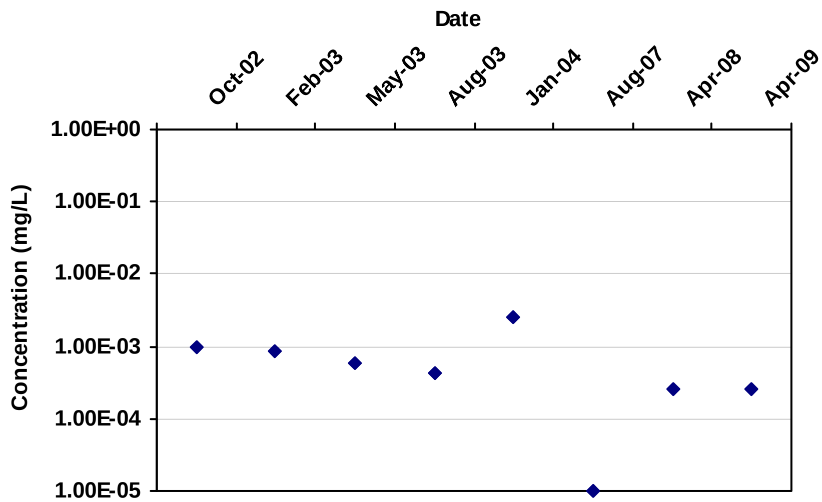
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
EPAS-3	T	2/1/2003	DINOSEB	2.4E-01		1	1
EPAS-3	T	5/1/2003	DINOSEB	1.3E+00		2	2
EPAS-3	T	8/1/2003	DINOSEB	9.6E-01		1	1
EPAS-3	T	1/1/2004	DINOSEB	1.3E+00		1	1
EPAS-3	T	8/5/2007	DINOSEB	2.0E+00		1	1
EPAS-3	T	4/21/2008	DINOSEB	2.9E+00		1	1
EPAS-3	T	4/27/2009	DINOSEB	2.3E+00		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: EPAS-2
Well Type: T
COC: 1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -15

Confidence in Trend: 95.8%

Coefficient of Variation: 1.06

Mann Kendall Concentration Trend: (See Note) D

Data Table:

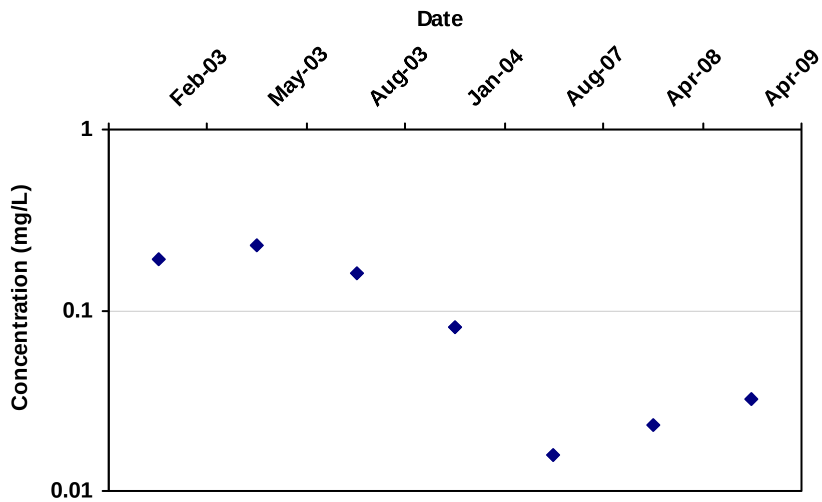
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
EPAS-2	T	10/1/2002	1,2-DIBROMOETHANE (ETHYLE	9.9E-04		1	1
EPAS-2	T	2/1/2003	1,2-DIBROMOETHANE (ETHYLE	8.6E-04		1	1
EPAS-2	T	5/1/2003	1,2-DIBROMOETHANE (ETHYLE	6.0E-04		1	1
EPAS-2	T	8/1/2003	1,2-DIBROMOETHANE (ETHYLE	4.3E-04		1	1
EPAS-2	T	1/1/2004	1,2-DIBROMOETHANE (ETHYLE	2.5E-03	ND	1	0
EPAS-2	T	8/5/2007	1,2-DIBROMOETHANE (ETHYLE	1.0E-05		1	1
EPAS-2	T	4/21/2008	1,2-DIBROMOETHANE (ETHYLE	2.6E-04	ND	2	0
EPAS-2	T	4/27/2009	1,2-DIBROMOETHANE (ETHYLE	2.6E-04	ND	2	0

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: EPAS-2
Well Type: T
COC: DINOSEB

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -13

Confidence in Trend: 96.5%

Coefficient of Variation: 0.84

Mann Kendall Concentration Trend: (See Note) D

Data Table:

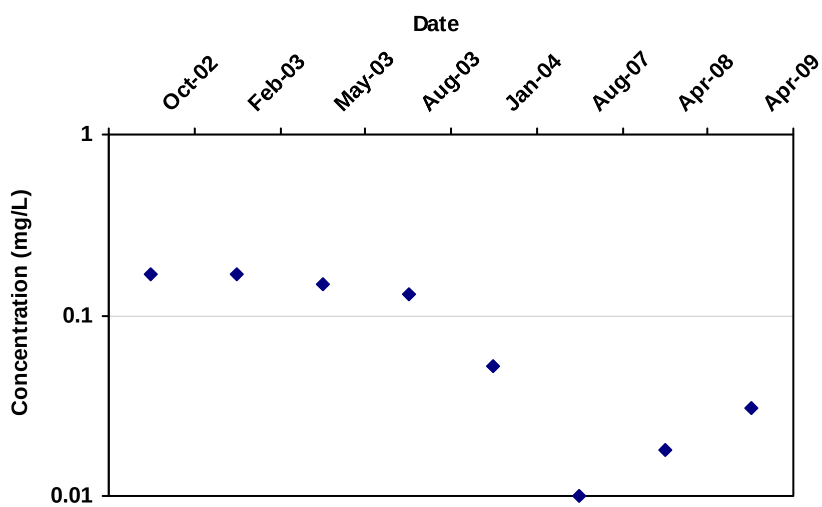
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
EPAS-2	T	2/1/2003	DINOSEB	1.9E-01		1	1
EPAS-2	T	5/1/2003	DINOSEB	2.3E-01		2	2
EPAS-2	T	8/1/2003	DINOSEB	1.6E-01		1	1
EPAS-2	T	1/1/2004	DINOSEB	8.0E-02		1	1
EPAS-2	T	8/5/2007	DINOSEB	1.6E-02		1	1
EPAS-2	T	4/21/2008	DINOSEB	2.3E-02		1	1
EPAS-2	T	4/27/2009	DINOSEB	3.2E-02		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: EPAS-2
Well Type: T
COC: 1,2,3-TRICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -21

Confidence in Trend: 99.6%

Coefficient of Variation: 0.77

Mann Kendall Concentration Trend: (See Note) D

Data Table:

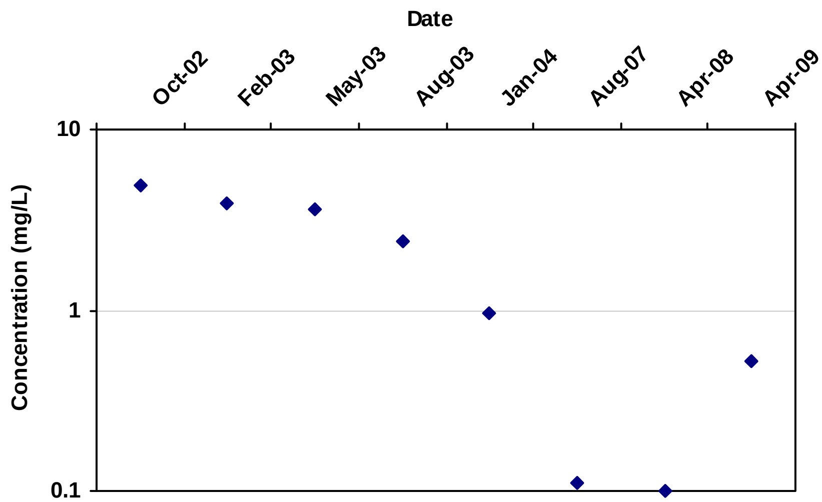
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
EPAS-2	T	10/1/2002	1,2,3-TRICHLOROPROPANE	1.7E-01		1	1
EPAS-2	T	2/1/2003	1,2,3-TRICHLOROPROPANE	1.7E-01		1	1
EPAS-2	T	5/1/2003	1,2,3-TRICHLOROPROPANE	1.5E-01		1	1
EPAS-2	T	8/1/2003	1,2,3-TRICHLOROPROPANE	1.3E-01		1	1
EPAS-2	T	1/1/2004	1,2,3-TRICHLOROPROPANE	5.2E-02		1	1
EPAS-2	T	8/5/2007	1,2,3-TRICHLOROPROPANE	1.0E-02		1	1
EPAS-2	T	4/21/2008	1,2,3-TRICHLOROPROPANE	1.8E-02		2	2
EPAS-2	T	4/27/2009	1,2,3-TRICHLOROPROPANE	3.1E-02		2	2

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: EPAS-2
Well Type: T
COC: 1,2-DICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -24

Confidence in Trend: 99.9%

Coefficient of Variation: 0.92

Mann Kendall Concentration Trend: (See Note) D

Data Table:

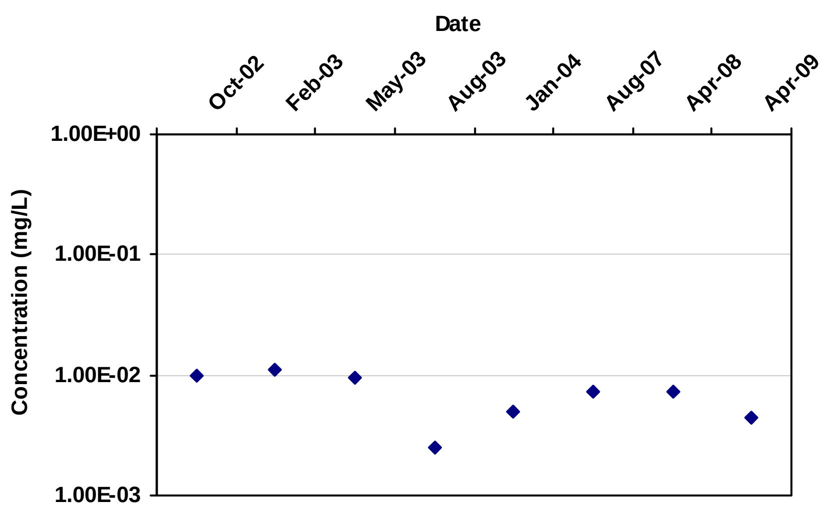
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
EPAS-2	T	10/1/2002	1,2-DICHLOROPROPANE	4.9E+00		1	1
EPAS-2	T	2/1/2003	1,2-DICHLOROPROPANE	3.9E+00		1	1
EPAS-2	T	5/1/2003	1,2-DICHLOROPROPANE	3.6E+00		1	1
EPAS-2	T	8/1/2003	1,2-DICHLOROPROPANE	2.4E+00		1	1
EPAS-2	T	1/1/2004	1,2-DICHLOROPROPANE	9.6E-01		1	1
EPAS-2	T	8/5/2007	1,2-DICHLOROPROPANE	1.1E-01		1	1
EPAS-2	T	4/21/2008	1,2-DICHLOROPROPANE	1.0E-01		1	1
EPAS-2	T	4/27/2009	1,2-DICHLOROPROPANE	5.2E-01		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: EPAS-2
Well Type: T
COC: 1,2-DIBROMO-3-CHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -12

Confidence in Trend: 91.1%

Coefficient of Variation: 0.42

Mann Kendall Concentration Trend: (See Note) PD

Data Table:

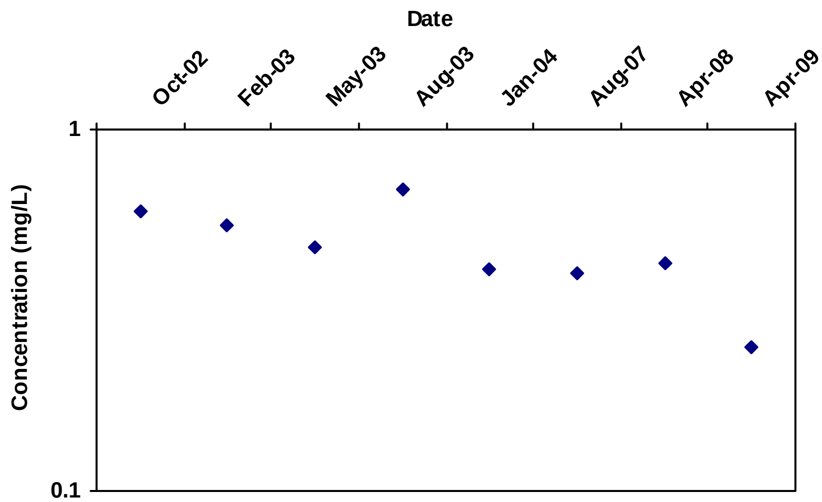
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
EPAS-2	T	10/1/2002	1,2-DIBROMO-3-CHLOROPROPA	9.9E-03		1	1
EPAS-2	T	2/1/2003	1,2-DIBROMO-3-CHLOROPROPA	1.1E-02		1	1
EPAS-2	T	5/1/2003	1,2-DIBROMO-3-CHLOROPROPA	9.4E-03		1	1
EPAS-2	T	8/1/2003	1,2-DIBROMO-3-CHLOROPROPA	2.5E-03	ND	1	0
EPAS-2	T	1/1/2004	1,2-DIBROMO-3-CHLOROPROPA	5.0E-03		1	1
EPAS-2	T	8/5/2007	1,2-DIBROMO-3-CHLOROPROPA	7.2E-03		1	1
EPAS-2	T	4/21/2008	1,2-DIBROMO-3-CHLOROPROPA	7.3E-03		2	2
EPAS-2	T	4/27/2009	1,2-DIBROMO-3-CHLOROPROPA	4.5E-03		2	2

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: EPAS-1
Well Type: T
COC: 1,2,3-TRICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -18

Confidence in Trend: 98.4%

Coefficient of Variation: 0.28

Mann Kendall Concentration Trend: (See Note) D

Data Table:

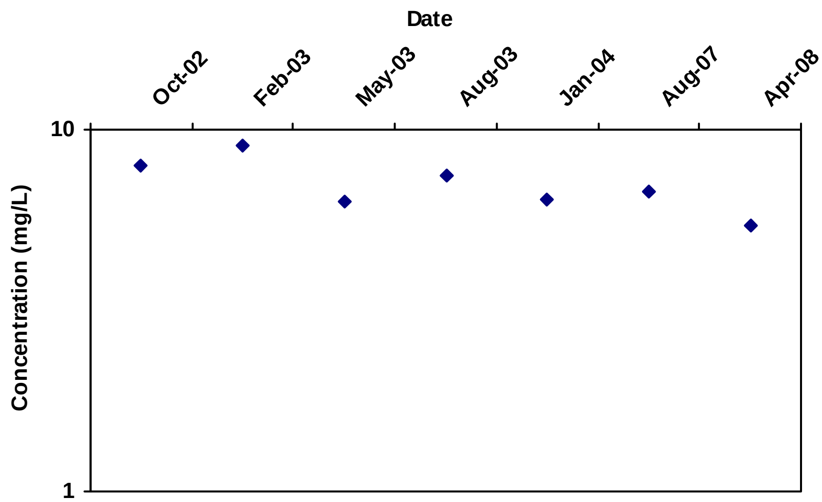
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
EPAS-1	T	10/1/2002	1,2,3-TRICHLOROPROPANE	5.9E-01		1	1
EPAS-1	T	2/1/2003	1,2,3-TRICHLOROPROPANE	5.4E-01		1	1
EPAS-1	T	5/1/2003	1,2,3-TRICHLOROPROPANE	4.7E-01		1	1
EPAS-1	T	8/1/2003	1,2,3-TRICHLOROPROPANE	6.8E-01		1	1
EPAS-1	T	1/1/2004	1,2,3-TRICHLOROPROPANE	4.1E-01		1	1
EPAS-1	T	8/5/2007	1,2,3-TRICHLOROPROPANE	4.0E-01		1	1
EPAS-1	T	4/21/2008	1,2,3-TRICHLOROPROPANE	4.3E-01		2	2
EPAS-1	T	4/27/2009	1,2,3-TRICHLOROPROPANE	2.5E-01		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: EPAS-1
Well Type: T
COC: 1,2-DICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -11

Confidence in Trend: 93.2%

Coefficient of Variation: 0.17

Mann Kendall Concentration Trend: (See Note) PD

Data Table:

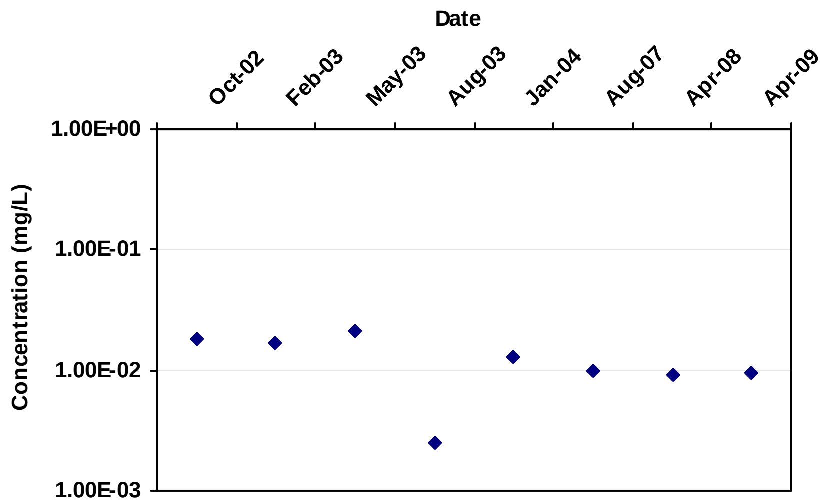
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
EPAS-1	T	10/1/2002	1,2-DICHLOROPROPANE	8.0E+00		1	1
EPAS-1	T	2/1/2003	1,2-DICHLOROPROPANE	9.0E+00		1	1
EPAS-1	T	5/1/2003	1,2-DICHLOROPROPANE	6.3E+00		1	1
EPAS-1	T	8/1/2003	1,2-DICHLOROPROPANE	7.5E+00		1	1
EPAS-1	T	1/1/2004	1,2-DICHLOROPROPANE	6.4E+00		1	1
EPAS-1	T	8/5/2007	1,2-DICHLOROPROPANE	6.7E+00		1	1
EPAS-1	T	4/21/2008	1,2-DICHLOROPROPANE	5.4E+00		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: EPAS-1
Well Type: T
COC: 1,2-DIBROMO-3-CHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic:
-14

Confidence in Trend:
94.6%

Coefficient of Variation:
0.48

Mann Kendall Concentration Trend: (See Note)
PD

Data Table:

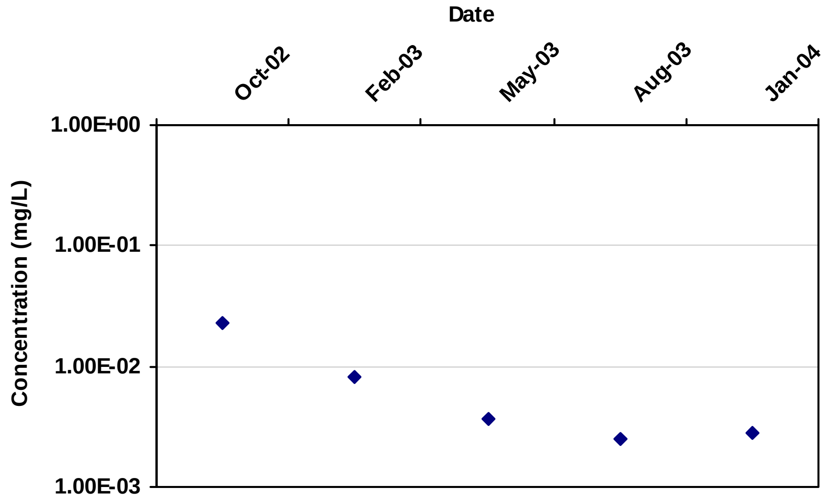
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
EPAS-1	T	10/1/2002	1,2-DIBROMO-3-CHLOROPROPA	1.8E-02		1	1
EPAS-1	T	2/1/2003	1,2-DIBROMO-3-CHLOROPROPA	1.7E-02		1	1
EPAS-1	T	5/1/2003	1,2-DIBROMO-3-CHLOROPROPA	2.1E-02		1	1
EPAS-1	T	8/1/2003	1,2-DIBROMO-3-CHLOROPROPA	2.5E-03	ND	1	0
EPAS-1	T	1/1/2004	1,2-DIBROMO-3-CHLOROPROPA	1.3E-02		1	1
EPAS-1	T	8/5/2007	1,2-DIBROMO-3-CHLOROPROPA	9.8E-03		1	1
EPAS-1	T	4/21/2008	1,2-DIBROMO-3-CHLOROPROPA	9.0E-03		2	2
EPAS-1	T	4/27/2009	1,2-DIBROMO-3-CHLOROPROPA	9.4E-03		2	2

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: AP-4
Well Type: S
COC: 1,2-DIBROMO-3-CHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -8

Confidence in Trend: 95.8%

Coefficient of Variation: 1.08

Mann Kendall Concentration Trend: (See Note) D

Data Table:

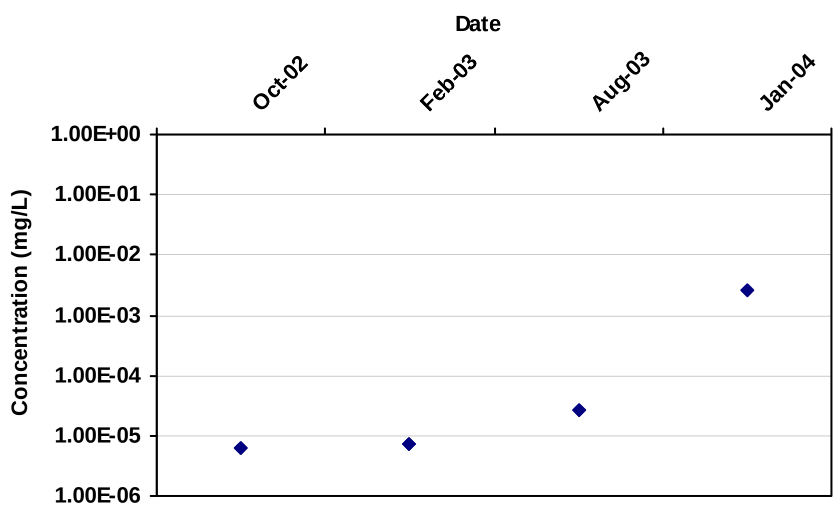
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
AP-4	S	10/1/2002	1,2-DIBROMO-3-CHLOROPROPA	2.3E-02		1	1
AP-4	S	2/1/2003	1,2-DIBROMO-3-CHLOROPROPA	8.1E-03		1	1
AP-4	S	5/1/2003	1,2-DIBROMO-3-CHLOROPROPA	3.7E-03		1	1
AP-4	S	8/1/2003	1,2-DIBROMO-3-CHLOROPROPA	2.5E-03	ND	1	0
AP-4	S	1/1/2004	1,2-DIBROMO-3-CHLOROPROPA	2.8E-03		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: AP-2
Well Type: T
COC: 1,2-DIBROMO-3-CHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 6

Confidence in Trend: 95.8%

Coefficient of Variation: 1.96

Mann Kendall Concentration Trend: (See Note) I

Data Table:

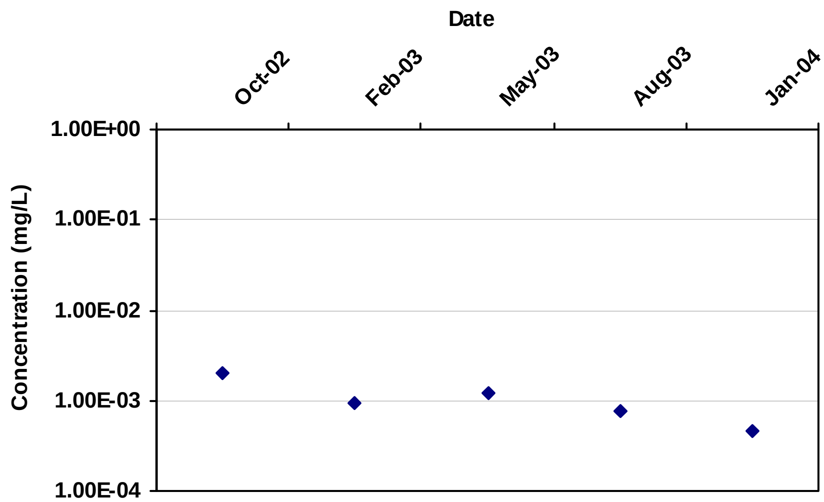
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
AP-2	T	10/1/2002	1,2-DIBROMO-3-CHLOROPROPA	6.2E-06		1	1
AP-2	T	2/1/2003	1,2-DIBROMO-3-CHLOROPROPA	7.1E-06		1	1
AP-2	T	8/1/2003	1,2-DIBROMO-3-CHLOROPROPA	2.7E-05		1	1
AP-2	T	1/1/2004	1,2-DIBROMO-3-CHLOROPROPA	2.5E-03	ND	1	0

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: AP-1
Well Type: T
COC: 1,2-DICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -8

Confidence in Trend: 95.8%

Coefficient of Variation: 0.54

Mann Kendall Concentration Trend: (See Note) D

Data Table:

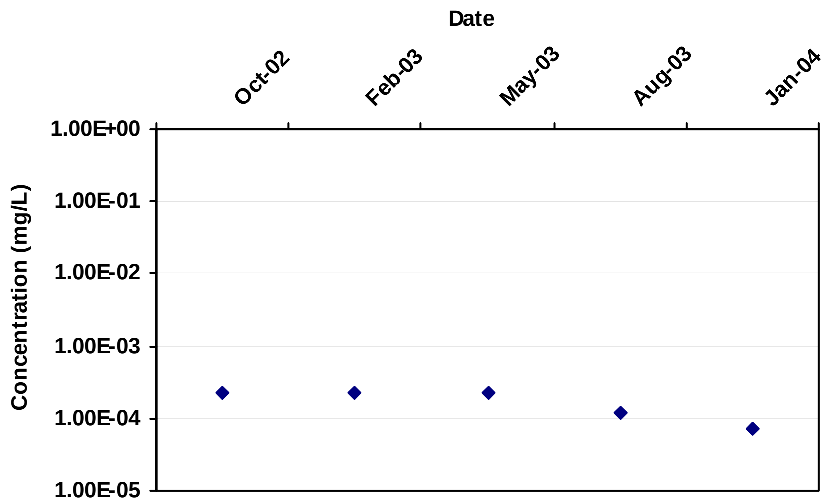
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
AP-1	T	10/1/2002	1,2-DICHLOROPROPANE	2.0E-03		1	1
AP-1	T	2/1/2003	1,2-DICHLOROPROPANE	9.6E-04		1	1
AP-1	T	5/1/2003	1,2-DICHLOROPROPANE	1.2E-03		1	1
AP-1	T	8/1/2003	1,2-DICHLOROPROPANE	7.6E-04		1	1
AP-1	T	1/1/2004	1,2-DICHLOROPROPANE	4.6E-04		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: AP-1
Well Type: T
COC: 1,2-DIBROMO-3-CHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -7

Confidence in Trend: 92.1%

Coefficient of Variation: 0.41

Mann Kendall Concentration Trend: (See Note) PD

Data Table:

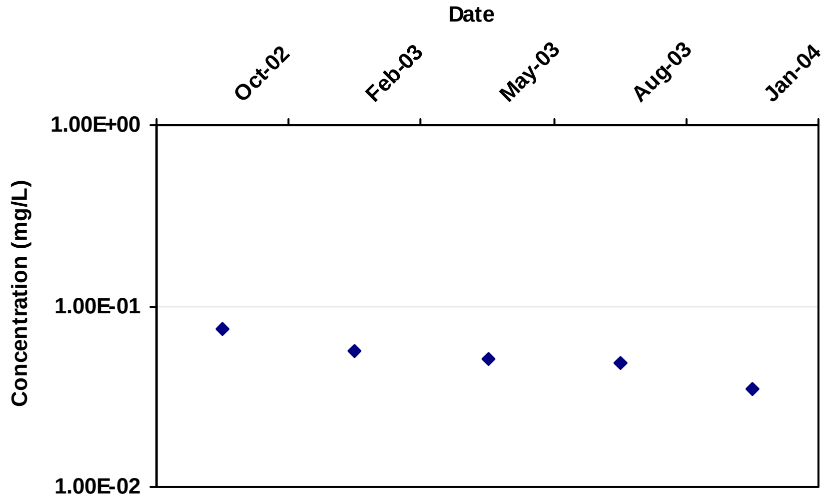
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
AP-1	T	10/1/2002	1,2-DIBROMO-3-CHLOROPROPA	2.2E-04		1	1
AP-1	T	2/1/2003	1,2-DIBROMO-3-CHLOROPROPA	2.2E-04		1	1
AP-1	T	5/1/2003	1,2-DIBROMO-3-CHLOROPROPA	2.2E-04		1	1
AP-1	T	8/1/2003	1,2-DIBROMO-3-CHLOROPROPA	1.2E-04		1	1
AP-1	T	1/1/2004	1,2-DIBROMO-3-CHLOROPROPA	7.4E-05		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: AMW-1P
Well Type: S
COC: 1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -10

Confidence in Trend: 99.2%

Coefficient of Variation: 0.27

Mann Kendall Concentration Trend: (See Note) D

Data Table:

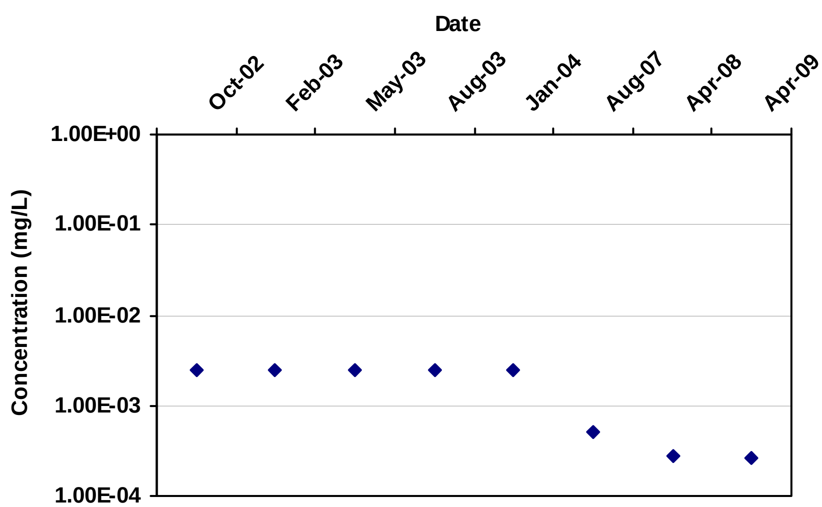
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
AMW-1P	S	10/1/2002	1,2-DIBROMOETHANE (ETHYLE	7.5E-02		1	1
AMW-1P	S	2/1/2003	1,2-DIBROMOETHANE (ETHYLE	5.6E-02		1	1
AMW-1P	S	5/1/2003	1,2-DIBROMOETHANE (ETHYLE	5.1E-02		1	1
AMW-1P	S	8/1/2003	1,2-DIBROMOETHANE (ETHYLE	4.9E-02		1	1
AMW-1P	S	1/1/2004	1,2-DIBROMOETHANE (ETHYLE	3.5E-02		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: WA-9
Well Type: T
COC: 1,2,3-TRICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/27/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -18

Confidence in Trend: 98.4%

Coefficient of Variation: 0.66

Mann Kendall Concentration Trend: (See Note) D

Data Table:

Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
WA-9	T	10/1/2002	1,2,3-TRICHLOROPROPANE	2.5E-03	ND	1	0
WA-9	T	2/1/2003	1,2,3-TRICHLOROPROPANE	2.5E-03	ND	1	0
WA-9	T	5/1/2003	1,2,3-TRICHLOROPROPANE	2.5E-03	ND	1	0
WA-9	T	8/1/2003	1,2,3-TRICHLOROPROPANE	2.5E-03	ND	1	0
WA-9	T	1/1/2004	1,2,3-TRICHLOROPROPANE	2.5E-03	ND	1	0
WA-9	T	8/5/2007	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
WA-9	T	4/21/2008	1,2,3-TRICHLOROPROPANE	2.7E-04		2	1
WA-9	T	4/27/2009	1,2,3-TRICHLOROPROPANE	2.7E-04		2	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

Attachment C-3
Moment Analysis for the A-zone

MAROS Spatial Moment Analysis Summary

Project: Brown & Bryant 3rd FYR

Location: Arvin

User Name: Mike Bailey

State: California

Effective Date	0th Moment: Estimated Mass (Kg)	1st Moment (Center of Mass): Xc (ft)	Yc (ft)	Source Distance (ft)	2nd Moment (Spread): Sigma XX (sq ft)	Sigma YY (sq ft)	Number of Wells
1,2,3-TRICHLOROPROPANE							
10/1/2002	5.7E+00	-5	-5	57	17,005	15,009	20
2/1/2003	4.2E+00	-7	10	69	19,030	16,150	21
5/1/2003	4.0E+00	-4	6	64	20,587	17,120	21
8/1/2003	6.1E+00	-14	8	72	19,277	11,745	22
1/1/2004	4.0E+00	-11	-1	63	22,795	13,138	23
8/5/2007	5.8E+00	-7	-33	44	20,087	12,217	15
4/21/2008	5.1E+00	1	-50	34	18,842	7,148	14
4/27/2009	7.3E-01	-85	-30	120	31,340	13,944	12
1,2-DIBROMO-3-CHLOROPROPANE							
10/1/2002	6.7E-01	65	-51	30	12,114	26,321	21
2/1/2003	4.9E-01	32	-10	35	15,767	31,645	21
5/1/2003	1.0E+00	122	-36	87	17,520	18,819	20
8/1/2003	7.3E-02	-15	49	106	33,323	82,966	22
1/1/2004	6.6E-01	92	-37	57	18,985	22,339	23
8/5/2007	8.3E-01	79	-93	65	5,861	3,466	15
4/21/2008	8.9E-01	74	-83	55	6,607	5,228	14
4/27/2009	1.2E-01	78	-118	85	16,549	12,539	12
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)							
10/1/2002	2.6E-01	155	21	137	18,978	59,432	20
2/1/2003	2.2E-01	130	58	140	28,853	61,630	20
5/1/2003	1.9E-01	127	96	168	32,645	61,937	19
8/1/2003	2.1E-01	133	66	148	28,924	61,517	20
1/1/2004	2.2E-01	135	35	128	32,172	65,814	21
8/5/2007	2.0E-02	110	-18	80	3,383	37,590	15
4/21/2008	3.4E-02	83	-96	70	11,964	13,563	14
4/27/2009	2.4E-02	74	-101	68	15,861	14,441	12
1,2-DICHLOROPROPANE							
10/1/2002	7.4E+01	-20	-21	60	11,163	6,738	21
2/1/2003	4.2E+01	-38	-8	82	14,373	5,426	21
5/1/2003	4.2E+01	-20	-17	62	15,284	7,116	21
8/1/2003	5.6E+01	-35	-1	82	13,547	6,108	22
1/1/2004	4.6E+01	-41	0	89	14,540	7,144	23
8/5/2007	4.1E+01	-9	-53	45	18,594	5,821	15
4/21/2008	3.6E+01	-3	-58	40	18,166	4,359	14
4/27/2009	3.4E+00	32	-84	39	20,034	9,790	11

Project: Brown & Bryant 3rd FYR

Location: Arvin

User Name: Mike Bailey

State: California

Effective Date	0th Moment Estimated Mass (kg)	1st Moment (Center of Mass) Xc (ft)	Yc (ft)	Source Distance (ft)	2nd Moment (Spread) Sigma XX (sq ft)	Sigma YY (sq ft)	Number of Wells
DINOSEB							
DINOSEB							
2/1/2003	1.0E+00	168	-37	134	33,374	38,327	27
5/1/2003	1.0E+00	154	-65	121	27,742	35,247	27
8/1/2003	8.9E+00	151	-95	127	7,205	9,541	22
1/1/2004	7.5E+00	167	-109	146	8,970	11,353	23
8/5/2007	2.6E+00	89	-95	74	4,727	4,208	15
4/21/2008	3.3E+00	89	-98	75	4,107	2,304	14
4/27/2009	5.6E-01	107	-145	123	9,984	6,866	12

Project: Brown & Bryant 3rd FYR
Location: Arvin

User Name: Mike Bailey
State: California

Moment Type	Constituent	Coefficient of Variation	Mann-Kendall S Statistic	Confidence in Trend	Moment Trend
Zeroth Moment: Mass					
	1,2,3-TRICHLOROPROPANE	0.39	-6	72.6%	S
	1,2-DIBROMO-3-CHLOROPROPAN	0.58	0	45.2%	S
	1,2-DIBROMOETHANE (ETHYLENE	0.69	-18	98.4%	D
	1,2-DICHLOROPROPANE	0.47	-20	99.3%	D
	DINOSEB	0.94	-3	61.4%	S
1st Moment: Distance to Source					
	1,2,3-TRICHLOROPROPANE	0.39	-2	54.8%	S
	1,2-DIBROMO-3-CHLOROPROPAN	0.41	8	80.1%	NT
	1,2-DIBROMOETHANE (ETHYLENE	0.33	-18	98.4%	D
	1,2-DICHLOROPROPANE	0.32	-10	86.2%	S
	DINOSEB	0.25	-5	71.9%	S
2nd Moment: Sigma XX					
	1,2,3-TRICHLOROPROPANE	0.21	12	91.1%	PI
	1,2-DIBROMO-3-CHLOROPROPAN	0.54	0	45.2%	S
	1,2-DIBROMOETHANE (ETHYLENE	0.50	-6	72.6%	S
	1,2-DICHLOROPROPANE	0.19	20	99.3%	I
	DINOSEB	0.86	-11	93.2%	PD
2nd Moment: Sigma YY					
	1,2,3-TRICHLOROPROPANE	0.23	-10	86.2%	S
	1,2-DIBROMO-3-CHLOROPROPAN	0.99	-12	91.1%	PD
	1,2-DIBROMOETHANE (ETHYLENE	0.47	-10	86.2%	S
	1,2-DICHLOROPROPANE	0.24	2	54.8%	NT
	DINOSEB	0.97	-15	98.5%	D

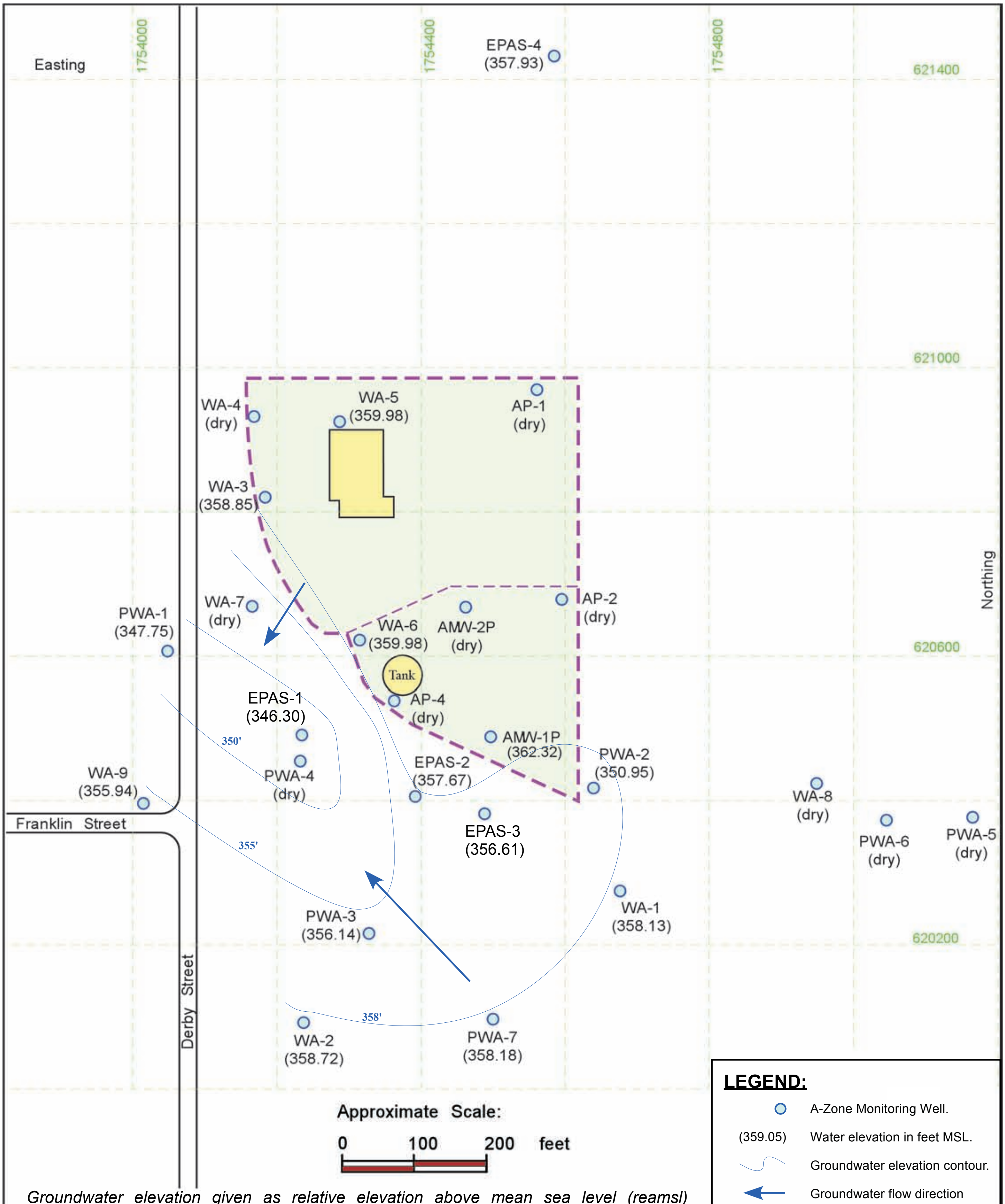
Note: The following assumptions were applied for the calculation of the Zeroth Moment:

Porosity: 0.25 **Saturated Thickness:** Uniform: 10 ft

Mann-Kendall Trend test performed on all sample events for each constituent. Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A)-Due to insufficient Data (< 4 sampling events).

Note: The Sigma XX and Sigma YY components are estimated using the given field coordinate system and then rotated to align with the estimated groundwater flow direction. Moments are not calculated for sample events with less than 6 wells.

Attachment C-4
Potentiometric Surface and Contaminant Distribution Maps for the A-zone



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

Environmental Excellence

Eco & Associates, Inc.
1855 W. Katella Avenue, Suite 340
Orange, California 92867

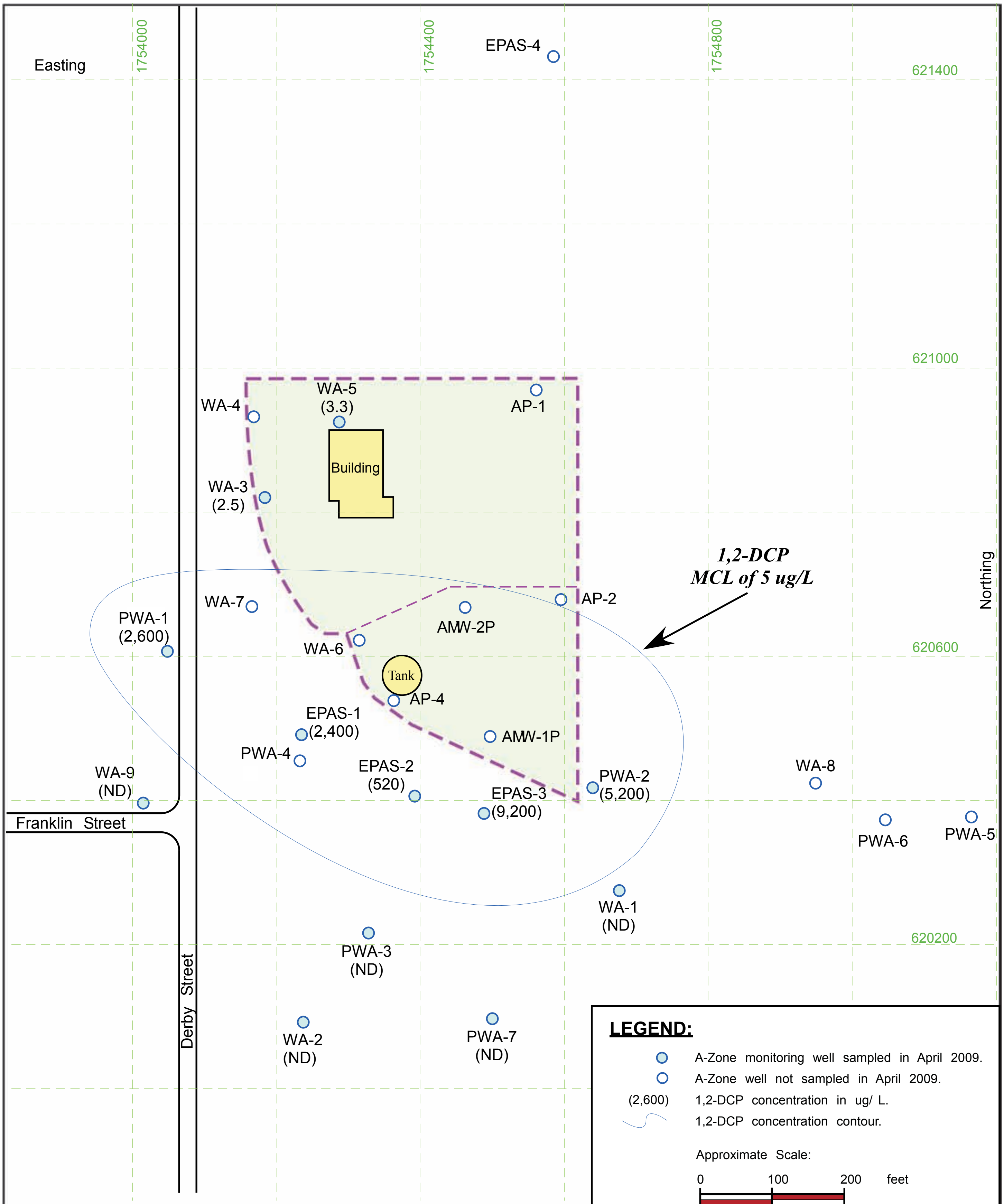
Phone: 714.289.0995 FAX: 714.289.0965

PIEZOMETRIC SURFACE
A-ZONE
Brown & Bryant Superfund Site

Project No.: Eco-09-350

Dated: November 2009

FIGURE: 3



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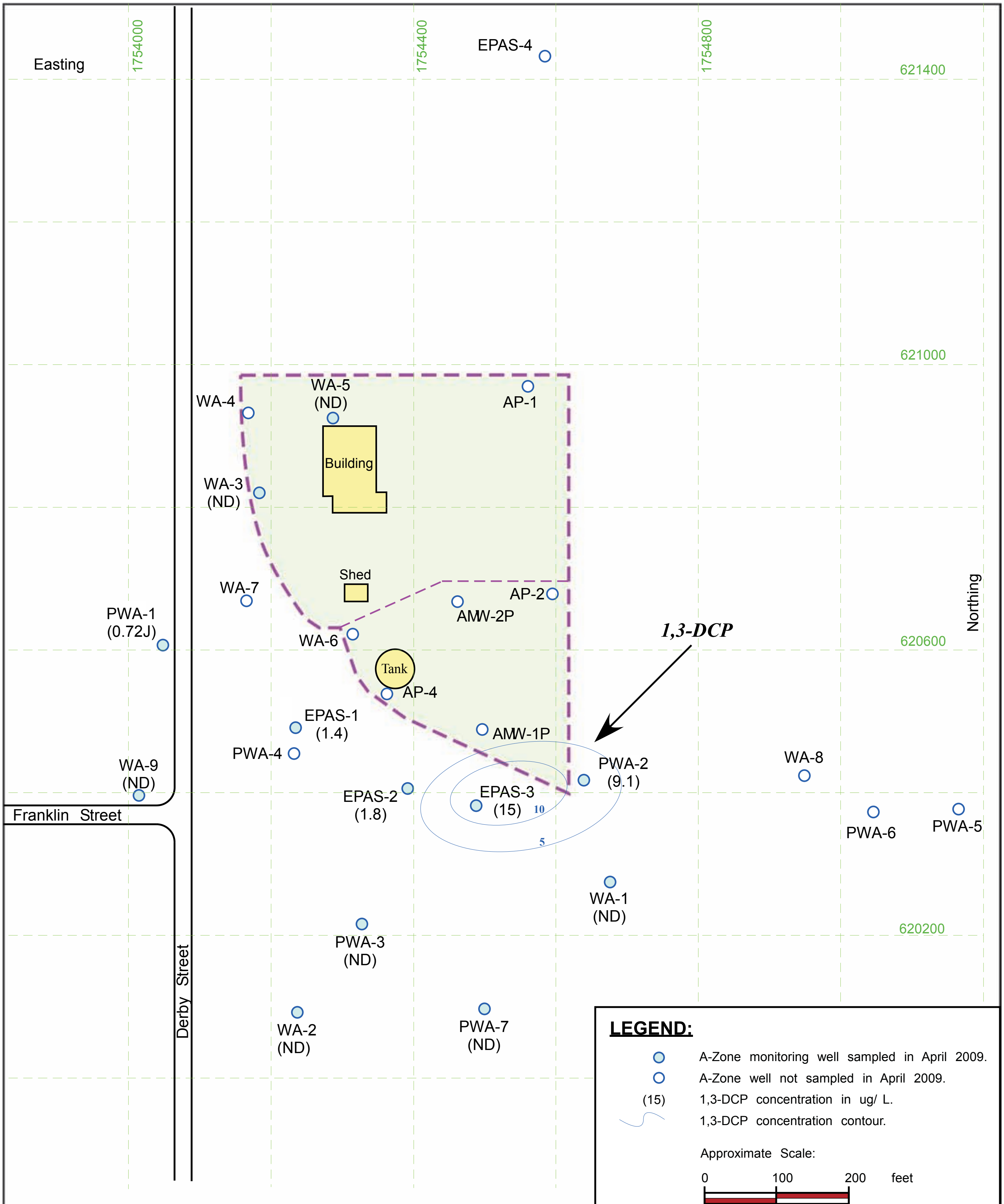
1,2-DCP IN GROUNDWATER
A-ZONE
Brown & Bryant Superfund Site

Project No.: Eco-09-350

Dated: November 2010

FIGURE:
5



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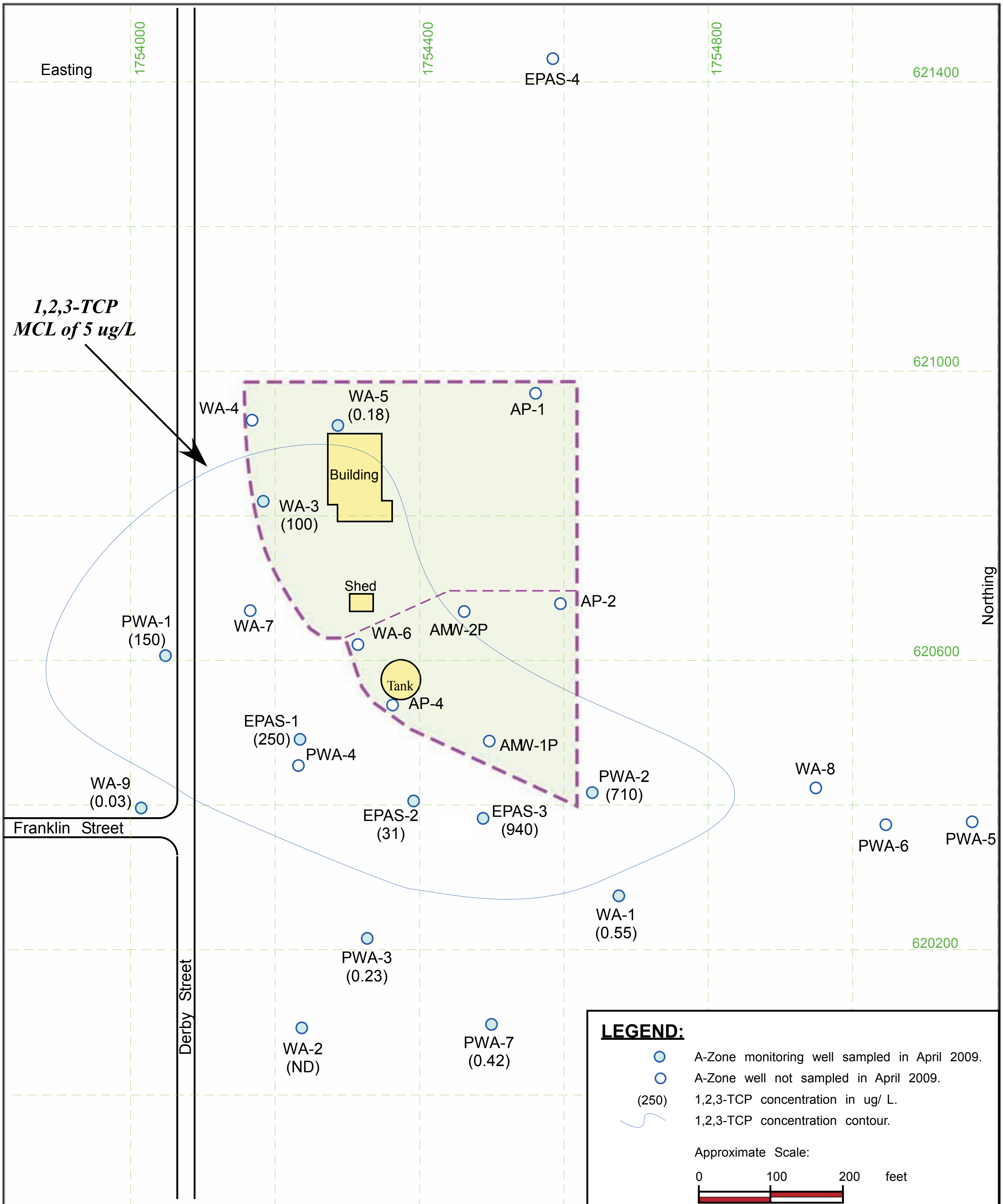
1,3-DCP IN GROUNDWATER
A-ZONE
Brown & Bryant Superfund Site

Project No.: Eco-09-350

Dated: November 2010

FIGURE: 6



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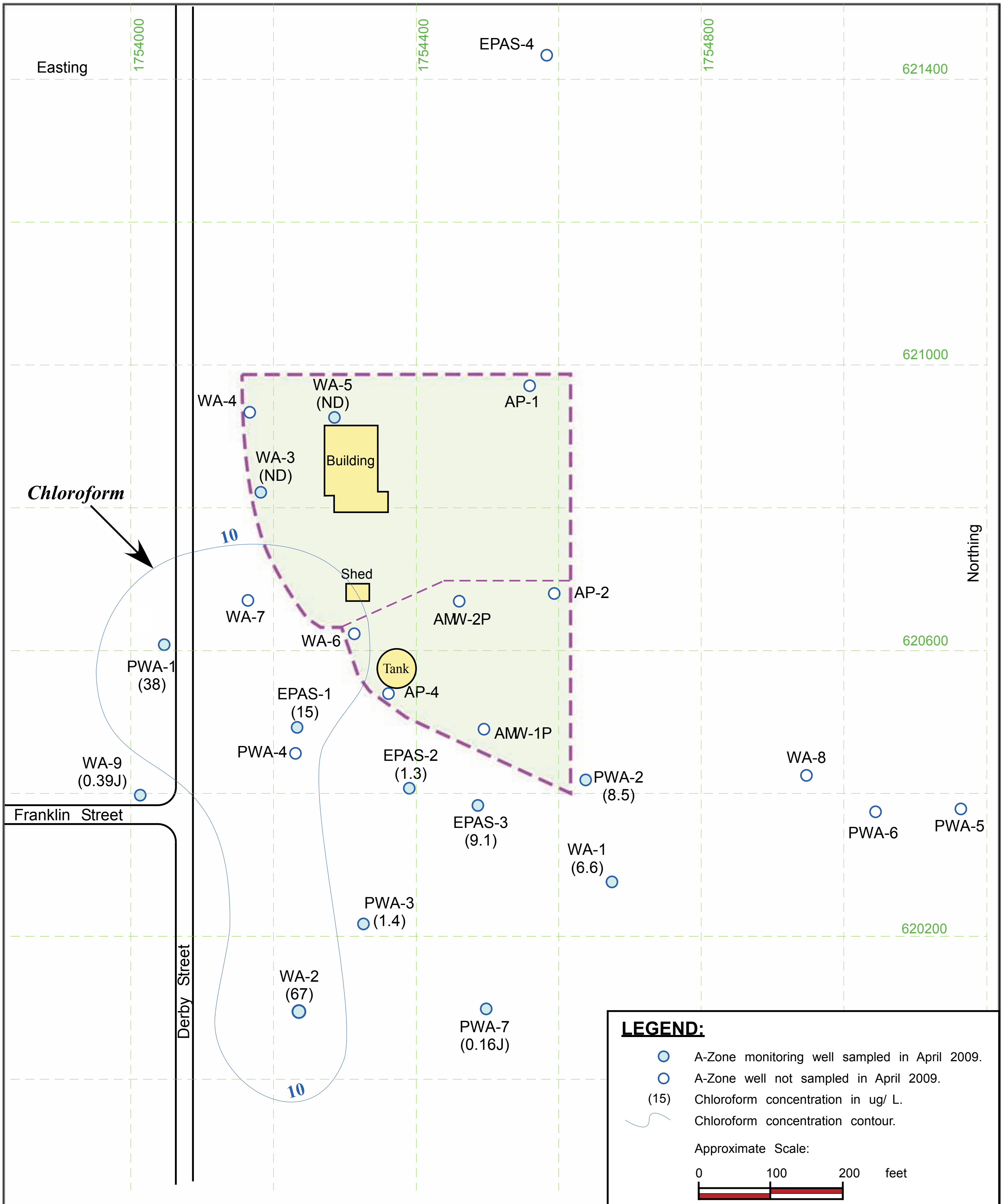
1,2,3-TCP IN GROUNDWATER
A-ZONE
Brown & Bryant Superfund Site

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

FIGURE: 7



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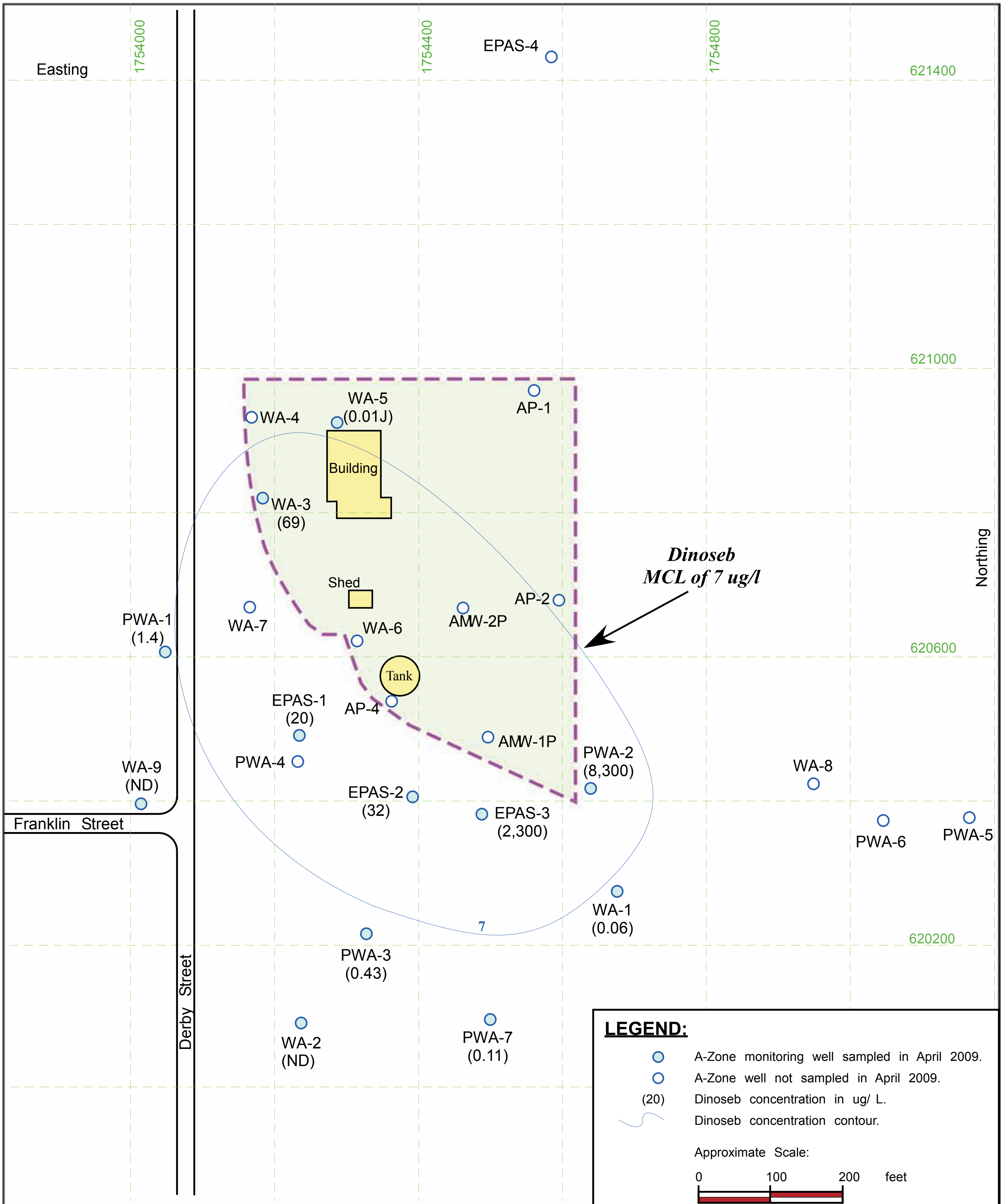
CHLOROFORM IN GROUNDWATER
A-ZONE
Brown & Bryant Superfund Site

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

FIGURE: 8



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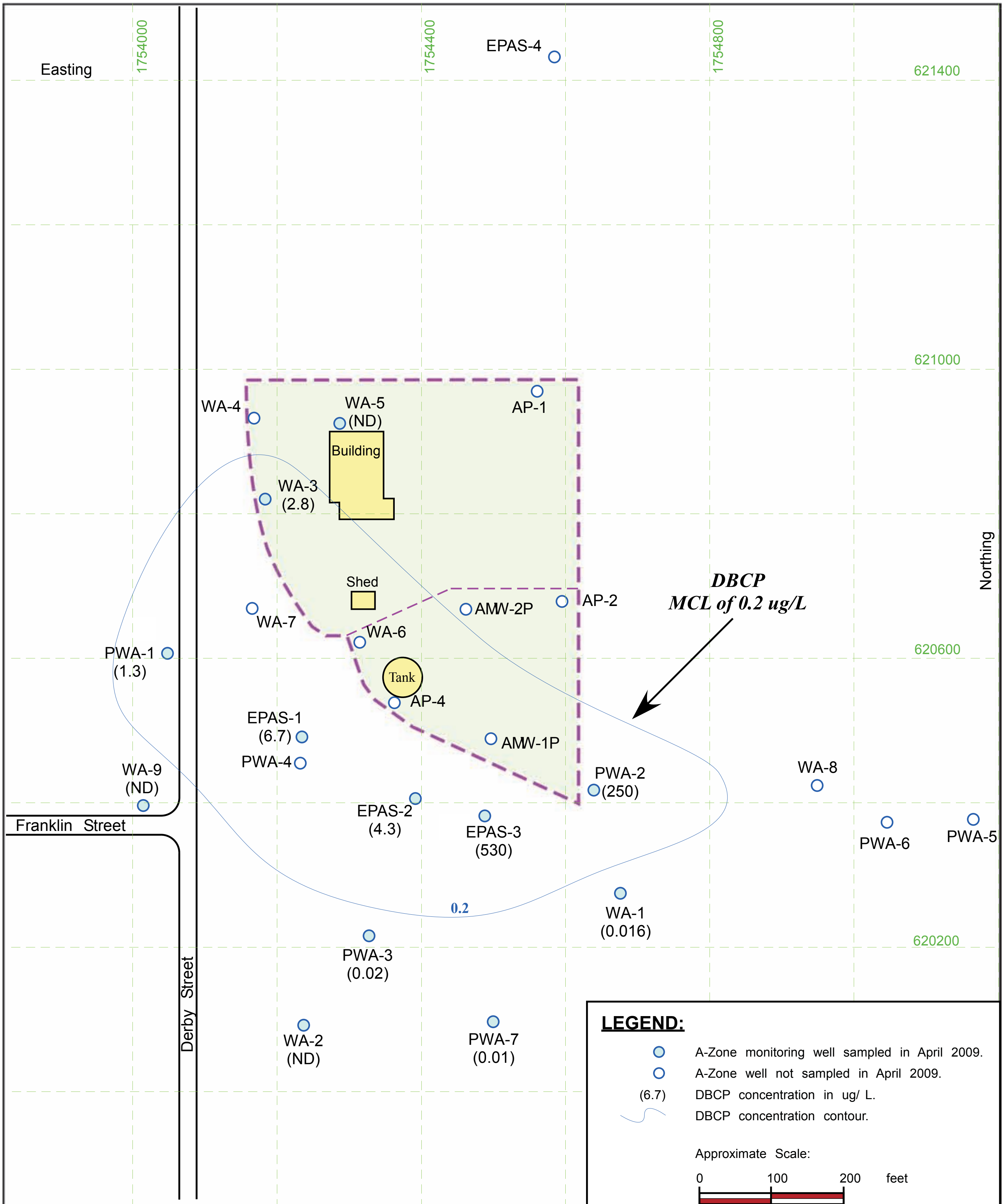
DINOSEB IN GROUNDWATER
A-ZONE
Brown & Bryant Superfund Site

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

FIGURE: 9



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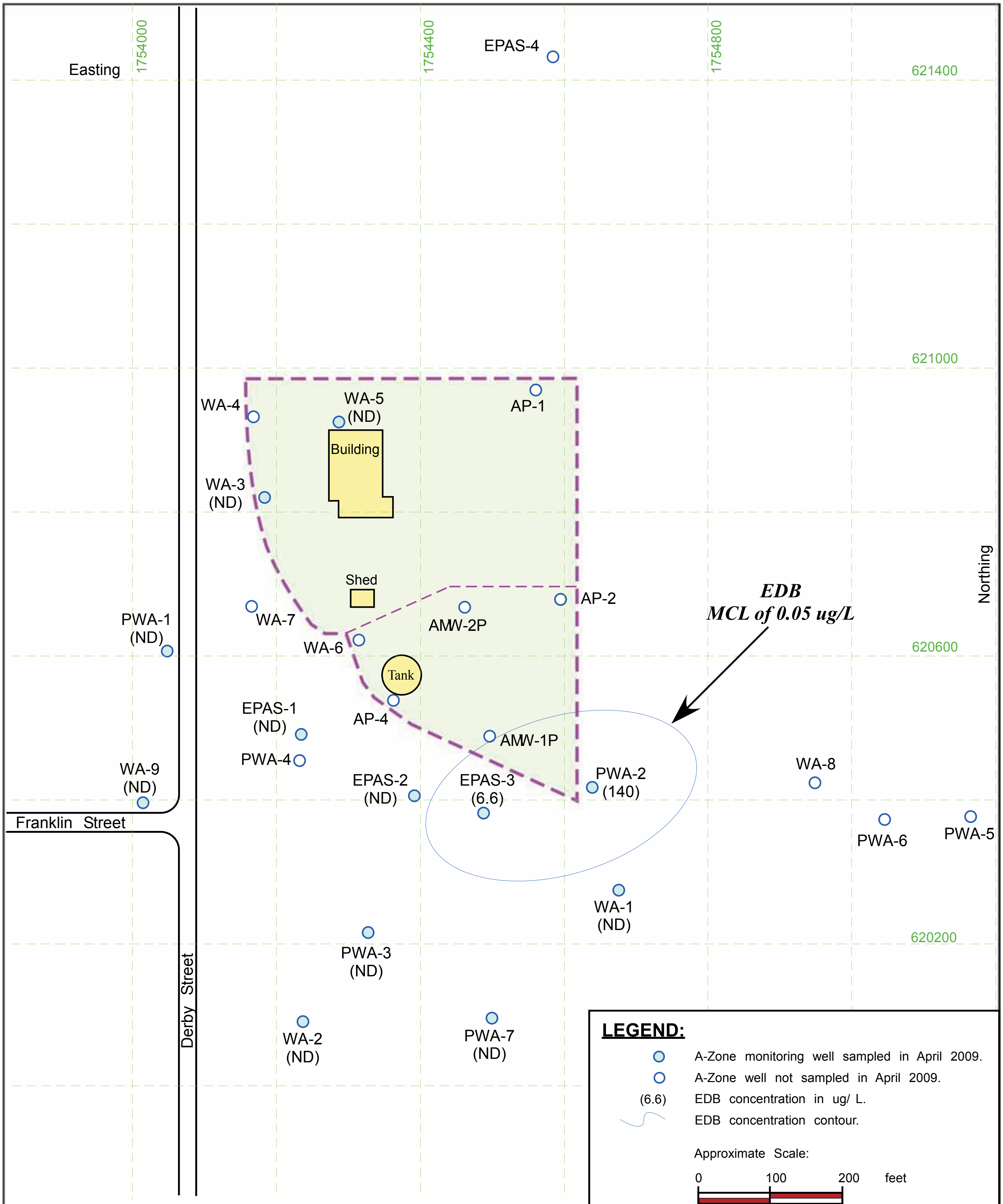
DBCP IN GROUNDWATER
A-ZONE
Brown & Bryant Superfund Site

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

FIGURE: 10



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EDB IN GROUNDWATER
A-ZONE
Brown & Bryant Superfund Site

Project No.: Eco-09-350 Dated: November 2010

FIGURE:
11

Attachment C-5
Mann-Kendall Summary Statistics
for the B-zone

MAROS Mann-Kendall Statistics Summary

Project: Brown & Bryant 3rd FYR

User Name: Mike Bailey

Location: Arvin

State: California

Time Period: 10/1/2002 **to** 4/28/2009

Consolidation Period: No Time Consolidation

Consolidation Type: Median

Duplicate Consolidation: Average

ND Values: 1/2 Detection Limit

J Flag Values : Actual Value

Well	Source/ Tail	Number of Samples	Number of Detects	Coefficient of Variation	Mann-Kendall Statistic	Confidence in Trend	All Samples "ND" ?	Concentration Trend
1,2,3-TRICHLOROPROPANE								
AMW-3R	T	8	7	0.20	4	64.0%	No	NT
AMW-4R	S	8	4	0.19	6	72.6%	No	NT
AR-1	T	8	7	0.26	-2	54.8%	No	S
PWB-1	S	8	6	0.60	-7	76.4%	No	S
PWB-10	T	7	2	1.78	9	88.1%	No	NT
PWB-11	T	6	4	1.40	12	98.2%	No	I
PWB-2	T	8	3	0.14	-16	96.9%	No	D
PWB-3	T	8	7	1.58	-24	99.9%	No	D
PWB-4	T	8	8	0.43	-4	64.0%	No	S
PWB-5	T	30	6	0.66	106	97.0%	No	I
PWB-6	T	7	2	0.17	1	50.0%	No	NT
PWB-7	T	1	1	0.00	0	0.0%	No	N/A
PWB-8	T	7	5	0.46	-15	98.5%	No	D
PWB-9	T	7	1	0.25	-11	93.2%	No	PD
WB2-1	S	8	8	0.82	-26	100.0%	No	D
WB2-2	T	8	8	0.42	8	80.1%	No	NT
WB2-3	T	8	2	0.23	-11	88.7%	No	S
WB2-4	T	30	2	0.12	-55	83.1%	No	S
1,2-DIBROMO-3-CHLOROPROPANE								
AMW-3R	T	8	3	0.48	-12	91.1%	No	PD
AMW-4R	S	8	4	0.87	3	59.4%	No	NT
AR-1	T	8	3	0.69	-6	72.6%	No	S
PWB-1	S	8	2	0.75	0	45.2%	No	S
PWB-10	T	7	3	1.58	-3	61.4%	No	NT
PWB-11	T	6	1	0.59	-8	89.8%	No	S
PWB-2	T	8	0	0.50	-13	92.9%	Yes	ND
PWB-3	T	8	7	1.34	-4	64.0%	No	NT
PWB-4	T	8	8	0.82	-20	99.3%	No	D
PWB-5	T	30	13	0.75	-126	98.8%	No	D
PWB-6	T	7	2	0.48	-3	61.4%	No	S
PWB-7	T	1	1	0.00	0	0.0%	No	N/A
PWB-8	T	7	0	0.54	-10	90.7%	Yes	ND
PWB-9	T	7	2	0.74	-8	84.5%	No	S
WB2-1	S	8	6	1.70	-4	64.0%	No	NT
WB2-2	T	8	8	0.46	-2	54.8%	No	S
WB2-3	T	8	1	0.70	-5	68.3%	No	S
WB2-4	T	30	2	0.28	-56	83.6%	No	S

Project: Brown & Bryant 3rd FYR

User Name: Mike Bailey

Location: Arvin

State: California

Well	Source/ Tail	Number of Samples	Number of Detects	Coefficient of Variation	Mann-Kendall Statistic	Confidence in Trend	All Samples "ND" ?	Concentration Trend
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)								
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)								
AMW-3R	T	8	0	0.49	-13	92.9%	Yes	ND
AMW-4R	S	8	0	0.49	-13	92.9%	Yes	ND
AR-1	T	8	0	0.49	-13	92.9%	Yes	ND
PWB-1	S	8	0	0.49	-13	92.9%	Yes	ND
PWB-10	T	5	0	0.67	-4	75.8%	Yes	ND
PWB-11	T	6	0	0.59	-7	86.4%	Yes	ND
PWB-2	T	8	0	0.49	-13	92.9%	Yes	ND
PWB-3	T	8	0	0.49	-13	92.9%	Yes	ND
PWB-4	T	8	1	1.74	-11	88.7%	No	NT
PWB-5	T	30	1	0.29	-67	87.9%	No	S
PWB-6	T	7	0	0.54	-10	90.7%	Yes	ND
PWB-7	T	1	0	0.00	0	0.0%	Yes	ND
PWB-8	T	7	2	0.91	-1	50.0%	No	S
PWB-9	T	7	0	0.54	-10	90.7%	Yes	ND
WB2-1	S	8	0	0.49	-13	92.9%	Yes	ND
WB2-2	T	8	0	0.49	-13	92.9%	Yes	ND
WB2-3	T	8	0	0.49	-13	92.9%	Yes	ND
WB2-4	T	30	1	0.29	-67	87.9%	No	S
1,2-DICHLOROPROPANE								
AMW-3R	T	8	7	0.47	-16	96.9%	No	D
AMW-4R	S	8	6	0.78	-2	54.8%	No	S
AR-1	T	8	6	0.40	-16	96.9%	No	D
PWB-1	S	8	6	0.59	-19	98.9%	No	D
PWB-10	T	7	6	1.42	13	96.5%	No	I
PWB-11	T	6	5	0.65	9	93.2%	No	PI
PWB-2	T	8	8	0.60	24	99.9%	No	I
PWB-3	T	8	6	1.06	-19	98.9%	No	D
PWB-4	T	8	8	0.48	-15	95.8%	No	D
PWB-5	T	30	30	5.47	-4	52.1%	No	NT
PWB-6	T	7	0	0.00	0	43.7%	Yes	ND
PWB-7	T	1	1	0.00	0	0.0%	No	N/A
PWB-8	T	7	7	0.54	-15	98.5%	No	D
PWB-9	T	7	1	0.02	-4	66.7%	No	S
WB2-1	S	8	8	0.86	-26	100.0%	No	D
WB2-2	T	8	8	0.41	11	88.7%	No	NT
WB2-3	T	8	7	0.71	-14	94.6%	No	PD
WB2-4	T	30	24	0.61	175	99.9%	No	I
DINOSEB								
AMW-3R	T	7	1	0.89	-14	97.5%	No	D
AMW-4R	S	7	2	0.77	-11	93.2%	No	PD
AR-1	T	7	1	0.89	-10	90.7%	No	PD
PWB-1	S	7	2	0.85	-13	96.5%	No	D
PWB-10	T	7	3	0.97	-3	61.4%	No	S
PWB-11	T	6	3	0.78	0	42.3%	No	S
PWB-2	T	7	1	0.89	-10	90.7%	No	PD
PWB-3	T	7	3	0.83	-15	98.5%	No	D

Project: Brown & Bryant 3rd FYR

User Name: Mike Bailey

Location: Arvin

State: California

Well	Source/ Tail	Number of Samples	Number of Detects	Coefficient of Variation	Mann-Kendall Statistic	Confidence in Trend	All Samples "ND" ?	Concentration Trend
DINOSEB								
PWB-4	T	7	7	0.44	-9	88.1%	No	S
PWB-5	T	29	3	0.25	-77	92.3%	No	PD
PWB-6	T	7	0	0.89	-12	94.9%	Yes	ND
PWB-7	T	1	0	0.00	0	0.0%	Yes	ND
PWB-8	T	7	3	0.79	-13	96.5%	No	D
PWB-9	T	7	2	0.84	-15	98.5%	No	D
WB2-1	S	7	7	0.77	-16	99.0%	No	D
WB2-2	T	7	7	0.45	12	94.9%	No	PI
WB2-3	T	7	3	0.82	-12	94.9%	No	PD
WB2-4	T	29	1	0.33	-76	92.0%	No	PD

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A)- Due to insufficient Data (< 4 sampling events); Source/Tail (S/T)

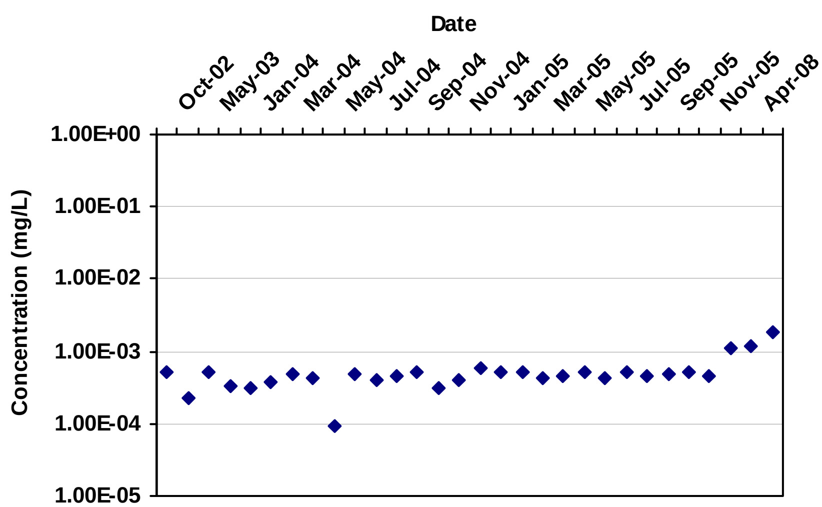
The Number of Samples and Number of Detects shown above are post-consolidation values.

Attachment C-6
Time-Series Charts for the B-zone

MAROS Mann-Kendall Statistics Summary

Well: WB2-4
Well Type: T
COC: 1,2-DICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 175

Confidence in Trend: 99.9%

Coefficient of Variation: 0.61

Mann Kendall Concentration Trend: (See Note) I

Data Table:

Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
WB2-4	T	10/1/2002	1,2-DICHLOROPROPANE	5.0E-04	ND	1	0
WB2-4	T	2/1/2003	1,2-DICHLOROPROPANE	2.2E-04		1	1
WB2-4	T	5/1/2003	1,2-DICHLOROPROPANE	5.0E-04	ND	1	0
WB2-4	T	8/1/2003	1,2-DICHLOROPROPANE	3.4E-04		1	1
WB2-4	T	1/1/2004	1,2-DICHLOROPROPANE	3.1E-04		1	1
WB2-4	T	2/1/2004	1,2-DICHLOROPROPANE	3.7E-04		1	1
WB2-4	T	3/1/2004	1,2-DICHLOROPROPANE	4.8E-04		1	1
WB2-4	T	4/1/2004	1,2-DICHLOROPROPANE	4.2E-04		1	1
WB2-4	T	5/1/2004	1,2-DICHLOROPROPANE	9.0E-05		1	1
WB2-4	T	6/1/2004	1,2-DICHLOROPROPANE	4.8E-04		1	1
WB2-4	T	7/1/2004	1,2-DICHLOROPROPANE	4.1E-04		1	1
WB2-4	T	8/1/2004	1,2-DICHLOROPROPANE	4.5E-04		1	1
WB2-4	T	9/1/2004	1,2-DICHLOROPROPANE	5.0E-04	ND	1	0
WB2-4	T	10/1/2004	1,2-DICHLOROPROPANE	3.2E-04		1	1
WB2-4	T	11/1/2004	1,2-DICHLOROPROPANE	3.9E-04		1	1
WB2-4	T	12/1/2004	1,2-DICHLOROPROPANE	5.8E-04		1	1
WB2-4	T	1/1/2005	1,2-DICHLOROPROPANE	5.0E-04		1	1
WB2-4	T	2/1/2005	1,2-DICHLOROPROPANE	5.0E-04	ND	1	0
WB2-4	T	3/1/2005	1,2-DICHLOROPROPANE	4.4E-04		1	1
WB2-4	T	4/1/2005	1,2-DICHLOROPROPANE	4.6E-04		1	1
WB2-4	T	5/1/2005	1,2-DICHLOROPROPANE	5.0E-04	ND	1	0
WB2-4	T	6/1/2005	1,2-DICHLOROPROPANE	4.3E-04		1	1

MAROS Mann-Kendall Statistics Summary

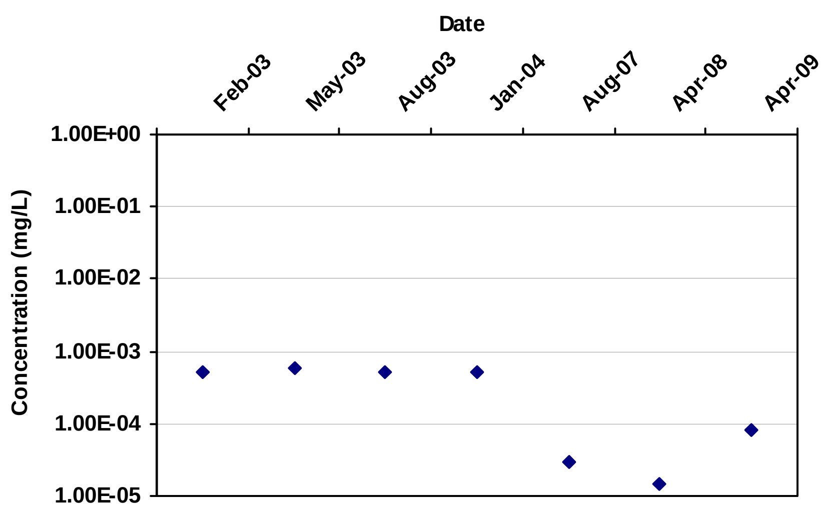
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
WB2-4	T	7/1/2005	1,2-DICHLOROPROPANE	5.0E-04	ND	1	0
WB2-4	T	8/1/2005	1,2-DICHLOROPROPANE	4.5E-04		1	1
WB2-4	T	9/1/2005	1,2-DICHLOROPROPANE	4.8E-04		1	1
WB2-4	T	10/1/2005	1,2-DICHLOROPROPANE	5.0E-04		1	1
WB2-4	T	11/1/2005	1,2-DICHLOROPROPANE	4.5E-04		1	1
WB2-4	T	8/5/2007	1,2-DICHLOROPROPANE	1.1E-03		1	1
WB2-4	T	4/22/2008	1,2-DICHLOROPROPANE	1.2E-03		1	1
WB2-4	T	4/28/2009	1,2-DICHLOROPROPANE	1.8E-03		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: WB2-3
Well Type: T
COC: DINOSEB

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -12

Confidence in Trend: 94.9%

Coefficient of Variation: 0.82

Mann Kendall Concentration Trend: (See Note) PD

Data Table:

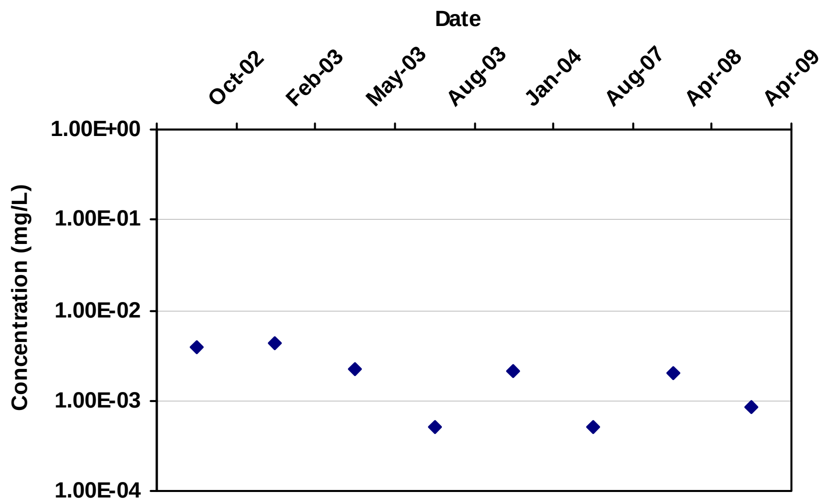
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
WB2-3	T	2/1/2003	DINOSEB	5.0E-04	ND	1	0
WB2-3	T	5/1/2003	DINOSEB	5.7E-04		1	1
WB2-3	T	8/1/2003	DINOSEB	5.0E-04	ND	1	0
WB2-3	T	1/1/2004	DINOSEB	5.0E-04	ND	1	0
WB2-3	T	8/5/2007	DINOSEB	3.0E-05		1	1
WB2-3	T	4/22/2008	DINOSEB	1.5E-05	ND	1	0
WB2-3	T	4/28/2009	DINOSEB	8.0E-05		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: WB2-3
Well Type: T
COC: 1,2-DICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic:

-14

Confidence in Trend:

94.6%

Coefficient of Variation:

0.71

Mann Kendall Concentration Trend: (See Note)

PD

Data Table:

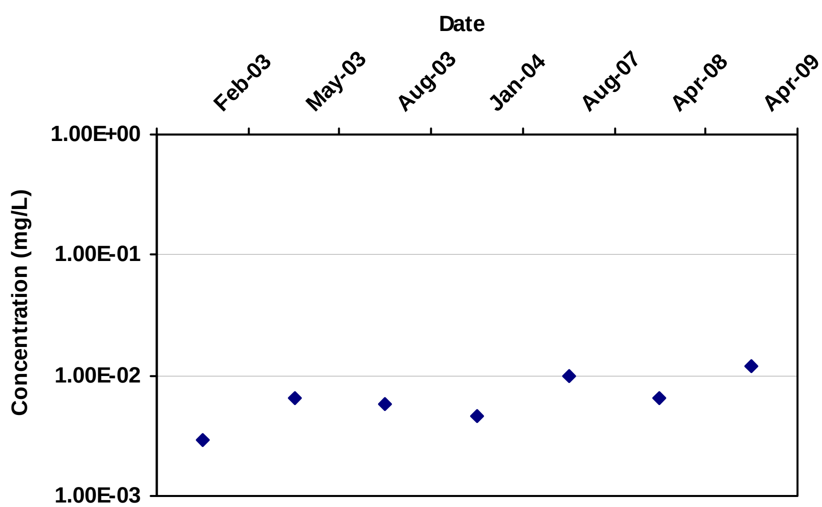
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
WB2-3	T	10/1/2002	1,2-DICHLOROPROPANE	4.0E-03		1	1
WB2-3	T	2/1/2003	1,2-DICHLOROPROPANE	4.3E-03		1	1
WB2-3	T	5/1/2003	1,2-DICHLOROPROPANE	2.2E-03		1	1
WB2-3	T	8/1/2003	1,2-DICHLOROPROPANE	5.0E-04	ND	1	0
WB2-3	T	1/1/2004	1,2-DICHLOROPROPANE	2.1E-03		1	1
WB2-3	T	8/5/2007	1,2-DICHLOROPROPANE	5.2E-04		1	1
WB2-3	T	4/22/2008	1,2-DICHLOROPROPANE	2.0E-03		1	1
WB2-3	T	4/28/2009	1,2-DICHLOROPROPANE	8.5E-04		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: WB2-2
Well Type: T
COC: DINOSEB

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 12

Confidence in Trend: 94.9%

Coefficient of Variation: 0.45

Mann Kendall Concentration Trend: (See Note) PI

Data Table:

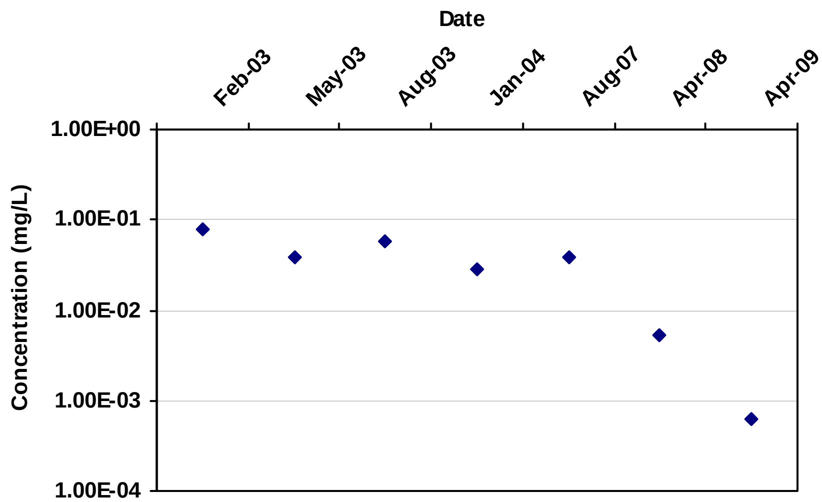
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
WB2-2	T	2/1/2003	DINOSEB	2.9E-03		1	1
WB2-2	T	5/1/2003	DINOSEB	6.5E-03		1	1
WB2-2	T	8/1/2003	DINOSEB	5.8E-03		1	1
WB2-2	T	1/1/2004	DINOSEB	4.6E-03		1	1
WB2-2	T	8/5/2007	DINOSEB	1.0E-02		1	1
WB2-2	T	4/22/2008	DINOSEB	6.5E-03		1	1
WB2-2	T	4/28/2009	DINOSEB	1.2E-02		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: WB2-1
Well Type: S
COC: DINOSEB

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -16

Confidence in Trend: 99.0%

Coefficient of Variation: 0.77

Mann Kendall Concentration Trend: (See Note) D

Data Table:

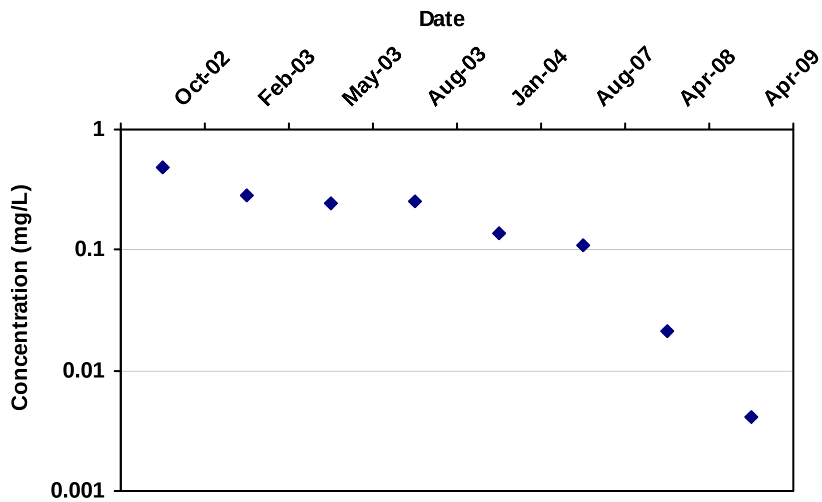
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
WB2-1	S	2/1/2003	DINOSEB	7.8E-02		1	1
WB2-1	S	5/1/2003	DINOSEB	3.9E-02		1	1
WB2-1	S	8/1/2003	DINOSEB	5.8E-02		1	1
WB2-1	S	1/1/2004	DINOSEB	2.8E-02		1	1
WB2-1	S	8/5/2007	DINOSEB	3.9E-02		1	1
WB2-1	S	4/22/2008	DINOSEB	5.4E-03		1	1
WB2-1	S	4/28/2009	DINOSEB	6.2E-04		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: WB2-1
Well Type: S
COC: 1,2,3-TRICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -26

Confidence in Trend: 100.0%

Coefficient of Variation: 0.82

Mann Kendall Concentration Trend: (See Note) D

Data Table:

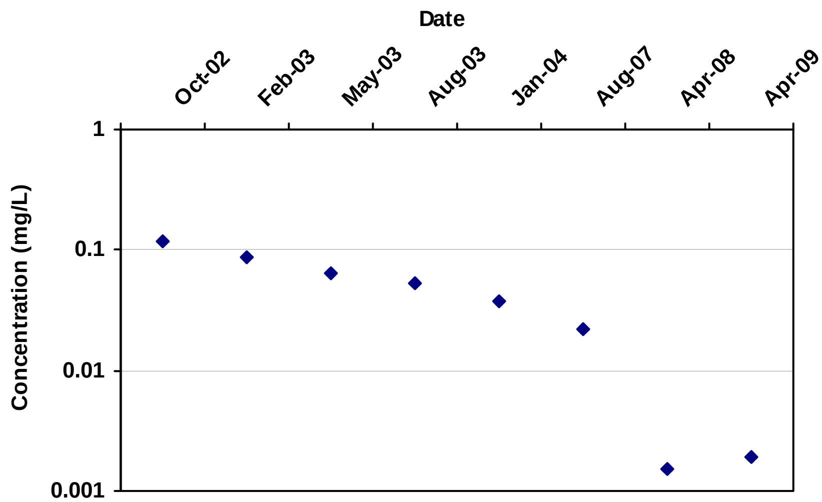
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
WB2-1	S	10/1/2002	1,2,3-TRICHLOROPROPANE	4.8E-01		1	1
WB2-1	S	2/1/2003	1,2,3-TRICHLOROPROPANE	2.8E-01		1	1
WB2-1	S	5/1/2003	1,2,3-TRICHLOROPROPANE	2.4E-01		1	1
WB2-1	S	8/1/2003	1,2,3-TRICHLOROPROPANE	2.5E-01		1	1
WB2-1	S	1/1/2004	1,2,3-TRICHLOROPROPANE	1.4E-01		1	1
WB2-1	S	8/5/2007	1,2,3-TRICHLOROPROPANE	1.1E-01		1	1
WB2-1	S	4/22/2008	1,2,3-TRICHLOROPROPANE	2.2E-02		2	2
WB2-1	S	4/28/2009	1,2,3-TRICHLOROPROPANE	4.2E-03		2	2

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: WB2-1
Well Type: S
COC: 1,2-DICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -26

Confidence in Trend: 100.0%

Coefficient of Variation: 0.86

Mann Kendall Concentration Trend: (See Note) D

Data Table:

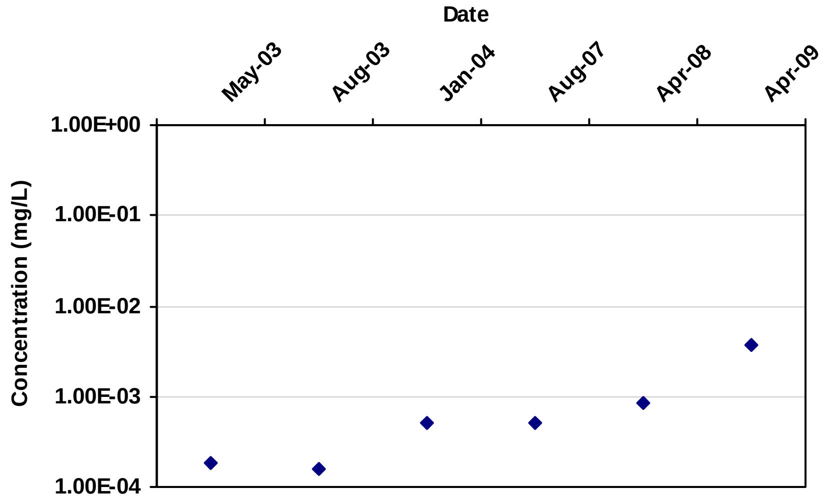
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
WB2-1	S	10/1/2002	1,2-DICHLOROPROPANE	1.2E-01		1	1
WB2-1	S	2/1/2003	1,2-DICHLOROPROPANE	8.8E-02		1	1
WB2-1	S	5/1/2003	1,2-DICHLOROPROPANE	6.4E-02		1	1
WB2-1	S	8/1/2003	1,2-DICHLOROPROPANE	5.3E-02		1	1
WB2-1	S	1/1/2004	1,2-DICHLOROPROPANE	3.8E-02		1	1
WB2-1	S	8/5/2007	1,2-DICHLOROPROPANE	2.2E-02		1	1
WB2-1	S	4/22/2008	1,2-DICHLOROPROPANE	1.5E-03		1	1
WB2-1	S	4/28/2009	1,2-DICHLOROPROPANE	1.9E-03		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWB-11
Well Type: T
COC: 1,2,3-TRICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 12

Confidence in Trend: 98.2%

Coefficient of Variation: 1.40

Mann Kendall Concentration Trend: (See Note) I

Data Table:

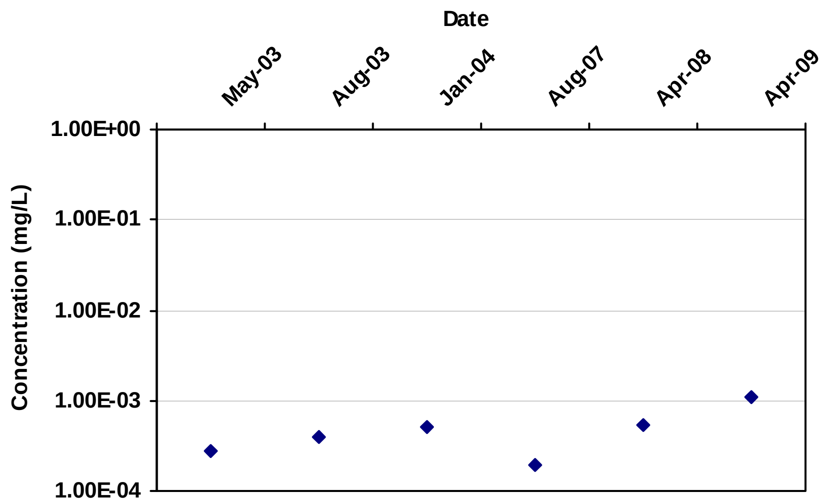
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-11	T	5/1/2003	1,2,3-TRICHLOROPROPANE	1.8E-04		1	1
PWB-11	T	8/1/2003	1,2,3-TRICHLOROPROPANE	1.6E-04		1	1
PWB-11	T	1/1/2004	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-11	T	8/5/2007	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-11	T	4/22/2008	1,2,3-TRICHLOROPROPANE	8.5E-04		2	1
PWB-11	T	4/28/2009	1,2,3-TRICHLOROPROPANE	3.8E-03		2	2

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWB-11
Well Type: T
COC: 1,2-DICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 9

Confidence in Trend: 93.2%

Coefficient of Variation: 0.65

Mann Kendall Concentration Trend: (See Note) PI

Data Table:

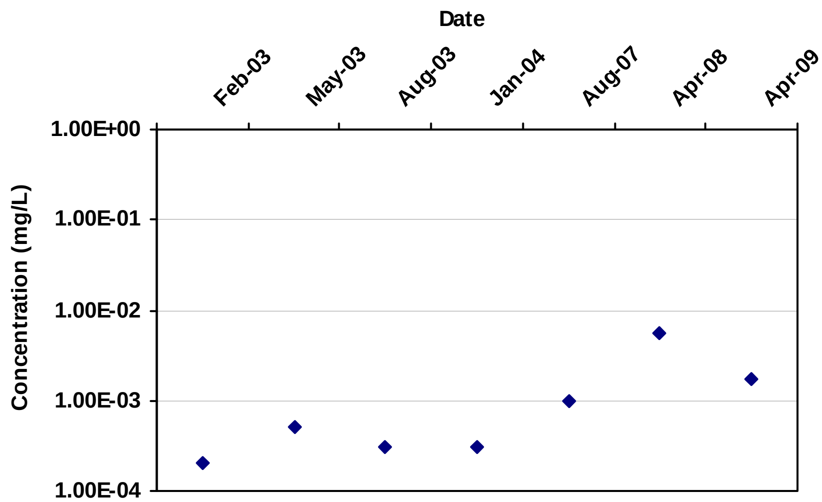
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-11	T	5/1/2003	1,2-DICHLOROPROPANE	2.7E-04		1	1
PWB-11	T	8/1/2003	1,2-DICHLOROPROPANE	3.9E-04		1	1
PWB-11	T	1/1/2004	1,2-DICHLOROPROPANE	5.0E-04	ND	1	0
PWB-11	T	8/5/2007	1,2-DICHLOROPROPANE	1.9E-04		1	1
PWB-11	T	4/22/2008	1,2-DICHLOROPROPANE	5.3E-04		1	1
PWB-11	T	4/28/2009	1,2-DICHLOROPROPANE	1.1E-03		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWB-10
Well Type: T
COC: 1,2-DICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 13

Confidence in Trend: 96.5%

Coefficient of Variation: 1.42

Mann Kendall Concentration Trend: (See Note) I

Data Table:

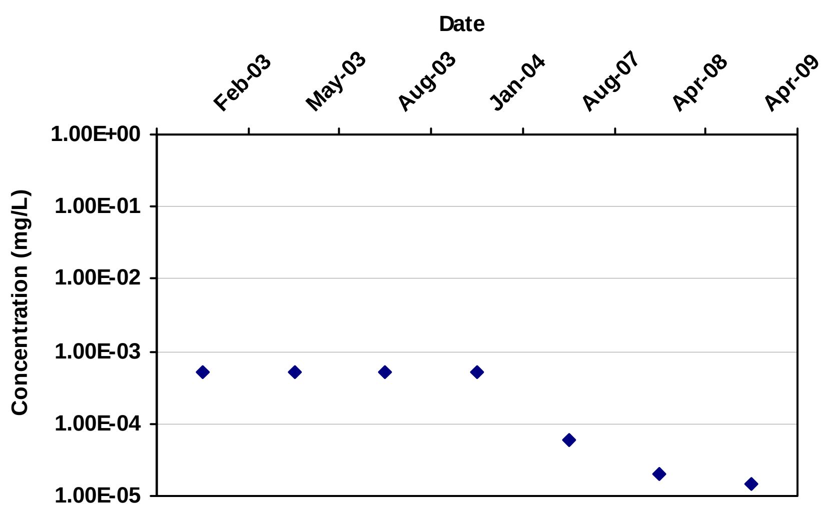
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-10	T	2/1/2003	1,2-DICHLOROPROPANE	2.0E-04		1	1
PWB-10	T	5/1/2003	1,2-DICHLOROPROPANE	5.0E-04	ND	1	0
PWB-10	T	8/1/2003	1,2-DICHLOROPROPANE	3.1E-04		1	1
PWB-10	T	1/1/2004	1,2-DICHLOROPROPANE	3.0E-04		1	1
PWB-10	T	8/5/2007	1,2-DICHLOROPROPANE	1.0E-03		1	1
PWB-10	T	4/22/2008	1,2-DICHLOROPROPANE	5.7E-03		1	1
PWB-10	T	4/28/2009	1,2-DICHLOROPROPANE	1.7E-03		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWB-9
Well Type: T
COC: DINOSEB

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -15

Confidence in Trend: 98.5%

Coefficient of Variation: 0.84

Mann Kendall Concentration Trend: (See Note) D

Data Table:

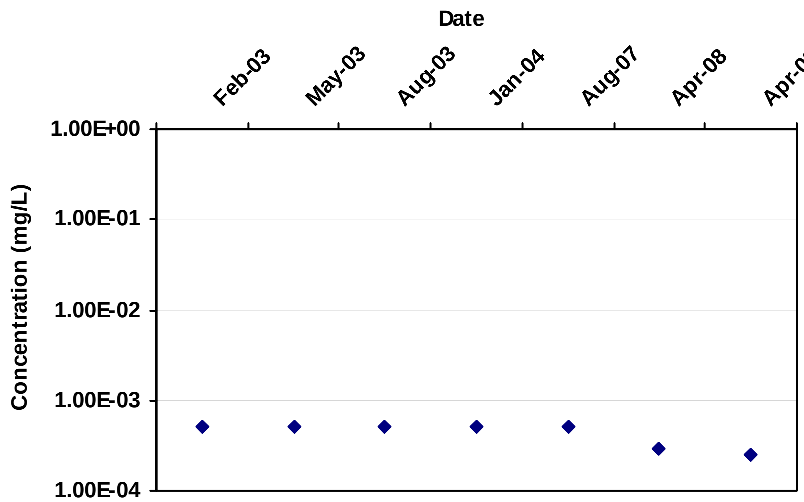
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-9	T	2/1/2003	DINOSEB	5.0E-04	ND	1	0
PWB-9	T	5/1/2003	DINOSEB	5.0E-04	ND	1	0
PWB-9	T	8/1/2003	DINOSEB	5.0E-04	ND	1	0
PWB-9	T	1/1/2004	DINOSEB	5.0E-04	ND	1	0
PWB-9	T	8/5/2007	DINOSEB	6.0E-05		1	1
PWB-9	T	4/22/2008	DINOSEB	2.0E-05		1	1
PWB-9	T	4/28/2009	DINOSEB	1.5E-05	ND	1	0

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWB-9
Well Type: T
COC: 1,2,3-TRICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -11

Confidence in Trend: 93.2%

Coefficient of Variation: 0.25

Mann Kendall Concentration Trend: (See Note) PD

Data Table:

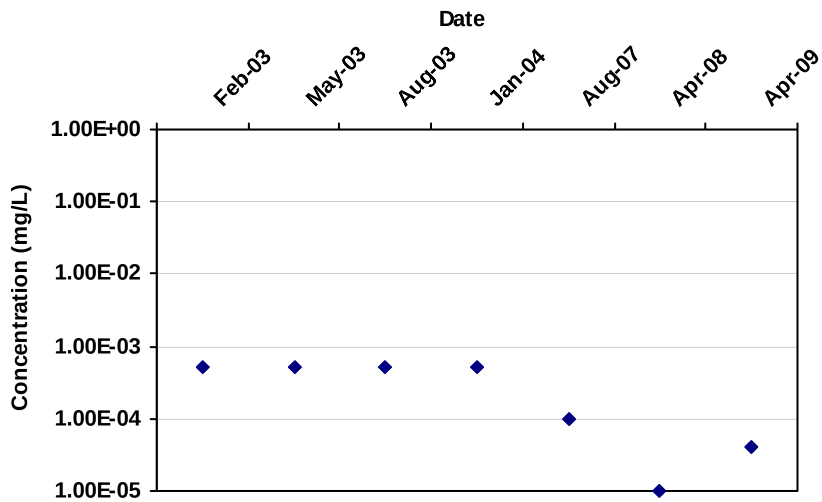
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-9	T	2/1/2003	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-9	T	5/1/2003	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-9	T	8/1/2003	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-9	T	1/1/2004	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-9	T	8/5/2007	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-9	T	4/22/2008	1,2,3-TRICHLOROPROPANE	3.0E-04		2	1
PWB-9	T	4/28/2009	1,2,3-TRICHLOROPROPANE	2.6E-04	ND	2	0

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWB-8
Well Type: T
COC: DINOSEB

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -13

Confidence in Trend: 96.5%

Coefficient of Variation: 0.79

Mann Kendall Concentration Trend: (See Note) D

Data Table:

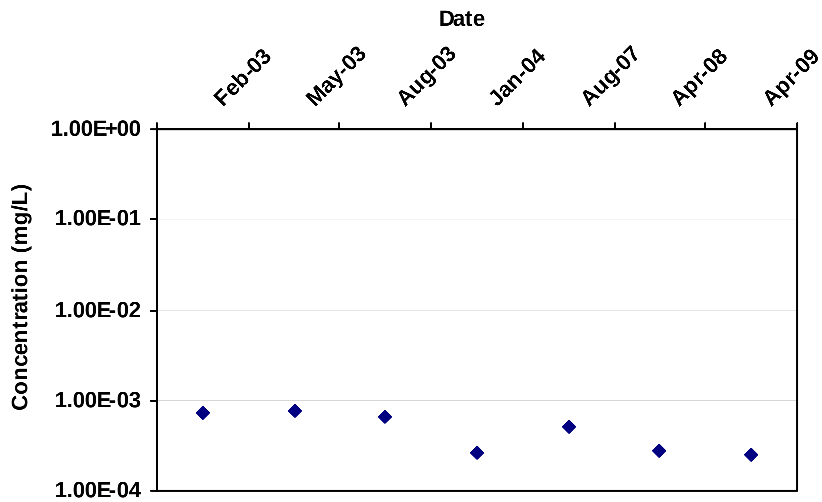
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-8	T	2/1/2003	DINOSEB	5.0E-04	ND	1	0
PWB-8	T	5/1/2003	DINOSEB	5.0E-04	ND	1	0
PWB-8	T	8/1/2003	DINOSEB	5.0E-04	ND	1	0
PWB-8	T	1/1/2004	DINOSEB	5.0E-04	ND	1	0
PWB-8	T	8/5/2007	DINOSEB	1.0E-04		1	1
PWB-8	T	4/22/2008	DINOSEB	1.0E-05		1	1
PWB-8	T	4/28/2009	DINOSEB	4.1E-05		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWB-8
Well Type: T
COC: 1,2,3-TRICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -15

Confidence in Trend: 98.5%

Coefficient of Variation: 0.46

Mann Kendall Concentration Trend: (See Note) D

Data Table:

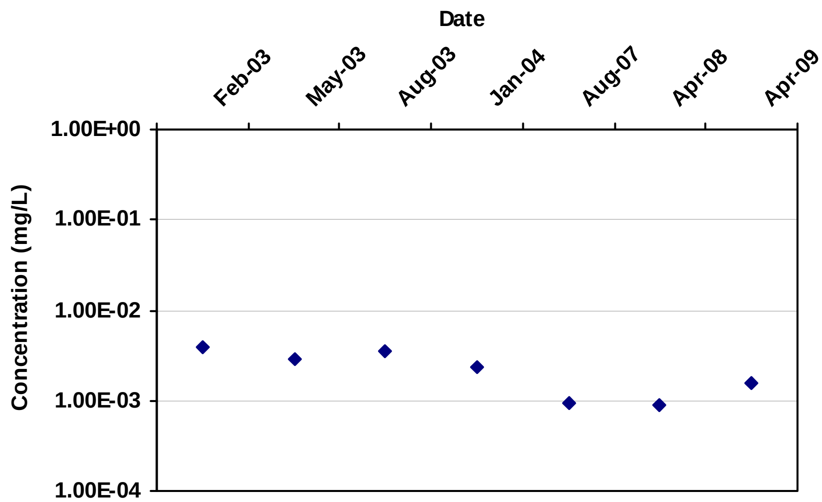
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-8	T	2/1/2003	1,2,3-TRICHLOROPROPANE	7.3E-04		1	1
PWB-8	T	5/1/2003	1,2,3-TRICHLOROPROPANE	7.6E-04		1	1
PWB-8	T	8/1/2003	1,2,3-TRICHLOROPROPANE	6.7E-04		1	1
PWB-8	T	1/1/2004	1,2,3-TRICHLOROPROPANE	2.6E-04		1	1
PWB-8	T	8/5/2007	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-8	T	4/22/2008	1,2,3-TRICHLOROPROPANE	2.8E-04		2	1
PWB-8	T	4/28/2009	1,2,3-TRICHLOROPROPANE	2.6E-04	ND	2	0

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWB-8
Well Type: T
COC: 1,2-DICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -15

Confidence in Trend: 98.5%

Coefficient of Variation: 0.54

Mann Kendall Concentration Trend: (See Note) D

Data Table:

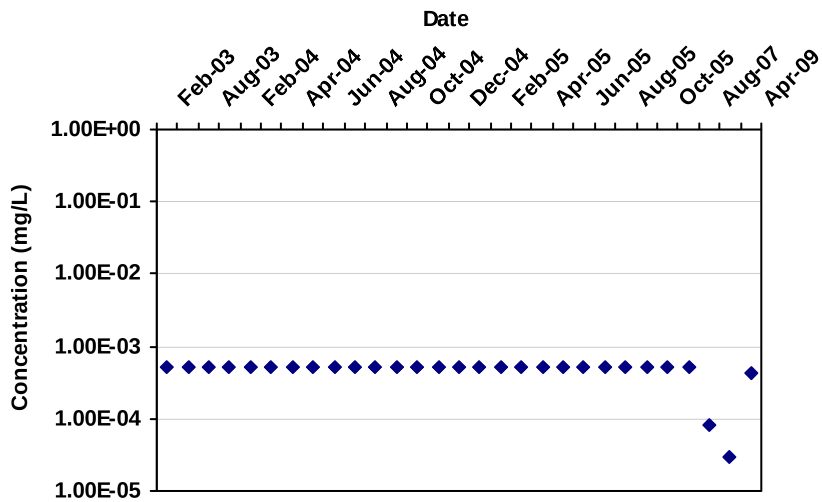
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-8	T	2/1/2003	1,2-DICHLOROPROPANE	4.0E-03		1	1
PWB-8	T	5/1/2003	1,2-DICHLOROPROPANE	2.9E-03		1	1
PWB-8	T	8/1/2003	1,2-DICHLOROPROPANE	3.6E-03		1	1
PWB-8	T	1/1/2004	1,2-DICHLOROPROPANE	2.3E-03		1	1
PWB-8	T	8/5/2007	1,2-DICHLOROPROPANE	9.5E-04		1	1
PWB-8	T	4/22/2008	1,2-DICHLOROPROPANE	8.7E-04		1	1
PWB-8	T	4/28/2009	1,2-DICHLOROPROPANE	1.6E-03		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWB-5
Well Type: T
COC: DINOSEB

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -77

Confidence in Trend: 92.3%

Coefficient of Variation: 0.25

Mann Kendall Concentration Trend: (See Note) PD

Data Table:

Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-5	T	2/1/2003	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	5/1/2003	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	8/1/2003	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	1/1/2004	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	2/1/2004	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	3/1/2004	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	4/1/2004	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	5/1/2004	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	6/1/2004	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	7/1/2004	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	8/1/2004	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	9/1/2004	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	10/1/2004	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	11/1/2004	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	12/1/2004	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	1/1/2005	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	2/1/2005	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	3/1/2005	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	4/1/2005	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	5/1/2005	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	6/1/2005	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	7/1/2005	DINOSEB	5.0E-04	ND	1	0

MAROS Mann-Kendall Statistics Summary

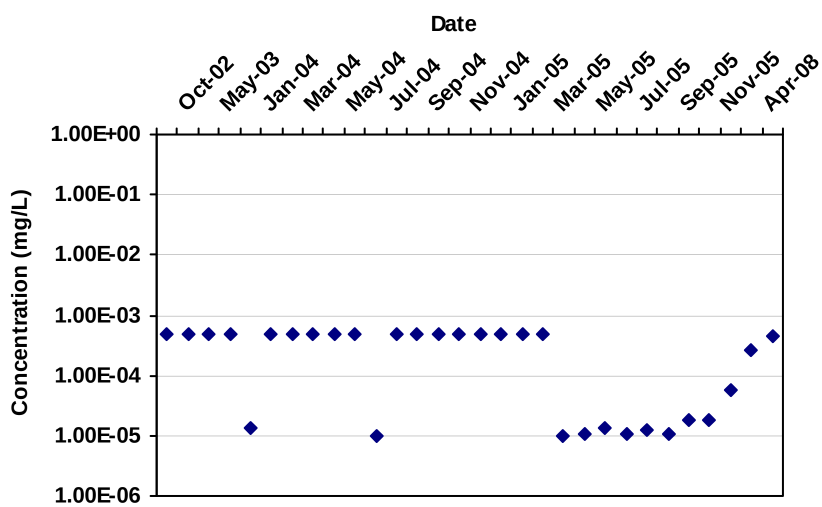
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-5	T	8/1/2005	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	9/1/2005	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	10/1/2005	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	11/1/2005	DINOSEB	5.0E-04	ND	1	0
PWB-5	T	8/5/2007	DINOSEB	8.0E-05		1	1
PWB-5	T	4/22/2008	DINOSEB	3.0E-05		1	1
PWB-5	T	4/28/2009	DINOSEB	4.3E-04		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWB-5
Well Type: T
COC: 1,2-DIBROMO-3-CHLOROPROPANE

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -126

Confidence in Trend: 98.8%

Coefficient of Variation: 0.75

Mann Kendall Concentration Trend: (See Note) D

Data Table:

Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-5	T	10/1/2002	1,2-DIBROMO-3-CHLOROPROPA	5.0E-04	ND	1	0
PWB-5	T	2/1/2003	1,2-DIBROMO-3-CHLOROPROPA	5.0E-04	ND	1	0
PWB-5	T	5/1/2003	1,2-DIBROMO-3-CHLOROPROPA	5.0E-04	ND	1	0
PWB-5	T	8/1/2003	1,2-DIBROMO-3-CHLOROPROPA	5.0E-04	ND	1	0
PWB-5	T	1/1/2004	1,2-DIBROMO-3-CHLOROPROPA	1.3E-05		1	1
PWB-5	T	2/1/2004	1,2-DIBROMO-3-CHLOROPROPA	5.0E-04	ND	1	0
PWB-5	T	3/1/2004	1,2-DIBROMO-3-CHLOROPROPA	5.0E-04	ND	1	0
PWB-5	T	4/1/2004	1,2-DIBROMO-3-CHLOROPROPA	5.0E-04	ND	1	0
PWB-5	T	5/1/2004	1,2-DIBROMO-3-CHLOROPROPA	5.0E-04	ND	1	0
PWB-5	T	6/1/2004	1,2-DIBROMO-3-CHLOROPROPA	5.0E-04	ND	1	0
PWB-5	T	7/1/2004	1,2-DIBROMO-3-CHLOROPROPA	9.9E-06		1	1
PWB-5	T	8/1/2004	1,2-DIBROMO-3-CHLOROPROPA	5.0E-04	ND	1	0
PWB-5	T	9/1/2004	1,2-DIBROMO-3-CHLOROPROPA	5.0E-04	ND	1	0
PWB-5	T	10/1/2004	1,2-DIBROMO-3-CHLOROPROPA	5.0E-04	ND	1	0
PWB-5	T	11/1/2004	1,2-DIBROMO-3-CHLOROPROPA	5.0E-04	ND	1	0
PWB-5	T	12/1/2004	1,2-DIBROMO-3-CHLOROPROPA	5.0E-04	ND	1	0
PWB-5	T	1/1/2005	1,2-DIBROMO-3-CHLOROPROPA	5.0E-04	ND	1	0
PWB-5	T	2/1/2005	1,2-DIBROMO-3-CHLOROPROPA	5.0E-04	ND	1	0
PWB-5	T	3/1/2005	1,2-DIBROMO-3-CHLOROPROPA	5.0E-04	ND	1	0
PWB-5	T	4/1/2005	1,2-DIBROMO-3-CHLOROPROPA	1.0E-05		1	1
PWB-5	T	5/1/2005	1,2-DIBROMO-3-CHLOROPROPA	1.1E-05		1	1
PWB-5	T	6/1/2005	1,2-DIBROMO-3-CHLOROPROPA	1.3E-05		1	1

MAROS Mann-Kendall Statistics Summary

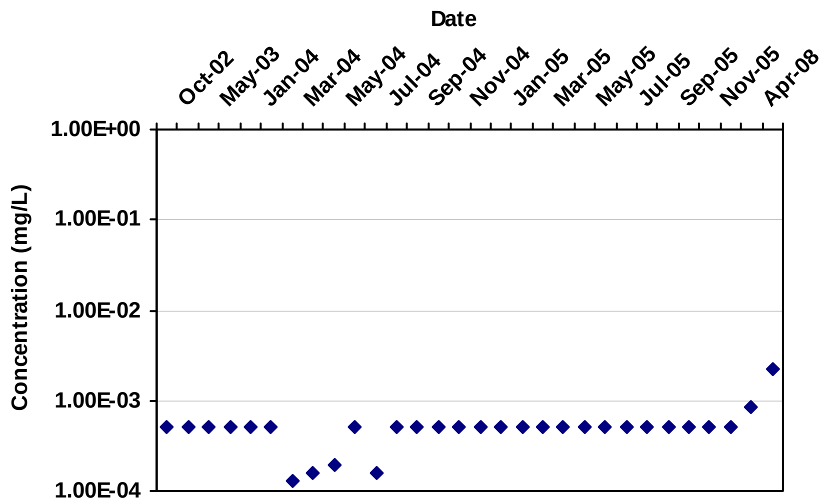
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-5	T	7/1/2005	1,2-DIBROMO-3-CHLOROPROPA	1.1E-05		1	1
PWB-5	T	8/1/2005	1,2-DIBROMO-3-CHLOROPROPA	1.2E-05		1	1
PWB-5	T	9/1/2005	1,2-DIBROMO-3-CHLOROPROPA	1.1E-05		1	1
PWB-5	T	10/1/2005	1,2-DIBROMO-3-CHLOROPROPA	1.8E-05		1	1
PWB-5	T	11/1/2005	1,2-DIBROMO-3-CHLOROPROPA	1.8E-05		1	1
PWB-5	T	8/5/2007	1,2-DIBROMO-3-CHLOROPROPA	5.9E-05		1	1
PWB-5	T	4/22/2008	1,2-DIBROMO-3-CHLOROPROPA	2.6E-04		2	1
PWB-5	T	4/28/2009	1,2-DIBROMO-3-CHLOROPROPA	4.5E-04		2	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWB-5
Well Type: T
COC: 1,2,3-TRICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 106

Confidence in Trend: 97.0%

Coefficient of Variation: 0.66

Mann Kendall Concentration Trend: (See Note) I

Data Table:

Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-5	T	10/1/2002	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	2/1/2003	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	5/1/2003	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	8/1/2003	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	1/1/2004	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	2/1/2004	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	3/1/2004	1,2,3-TRICHLOROPROPANE	1.3E-04		1	1
PWB-5	T	4/1/2004	1,2,3-TRICHLOROPROPANE	1.6E-04		1	1
PWB-5	T	5/1/2004	1,2,3-TRICHLOROPROPANE	1.9E-04		1	1
PWB-5	T	6/1/2004	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	7/1/2004	1,2,3-TRICHLOROPROPANE	1.6E-04		1	1
PWB-5	T	8/1/2004	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	9/1/2004	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	10/1/2004	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	11/1/2004	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	12/1/2004	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	1/1/2005	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	2/1/2005	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	3/1/2005	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	4/1/2005	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	5/1/2005	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	6/1/2005	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0

MAROS Mann-Kendall Statistics Summary

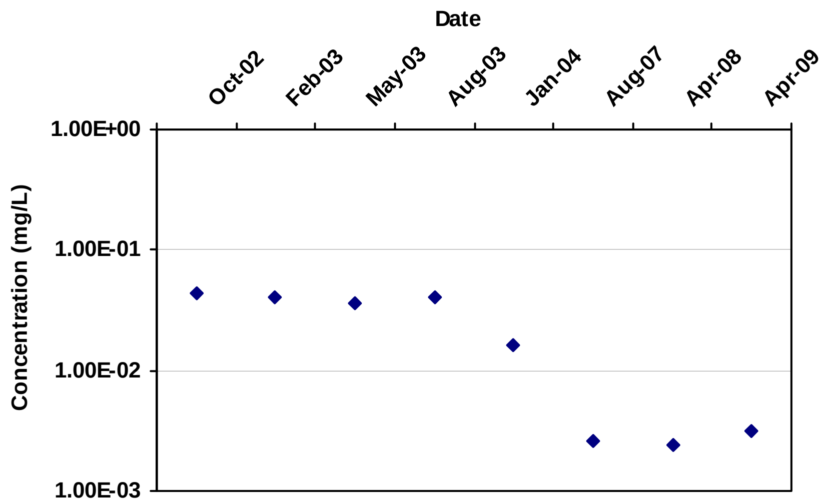
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-5	T	7/1/2005	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	8/1/2005	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	9/1/2005	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	10/1/2005	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	11/1/2005	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	8/5/2007	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-5	T	4/22/2008	1,2,3-TRICHLOROPROPANE	8.5E-04		2	1
PWB-5	T	4/28/2009	1,2,3-TRICHLOROPROPANE	2.2E-03		2	2

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWB-4
Well Type: T
COC: 1,2-DIBROMO-3-CHLOROPROPANE

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -20

Confidence in Trend: 99.3%

Coefficient of Variation: 0.82

Mann Kendall Concentration Trend: (See Note) D

Data Table:

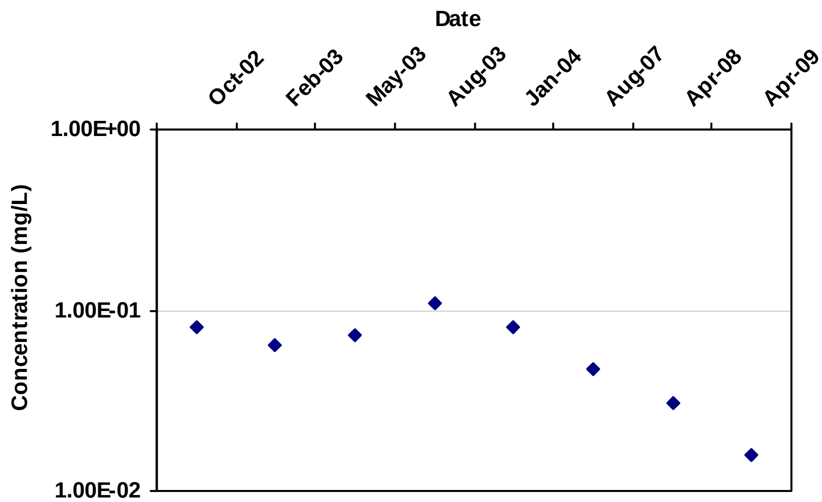
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-4	T	10/1/2002	1,2-DIBROMO-3-CHLOROPROPA	4.4E-02		1	1
PWB-4	T	2/1/2003	1,2-DIBROMO-3-CHLOROPROPA	4.0E-02		1	1
PWB-4	T	5/1/2003	1,2-DIBROMO-3-CHLOROPROPA	3.6E-02		1	1
PWB-4	T	8/1/2003	1,2-DIBROMO-3-CHLOROPROPA	4.1E-02		1	1
PWB-4	T	1/1/2004	1,2-DIBROMO-3-CHLOROPROPA	1.6E-02		1	1
PWB-4	T	8/5/2007	1,2-DIBROMO-3-CHLOROPROPA	2.6E-03		1	1
PWB-4	T	4/22/2008	1,2-DIBROMO-3-CHLOROPROPA	2.4E-03		2	2
PWB-4	T	4/28/2009	1,2-DIBROMO-3-CHLOROPROPA	3.2E-03		2	2

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWB-4
Well Type: T
COC: 1,2-DICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -15

Confidence in Trend: 95.8%

Coefficient of Variation: 0.48

Mann Kendall Concentration Trend: (See Note) D

Data Table:

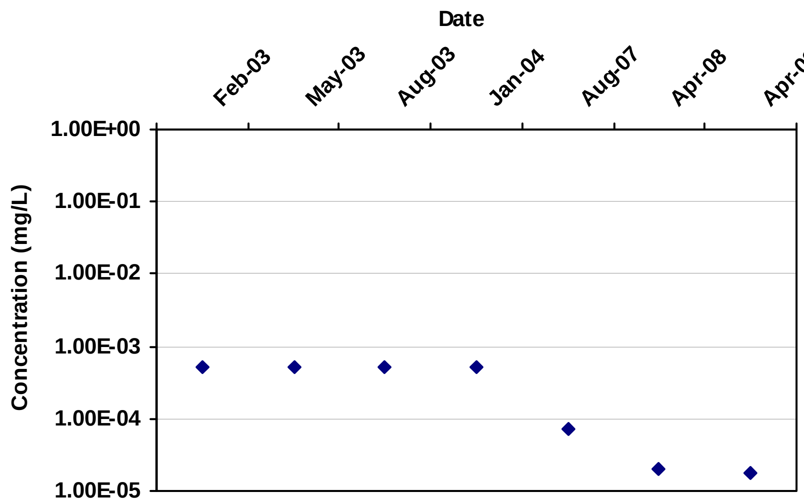
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-4	T	10/1/2002	1,2-DICHLOROPROPANE	8.0E-02		1	1
PWB-4	T	2/1/2003	1,2-DICHLOROPROPANE	6.4E-02		1	1
PWB-4	T	5/1/2003	1,2-DICHLOROPROPANE	7.2E-02		1	1
PWB-4	T	8/1/2003	1,2-DICHLOROPROPANE	1.1E-01		1	1
PWB-4	T	1/1/2004	1,2-DICHLOROPROPANE	8.0E-02		1	1
PWB-4	T	8/5/2007	1,2-DICHLOROPROPANE	4.7E-02		1	1
PWB-4	T	4/22/2008	1,2-DICHLOROPROPANE	3.1E-02		1	1
PWB-4	T	4/28/2009	1,2-DICHLOROPROPANE	1.6E-02		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWB-3
Well Type: T
COC: DINOSEB

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -15

Confidence in Trend: 98.5%

Coefficient of Variation: 0.83

Mann Kendall Concentration Trend: (See Note) D

Data Table:

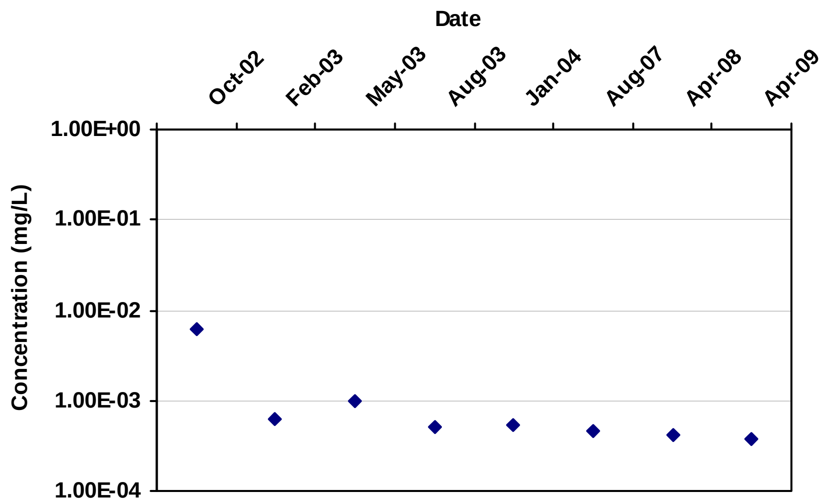
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-3	T	2/1/2003	DINOSEB	5.0E-04	ND	1	0
PWB-3	T	5/1/2003	DINOSEB	5.0E-04	ND	1	0
PWB-3	T	8/1/2003	DINOSEB	5.0E-04	ND	1	0
PWB-3	T	1/1/2004	DINOSEB	5.0E-04	ND	1	0
PWB-3	T	8/5/2007	DINOSEB	7.0E-05		1	1
PWB-3	T	4/22/2008	DINOSEB	2.0E-05		1	1
PWB-3	T	4/28/2009	DINOSEB	1.8E-05		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWB-3
Well Type: T
COC: 1,2,3-TRICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic:
-24

Confidence in Trend:
99.9%

Coefficient of Variation:
1.58

Mann Kendall Concentration Trend: (See Note)
D

Data Table:

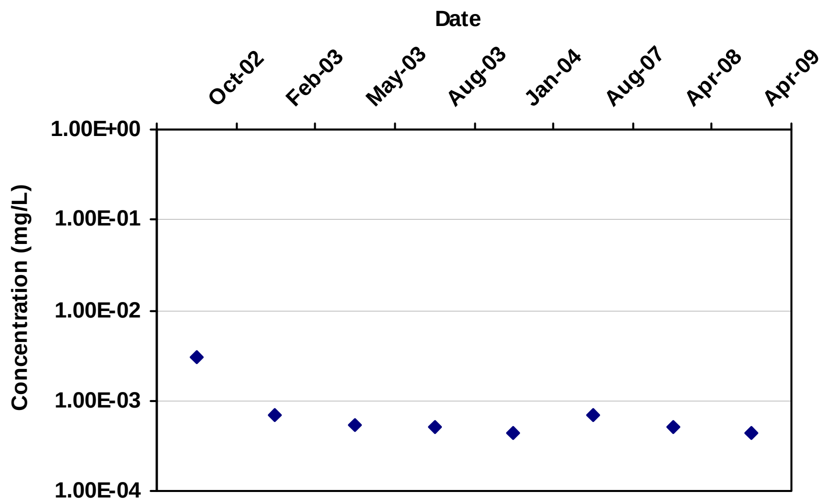
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-3	T	10/1/2002	1,2,3-TRICHLOROPROPANE	6.2E-03		1	1
PWB-3	T	2/1/2003	1,2,3-TRICHLOROPROPANE	6.4E-04		1	1
PWB-3	T	5/1/2003	1,2,3-TRICHLOROPROPANE	1.0E-03		1	1
PWB-3	T	8/1/2003	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-3	T	1/1/2004	1,2,3-TRICHLOROPROPANE	5.3E-04		1	1
PWB-3	T	8/5/2007	1,2,3-TRICHLOROPROPANE	4.6E-04		1	1
PWB-3	T	4/22/2008	1,2,3-TRICHLOROPROPANE	4.1E-04		2	1
PWB-3	T	4/28/2009	1,2,3-TRICHLOROPROPANE	3.9E-04		2	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWB-3
Well Type: T
COC: 1,2-DICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -19

Confidence in Trend: 98.9%

Coefficient of Variation: 1.06

Mann Kendall Concentration Trend: (See Note) D

Data Table:

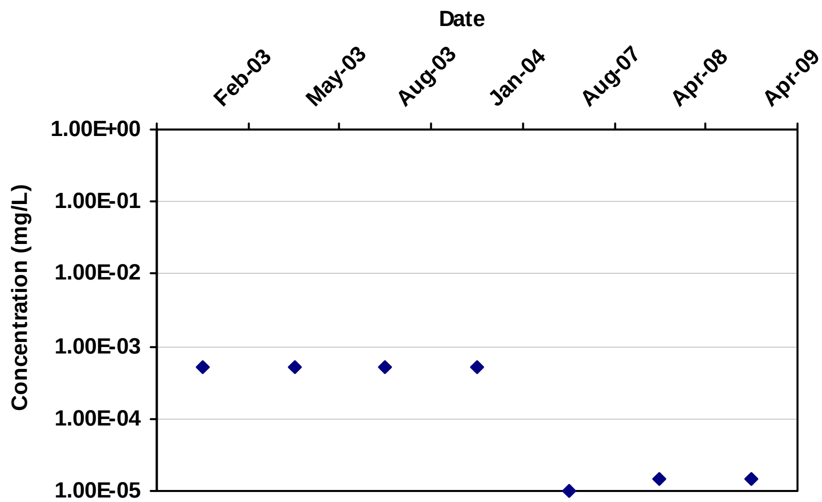
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-3	T	10/1/2002	1,2-DICHLOROPROPANE	3.1E-03		1	1
PWB-3	T	2/1/2003	1,2-DICHLOROPROPANE	6.9E-04		1	1
PWB-3	T	5/1/2003	1,2-DICHLOROPROPANE	5.4E-04		1	1
PWB-3	T	8/1/2003	1,2-DICHLOROPROPANE	5.0E-04	ND	1	0
PWB-3	T	1/1/2004	1,2-DICHLOROPROPANE	4.4E-04		1	1
PWB-3	T	8/5/2007	1,2-DICHLOROPROPANE	6.8E-04		1	1
PWB-3	T	4/22/2008	1,2-DICHLOROPROPANE	5.0E-04	ND	1	0
PWB-3	T	4/28/2009	1,2-DICHLOROPROPANE	4.3E-04		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWB-2
Well Type: T
COC: DINOSEB

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -10

Confidence in Trend: 90.7%

Coefficient of Variation: 0.89

Mann Kendall Concentration Trend: (See Note) PD

Data Table:

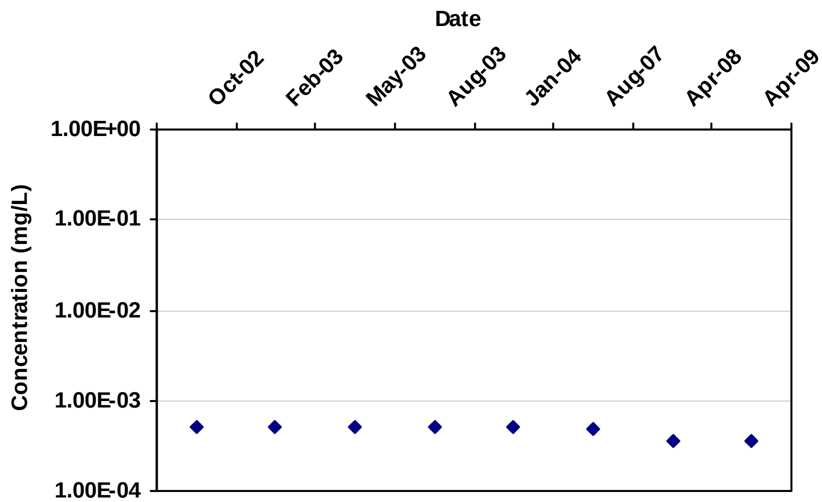
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-2	T	2/1/2003	DINOSEB	5.0E-04	ND	1	0
PWB-2	T	5/1/2003	DINOSEB	5.0E-04	ND	1	0
PWB-2	T	8/1/2003	DINOSEB	5.0E-04	ND	1	0
PWB-2	T	1/1/2004	DINOSEB	5.0E-04	ND	1	0
PWB-2	T	8/5/2007	DINOSEB	1.0E-05		1	1
PWB-2	T	4/22/2008	DINOSEB	1.5E-05	ND	1	0
PWB-2	T	4/28/2009	DINOSEB	1.5E-05	ND	1	0

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWB-2
Well Type: T
COC: 1,2,3-TRICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -16

Confidence in Trend: 96.9%

Coefficient of Variation: 0.14

Mann Kendall Concentration Trend: (See Note) D

Data Table:

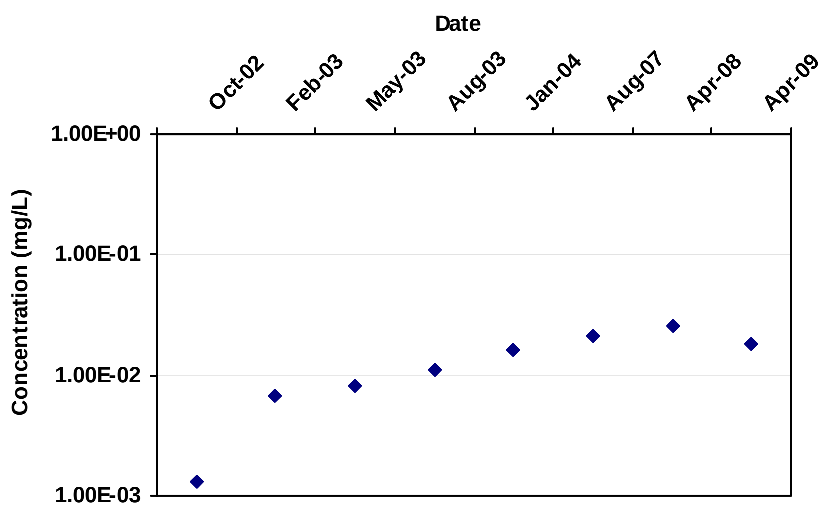
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-2	T	10/1/2002	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-2	T	2/1/2003	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-2	T	5/1/2003	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-2	T	8/1/2003	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-2	T	1/1/2004	1,2,3-TRICHLOROPROPANE	5.0E-04	ND	1	0
PWB-2	T	8/5/2007	1,2,3-TRICHLOROPROPANE	4.8E-04		1	1
PWB-2	T	4/22/2008	1,2,3-TRICHLOROPROPANE	3.5E-04		2	1
PWB-2	T	4/28/2009	1,2,3-TRICHLOROPROPANE	3.6E-04		2	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWB-2
Well Type: T
COC: 1,2-DICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: 24

Confidence in Trend: 99.9%

Coefficient of Variation: 0.60

Mann Kendall Concentration Trend: (See Note) I

Data Table:

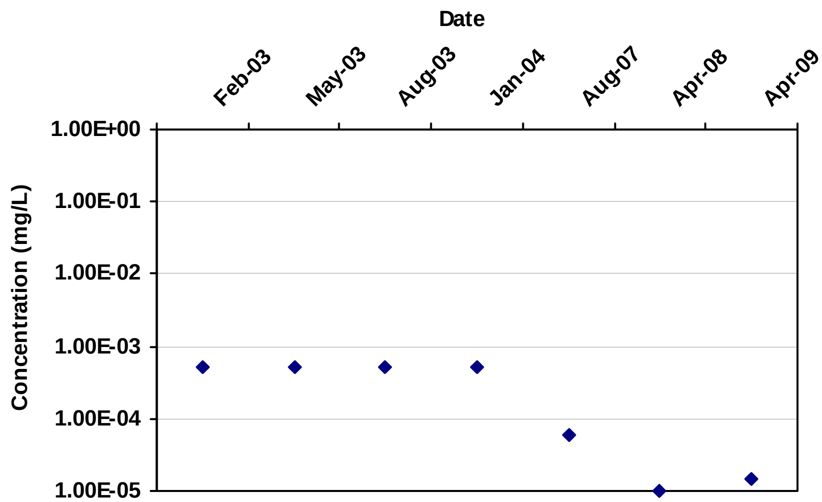
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-2	T	10/1/2002	1,2-DICHLOROPROPANE	1.3E-03		1	1
PWB-2	T	2/1/2003	1,2-DICHLOROPROPANE	6.8E-03		1	1
PWB-2	T	5/1/2003	1,2-DICHLOROPROPANE	8.1E-03		1	1
PWB-2	T	8/1/2003	1,2-DICHLOROPROPANE	1.1E-02		1	1
PWB-2	T	1/1/2004	1,2-DICHLOROPROPANE	1.6E-02		1	1
PWB-2	T	8/5/2007	1,2-DICHLOROPROPANE	2.1E-02		1	1
PWB-2	T	4/22/2008	1,2-DICHLOROPROPANE	2.6E-02		1	1
PWB-2	T	4/28/2009	1,2-DICHLOROPROPANE	1.8E-02		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWB-1
Well Type: S
COC: DINOSEB

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -13

Confidence in Trend: 96.5%

Coefficient of Variation: 0.85

Mann Kendall Concentration Trend: (See Note) D

Data Table:

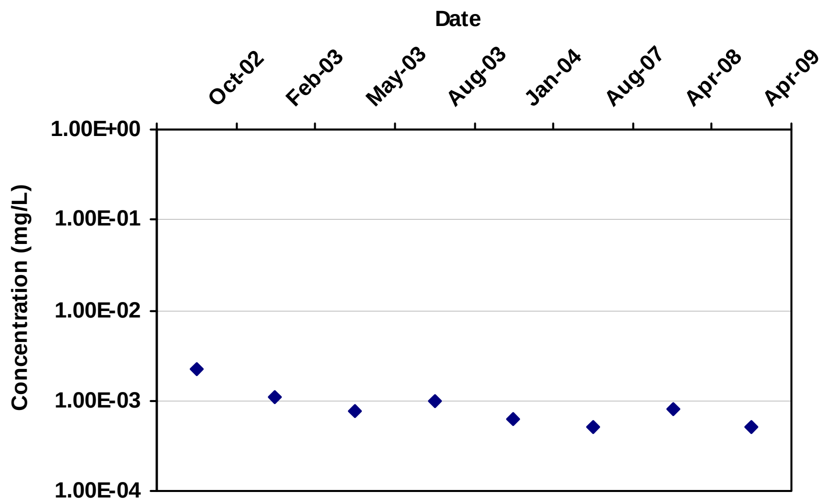
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-1	S	2/1/2003	DINOSEB	5.0E-04	ND	1	0
PWB-1	S	5/1/2003	DINOSEB	5.0E-04	ND	1	0
PWB-1	S	8/1/2003	DINOSEB	5.0E-04	ND	1	0
PWB-1	S	1/1/2004	DINOSEB	5.0E-04	ND	1	0
PWB-1	S	8/5/2007	DINOSEB	6.0E-05		1	1
PWB-1	S	4/22/2008	DINOSEB	1.0E-05		1	1
PWB-1	S	4/28/2009	DINOSEB	1.5E-05	ND	1	0

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: PWB-1
Well Type: S
COC: 1,2-DICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -19

Confidence in Trend: 98.9%

Coefficient of Variation: 0.59

Mann Kendall Concentration Trend: (See Note) D

Data Table:

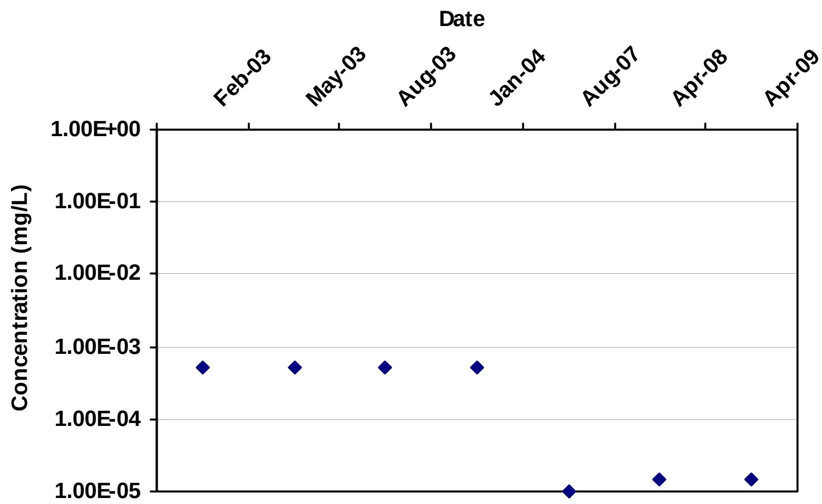
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
PWB-1	S	10/1/2002	1,2-DICHLOROPROPANE	2.2E-03		1	1
PWB-1	S	2/1/2003	1,2-DICHLOROPROPANE	1.1E-03		1	1
PWB-1	S	5/1/2003	1,2-DICHLOROPROPANE	7.7E-04		1	1
PWB-1	S	8/1/2003	1,2-DICHLOROPROPANE	1.0E-03		1	1
PWB-1	S	1/1/2004	1,2-DICHLOROPROPANE	6.2E-04		1	1
PWB-1	S	8/5/2007	1,2-DICHLOROPROPANE	5.0E-04	ND	1	0
PWB-1	S	4/22/2008	1,2-DICHLOROPROPANE	7.9E-04		1	1
PWB-1	S	4/28/2009	1,2-DICHLOROPROPANE	5.0E-04	ND	1	0

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: AR-1
Well Type: T
COC: DINOSEB

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -10

Confidence in Trend: 90.7%

Coefficient of Variation: 0.89

Mann Kendall Concentration Trend: (See Note) PD

Data Table:

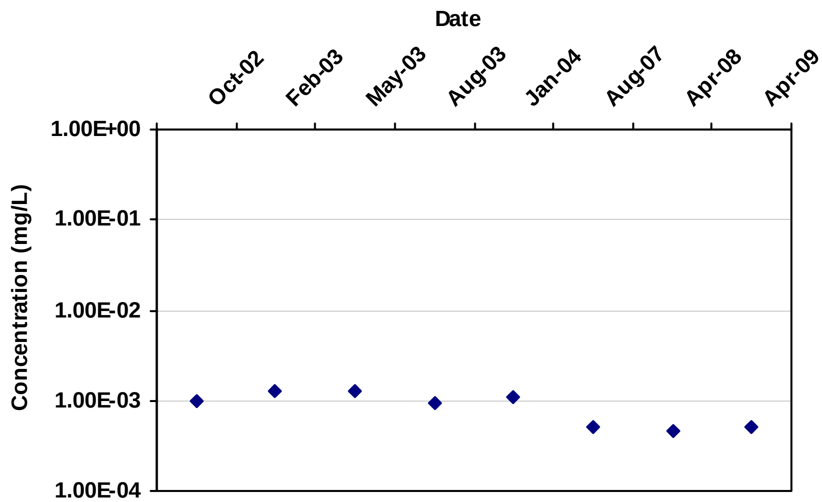
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
AR-1	T	2/1/2003	DINOSEB	5.0E-04	ND	1	0
AR-1	T	5/1/2003	DINOSEB	5.0E-04	ND	1	0
AR-1	T	8/1/2003	DINOSEB	5.0E-04	ND	1	0
AR-1	T	1/1/2004	DINOSEB	5.0E-04	ND	1	0
AR-1	T	8/5/2007	DINOSEB	1.0E-05		1	1
AR-1	T	4/22/2008	DINOSEB	1.5E-05	ND	1	0
AR-1	T	4/28/2009	DINOSEB	1.5E-05	ND	1	0

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: AR-1
Well Type: T
COC: 1,2-DICHLOROPROPANE

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -16

Confidence in Trend: 96.9%

Coefficient of Variation: 0.40

Mann Kendall Concentration Trend: (See Note) D

Data Table:

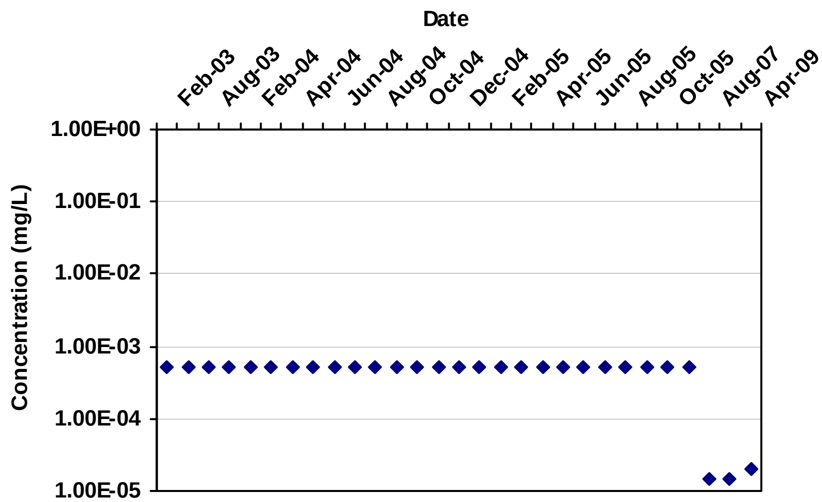
Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
AR-1	T	10/1/2002	1,2-DICHLOROPROPANE	1.0E-03		1	1
AR-1	T	2/1/2003	1,2-DICHLOROPROPANE	1.3E-03		1	1
AR-1	T	5/1/2003	1,2-DICHLOROPROPANE	1.3E-03		1	1
AR-1	T	8/1/2003	1,2-DICHLOROPROPANE	9.3E-04		1	1
AR-1	T	1/1/2004	1,2-DICHLOROPROPANE	1.1E-03		1	1
AR-1	T	8/5/2007	1,2-DICHLOROPROPANE	5.0E-04	ND	1	0
AR-1	T	4/22/2008	1,2-DICHLOROPROPANE	4.7E-04		1	1
AR-1	T	4/28/2009	1,2-DICHLOROPROPANE	5.0E-04	ND	1	0

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

MAROS Mann-Kendall Statistics Summary

Well: WB2-4
Well Type: T
COC: DINOSEB

Time Period: 10/1/2002 **to** 4/28/2009
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: 1/2 Detection Limit
J Flag Values : Actual Value



Mann Kendall S Statistic: -76

Confidence in Trend: 92.0%

Coefficient of Variation: 0.33

Mann Kendall Concentration Trend: (See Note) PD

Data Table:

Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
WB2-4	T	2/1/2003	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	5/1/2003	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	8/1/2003	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	1/1/2004	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	2/1/2004	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	3/1/2004	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	4/1/2004	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	5/1/2004	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	6/1/2004	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	7/1/2004	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	8/1/2004	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	9/1/2004	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	10/1/2004	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	11/1/2004	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	12/1/2004	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	1/1/2005	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	2/1/2005	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	3/1/2005	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	4/1/2005	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	5/1/2005	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	6/1/2005	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	7/1/2005	DINOSEB	5.0E-04	ND	1	0

MAROS Mann-Kendall Statistics Summary

Well	Well Type	Effective Date	Constituent	Result (mg/L)	Flag	Number of Samples	Number of Detects
WB2-4	T	8/1/2005	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	9/1/2005	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	10/1/2005	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	11/1/2005	DINOSEB	5.0E-04	ND	1	0
WB2-4	T	8/5/2007	DINOSEB	1.5E-05	ND	1	0
WB2-4	T	4/22/2008	DINOSEB	1.5E-05	ND	1	0
WB2-4	T	4/28/2009	DINOSEB	2.0E-05		1	1

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); ND = Non-detect

Attachment C-7
Moment Analysis for the B-zone

MAROS Spatial Moment Analysis Summary

Project: Brown & Bryant 3rd FYR

Location: Arvin

User Name: Mike Bailey

State: California

	0th Moment	1st Moment (Center of Mass)			2nd Moment (Spread)		
Effective Date	**Estimated Mass (Kg)**	**Xc (ft)**	**Yc (ft)**	**Source Distance (ft)**	**Sigma XX (sq ft)**	**Sigma YY (sq ft)**	**Number of Wells**
1,2,3-TRICHLOROPROPANE							
10/1/2002	1.7E+00	-48	-129	248	8,758	16,667	12
2/1/2003	2.8E+00	-30	-237	338	14,709	35,154	17
5/1/2003	1.7E+00	-82	-113	255	17,403	23,767	17
8/1/2003	1.8E+00	-86	-106	253	14,930	21,633	17
1/1/2004	1.7E+00	-79	-102	245	17,503	24,440	17
2/1/2004	0.0E+00						2
3/1/2004	0.0E+00						2
4/1/2004	0.0E+00						2
5/1/2004	0.0E+00						2
6/1/2004	0.0E+00						2
7/1/2004	0.0E+00						2
8/1/2004	0.0E+00						2
9/1/2004	0.0E+00						2
10/1/2004	0.0E+00						2
11/1/2004	0.0E+00						2
12/1/2004	0.0E+00						2
1/1/2005	0.0E+00						2
2/1/2005	0.0E+00						2
3/1/2005	0.0E+00						2
4/1/2005	0.0E+00						2
5/1/2005	0.0E+00						2
6/1/2005	0.0E+00						2
7/1/2005	0.0E+00						2
8/1/2005	0.0E+00						2
9/1/2005	0.0E+00						2
10/1/2005	0.0E+00						2
11/1/2005	0.0E+00						2
8/5/2007	1.6E+00	-88	-102	251	18,318	25,944	17
4/22/2008	1.0E+00	-89	-123	267	26,809	47,558	17
4/28/2009	7.7E-01	-61	-178	297	39,342	65,420	17
1,2-DIBROMO-3-CHLOROPROPANE							
10/1/2002	8.9E-02	-133	-175	335	14,278	78,347	12
1/1/2003	0.0E+00						1
2/1/2003	4.2E-01	-130	-400	526	22,186	60,795	17
5/1/2003	3.6E-01	-114	-176	324	43,682	79,520	17
8/1/2003	4.3E-01	-97	-154	296	37,224	56,420	17
1/1/2004	2.3E-01	6	-127	222	43,364	67,293	16
2/1/2004	0.0E+00						2

Project: Brown & Bryant 3rd FYR

Location: Arvin

User Name: Mike Bailey

State: California

Effective Date	0th Moment Estimated Mass (kg)	1st Moment (Center of Mass) Xc (ft)	Yc (ft)	Source Distance (ft)	2nd Moment (Spread) Sigma XX (sq ft)	Sigma YY (sq ft)	Number of Wells
1,2-DIBROMO-3-CHLOROPROPANE							
3/1/2004	0.0E+00						2
4/1/2004	0.0E+00						2
5/1/2004	0.0E+00						2
6/1/2004	0.0E+00						2
7/1/2004	0.0E+00						2
8/1/2004	0.0E+00						2
9/1/2004	0.0E+00						2
10/1/2004	0.0E+00						2
11/1/2004	0.0E+00						2
12/1/2004	0.0E+00						2
1/1/2005	0.0E+00						2
2/1/2005	0.0E+00						2
3/1/2005	0.0E+00						2
4/1/2005	0.0E+00						2
5/1/2005	0.0E+00						2
6/1/2005	0.0E+00						2
7/1/2005	0.0E+00						2
8/1/2005	0.0E+00						2
9/1/2005	0.0E+00						2
10/1/2005	0.0E+00						2
11/1/2005	0.0E+00						2
8/5/2007	1.9E-02	-106	-63	238	24,095	38,361	17
4/22/2008	2.4E-01	-132	-260	403	60,482	87,396	17
4/28/2009	1.9E-01	-67	-226	342	55,245	79,351	17
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)							
10/1/2002	1.2E-01	-67	-201	319	18,662	88,525	12
2/1/2003	1.7E-01	-134	-225	376	35,592	86,434	17
5/1/2003	2.7E-01	-34	-267	367	63,619	81,147	17
8/1/2003	2.7E-01	-2	-208	300	51,066	69,840	16
1/1/2004	2.7E-01	-34	-267	367	63,558	80,165	16
2/1/2004	0.0E+00						2
3/1/2004	0.0E+00						2
4/1/2004	0.0E+00						2
5/1/2004	0.0E+00						2
6/1/2004	0.0E+00						2
7/1/2004	0.0E+00						2
8/1/2004	0.0E+00						2
9/1/2004	0.0E+00						2
10/1/2004	0.0E+00						2
11/1/2004	0.0E+00						2
12/1/2004	0.0E+00						2
1/1/2005	0.0E+00						2

Project: Brown & Bryant 3rd FYR

Location: Arvin

User Name: Mike Bailey

State: California

	0th Moment	1st Moment (Center of Mass)			2nd Moment (Spread)		
Effective Date	Estimated Mass (kg)	Xc (ft)	Yc (ft)	Source Distance (ft)	Sigma XX (sq ft)	Sigma YY (sq ft)	Number of Wells
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)							
2/1/2005	0.0E+00						2
3/1/2005	0.0E+00						2
4/1/2005	0.0E+00						2
5/1/2005	0.0E+00						2
6/1/2005	0.0E+00						2
7/1/2005	0.0E+00						2
8/1/2005	0.0E+00						2
9/1/2005	0.0E+00						2
10/1/2005	0.0E+00						2
11/1/2005	0.0E+00						2
8/5/2007	5.4E-03	-34	-267	367	63,619	81,147	17
4/22/2008	1.4E-01	-34	-267	367	63,619	81,147	17
4/28/2009	1.4E-01	-34	-267	367	63,619	81,147	17
1,2-DICHLOROPROPANE							
10/1/2002	1.8E+00	-49	-147	263	9,961	31,436	12
2/1/2003	5.3E+00	-41	-321	420	13,522	41,973	17
5/1/2003	2.2E+00	-97	-143	288	22,181	36,813	17
8/1/2003	1.7E+00	-116	-149	305	24,248	34,104	17
1/1/2004	2.0E+00	-111	-160	309	23,612	35,874	17
2/1/2004	0.0E+00						2
3/1/2004	0.0E+00						2
4/1/2004	0.0E+00						2
5/1/2004	0.0E+00						2
6/1/2004	0.0E+00						2
7/1/2004	0.0E+00						2
8/1/2004	0.0E+00						2
9/1/2004	0.0E+00						2
10/1/2004	0.0E+00						2
11/1/2004	0.0E+00						2
12/1/2004	0.0E+00						2
1/1/2005	0.0E+00						2
2/1/2005	0.0E+00						2
3/1/2005	0.0E+00						2
4/1/2005	0.0E+00						2
5/1/2005	0.0E+00						2
6/1/2005	0.0E+00						2
7/1/2005	0.0E+00						2
8/1/2005	0.0E+00						2
9/1/2005	0.0E+00						2
10/1/2005	0.0E+00						2
11/1/2005	0.0E+00						2
8/5/2007	1.4E+00	-138	-163	330	25,869	38,442	17

Project: Brown & Bryant 3rd FYR

Location: Arvin

User Name: Mike Bailey

State: California

Effective Date	0th Moment Estimated Mass (kg)	1st Moment (Center of Mass) Xc (ft)	Yc (ft)	Source Distance (ft)	2nd Moment (Spread) Sigma XX (sq ft)	Sigma YY (sq ft)	Number of Wells
1,2-DICHLOROPROPANE							
4/22/2008	1.5E+00	-129	-168	328	33,470	57,035	17
4/28/2009	1.1E+00	-117	-208	352	39,724	64,143	17
DINOSEB							
2/1/2003	7.8E-01	-80	-176	305	18,972	38,604	17
5/1/2003	7.2E-01	-65	-164	286	31,595	44,670	17
8/1/2003	8.4E-01	-65	-152	277	27,409	39,312	17
1/1/2004	6.6E-01	-64	-166	287	32,672	46,541	17
2/1/2004	0.0E+00						2
3/1/2004	0.0E+00						2
4/1/2004	0.0E+00						2
5/1/2004	0.0E+00						2
6/1/2004	0.0E+00						2
7/1/2004	0.0E+00						2
8/1/2004	0.0E+00						2
9/1/2004	0.0E+00						2
10/1/2004	0.0E+00						2
11/1/2004	0.0E+00						2
12/1/2004	0.0E+00						2
1/1/2005	0.0E+00						2
2/1/2005	0.0E+00						2
3/1/2005	0.0E+00						2
4/1/2005	0.0E+00						2
5/1/2005	0.0E+00						2
6/1/2005	0.0E+00						2
7/1/2005	0.0E+00						2
8/1/2005	0.0E+00						2
9/1/2005	0.0E+00						2
10/1/2005	0.0E+00						2
11/1/2005	0.0E+00						2
8/5/2007	1.8E-01	-69	-93	231	12,839	19,345	17
4/22/2008	9.1E-02	-96	-115	266	19,885	36,986	17
4/28/2009	1.2E-01	-48	-187	298	26,541	69,081	17

Project: Brown & Bryant 3rd FYR

Location: Arvin

User Name: Mike Bailey

State: California

Moment Type	Constituent	Coefficient of Variation	Mann-Kendall S Statistic	Confidence in Trend	Moment Trend
Zeroth Moment: Mass					
	1,2,3-TRICHLOROPROPANE	1.82	-66	87.6%	NT
	1,2-DIBROMO-3-CHLOROPROPAN	2.06	-44	76.6%	NT
	1,2-DIBROMOETHANE (ETHYLENE	1.96	-48	79.7%	NT
	1,2-DICHLOROPROPANE	2.05	-62	86.0%	NT
	DINOSEB	2.24	-37	74.9%	NT
1st Moment: Distance to Source					
	1,2,3-TRICHLOROPROPANE	0.12	4	64.0%	NT
	1,2-DIBROMO-3-CHLOROPROPAN	0.29	-4	64.0%	S
	1,2-DIBROMOETHANE (ETHYLENE	0.08	-2	54.8%	S
	1,2-DICHLOROPROPANE	0.15	14	94.6%	PI
	DINOSEB	0.09	-5	71.9%	S
2nd Moment: Sigma XX					
	1,2,3-TRICHLOROPROPANE	0.48	26	100.0%	I
	1,2-DIBROMO-3-CHLOROPROPAN	0.43	16	96.9%	I
	1,2-DIBROMOETHANE (ETHYLENE	0.32	12	91.1%	PI
	1,2-DICHLOROPROPANE	0.40	26	100.0%	I
	DINOSEB	0.30	-1	50.0%	S
2nd Moment: Sigma YY					
	1,2,3-TRICHLOROPROPANE	0.50	18	98.4%	I
	1,2-DIBROMO-3-CHLOROPROPAN	0.23	2	54.8%	NT
	1,2-DIBROMOETHANE (ETHYLENE	0.07	-10	86.2%	S
	1,2-DICHLOROPROPANE	0.28	16	96.9%	I
	DINOSEB	0.35	3	61.4%	NT

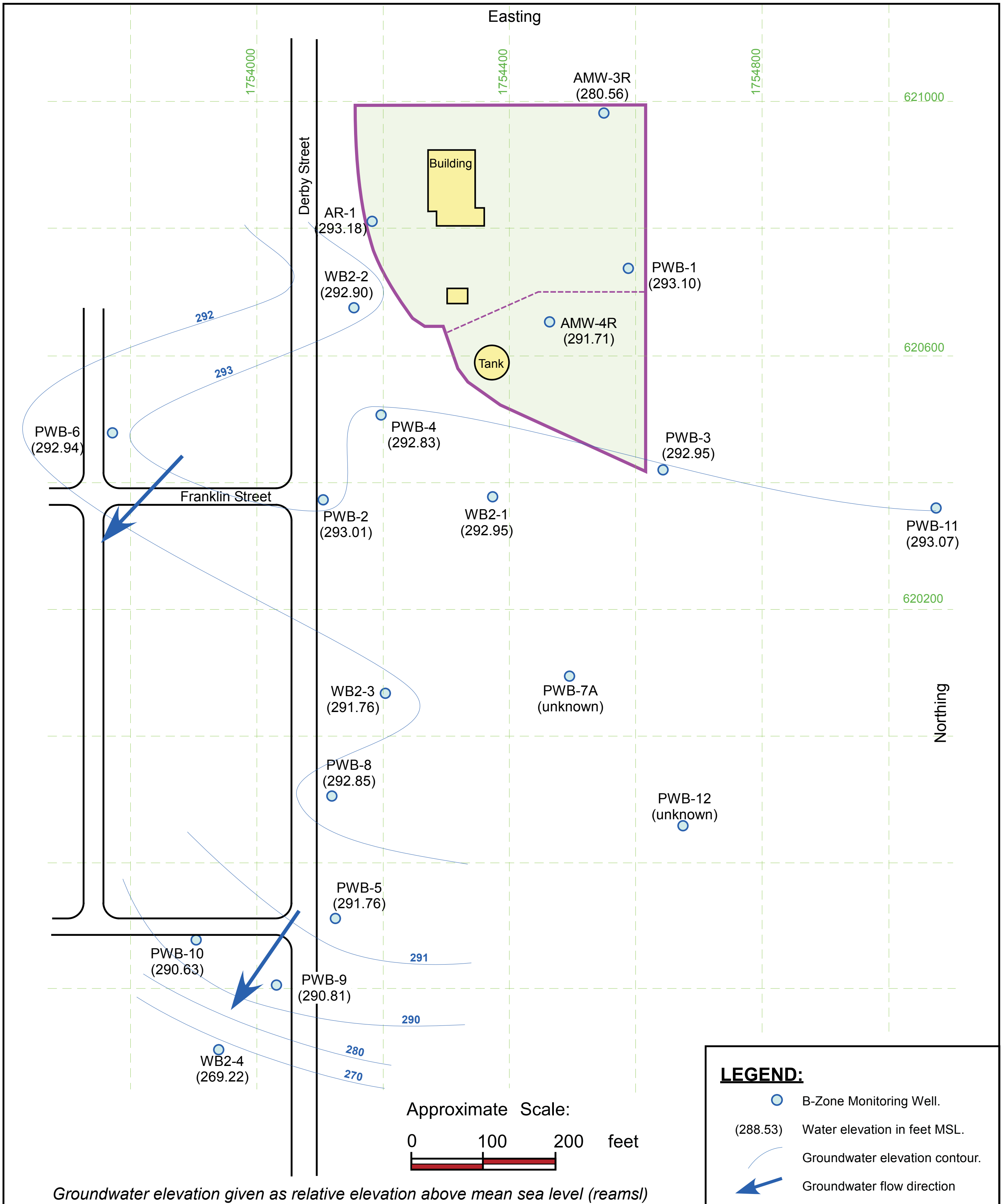
Note: The following assumptions were applied for the calculation of the Zeroth Moment:

Porosity: 0.25 **Saturated Thickness:** Uniform: 80 ft

Mann-Kendall Trend test performed on all sample events for each constituent. Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A)-Due to insufficient Data (< 4 sampling events).

Note: The Sigma XX and Sigma YY components are estimated using the given field coordinate system and then rotated to align with the estimated groundwater flow direction. Moments are not calculated for sample events with less than 6 wells.

Attachment C-8
Potentiometric Surface and Contaminant Distribution Maps for the B-zone



Environmental Excellence

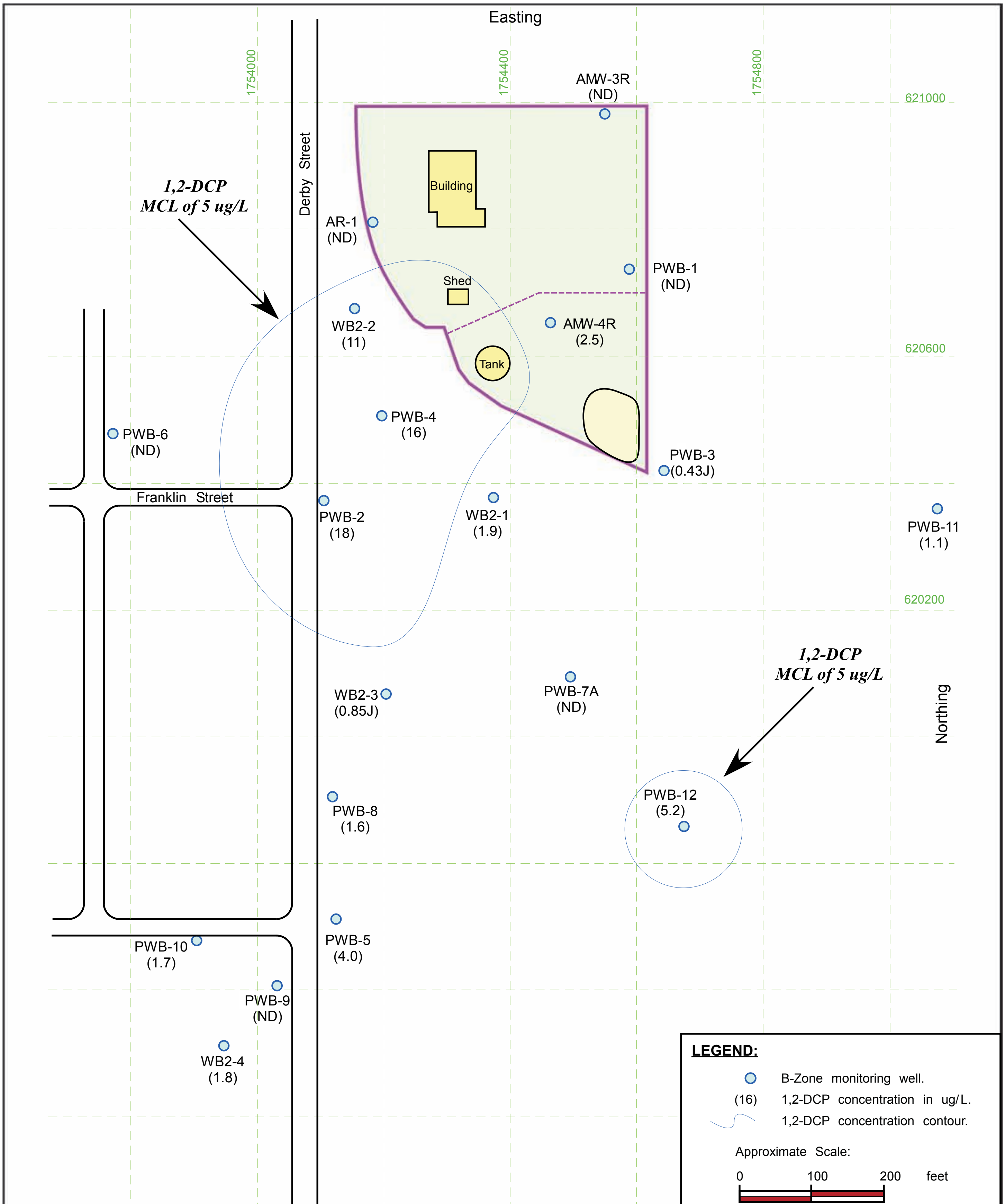
Eco & Associates, Inc.
1855 W. Katella Avenue, Suite 340
Orange, California 92867

Phone: 714.289.0995 FAX: 714.289.0965

PIEZOMETRIC SURFACE
B-ZONE
Brown & Bryant Superfund Site

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

FIGURE:
4



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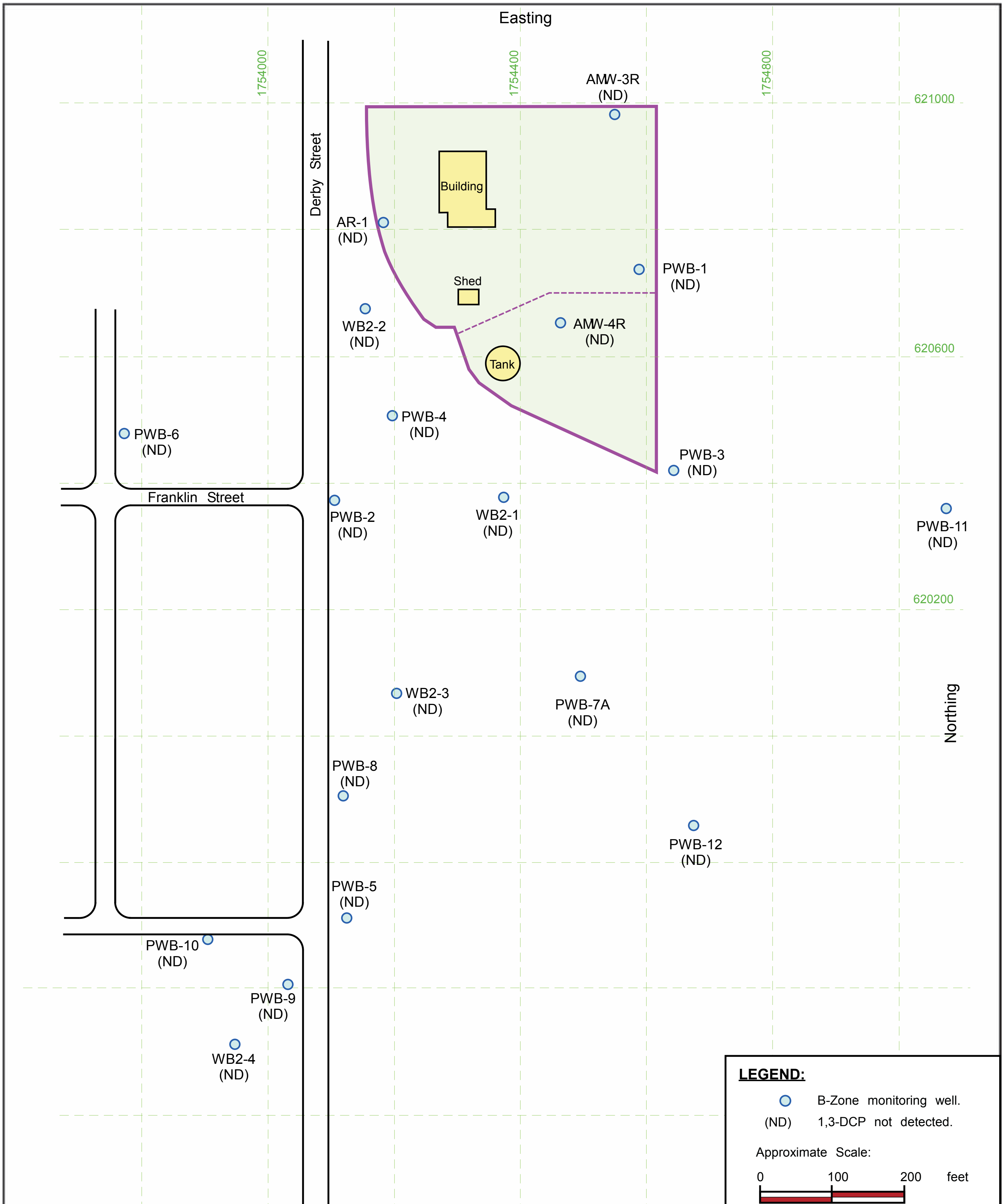
1,2-DCP IN GROUNDWATER
B-ZONE
Brown & Bryant Superfund Site

Project No.: Eco-09-350

Dated: November 2010

FIGURE: 12



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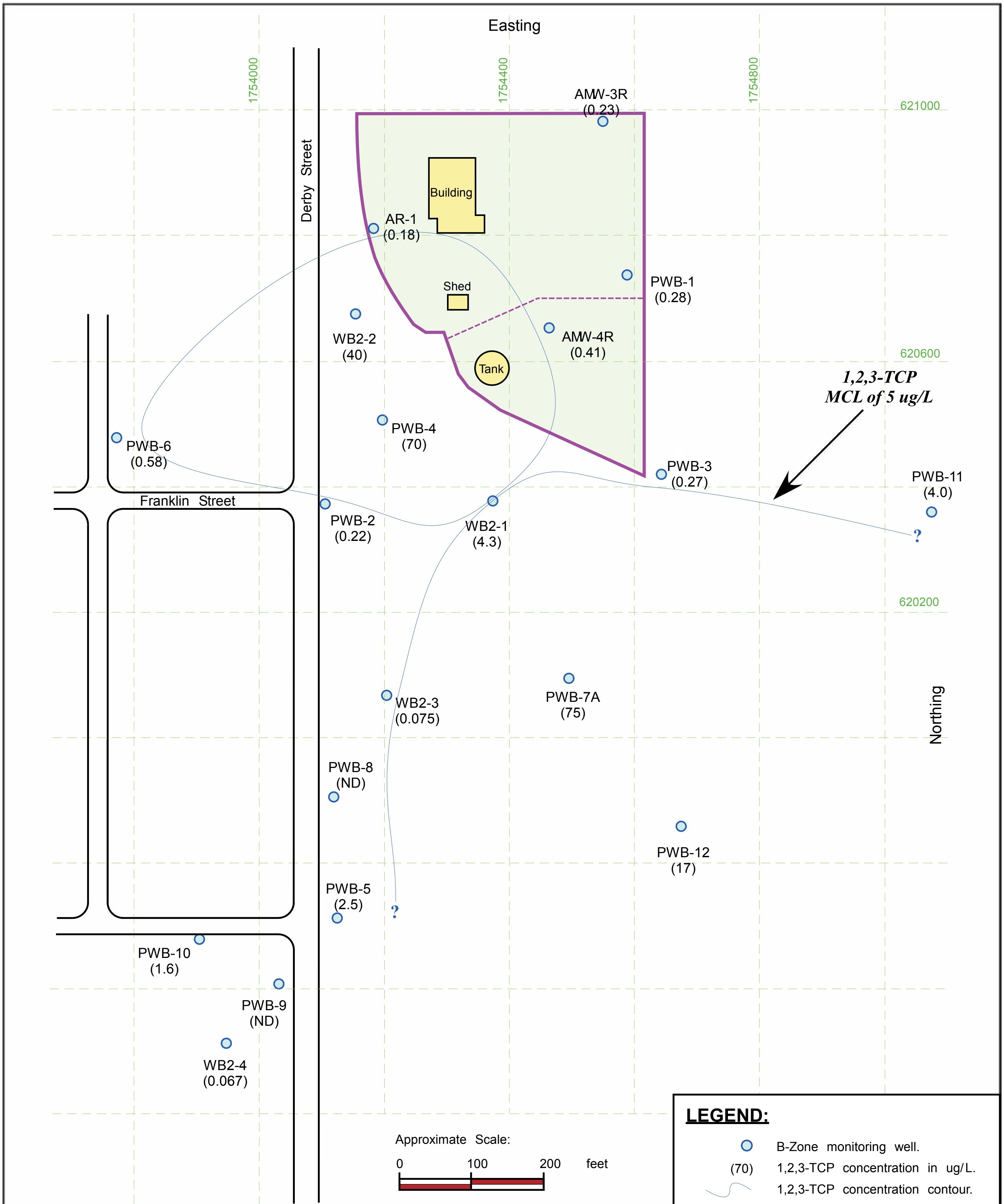
1,3-DCP IN GROUNDWATER
B-ZONE
Brown & Bryant Superfund Site

Project No.: Eco-09-350

Dated: November 2010

FIGURE:

13



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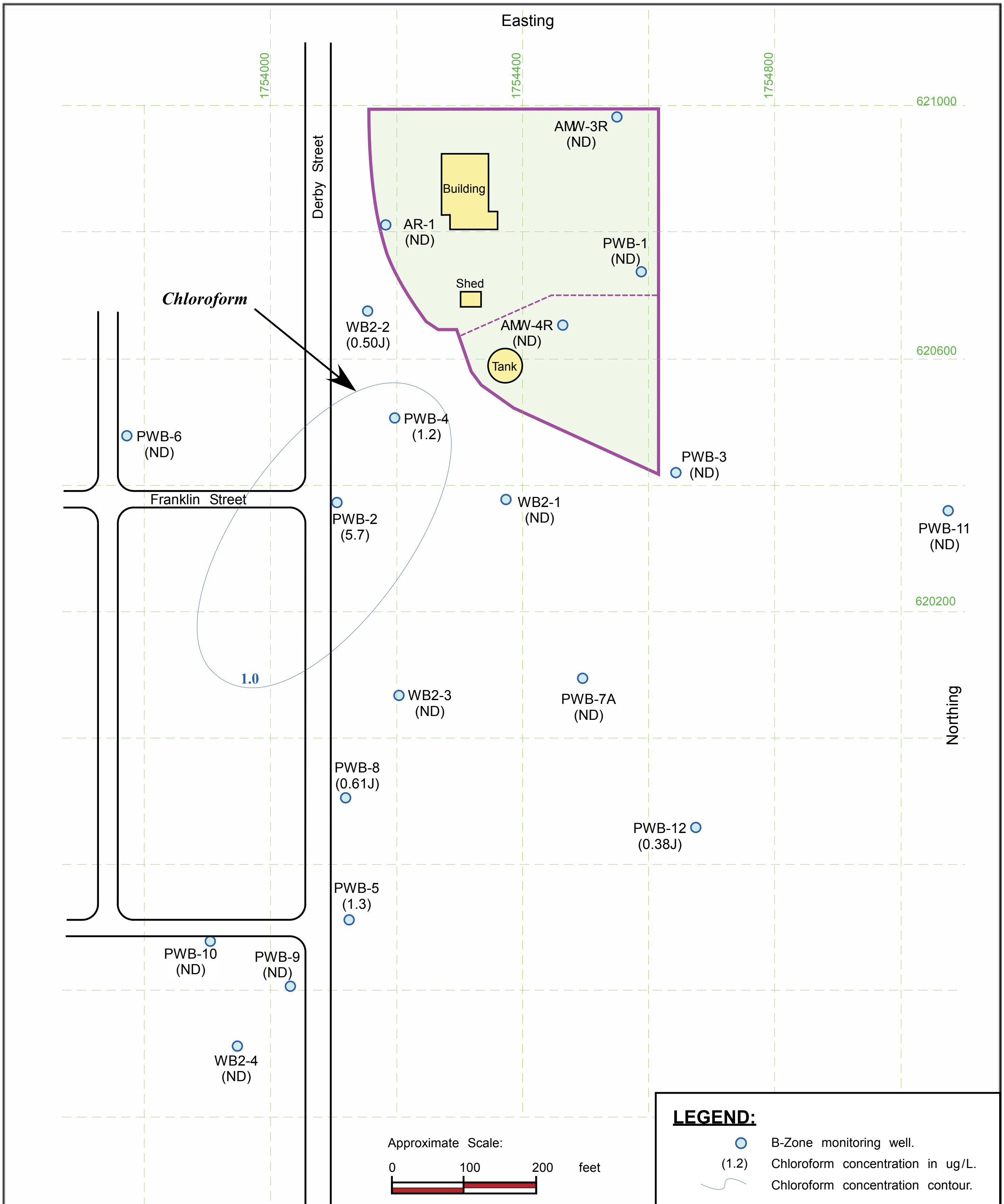
1,2,3-TCP IN GROUNDWATER
B-ZONE
Brown & Bryant Superfund Site

Project No.: Eco-09-350

Dated: November 2010

FIGURE: 14



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Orange, California 92867

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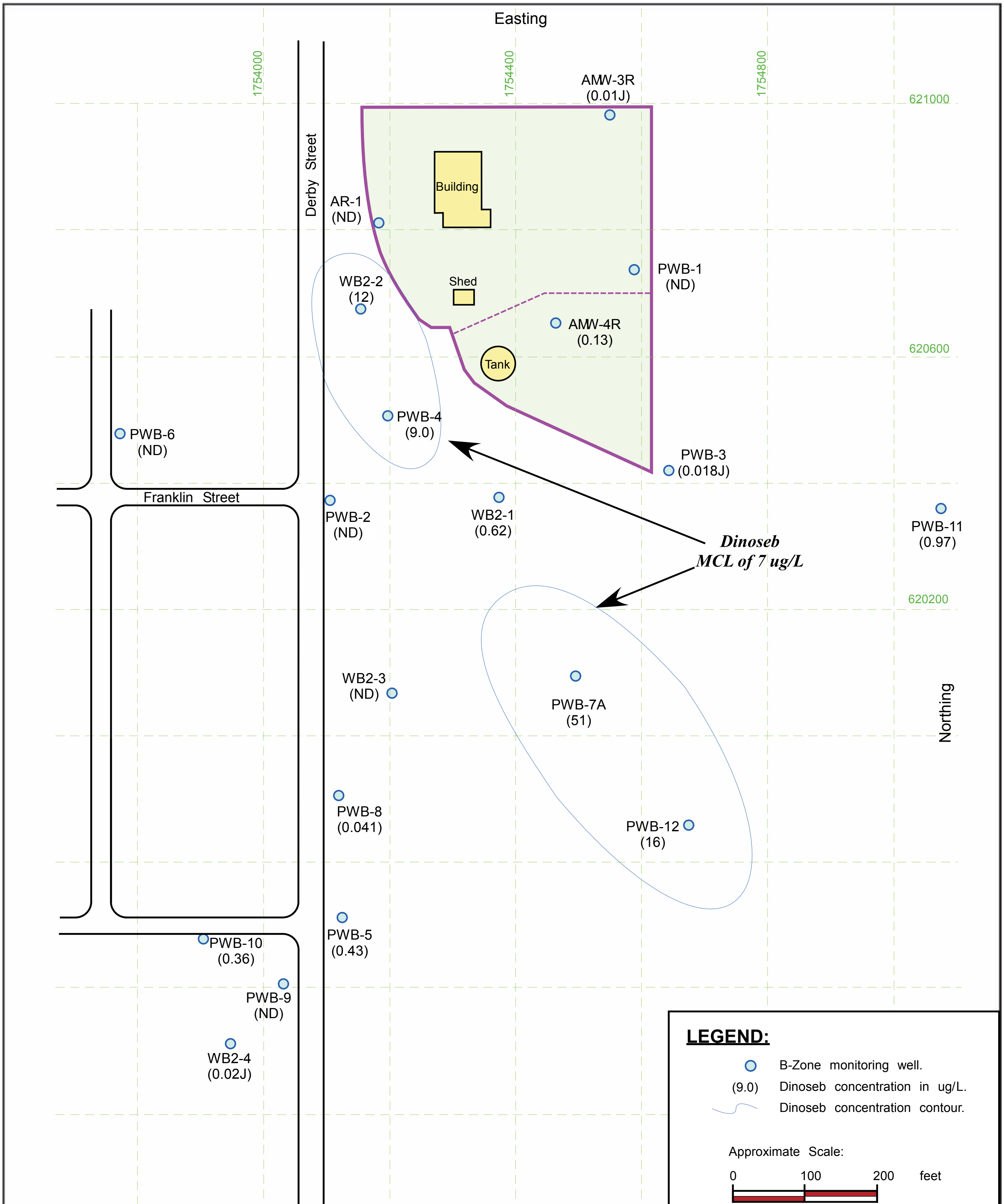
CHLOROFORM IN GROUNDWATER
B-ZONE
Brown & Bryant Superfund Site

Project No.: Eco-09-350

Dated: November 2010

FIGURE: 15



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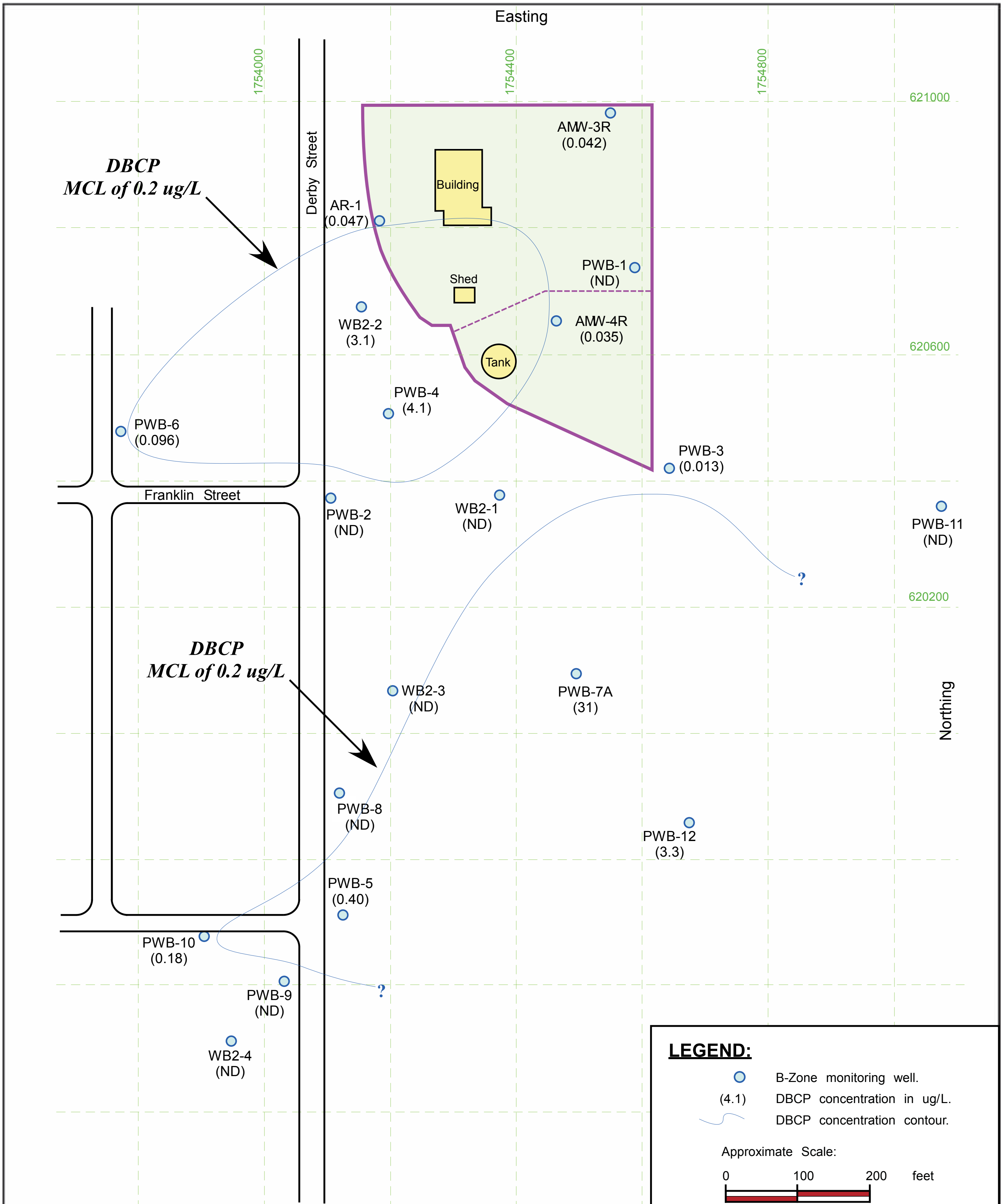
DINOSEB IN GROUNDWATER
B-ZONE
Brown & Bryant Superfund Site

Project No.: Eco-09-350

Dated: November 2010

FIGURE: 16



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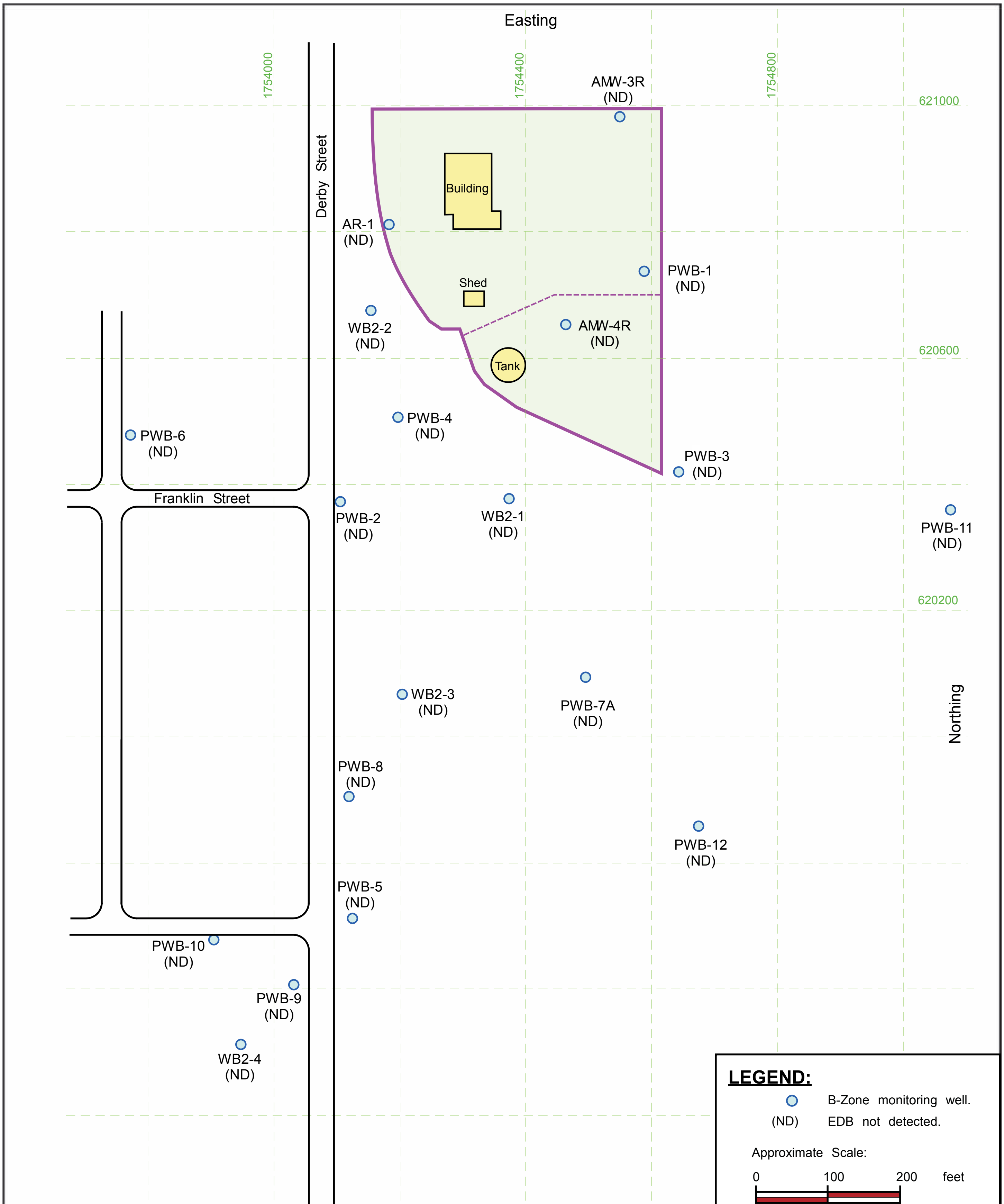
DBCP IN GROUNDWATER
B-ZONE
Brown & Bryant Superfund Site

Project No.: Eco-09-350
Dated: November 2010

FIGURE:
17



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EDB IN GROUNDWATER
B-ZONE
Brown & Bryant Superfund Site

Project No.: Eco-09-350

Dated: November 2010

FIGURE: 18

US Environmental Protection Agency

Attachment D
Site Inspection Report
for
Brown and Bryant Superfund Site
Arvin, California

Prepared by: US Army Corps of Engineers
Environmental and Munitions Center of Expertise
Omaha, Nebraska

Prepared for: US Environmental Protection Agency, Region 9
San Francisco, California

September 2011

Brown and Bryant Superfund Site Five-Year Review

Site Inspection Report

TRIP REPORT

1. INTRODUCTION

a. Date: December 6-8, 2010

b. Location: Arvin, CA

c. Purpose: The site inspection was conducted to provide information about the site's status and to visually confirm and document the conditions of the remedy, the site, and the surrounding area. In addition, interviews were conducted with the site manager and a representative of the Committee for a Better Arvin. The condition of the document repository and the status of institutional controls were also reviewed.

d. Travelers:

Michael M. Bailey	USACE EM CX Geologist	(402) 697-2584
Mark Rothas	USACE EM CX Engineer	(402) 697-2580

e. Contacts:

Rick Lainhart	USACE Site Manager	(951) 316-0430
Salvador Partida	Representative Committee for a Better Arvin	(661) 854-7000
Librarian	Kern County Library, Arvin, CA	(661) 854-5934
Reference Librarian	Beale Library, Kern County, Bakersfield, CA	(661) 868-0701
Staff	Hall of Records, Kern County, Bakersfield, CA	(661) 868-6448
Staff	Assessor's Office, Kern County, Bakersfield, CA	(661) 868-2000
Staff	Environmental Health Services, Kern County, Bakersfield, CA	(661) 862-8700

2. SUMMARY

Mike Bailey and Mark Rothas arrived at Bakersfield, CA at approximately 3 PM on December 6, 2010, where they first visited the Kern County Hall of Records. Records pertaining to the Brown & Bryant Superfund site could not be located, even with the assistance of staff members. It was suggested that they return the following day to obtain assistance from an office supervisor. After leaving the Recorder's Office, they went to the Assessor's Office to confirm the parcel identification number for the property. At the recommendation of the Recorder's Office, the CX team then went to the Kern County Public Services Office, which houses the Planning Department and the Environmental Health Services Department. The Recorder's Office thought that institutional controls, in the form of covenants, conditions, or restrictions (CCRs), might be in the Planning or Health Services database, as a means of ensuring that properties are not developed or used in such a way that public health would be at risk. An Environmental Health

Services staff member, after consulting with a coworker in the Planning Department, indicated that they have no knowledge of CCRs incorporated in deeds for the Brown and Bryant site, and that they rely on the property owner to obey any restrictions that are placed on the property. The final stop of the day was to the Beale Memorial Library, which turned out to be closed on Mondays.

The following morning, the CX personnel returned to the Hall of Recorders and spoke with the supervisor. She was able to pull up the deed for the property (attached), as well as other records (primarily liens). No CCRs were found for the property.

After completing their search for institutional controls, the CX team traveled to the site in Arvin, arriving at 9 AM, and met with the USACE site manager, Rick Lainhart. The site manager provided a briefing on recent operation and maintenance (O&M) activities, activities proposed at the site, and led the CX team on a site tour. Various aspects of site activities and status were also discussed, such as community sentiment, land use, demographics, communication, and property issues. Information relevant to the site inspection is contained in the site inspection report included as an attachment to this trip report. A summary of the interview with the site manager is included in Attachment E. The site inspection concluded at 11:30 AM.

During the afternoon of Dec 7, the CX team visited the Arvin Branch of the Kern County Library (Arvin library) to review the status of the administrative record for the site at that location. The librarian at the information desk was not aware of any documents relating to the site, but another library staff person showed the team the information repository. Although the information repository had been updated recently (Nov 2010 Technical Specs & Design Analysis), many documents were not present.

After completing the search at the Arvin library, the CX team met with Mr. Salvador Partida, co-chair of the Committee for a Better Arvin, at his office. The CX team interviewed Mr. Partida for approximately an hour. A summary of the interview is included in Attachment E.

Because the previous Five-Year Review had noted that the administrative record had been transferred to Bakersfield, the CX team left Arvin after interviewing Mr. Partida and traveled to the Beale Memorial Library in Bakersfield to review the status of the administrative record at that location.

The CX team returned to Omaha, NE on December 8, 2010.

3. DISCUSSION

Property records research was performed on the afternoon of the 6th and morning of the 7th of December to establish if any CCRs had been placed on the Arvin parcels formerly owned by Brown and Bryant, Inc. During the records research, offices of the Kern County Recorder, Assessor, and Environmental Health Service and Planning Department were visited. The deed for the property contains no CCRs. Staff personnel reported that county planning and environmental offices have no way of knowing if CCRs have been placed on a property that would limit development/excavation or well installation. Although the OU-1 ROD contained institutional controls as an element of the selected remedy, it appears that all institutional controls will be implemented on completion of the OU-2 remedial action, according to the OU-1 Remedial Action Completion Report (EPA, March 2009).

From the Hall of Records office in Bakersfield on Dec 7, the CX team traveled to the site. They were met by Mr. Rick Lainhart (Los Angeles District), the site manager who oversees O&M activities. Mr. Lainhart conducted a site tour for the CX team, and highlighted some of the identified issues that were of primary importance as follows:

- the cracking present in the asphalt cap;
- the areas of poor drainage where ponding occurs;
- monitoring well damage and security; and
- accumulation of tumbleweeds against the fences.

Mr. Lainhart indicated that the removal in 2009 of the Brown & Bryant storage tank (a visible landmark for years) was the most significant on-site activity since the previous Five-Year Review. The new asphalt cover at the former location of the tank was noted during the site inspection by the CX team. The CX team also noted and documented items such as cracks in the cover, current well head conditions, areas of rodent burrows under the cap, areas of poor cap drainage, and general condition of the facilities. Cracks in the asphalt cap have been an ongoing problem, which were documented in the Second Five-Year Review Report. Mr. Lainhart has documented many cracks over time, and they continue to propagate. He indicated that repairs to the asphalt cap are planned for 2011, including grinding out (enlarging) the cracks and resealing with asphalt.

Ponding was another issue identified in the previous Five-Year Review. Ponding in several locations occurs on the non-RCRA portion of the asphalt cap after precipitation events; it is less of a problem on the RCRA portion of the asphalt cap. The previous Five-Year Review noted that drainage was blocked on the east-central portion of the cap by construction of a berm on the adjacent land owner's property to prevent flooding of an unimproved road. The berm is no longer present and drainage is currently relatively unimpeded, although minor ponding persists. Ponding also occurs along the eastern side of the warehouse, and is most prevalent along the western side of the warehouse. Actions proposed by the site manager during the previous Five-Year Review to resurface the cap with asphalt to fill in low spots and to direct flow off the cap were not completed, but are planned for 2011.

Another issue identified in the previous Five-Year Review was the occurrence of multiple rodent burrow holes originating from outside the fence line and often penetrating the surface of the asphalt cap. Two locations were noted by the CX team during the site visit where active rodent burrows extended under the asphalt cover. One of the burrows had an exit hole through the asphalt surface. The entrance holes were easily identified by the mounds of sand and gravel removed from the subsurface. There were no indications that the geosynthetic clay cap subsurface liner had been compromised. Part of ongoing O&M is to fill burrows with concrete and seal surface penetrations with asphalt. Old sealed burrows were pointed out by Mr. Lainhart during the site walk.

During a survey of monitoring wells, numerous issues associated with condition of the wells were noted. While most wells were in good condition, a few well protective casings and bollards needed painting and some flush-mount wells had cracked surface pads. Many wells either lacked a lock, or the lock was not able to close due to settling of the protective casing (which caused the well casing to stick up, preventing proper closing of the well). Some of the wells were not labeled on the outside, though they may have had markings not visible on the inside. Some wells were obscured by vegetative growth or covered by dirt (flush-mounts). The tour included a visit to the water supply well CW-1.

Damage to barbed wire surmounting the chain link fence that was identified in the previous Five-Year Review has been repaired. The fence and barbed wire were in good condition. Overall site security appears adequate, with a single access point to the site equipped with a lock. There have been no reports of vandalism at the site, and no signs (such as graffiti) suggesting that trespassers have accessed the property.

The interior of the warehouse, which will be used during implementation of the OU-2 remedy, has deteriorated due to a recent infestation of pigeons. The pigeons are accessing the inside through a missing panel in the roof that blew off during a wind storm. Pigeon droppings were evident. Mr. Lainhart indicated that the missing panel would be repaired and the interior of the warehouse cleaned in the near future.

The afternoon of Dec 7th was used to interview a community member (Salvador Partida), as well as visit two libraries where information repositories for the site had resided at one time. Mr. Partida, co-chair of the Committee for a Better Arvin, was interviewed at his office. He was not satisfied with the pace of remediation activities at the site, and also felt that EPA could do a better job of communicating with the community on a more frequent basis. Although he did not regard the cap as a remedy for contaminated soil at the site, he and the community accepted it as the best of the alternatives offered by EPA.

Neither of the libraries visited in Arvin or Bakersfield contained a complete information repository. The Arvin librarian was not initially aware that the repository existed. Another staff member showed the CX team the documents in the library's possession. Important documents covering recent activities were not present in the administrative record on file at the Arvin library. Among the missing records were the OU2 Record of Decision (Sep 2007), OU1 Remedial Action Completion Report (Mar 2009), OU1 Remedial Action Closure Report (July 2000), and recent groundwater monitoring reports. The Beale Memorial library in Bakersfield only contained documents (on microfiche) through 1993.

4. ACTIONS RECOMMENDED

The EM CX will incorporate the findings into the Five Year Review Report.

Michael M. Bailey, P.G.
Geologist
CEHNC-CX-EG

Mark Rothas, P.E.
Engineer
CEHNC-CX-EG

Site Inspection Checklist

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: Brown & Bryant	**Date of inspection: Dec 7, 2010**
Location and Region: Arvin, CA – Region 9	**EPA ID: CAD052384021**
Agency, office, or company leading the five-year review: US Army Corps of Engineers	**Weather/temperature: 60 degrees, clear, calm**

Remedy Includes: (Check all that apply)

√ Landfill cover/containment
□ Access controls
√ Institutional controls
□ Groundwater pump and treatment
□ Surface water collection and treatment
□ Monitored natural attenuation
□ Groundwater containment
□ Vertical barrier walls
√ Other Only the OU-1 remedy has been implemented. The OU-2 ROD, which was signed in Sep 2007, includes monitored natural attenuation and extraction and treatment of A-zone groundwater.

Attachments: □ Inspection team roster attached √ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** Rick Lainhart ______ ______ Dec 7, 2010
   Name Title Date
   Interviewed √ at site □ at office □ by phone Phone no. ______
   Problems, suggestions; √ Report attached Interview record is included as an attachment to the Five-Year Review Report.

2. **O&M staff** ______ ______ ______
   Name Title Date
   Interviewed □ at site □ at office □ by phone Phone no. ______
   Problems, suggestions; □ Report attached ______
   ______

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______________________________
Contact ______________________________ ____________________ _________ _____________
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached ____
____

Agency ______________________________
Contact ______________________________ ____________________ _________ _____________
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached ____
____

Agency ______________________________
Contact ______________________________ ____________________ _________ _____________
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached ____
____

Agency ______________________________
Contact ______________________________ ____________________ _________ _____________
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached ____
____

4. **Other interviews** (optional) ☐ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)	
1.	**O&M Documents** □ O&M manual □ Readily available □ Up to date □ N/A □ As-built drawings □ Readily available □ Up to date □ N/A □ Maintenance logs □ Readily available □ Up to date □ N/A Remarks <u>Site is inactive aside from monthly visits, quarterly O&M inspections, and periodic groundwater sampling events. No office on site. O&M documents not stored on site.</u>
2.	**Site-Specific Health and Safety Plan** □ Readily available □ Up to date □ N/A □ Contingency plan/emergency response plan □ Readily available □ Up to date □ N/A Remarks <u>Documents not maintained on site except during site activities.</u>
3.	**O&M and OSHA Training Records** □ Readily available □ Up to date □ N/A Remarks <u>Documents not maintained on site except during site activities.</u>
4.	**Permits and Service Agreements** □ Air discharge permit □ Readily available □ Up to date √N/A □ Effluent discharge □ Readily available □ Up to date √ N/A □ Waste disposal, POTW □ Readily available □ Up to date √ N/A □ Other permits______________________ □ Readily available □ Up to date √ N/A Remarks______________________________
5.	**Gas Generation Records** □ Readily available □ Up to date √ N/A Remarks______________________________
6.	**Settlement Monument Records** □ Readily available □ Up to date √ N/A Remarks <u>The cap does not have settlement monuments, although they have been proposed for addition</u>
7.	**Groundwater Monitoring Records** √ Readily available □ Up to date □ N/A Remarks <u>Available from Albuquerque District. As noted above, no records are maintained on site.</u>
8.	**Leachate Extraction Records** □ Readily available □ Up to date √ N/A Remarks______________________________
9.	**Discharge Compliance Records** □ Air □ Readily available □ Up to date √ N/A □ Water (effluent) □ Readily available □ Up to date √ N/A Remarks______________________________
10.	**Daily Access/Security Logs** □ Readily available □ Up to date √ N/A Remarks <u>Site is inactive aside from periodic inspections.</u>

IV. O&M COSTS

1. **O&M Organization**
☐ State in-house ☐ Contractor for State
☐ PRP in-house ☐ Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
√ Other Contractor for US Army Corps of Engineers

2. **O&M Cost Records**
√ Readily available ☐ Up to date
☐ Funding mechanism/agreement in place
Original O&M cost estimate $103,000 (in 2008 dollars) ☐ Breakdown attached

Total annual cost by year for review period if available

From (Date)	To (Date)	Total cost	
	2006	$175,000	☐ Breakdown attached
	2007	$260,000	☐ Breakdown attached
	2008	$223,000	☐ Breakdown attached
			☐ Breakdown attached
			☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**
Describe costs and reasons:

V. ACCESS AND INSTITUTIONAL CONTROLS √ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map √ Gates secured ☐ N/A
Remarks Fences and gates in good condition.

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
Remarks Signs posted at frequent intervals on fence.

C. Institutional Controls (ICs)
1. **Implementation and enforcement** Site conditions imply ICs not properly implemented ☐ Yes √ No ☐ N/A Site conditions imply ICs not being fully enforced ☐ Yes √ No ☐ N/A Type of monitoring (*e.g.*, self-reporting, drive by) ____ Frequency ____ Responsible party/agency ____ Contact ____ Name ____ Title ____ Date ____ Phone no. Reporting is up-to-date ☐ Yes ☐ No ☐ N/A Reports are verified by the lead agency ☐ Yes ☐ No ☐ N/A Specific requirements in deed or decision documents have been met ☐ Yes ☐ No √ N/A Violations have been reported ☐ Yes ☐ No √ N/A Other problems or suggestions: ☐ Report attached Search of Kern County Hall of Records indicates no institutional controls recorded. USEPA still maintains control of the site to enforce any on-site use restrictions. OU-2 controls will require restrictions on off-site wells within ½-mile of site. It is uncertain how these controls will be implemented. Kern County Environmental Health Services Dept responsible for well installation permits is not informed of deed restrictions, nor does it have jurisdiction to withhold permits for environmental purposes. The State of CA may have this jurisdiction based on feedback from county.
2. **Adequacy** ☐ ICs are adequate ☐ ICs are inadequate ☐ N/A Remarks Institutional controls required by RODs for OU-1 and OU-2 have not been implemented. However, there is no indication that potential receptors have been exposed to contaminated media. Current plan is to implement ICs after completion of OU-2 remedial action.
D. General
1. **Vandalism/trespassing** ☐ Location shown on site map √ No vandalism evident Remarks Holes from shotgun pellets noted on one warning sign.
2. **Land use changes on site** √ N/A Remarks____
3. **Land use changes off site** √ N/A Remarks____
VI. GENERAL SITE CONDITIONS
A. Roads ☐ Applicable √ N/A
1. **Roads damaged** ☐ Location shown on site map ☐ Roads adequate ☐ N/A Remarks____

B. Other Site Conditions
Remarks Site is in good condition; no trash or debris visible; occasional tumbleweed against fence. Large storage tank that was empty, but highly visible to community, was removed during this review period. Building was secured, with an asphalt containment berm constructed around it to prevent ponded water from draining into the building and to allow indoor material storage to support site activities. Small section of the metal roof had been blown off during a windstorm that allowed pigeons and rainfall to enter building. O&M contractor needs to coordinate roof repairs and cleaning of resulting debris and water.
VII. LANDFILL COVERS √ Applicable ☐ N/A
A. Landfill Surface
1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident Areal extent Variable (up to 100s of square feet) Depth Not surveyed, but no more than inches Remarks______
2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident Lengths Up to 10s of feet Widths Up to approx. ½" Depths______ Remarks Vegetation has taken root in some cracks
3. **Erosion** ☐ Location shown on site map √ Erosion not evident Areal extent______ Depth______ Remarks______
4. **Holes** ☐ Location shown on site map ☐ Holes not evident Areal extent______ Depth______ Remarks One rodent hole through side slope of RCRA cap; other holes burrowing under edge of cap. Possible rodent holes or beginnings of rodent holes observed at multiple locations.
5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress ☐ Trees/Shrubs (indicate size and locations on a diagram) √ N/A Remarks______
6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A Remarks Asphaltic concrete
7. **Bulges** ☐ Location shown on site map √ Bulges not evident Areal extent______ Height______ Remarks______

8.	**Wet Areas/Water Damage** ☐ Wet areas/water damage not evident ☐ Wet areas ☐ Location shown on site map Areal extent______________ √ Ponding √ Location shown on site map Areal extent______________ ☐ Seeps ☐ Location shown on site map Areal extent______________ ☐ Soft subgrade ☐ Location shown on site map Areal extent______________ Remarks Run-off ponding occurs at multiple, isolated topographic low points that exist based on either original construction or settlement of the asphalt pavement. Ponding has been reduced versus last 5-year review due to removal of tilling windrow adjacent to the fence line from surrounding agricultural field that had blocked site run-off .	
9.	**Slope Instability** ☐ Slides ☐ Location shown on site map √ No evidence of slope instability Areal extent______________ Remarks____	
B. Benches	☐ Applicable √ N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)	
1.	**Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay Remarks____	
2.	**Bench Breached** ☐ Location shown on site map ☐ N/A or okay Remarks____	
3.	**Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay Remarks____	
C. Letdown Channels	☐ Applicable √ N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)	
1.	**Settlement** ☐ Location shown on site map ☐ No evidence of settlement Areal extent______________ Depth____________ Remarks____	
2.	**Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation Material type_______________ Areal extent_____________ Remarks____	
3.	**Erosion** ☐ Location shown on site map ☐ No evidence of erosion Areal extent______________ Depth____________ Remarks____	

4.	**Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting Areal extent______________ Depth____________ Remarks____	
5.	**Obstructions** Type_____________________ ☐ No obstructions ☐ Location shown on site map Areal extent______________ Size____________ Remarks____	
6.	**Excessive Vegetative Growth** Type____________________ ☐ No evidence of excessive growth ☐ Vegetation in channels does not obstruct flow ☐ Location shown on site map Areal extent______________ Remarks____	
D. Cover Penetrations √ Applicable ☐ N/A		
1.	**Gas Vents** ☐ Active ☐ Passive ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance √ N/A Remarks____	
2.	**Gas Monitoring Probes** ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance √ N/A Remarks____	
3.	**Monitoring Wells** (within surface area of landfill) ☐ Properly secured/locked √ Functioning √ Routinely sampled √ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks Not all wells were locked due to settlement of protective casing, which prevents cap from seating properly.	
4.	**Leachate Extraction Wells** ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance √ N/A Remarks____	
5.	**Settlement Monuments** ☐ Located ☐ Routinely surveyed √ N/A Remarks None, but addition of settlement monuments has been proposed.	

E. Gas Collection and Treatment	□ Applicable √ N/A	
1.	**Gas Treatment Facilities** □ Flaring □ Thermal destruction □ Collection for reuse □ Good condition □ Needs Maintenance Remarks____ ____	
2.	**Gas Collection Wells, Manifolds and Piping** □ Good condition □ Needs Maintenance Remarks____ ____	
3.	**Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings) □ Good condition □ Needs Maintenance □ N/A Remarks____ ____	
F. Cover Drainage Layer	□ Applicable √ N/A	
1.	**Outlet Pipes Inspected** □ Functioning □ N/A Remarks____ ____	
2.	**Outlet Rock Inspected** □ Functioning □ N/A Remarks____ ____	
G. Detention/Sedimentation Ponds	□ Applicable √ N/A	
1.	**Siltation** Areal extent______________ Depth____________ □ N/A □ Siltation not evident Remarks____ ____	
2.	**Erosion** Areal extent______________ Depth____________ □ Erosion not evident Remarks____ ____	
3.	**Outlet Works** □ Functioning □ N/A Remarks____ ____	
4.	**Dam** □ Functioning □ N/A Remarks____ ____	

H. Retaining Walls		□ Applicable √ N/A	
1.	**Deformations**	□ Location shown on site map	□ Deformation not evident
	Horizontal displacement_____________ Vertical displacement________________ Rotational displacement_____________ Remarks____		
2.	**Degradation**	□ Location shown on site map	□ Degradation not evident
	Remarks____		
I. Perimeter Ditches/Off-Site Discharge		√ Applicable □ N/A	
1.	**Siltation**	□ Location shown on site map	□ Siltation not evident
	Areal extent_______________ Depth_____________ Remarks Aside from areas of ponding, drainage flows to collection/discharge points; discharge is unimpeded, although there is minor siltation where asphalt berms direct flow.		
2.	**Vegetative Growth**	□ Location shown on site map	√ N/A
	□ Vegetation does not impede flow Areal extent_______________ Type_____________ Remarks____		
3.	**Erosion**	□ Location shown on site map	√ Erosion not evident
	Areal extent_______________ Depth_____________ Remarks____		
4.	**Discharge Structure**	□ Functioning √ N/A	
	Remarks____		
VIII. VERTICAL BARRIER WALLS		□ Applicable √ N/A	
1.	**Settlement**	□ Location shown on site map	□ Settlement not evident
	Areal extent_______________ Depth_____________ Remarks____		
2.	**Performance Monitoring**	Type of monitoring___________________________	
	□ Performance not monitored Frequency_________________________________ □ Evidence of breaching Head differential___________________________ Remarks____		

IX. GROUNDWATER/SURFACE WATER REMEDIES √ Applicable □ N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines □ Applicable √ N/A
1. **Pumps, Wellhead Plumbing, and Electrical** □ Good condition □ All required wells properly operating □ Needs Maintenance □ N/A Remarks____ ____ ____
2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** □ Good condition □ Needs Maintenance Remarks____ ____
3. **Spare Parts and Equipment** □ Readily available □ Good condition □ Requires upgrade □ Needs to be provided Remarks____ ____
B. Surface Water Collection Structures, Pumps, and Pipelines □ Applicable √ N/A
1. **Collection Structures, Pumps, and Electrical** □ Good condition □ Needs Maintenance Remarks____ ____
2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** □ Good condition □ Needs Maintenance Remarks____ ____
3. **Spare Parts and Equipment** □ Readily available □ Good condition □ Requires upgrade □ Needs to be provided Remarks____ ____

C. Treatment System	□ Applicable √ N/A
1.	**Treatment Train** (Check components that apply) □ Metals removal □ Oil/water separation □ Bioremediation □ Air stripping □ Carbon adsorbers □ Filters______________________________ □ Additive (*e.g.*, chelation agent, flocculent)____________________ □ Others______________________________ □ Good condition □ Needs Maintenance □ Sampling ports properly marked and functional □ Sampling/maintenance log displayed and up to date □ Equipment properly identified □ Quantity of groundwater treated annually________________ □ Quantity of surface water treated annually________________ Remarks______________________________ ______________________________
2.	**Electrical Enclosures and Panels** (properly rated and functional) □ N/A □ Good condition □ Needs Maintenance Remarks______________________________ ______________________________
3.	**Tanks, Vaults, Storage Vessels** □ N/A □ Good condition □ Proper secondary containment □ Needs Maintenance Remarks______________________________ ______________________________
4.	**Discharge Structure and Appurtenances** □ N/A □ Good condition □ Needs Maintenance Remarks______________________________ ______________________________
5.	**Treatment Building(s)** □ N/A □ Good condition (esp. roof and doorways) □ Needs repair □ Chemicals and equipment properly stored Remarks______________________________ ______________________________
6.	**Monitoring Wells** (pump and treatment remedy) □ Properly secured/locked □ Functioning □ Routinely sampled □ Good condition □ All required wells located □ Needs Maintenance □ N/A Remarks______________________________ ______________________________
D. Monitoring Data	√ Applicable □ N/A
1.	Monitoring Data □ Is routinely submitted on time √ Is of acceptable quality
2.	Monitoring data suggests: □ Groundwater plume is effectively contained □ Contaminant concentrations are declining

D. Monitored Natural Attenuation	□ Applicable √ N/A
1.	**Monitoring Wells** (natural attenuation remedy) □ Properly secured/locked □ Functioning □ Routinely sampled □ Good condition □ All required wells located □ Needs Maintenance □ N/A Remarks MNA is a component of the OU-2 ROD remedy and has not been implemented yet.

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

Remedy consists of a RCRA cap and a non-RCRA cap. The RCRA cap isolates contaminated soil, prevents exposure, and minimizes infiltration. The non-RCRA cap covers uncontaminated soil and minimizes infiltration. Cracks in asphalt cover permit some infiltration, although there is no evidence to suggest that the cap liner has been breached; ponding indicates that settling has occurred and may be continuing to occur. Minor problems with cracks and ponding do not suggest that the remedy is not effective or functioning as intended; although if left uncorrected, they may affect performance in the future.

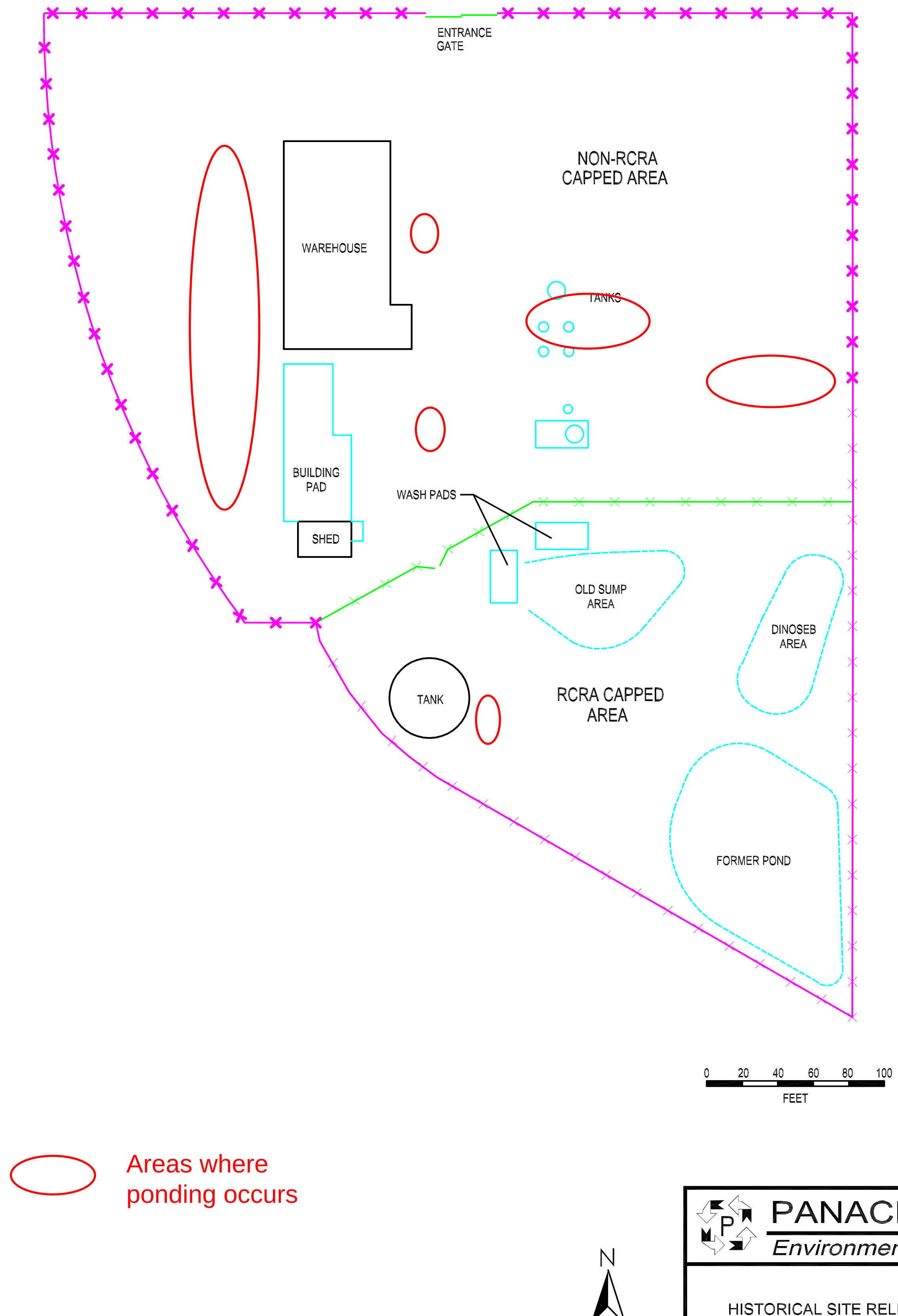
B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Previous attempts to repair cracks with sealant have not been effective. More aggressive patching is planned. Rodent burrows are an on-going problem dealt with as discovered by filling holes with concrete and sealing cap penetrations with asphalt. Site manager mentioned that protective bollards around off-property monitoring wells are occasionally damaged by vehicles. Concrete aprons around monitoring wells also get damaged by traffic. These problems would have to get much worse before there would be an impact to protectiveness of the remedy.

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. As noted in A and B above, cracks and settling have become more pronounced over time. If allowed to develop, they may eventually compromise the integrity of the cap. Repairs are apparently scheduled for 2011.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. Groundwater monitoring optimization opportunities were identified during the previous Five-Year Review and subsequently implemented. Because the OU-2 remedy will be implemented in the near future, the groundwater monitoring program is in a state of transition. Monitoring will be driven, in part, by design needs for the groundwater remedy. It is premature to propose modifications to the monitoring program.

Site Map



PANACEA, INC.
Environmental Services

HISTORICAL SITE RELEASE AREAS
ARVIN, CALIFORNIA

PROJECT NO. C00-266.2	FIGURE I-5

Site Photographs

1. View northeast; ponding on non-RCRA cap.

2. View east; ponding in drainage swale on non-RCRA cap.

3. View north; ponding on western side of warehouse.

4. View east; ponding on RCRA cap, new asphalt at former location of storage tank in foreground.

5. View east along southern fence line showing edge of RCRA cap with cracks; portion of well field.

6.. Cracks in asphalt cover on RCRA cap showing vegetation and previous repairs.

7. Typical well penetrating RCRA cap; protective bollards and locked well cap.

8. Example of a well where settling of the protective casing has occurred, preventing proper seating and locking of the well cap.

9. Animal burrow in RCRA cap along eastern fence line.

10. Sealed animal burrow to right of pen.

11. Inside of warehouse looking at roof and roosting pigeons.

12. Missing roof panel in warehouse.

13. Entrance gate with warning signs.

14. Example of warning sign.

15. Example of warning sign.

16. Brown & Bryant identification sign along western fence line.

17. Example of unlocked well on adjacent property with rusty bollards and protective casing.

18. Example of cracked surface pad for flush-mounted monitoring well.

19. Monitoring well on adjacent property obscured by tumbleweeds.

20. Example of properly secured flush-mounted well in good condition.

21. Example of flush-mounted well (center of photo) partially covered with dirt.

22. City well CW-1.

23. View northwest looking at RCRA cap.

24. View east with agricultural land beyond site.

25. View west with residences and light commercial/industrial properties beyond site.

26. View north with light commercial/industrial property beyond site.

US Environmental Protection Agency

Attachment E
Interviews
for
Brown and Bryant Superfund Site
Arvin, California

Prepared by: **US Army Corps of Engineers**
Environmental and Munitions Center of Expertise
Omaha, Nebraska

Prepared for: **US Environmental Protection Agency, Region 9**
San Francisco, California

September 2011

INTERVIEW DOCUMENTATION FORM

The following is a list of individual interviewed for this five-year review. See the attached contact records for a detailed summary of the interviews.

Name	Title/Position	Organization	Date
Rick Lainhart	Site Manager	USACE	12/7/2010
Steve Ross	Engineer	California DTSC	12/21/2010
Salvador Partida	Co-chair	Committee for a Better Arvin	12/7/2010
John Trino	Owner	Trino Packing & Cold Storage	12/16/2010
Cecilia Horner	Environmental Eng.	USACE	12/22/2010

INTERVIEW RECORD

Site Name: Brown & Bryant Superfund Site	**EPA ID No.: CAD052384021**
Subject: Five-Year Review	**Time:11:00 AM** / **Date: 12/7/10**
Type: ☐ Telephone √ Visit ☐ Other **Location of Visit: Brown & Bryant site (600 S Derby St, Arvin, CA)**	☐ Incoming ☐ Outgoing

Contact Made By:

Name: Mike Bailey **Mark Rothas**	**Title: Geologist** **Engineer**	**Organization: USACE EMCX**

Individual Contacted:

Name: Rick Lainhart	**Title: Site manager**	**Organization: USACE**
Telephone No: 951-316-0430 **Fax No:** **E-Mail Address:**	**Street Address:** **City, State, Zip:**	

Summary Of Conversation

1. What is your overall impression of the project? (general sentiment)
   He stated that the project is finally moving forward and that there has been a lot of progress with the public and the agencies over the past five years. He said that everyone, even the community, seems to agree with the path forward.

2. Is the remedy functioning as expected? How well is the remedy performing?
   For their age, the caps have done what they were supposed to do, in terms of preventing exposure and minimizing infiltration. Work is planned during 2011 to fix defects (cracks, settling) in the caps and to move forward with the design and installation of the groundwater extraction system.

3. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing?
   He has no knowledge of contaminant trend data, but believes that the newly installed wells have delineated the downgradient extent of the contaminant plume.

4. Is there a continuous on-site O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.
   There is no continuous on-site presence. He makes monthly visits to the site to check on conditions, and quarterly O&M visits are scheduled for maintenance (picking up trash & debris, checking and repairing fence line, filling rodent burrows, repairing wells). At present, monitoring wells are sampled annually, although he believes the frequency will be increased in the future to coincide with the installation of the groundwater extraction system. Monitoring well and other repairs are performed either annually or as needed.

5. Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routines since start-up or in the last five years? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts. *There has been an increase in O&M required to keep up with the condition of the caps. Cracks, typical for the age and amount of settling of the RCRA cap, are more of a visual concern and do not currently affect protectiveness. Rodent burrows along the edges of the cap also do not affect protectiveness.*
6. Have there been unexpected O&M difficulties or costs at the site since start-up or in the last five years? If so, please give details. *None.*
7. Have there been opportunities to optimize O&M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency. *None for routine maintenance and upkeep of the site. However, the site does require constant upkeep. A monitoring well sampling optimization program was performed following the last 5-year review and recommendations implemented, which involved reducing sampling frequency to annually for most wells.*
8. Do you have any comments, suggestions, or recommendations regarding the project? *He feels public awareness has made the site better over the last five years.*
9. What is the current status of construction (*e.g.*, budget and schedule)? *Significant O&M repairs will be started within the next two years, primarily consisting of monitoring well replacement (firm schedule not known) and repairs to cracks in the cap (probably in March or April after the rainy season). Also proposed is resurfacing of the caps to fill in low areas and improve drainage. Timed for the growing season of tumbleweeds, they plan to control their growth (possibly March). He is not aware of a firm schedule for installation of the arbor wells and replacement of the city well (OU-2 remedy). The large storage tank was removed during 2010, which reduced site visibility. EPA and the Water Department are still negotiating the installation of the replacement city water supply well.*
10. Have any problems been encountered which required, or will require, changes to this remedial design or this ROD? *None known.*

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INTERVIEW RECORD

Site Name: Brown & Bryant Superfund Site	**EPA ID No.: CAD052384021**	
Subject: Five-Year Review	**Time: 3:00 PM**	**Date: 12/21/10**
Type: √ Telephone ☐ Visit ☐ Other **Location of Visit:**	☐ Incoming ☐ Outgoing	

Contact Made By:

Name: Mike Bailey Mark Rothas	**Title: Geologist Engineer**	**Organization: USACE EMCX**

Individual Contacted:

Name: Steve Ross	**Title: Hazardous Substances Engineer**	**Organization: California Dept. of Toxic Substances Control**
Telephone No: 916-255-3694 Fax No: E-Mail Address:	**Street Address: 8800 Cal Center Drive City, State, Zip: Sacramento, CA 95826**	

Summary Of Conversation

1. What is your overall impression of the project? (general sentiment)
   Mr. Ross felt that the project is moving along, and he has no complaints about progress.

2. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results.
   Not recently. DTSC was active early in the project. Within the past year, EPA and the State signed an agreement that identifies roles of the agencies and cost-sharing details for the project, establishing the basis for more active involvement by his agency.

3. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, please give details of the events and results of the responses.
   No.

4. Do you feel well informed about the site's activities and progress?
   He did not feel well informed and felt there should be more communication between EPA and DTSC.

5. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?
   He would like increased communications between EPA and the State. He hopes to start seeing documents related to the implementation of the remedy for OU2 (design reports, work plans), as well as groundwater monitoring reports.

6. Discussion about implementation of institutional controls.
   Mr. Ross indicated that land-use covenants would be drafted by the State and would cover activities on the property (related to protecting the cap and prohibiting use of groundwater from contaminated aquifers beneath the property). For the state to move forward with implementation of required land use controls, input from EPA is needed regarding properties affected, and a delineation map for the off-site groundwater and well control must be provided (also needed by the county). He felt that off-property land-use controls would likely require a city ordinance due to the difficulties associated with establishing LUCs on so many properties – currently have similar situation with City of Chico. He also indicated that close coordination between EPA and the county well permitting agency was necessary to make the county aware of issues associated with groundwater and need for off-site groundwater use restrictions. DTSC would be consulted on new well installations and would make recommendations based on well construction details and depth of well, not simply based on well location. He stated that input from EPA is necessary to initiate communications, as well as coordinate the implementation of the necessary institutional controls with the state and local agencies, which has not occurred to date.

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INTERVIEW RECORD

Site Name: Brown & Bryant Superfund Site	**EPA ID No.: CAD052384021**	
Subject: Five-Year Review	**Time: 2:00 PM**	**Date: 12/7/10**
Type: ☐ Telephone √ Visit ☐ Other **Location of Visit: Express Tax & Accounting Services (Arvin, CA)**	☐ Incoming ☐ Outgoing	

Contact Made By:

Name: Mike Bailey Mark Rothas	**Title: Geologist Engineer**	**Organization: USACE EMCX**

Individual Contacted:

Name: Salvador Partida	**Title: Co-chair**	**Organization: Committee For Better Arvin (CBA)**
Telephone No: 661-854-7000 Fax No: E-Mail Address:	**Street Address: 1241 Bear Mt Blvd, Suite B City, State, Zip: Arvin, CA 93203**	

Summary Of Conversation

1. What is your overall impression of the project? (general sentiment)
   He is not impressed; project is not making progress, and his perception is that adequate funding has not been made available to the project. He feels that the cap is not a remedy, in that it only covers the contamination and does not clean it up, but his group and the community accepted it as the best alternative that would be offered by the EPA. Implementation of the groundwater remedy is not happening in a timely manner, and he is concerned about the impact to the drinking water aquifer. Although they (CBA) have been authorized to hire technical assistance through a TAG (technical assistance grant), they have no funding.

2. What effects have site operations had on the surrounding community?
   The removal of the storage tank has eliminated the constant reminder that a contaminated site was there.

3. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.
   The site makes everyone nervous. During meetings agreements are made with EPA but nothing happens afterwards. He stated that people are concerned about contaminant migration in soil and groundwater, and communicated the impression that the public water well will eventually become contaminated.

4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.
   He said that trucks used to park on site but the gate is now locked, preventing access. He is not aware of anyone trespassing.

5. Do you feel well informed about the site's activities and progress? *He does not feel well informed and only hears from EPA about Brown & Bryant roughly once per year. Mr. Partida feels that information and sampling data is getting to him too late (a year or more after event occurs), and that he does not receive any consistent and periodic status reports on the site, activity schedules, contacts from EPA, etc. He has not heard about additions to the info repository at the library. He would like to hear in advance when sampling is occurring. He felt that the EPA does not make firm commitments during the public meetings, and then does not follow-up afterwards to communicate pending activities and schedules. He feels that too many years have gone by without key components of the groundwater remedy being implemented (e.g., new public water well, groundwater extraction system) after being told on repeated occasions that these actions were moving forward.*
6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation? *He would like to hear that someone at EPA is pushing for work to get done (in other words, that the site has high priority). He feels that more data should be provided in a timely manner and that reports are dated (old) by the time they see them. He would like an explanation of the length of time necessary to get data from the lab. He thinks EPA can do a better job communicating with the community. From his standpoint, the replacement of CW-1 (city's water supply well) is priority #1, which has yet to happen after several years of discussions. He would like to receive more consistent and timely status reports, activity schedule, and/or communications from EPA with firm commitments.*

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INTERVIEW RECORD

Site Name: Brown & Bryant Superfund Site	**EPA ID No.: CAD052384021**	
Subject: Five-Year Review	**Time: 1 PM**	**Date: 12/16/2010**
Type: √ Telephone ☐ Visit ☐ Other **Location of Visit:**	☐ Incoming ☐ Outgoing	

Contact Made By:

Name: Mike Bailey	**Title: Geologist**	**Organization: USACE EMCX**

Individual Contacted:

Name: John Trino	**Title: Owner**	**Organization: Trino Packing & Cold Storage**

Telephone No: 661-854-5482 **Fax No:** **E-Mail Address:**	**Street Address: 818 South Derby St** **City, State, Zip: Arvin, CA 93203**

Summary Of Conversation

Prefatory comment: Mr. Trino was at times passionate and blunt. In transcribing his responses to the questions below, much of that is lost. However, the substance of his comments was preserved.

1. What is your overall impression of the project? (general sentiment)
   Mr. Trino said that it appears as though nothing is being done. He wants to know when the work is going to be done and feels that it is time get it over with. He feels that the property is a waste and is unproductive. He doesn't know who is being protected and regards much of the work as a waste of government resources.

2. What effects have site operations had on the surrounding community?
   He believes that site operations have created a temperament that is not healthy. The property was an employer for many years, and the only thing the hard working people in the community see are the lost jobs at the site. Site operations have not represented a source of jobs for locals. Further, it is not healthy that the community has no idea what's going on.

3. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.
   Typical of small towns, Arvin is subject to constant rumors about what's going on and when the work is going to end. To him, any activity would be better than nothing. He was not pleased when a drilling crew showed up unannounced on his property to start installing a well. He had not authorized any drilling on his property, and was very frustrated when told that the drill crew had permission to drill there. He thought it was inexcusable that it took so long to demonstrate that the well location was in fact on his property and that permission had not been granted.

4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details. *He characterized the limited activities (kids throwing stuff over the fence; tagging) as typical of the things kids do. He didn't regard it as significant.*
5. Do you feel well informed about the site's activities and progress? *His response was "absolutely not." He has received flyers, but said they look like junk mail. The information contained on the flyers is far too general, to the point that they are not informative. He said that specific correspondence would be nice, especially for activities that have a direct impact on adjacent property owners. He said that he is not notified in advance about when crews will be on his property to sample the well.*
6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation? *He said that more effort should be exerted to inform the community, especially to inform adjacent neighbors of activities. He characterized site activities as secretive, with people showing up and then leaving, with months going by before people show up again. He feels that the government has deservedly gotten a bad reputation for its handling of the site. He would appreciate it if people connected to the site would be polite and ask for opinions.*

INTERVIEW RECORD

Site Name: Brown & Bryant Superfund Site	**EPA ID No.: CAD052384021**	
Subject: Five-Year Review	**Time:10:40 AM**	**Date: 12/22/10**
Type: √ Telephone ☐ Visit ☐ Other **Location of Visit:**	☐ Incoming ☐ Outgoing	

Contact Made By:

Name: **Mike Bailey** **Mark Rothas**	**Title:** **Geologist** **Engineer**	**Organization:** **USACE EMCX**

Individual Contacted:

Name: Cecilia Horner	**Title: Environmental Engineer**	**Organization: USACE**
Telephone No: 505-342-3474 **Fax No:** **E-Mail Address:**	**Street Address: 4101 Jefferson Plaza NE** **City, State, Zip: Albuquerque, NM 87109**	

Summary Of Conversation

1. What is your overall impression of the project? (general sentiment)
   Ms. Horner stated that it's moving slower than it should be, partly due to funding constraints. Now that funding has been received, implementation of the OU2 remedy is proceeding.

2. Is the remedy functioning as expected? How well is the remedy performing?
   The cap is not performing as well as hoped (from a maintenance, not protectiveness or effectiveness, standpoint) because of invasion from burrowing animals, cracks developing (mainly in non-RCRA cap), and ponding (which has mostly been corrected). Removal of the tank recently has helped from a public relations standpoint, because the tank represented a constant reminder of the contaminated nature of the site.

3. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing?
   She is not involved in analysis of the monitoring data and relies on a chemist for that. However, her impression is that there has been little change over the last couple of years. She had hoped for a marked decrease with implementation of the OU1 remedy.

4. Is there a continuous on-site O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.
   There is no continuous presence at the present time. Every couple of months, conditions at the site are checked either by the Corps or their contractor. Annual inspections are required by the O&M manual, and findings are documented in trip reports.

5. Have there been any significant changes in the O&M requirements, maintenance schedules, or sampling routines since start-up or in the last five years? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts. *No sampling was conducted in 2010 due to a desire to complete remedial design work for OU2 as soon as possible. There have been changes to the maintenance schedules. Typical maintenance issues for wells (condition of wells and locks) are documented during sampling events, with follow-up trips scheduled to correct the problems. These problems have not raised any concerns regarding protectiveness of the remedy.*
6. Have there been unexpected O&M difficulties or costs at the site since start-up or in the last five years? If so, please give details. *The primary cap maintenance issue that was not anticipated was the animal burrows. Some cracking and settling were anticipated, although ponding was not anticipated to the extent it has developed. Repairs to seal cracks and rodent holes and improve drainage have resulted in minor additional costs (incurred in 2007).*
7. Have there been opportunities to optimize O&M, or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency. *She indicated that sampling optimization was limited to modifying the list of wells for sampling by removing wells that have gone dry.*
8. What is the current status of construction (*e.g.*, budget and schedule)? *Ms. Horner provided the schedule separately by email, but noted during the interview that the schedule for installation of the arbor wells and the city well had been moved up to the second quarter of FY11 at the request of EPA, from the third quarter for the city well and fourth quarter for the arbor wells.*
9. Have any problems been encountered which required, or will require, changes to this remedial design or this ROD? *The cap maintenance issues associated with OU1 (RCRA cap and non-RCRA cap), like rodent burrows and cracks, can be remedied through routine maintenance, although additional surface modifications to further improve drainage may be necessary to prevent ponding. These maintenance issues are not serious enough to require a change to the design.*
10. Do you have any comments, suggestions, or recommendations regarding the project? *In her opinion, the recommendations of the Value Engineering study (March 2010), particularly the recommendation to excavate source material, were not fully considered by the project team. She felt that removal of source material would allow for reuse of the site. She is also concerned about the ability of the OU2 remedy to attain the newly lowered maximum contaminant level (MCL) for 1,2,3-trichloropropane. She considers this a small site, but one with very high visibility, as evidenced by a 2009 Supreme Court decision that apportioned financial responsibility for cleaning up the site.*

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US Environmental Protection Agency

Attachment F
Risk Assessment and Toxicology Memorandum
for
Brown and Bryant Superfund Site
Arvin, California

Prepared by: US Army Corps of Engineers
Environmental and Munitions Center of Expertise
Omaha, Nebraska

Prepared for: US Environmental Protection Agency, Region 9
San Francisco, California

September 2011

Brown and Bryant Superfund Site Five-Year Review

Risk Assessment and Toxicology Memorandum

This memorandum is prepared to address Question B of the technical assessment, "*Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?*", to determine whether the remedy is protective.

<u>Changes in Standards and To Be Considereds (TBCs)</u>
Changes in cleanup standards and applicable or relevant and appropriate requirements (ARARs) are discussed in the ARAR Analysis Memorandum provided in Attachment F. There have been no changes in the ARARs or TBCs that affect the overall protectiveness of the remedy.

<u>Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics</u>
The former Brown & Bryant (B&B) facility was a pesticide reformulation and custom application facility from 1960 to 1989. The site is located in a light industrial and commercial area with a residential area located across the street. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy.

The first operable unit (OU-1) addresses the surface soil, the subsurface soil, and the A-zone groundwater (i.e., the first groundwater unit). According to the OU-1 Record of Decision (ROD), the following chemicals have been identified as chemicals of concern (COCs):

Surface Soil	Subsurface Soil	A-zone Groundwater
Dinoseb	1,2-Dichloropropane (1,2-DCP)	1,2-DCP
	1,3-Dichloropropane (1,3-DCP)	1,3-DCP
	1,2-Dibromo-3-chloropropane (DBCP)	DBCP
	1,2,3-Trichloropropane (1,2,3-TCP)	1,2,3-TCP
	Ethylene Dibromide (EDB)	EDB
	Dinoseb	Dinoseb
		Chloroform

As part of the 1993 OU-1 Remedial Investigation/Feasibility Study (RI/FS), a baseline human health risk assessment (BHHRA) was conducted, and dinoseb was selected as the only COC that may significantly contribute to the site risk and incidental ingestion of surface soil was selected as the dominant route of exposure. The exposure assumptions used to develop the BHHRA identified children and young adult trespassers and a construction worker as potential receptors. The A-zone groundwater is not legally classified as a potential drinking water source due to the extremely low production capacity of this water bearing unit, and therefore, was not characterized in the risk assessment. One objective for the response action is to control migration of the contamination in this zone to the second operable unit (OU-2). These assumptions are considered to be health protective and reasonable in evaluating risk for this site since the land use is expected to remain industrial. Therefore, there have been no changes to these assumptions that could affect the protectiveness of the remedy. In addition, there have been no changes in the toxicity factors that could affect the protectiveness of the remedy based on the comparison of the toxicity data available at the time of the remedy selection and the current toxicity values for dinoseb as shown in the table below.

COC	Toxicity Values							
	RfD_o (mg/kg-day)		SF_o $(mg/kg\text{-}day)^{-1}$		RfC_i (mg/m^3)		IUR $(ug/m^3)^{-1}$	
	Previous[a]	Current[b]	Previous	Current	Previous[a]	Current	Previous	Current
Dinoseb	1.0E-03	1.0E-03	--	--	3.5E-03	--	--	--

Notes:
[a.] Derived from Table 6.5, OU-1 RI/FS Report dated May 1993.
[b.] Obtained from www.epa.gov/iris/subst/index.html
IUR = inhalation unit risk
mg/kg-day = milligrams per kilogram per day
mg/m^3 = milligrams per cubic meter
RfC_i = inhalation reference concentration
RfD_o = oral reference dose
SF_o = oral slope factor
ug/m^3 = micrograms per cubic meter
-- = no data

OU-2 includes the subsurface soil from the base of the A-zone groundwater to the second groundwater unit (i.e., B-zone groundwater), and the B-zone groundwater. The B-zone groundwater is classified as a potential drinking water source; however, there is no current exposure route since it is not being used as a drinking water source. In accordance with the OU-2 ROD, the COCs identified for OU-2 are the same as those identified for OU-1. A BHHRA was completed as part of the 2004 OU-2 RI/FS. The exposure assumptions used to develop the BHHRA are considered to be health protective and reasonable in evaluating risk for this site since it assumes that the site is a commercial/industrial facility. Therefore, there have been no changes to these assumptions that could affect the protectiveness of the remedy. The cleanup level for 1,2,3-TCP is a response level that was calculated using a multiple of the California Department of Public Health (CDPH) drinking water notification level, which is a health-based advisory level. The response level depends on the toxicological endpoint (i.e., cancer or non-cancer risk) that provided the basis for the notification level. The notification level for 1,2,3-TCP was calculated using risk assessment methods for cancer endpoints. The toxicity data for 1,2,3-TCP are provided below for comparison.

COC	Toxicity Values							
	RfD_o (mg/kg-day)		SF_o $(mg/kg\text{-}day)^{-1}$		RfC_i (mg/m^3)		IUR $(ug/m^3)^{-1}$	
	Previous[a]	Current[b]	Previous[c]	Current	Previous[a]	Current[b]	Previous[c]	Current[b]
1,2,3-TCP	6.0E-03	4.0E-03	7.0E+00	--	2.1E-02	3.0E-04	2.0E-03	3.0E+01

Notes:
[a.] Derived from Table I-7-9, OU-2 RI/FS Report dated June 2004.
[b.] Obtained from www.epa.gov/iris/subst/index.html
[c.] Derived from Table I-7-10, OU-2 RI/FS Report dated June 2004.
IUR = inhalation unit risk
mg/kg-day = milligrams per kilogram per day
mg/m^3 = milligrams per cubic meter
RfC_i = inhalation reference concentration

RfD_o = oral reference dose
SF_o = oral slope factor
ug/m^3 = micrograms per cubic meter
-- = no data

Even though the toxicity values have changed and the estimated risk may or may not have increased, there have been no changes that could affect the protectiveness of the remedy since the toxicological endpoint is the same (i.e., cancer risk) and the notification level is still in place. The cleanup levels for all other COCs identified for OU-2 are not risk-based, and therefore, would not be affected by any changes in toxicity values.

The vapor intrusion pathway was identified as a potential protectiveness issue in the Second Five-Year Review Report. Vapor intrusion was evaluated in the 2004 OU-2 RI/FS, and soil vapor sampling was performed in 2006 to evaluate whether there were complete exposure pathways on- and off-site. Although COCs were present in soil vapor on-site and some non-COC volatile organic compounds (VOCs) were detected both on- and off-site, all constituents were detected at concentrations below the California Human Health Screening Levels (CHHSLs). Therefore, vapor intrusion does not affect the protectiveness of the remedy.

There are no significant ecological risks associated with OU-1 and OU-2; however, the cap should be routinely inspected for possible animal burrows. If observed, burrows should be filled and sealed to ensure the integrity of the cap and to maintain the protectiveness of the remedy.

Changes in Risk Assessment Methods

There has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy.

Expected Progress Towards Meeting RAOs

Institutional controls (ICs), such as site access control and site security, are in place. Site access is intermittent and there is security fencing around the perimeter of the site with locked gates. Signs are posted in English and Spanish stating that this is a hazardous area and entrance is prohibited. However, the ICs that are identified in the OU-2 ROD need to be implemented to ensure that the response action remains protective of human health and the environment. The remedy is progressing as expected, and it is expected to be protective of human health and the environment upon completion. Immediate threats have been addressed since the asphalt containment cap limits potentially complete exposure pathways to contaminated soil and groundwater; however, on-going groundwater monitoring should be conducted to ensure that the remedy is protective of human health and the environment in the long-term. Local earthquakes may be associated with cap cracking issues, and therefore, could affect the protectiveness of the remedy. Drainage issues and the possible infiltration of water may affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.