HORIZON ENVIRONMENTAL INC.

Specialists in Site Assessment, Remedial Testing, Design and Operation

SITE CLOSURE REQUEST REPORT

Former Beacon Station 3699
921 Merchant Street
Vacaville, California

Solano County File No. 29S-50025-6

Prepared for:

Ultramar Inc.
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Hanford, California 93230

Prepared by:

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SITE CLOSURE REQUEST REPORT

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Prepared for:
Ultramar Inc.

INTRODUCTION

At the request of the Ultramar Inc. (Ultramar), Horizon Environmental Inc. (Horizon) has prepared this *Site Closure Request Report* for the former Beacon Station No. 3699 (site) located in Solano County, California. Site investigations and remedial actions have been conducted to evaluate and remediate the environmental impacts resulting from the operation of former gasoline underground storage tank (UST) systems at the site. Preparation of this closure report is in response to a request by the Solano County Department of Environmental Management (SCDEM) to document that the site meets criteria for *no further action* status as established in the *Tri-Regional Board Staff Recommendations-Appendix A* (*Tri-Regional-Appendix A*). A copy of the SCDEM correspondence is contained in Appendix A.

This report is a compilation of site information upon which an objective decision can be made regarding site closure. This closure request has been prepared in accordance with the *Tri-Regional Appendix A* guidelines dated April 16, 2004. The rationale for closing the site is made on the basis of the results of previous subsurface investigations, two years of active soil and groundwater remediation, removal of the USTs and soil over-excavation, and results of 14 years of quarterly groundwater monitoring, a well search, a sensitive receptor, a land use survey, and an evaluation of local site conditions.

SITE DESCRIPTION

Former Beacon Station No. 3699 is located in Solano County as shown on Figure 1. Former station installations consisted of a building and two dispenser islands in the central portion of the site, and three USTs in the western portion of the site as shown on Figure 2. In December 1997, all structures and underground installations were demolished and removed from the site. The lot remained vacant until late 2001 when construction was started on a video rental store. Construction was completed in early 2002. Currently, seven monitoring wells (MW-3 through MW-9) are associated with the site.

PREVIOUS INVESTIGATIONS

Environmental investigations at the site have been previously conducted by Horizon and others. Historical site investigation data is contained in Appendix B. In October 1987, Conoco removed three single-walled USTs and replaced them with three 12,000 gallon double-walled USTs for storage of regular, plus and premium unleaded gasoline. In July 1990, Ultramar acquired the site from Conoco.

Groundwater monitoring wells MW-1 through MW-5 were installed in 1991. Soil analytical data indicated hydrocarbon impacts mainly at 15 feet bsg in the monitoring well MW-3 and MW-5 borings. A benzene concentration of 2,400 micrograms per liter (parts per billion or ppb) was detected in groundwater collected from monitoring well MW-5 located down gradient from the former USTs. Additional monitoring wells MW-6 through MW-8 were installed in February 1993. Soil analytical results indicated no soil impacts in the monitoring well MW-6 through MW-8 borings.

Vapor extraction and aquifer pumping tests were conducted in September 1993. A soil vapor extraction system (VES) was operated from September 1996 to February 1998 and included extraction on wells MW-3, MW-5 and MW-9. The VES was shut down due to declining hydrocarbon concentrations and station demolition. Approximately 2,228 pounds

of TPHg and 15 pounds of benzene were removed from the subsurface by VES operations. A groundwater treatment system (GWTS) operated at the site from August 1996 to March 1999.

In December 1997, the service station was demolished. The remediation systems were not removed during the station demolition. Approximately 1,240 cubic yards (1,860 tons) of soil were over-excavated from the UST basin and the northern dispenser island area. The excavated soil was disposed to the TSP Technologies, Inc. facility in Richmond, California. Approximately 6,000 gallons of groundwater were extracted from the two over-excavations by vacuum trucks and transported to DeMenno/Kerdoon disposal facility in Compton, California. Soil analytical data indicated residual hydrocarbon impacts at the limits of the excavations in the northern portion of UST basin and in the former dispenser island areas. Horizon documented the UST removal and remediation activities in *Tank Closure Letter Report* dated February 25, 1998.

In November 1998, groundwater monitoring wells MW-9 and MW-10 and two air sparge wells SW-1 and SW-2 were installed. This work was documented by Horizon in *Subsurface Investigation Report* dated February 1, 1999.

Horizon proposed abandonment of selected monitoring wells and requested environmental closure of the site in *Site Closure Request/Abandonment Request* dated October 13, 2000. The request for site closure was made on the basis of the results of the remedial action conducted in December 1997 during which the majority of gasoline-impacted soil was removed from the site. The excavated soil constituted a secondary source to soil and groundwater. In December 2000, monitoring wells MW-1, MW-2 and MW-10 and air-sparge wells SW-1 and SW-2 were destroyed to allow commercial development of the site.

In the fourth quarter of 2001 and January 2002, a series of over-purge groundwater extraction events were performed in an effort to reduce the low levels of dissolved hydrocarbons. Groundwater was extracted via submersible pumps from monitoring wells

MW-5, MW-8, and MW-9 and later disposed off-site to a licensed water treatment facility. Results of this interim remedial action were documented by Horizon in *Results of Interim Remedial Action* dated July 23, 2002.

In January 2003, Horizon submitted a *Site Closure Request Report*, including cross sections A-A' and B-B' (Figures 3 and 4) recommending low-risk closure status. After review of the closure request by the Regional Water Quality Control Board (RWQCB), the SCDEM requested further investigation of the vertical and lateral delineation of soil and groundwater impacts and evaluation of the effects of natural attenuation.

In December 2003, Horizon conducted an additional site assessment in off-site areas south and southeast of the site, as shown on Figure 5, to confirm delineation of the vertical and lateral extent of dissolved hydrocarbons in groundwater. The results of the assessment were documented by Horizon in *Results of Additional Site Assessment* dated March 4, 2004.

Quarterly groundwater monitoring has been conducted at the site since January 1992. Groundwater monitoring data collected since January 1998 are summarized in Table 1. The groundwater gradient map for second quarter 2005 is shown on Figure 6. Figures 7 and 8 show TPHg and MTBE isoconcentration contours for second quarter 2005. Isoconcentration contours for second quarter 2001 are also included on Figures 7 and 8 to show the decrease in lateral extent of the plume.

MASS BALANCE ESTIMATES FOR SOIL AND GROUNDWATER

The evaluation of the distribution of impacted soil indicates that the source of petroleum hydrocarbon in soil and groundwater was the result of releases from the former UST systems and dispenser islands. The observed distribution of petroleum hydrocarbons is the result of subsequent limited lateral and vertical migration in soil and groundwater beneath and down

gradient of these installations. The estimated soil volumes impacted by TPHg, benzene and MTBE were evaluated on the basis of analytical results and distribution assumptions.

For the purposes of estimating the volume of petroleum hydrocarbon-impacted soil remaining beneath the site, two separate areas are considered, as shown on the soil sample location figure in Appendix B. The two areas considered are: Area 1) an L-shaped area in the former dispenser island #1 area and adjacent to the former UST basin measuring 792 square feet (ft^2); and Area 2) a square area in the former dispenser island #2 proximity measuring 625 ft^2.

Mass Balance of Petroleum Hydrocarbons in Soil

The extent of petroleum hydrocarbon-impacted soil in the former UST area was essentially delineated by over-excavation and confirmation soil sampling except at soil sample location 8 where the soil sample contained 650 ppm TPHg. Over-excavation of the product line trenches and dispenser locations (Area 1) was successful in removing the majority of petroleum hydrocarbon-impacted vadose zone soil. Soil samples collected in the dispenser island area #1 below groundwater level at depths of 12 feet below surface grade (bsg) at soil sample location numbers 16, 17, 25 and 27 (see Figure 2 and Table 1 in Appendix B) contained TPHg concentrations from 1.4 to 31 ppm. The soil sample collected from 12 feet bsg at soil sample location number 18 contained a TPHg concentration of 190 ppm. No gasoline constituents were detected in the soil samples collected from 17 feet bsg at soil sample location number 14. Over-excavation soil analytical data indicate that remaining petroleum hydrocarbon-impacted soil in Area 1 is present from 12 to 17 feet, a thickness of 5 feet. The volume of remaining petroleum hydrocarbon-impacted soil within Area 1 with concentrations greater than 50 ppm TPHg is approximately 1500 cubic feet (ft^3).

Over-excavation of the dispenser island #2 area was successful in removing the majority of the laterally distributed gasoline-impacted vadose zone soil. No TPHg concentrations were detected in soil samples collected from 12 feet bsg at soil sample location numbers 21

through 24. However, the vertical extent of gasoline-impacted soil was not defined in the dispenser island #2 area. Soil samples collected below groundwater level in the excavation at depths of 12 to 20 feet bsg at soil sample location numbers 15, 19, 20 and 28 contained TPHg concentrations from 16 to 1300 ppm. Over-excavation soil analytical data indicate that remaining petroleum hydrocarbon-impacted soil in Area 2 is present at 12 feet bsg.

Installation of sparge well SW-2 did not indicate any evidence of hydrocarbons below 20 feet bsg at this location and soil analytical data indicate a decreasing trend from 15 to 20 feet bsg. The assumed thickness of petroleum hydrocarbon-impacted soil is from 12 to 25 feet, a total thickness of 13 feet. The volume of remaining petroleum hydrocarbon-impacted soil above 100 ppm TPHg is assumed be approximately one-half of Area 2 or 4000 ft^3.

For the purpose of estimating the masses of remaining petroleum hydrocarbons in soil in Areas 1 and 2, it is assumed that the concentrations of TPHg, benzene and MTBE in the soil volumes considered are the average concentration of the analytes in the respective samples that define the volumes. These average concentration calculations most likely yield values that are greater than those currently existing in site soil because of remedial actions and natural attenuation processes that occurred subsequent to the collection of the soil samples on which the calculations are based. The average assumed soil density is 120 pounds per cubic foot (lbs/ft^3). The weights of one gallon of gasoline, benzene and MTBE are 6.34 pounds (1 gal/6.34 lbs), 7.31 pounds (1 gal/7.31 lbs) and 6.42 pounds (1 gal/6.42 lbs), respectively.

The average concentrations in the five soil samples from Area 1 are 138 milligrams per kilogram (parts per million or ppm) TPHg (0.000138 TPHg), 0.22 ppm benzene (0.00000022 benzene) and 0.49 ppm MTBE (0.00000049 MTBE). The estimated volumes of TPHg (V_{gs1}), benzene (V_{bs1}) and MTBE (V_{Ms1}) in soil in Area 1 are:

$$V_{gs1} = (1500\ ft^3) \times (120\ lbs/ft^3) \times (0.000138\ TPHg) \times (1 gal/6.34\ lbs)$$
$$= 3.4 \text{ gallons TPHg}$$

V_{bs1} = (1500 ft^3) x (120 lbs/ft^3) x (0.00000022 benzene) x (1gal/7.31 lbs)
= 0.0054 gallons benzene

V_{Ms1} = (1500 ft^3) x (120 lbs/ft^3) x (0.00000049 MTBE) x (1gal/6.42 lbs)
= 0.014 gallons MTBE

The average concentrations in the four soil samples from Area 2 are 539 ppm TPHg (0.000539), 4.7 ppm benzene (0.0000047 benzene) and 9.1 ppm MTBE (0.0000091 MTBE). The estimated volumes of TPHg (V_{gs2}), benzene (V_{bs2}) and MTBE (V_{Ms2}) in soil in Area 2 are:

V_{gs2} = (4000 ft^3) x (120 lbs/ft^3) x (0.000539 TPHg) x (1gal/6.34 lbs)
= 40 gallons TPHg

V_{bs2} = (4000 ft^3) x (120 lbs/ft^3) x (0.0000047 benzene) x (1gal/7.31 lbs)
= 0.3 gallons benzene

V_{Ms2} = (4000 ft^3) x (120 lbs/ft^3) x (0.0000091 MTBE) x (1gal/6.42 lbs)
= 0.68 gallons MTBE

On the basis of soil analytical data, the estimated total hydrocarbon masses remaining in soil at the site in December 1997 (as reported in January 2003) are: 43.4 gallons TPHg; 0.3 gallons benzene; and 0.7 gallons MTBE. It was estimated that approximately 2,228 pounds or 351 gallons of TPHg were removed during active remediation activities. During UST and dispenser closure and overexcavation activities approximately 1,860 tons of hydrocarbon-impacted soil with an average concentration of 460 ppm TPHg was removed from the site. This equates to approximately 234 gallons of TPHg. Using the above calculations and assumptions, 585 gallons out of a total 628 gallons of TPHg have been removed from the subsurface soil or 93% of the estimated remaining mass in December 1997. Natural attenuation has likely further reduced the remaining hydrocarbon mass.

Mass Balance of Petroleum Hydrocarbons in Groundwater

Quarterly groundwater monitoring data since April 2004 (Table 1) indicate no concentrations of the volatile aromatic compounds benzene, toluene, ethylbenzene and

xylenes (BTEX) in the existing groundwater monitoring wells. First and second quarter 2005 quarterly monitoring data indicate concentrations of TPHg in monitoring wells MW-5 and MW-9, and concentrations of MTBE in monitoring wells MW-5, MW-8 and MW-9. No TPHg or MTBE was detected in groundwater samples from other wells. Quarterly groundwater monitoring data for second quarter 2005 and December 2003 grab-hydropunch groundwater analytical results were utilized to estimate the current extent of dissolved TPHg and MTBE in groundwater. The estimated TPHg and MTBE plumes are shown on Figure 5.

For the purposes of estimating the current mass of TPHg in groundwater, the December 2003 grab-hydropunch groundwater TPHg analytical results for hydropunch samples HP1-11 (410 micrograms per liter or ppb) and HP4-17 (1200 ppb) are adjusted for attenuation according to that indicated by quarterly groundwater monitoring data for monitoring well MW-5 (the well with the highest TPHg concentration for second quarter 2005) over the time interval from fourth quarter 2003 (the quarter in which the hydropunch samples were collected) to second quarter 2005. Indicated attenuation of the TPHg concentration in monitoring well MW-5 from fourth quarter 2003 (1000 ppb) to second quarter 2005 (660 ppb) is 66%. The adjusted HP1-11 and HP4-17 grab-hydropunch groundwater TPHg concentrations are 270 ppb and 792 ppb, respectively.

The estimated TPHg plume, as shown on Figure 5, is approximately 150 feet long by 110 feet wide. Dissolved TPHg is assumed to be present in the upper 5 feet of groundwater. It follows that the assumed total volume of TPHg-impacted aquifer is 82,500 ft^3. The average concentration of TPHg in the plume is assumed to be half of the maximum reported TPHg concentration of 792 ppb, or 396 ppb (0.000000396 TPHg). The hydrocarbon plume occurs predominantly in clayey sandy silt and silty clay sediments. The porosity of the mixed-grain-size sediments is assumed to be 25% (0.25). The estimated volume of dissolved TPHg in groundwater, V_{ggw}, is:

$$V_{ggw} = (82{,}500\ ft^3) \times (0.25) \times (0.000000396\ TPHg) \times (7.48\ gallons/ft^3)$$
$$= 0.061\ gallons\ TPHg$$

The estimated MTBE plume, as shown on Figure 5, is approximately 350 feet long by 50 feet wide. Dissolved MTBE is assumed to be present in the upper 5 feet of groundwater. It follows that the assumed total volume of MTBE-impacted aquifer is 87,500 ft^3. The December 2003 groundwater MTBE analytical result for hydropunch sample HP3-15 (9.2 ppb) is adjusted for MTBE attenuation according to that indicated for monitoring well MW-5, as for TPHg above. Indicated attenuation of the MTBE concentration in monitoring well MW-5 from fourth quarter 2003 (5.5 ppb) to second quarter 2005 (2.5 ppb) is 45%. The adjusted MTBE analytical result for hydropunch sample HP3-15 is 4.2 ppb. The average concentration of MTBE in the plume is assumed to be half of the maximum reported MTBE concentration of 4.2 ppb, or 2.1 ppb (0.0000000021 MTBE). The estimated volume of dissolved MTBE in groundwater, V_{Mgw}, is:

$$V_{Mgw} = (87{,}500\ ft^3) \times (0.25) \times (0.0000000021\ MTBE) \times (7.48\ gallons/ft^3)$$
$$= 0.0003\ gallons\ MTBE$$

SENSITIVE RECEPTOR SURVEY

A sensitive receptor survey was conducted to characterize local land use and identify sensitive receptors that might be affected by a release of petroleum hydrocarbons into the subsurface environment at the site. This survey included identification of existing water supply wells, surface waters and other receptors that may be threatened by the hydrocarbons remaining in the soil and groundwater beneath the site.

Site Vicinity and Local Land Use

The former Beacon station property is located in a primarily commercial area. The site is bounded by Merchant Street to the west, a commercial property containing retail shops to the north, an access roadway to the south where a restaurant and parking is located, and a vacant parking lot to the east which formerly was used as retail sales lot for campers and trailers. The former camper/trailer yard to the east and parking lot to the south is bounded on the

south by the Interstate Highway 80 right-of-way. In 2002, the station site was developed into a retail store and parking lot.

Local Hydrogeology

Shallow groundwater at the site occurs from approximately 12 to 14 feet bsg under unconfined conditions in very fine-grained soils predominantly consisting of clays and silt. Between 1996 and 2002, depth to groundwater at the site has typically ranged between approximately 9 to 14 feet bsg. In 1999, the depth to groundwater attained approximately 15 feet bsg.

The groundwater flow direction has typically been southward to southeastward toward Interstate Highway 80. The average groundwater gradient has been approximately 0.005. The groundwater flow direction for second quarter 2005 was southeastward under a gradient of approximately 0.004. Pumping tests conducted at the site have indicated that the average transmissivity of the shallow groundwater zone is 168 square feet per day.

Local Surface Hydrology

No surface water body was located within 2000 feet of the site.

Water Well Survey

In 1999, Horizon performed a water well survey to identify water wells within a 2000-foot radius of the subject site. The well survey included a physical search of the surrounding properties to locate private wells that were not part of the public record. In addition, a review of the records was performed at the Department of Water Resources (DWR) in Sacramento, California.

The results of the DWR record search revealed eight wells within 2000 feet of the site. Well survey data from this search are summarized in Figure 1 and Table 4 in Appendix C. The

closest well down gradient of the site was identified an irrigation well approximately 950 feet to the southeast across Interstate Highway 80. The results of the physical survey located no wells within 300 feet north of the site and no wells located between the site and Interstate Highway 80 to the southeast. Private wells were located at 100 and 101 Pine Street, 860 Camelia Way, and 861 Azalea Way. These wells are approximately 1,000 feet to the northeast of the site. It is not likely that any of the reported wells are impacted by the current dissolved hydrocarbon plume because of their distance, and in most cases their direction, from the site.

FATE AND TRANSPORT MODELING

Horizon utilized a modeling program, documented in the *Site Closure Request Report* dated January 2, 2003, to predict the fate and transport of MTBE down gradient of the site. The fate and transport model utilized is contained in the Risk Based Corrective Action (RBCA) Tool Kit compiled by Groundwater Services, Inc. (1998). The model was run utilizing the 95% upper confidence mean of MTBE concentrations detected in samples collected from wells MW-5, MW-8 and MW-9 for the first through fourth quarters 2002. The 95% upper confidence mean of MTBE concentrations for that period was calculated to be 17 ppb.

The prediction of the modeling calculation was that the MTBE concentration at a groundwater well or point of exposure (POE) located 200 feet down gradient of the approximate location of monitoring well MW-8 would be 0.9 ppb after one year, if the concentration at the source remained constant (i.e. the plume remained stable). The mean of MTBE concentrations reported in monitoring wells MW-5, MW-8 and MW-9 for the past four quarters (third quarter 2004 through second quarter 2005) is 1.7 ppb indicating an overall decrease of MTBE concentrations in these wells by a factor of ten.

CONCLUSIONS AND RATIONALE FOR SITE CLOSURE

A series of TPHg and MTBE concentrations, and depth-to-groundwater versus time graphs for monitoring wells MW-5, MW-8 and MW-9 are contained in Appendix D. The time scale is represented by quarterly monitoring events. Plotted values for below-reporting-limit concentrations are assigned one-half the reporting limit values. The graphs show fluctuations of groundwater levels with highs typically occurring in the winter quarter and lows typically occurring in the fall quarter coinciding with the wet and dry seasons, respectively. Seasonal groundwater level variations in the time represented on the graphs (the past seven years) have successively remained within a 5-foot range and typically vary over the 5-foot range each year. The concentration curves generally show similar seasonal fluctuations and are typically more pronounced for TPHg because of the greater magnitude of concentrations and variations. Seasonal fluctuations of MTBE concentrations in monitoring wells MW-5, MW-8 and MW-9 are becoming less apparent due to the generally decreasing and near-reporting-limit concentrations reported for the past two to three years.

Seasonal peaks of TPHg concentrations appear to coincide with low groundwater stands. This correlation is especially apparent for monitoring well MW-5 over the past two years and likely reflects the final stages of dissolved-phase hydrocarbon attenuation. Recurring peaks in concentrations over the past five years do not reach the level of the previous year indicating overall attenuation of hydrocarbons. The seasonal increases of TPHg concentrations during low groundwater stands are likely caused by hydrocarbons, residing in the upper portion of the groundwater column, occupying a shorter and deeper interval of screen in the well resulting in less mixing with clean groundwater from deeper levels of the aquifer. Decreased concentrations are again detected when groundwater levels rise allowing more clean water to enter the well from the lower portion of the screen resulting in dilution of hydrocarbons residing in the upper portion of the water column. The observed correlation between trends in groundwater level and TPHg concentration, and historical soil analytical data indicate that there is no residual hydrocarbon source in soil to cause the recurring concentration peaks in monitoring wells MW-5, MW-8 and MW-9.

Graphing program-generated trend lines are shown on the TPHg graphs to illustrate the overall downward trend in concentrations. The decrease in lateral extent of the TPHg plume since 2001 is shown on Figure 7. Extension of the trend line for monitoring well MW-5 through the end of 2007 generally indicates attainment of near-reporting-limit TPHg concentrations. Trend lines for monitoring wells MW-8 and MW-9 generally indicate current attainment of near-reporting-limit TPHg concentrations. Concentrations of MTBE in monitoring wells MW-5, MW-8 and MW-9 have been low relative to the reporting limit for the past three to four years and have been below the secondary maximum contaminant level (MCL) of 5 ppb for the past three to five quarters. The decrease in extent of the MTBE plume since 2001 is shown on Figure 8. The trends toward decreasing concentrations are indicative of ongoing natural attenuation processes.

Decommission of the station in 1997 resulted in the removal of the potential primary source of hydrocarbons to soil and groundwater. Remedial actions at the site, including soil removal, and vapor and groundwater extraction have been effective in removing the majority of secondary sources of hydrocarbons in soil and groundwater. Quarterly monitoring data indicate demonstrable decreases in hydrocarbon concentrations in groundwater and indicate that concentrations are approaching background conditions. The overall decrease in groundwater hydrocarbon concentrations indicate that the residual hydrocarbon concentrations in source area soil are attenuating by natural processes and that the attenuation processes are a dominant factor in concentration trends.

Environmental data indicate that this site should be granted low-risk groundwater closure status. The rationale for low-risk site closure was developed on the basis of the land usage in the site area, results of previous subsurface investigations, results of soil and groundwater remediation, quarterly groundwater monitoring trends, results of the sensitive receptor survey, distance to the closest downgradient POE, and results of fate and transport modeling as discussed above.

The current level of water quality does not affect the current and probable future beneficial uses of the usable groundwater resource in the site area. Additionally, groundwater

analytical data collected from hydropunch borings indicate that the vertical extent of impacted groundwater is delineated at 20 to 30 feet bsg and that regional, deeper aquifers have not been impacted by previous site conditions.

The State Water Resources Control Board has indicated that a site may be closed if the requisite level of water quality will be attained within a reasonable period of time. Horizon believes that the dissolved TPHg in groundwater will naturally attenuate to a level protective of beneficial uses in a reasonable period of time.

The Central Valley Regional Water Quality Control Board's *Staff Recommendations for No Further Action Requests* lists criteria for sites with residual petroleum hydrocarbon-impacted soils and groundwater that are deemed to be low risk and where background water quality standards are not met. Generally, background levels are considered to be non-detectable concentrations. The criteria for low-risk sites with petroleum hydrocarbon-impacted groundwater remaining are discussed below, individually as they appear in the *No Further Action* document.

1. *Contaminants remaining in the vadose zone must not reverse or threaten to reverse the mass reduction rate of groundwater pollutants discussed in No. 4 below.*

Hydrocarbons remaining in the vadose zone were actively remediated or removed by over-excavation to the maximum extent possible. Post-remediation petroleum hydrocarbon concentrations in soil have likely decreased further by natural attenuation processes. Groundwater monitoring results indicate that hydrocarbon concentrations in groundwater down gradient of the source area have continued to decline. Monitoring results indicate that the remaining mass in soil is not reversing the natural hydrocarbon attenuation in groundwater. Since the UST systems have been removed from the site, no additional primary sources for hydrocarbons exist.

2. *Separate-phase product has been removed to the extent practicable.*

Separate-phase product has not been observed in soil or groundwater beneath the site during the various subsurface investigations.

3. *Pollutants remaining in the aquifer threaten no existing water supply well, deeper aquifers, surface waters, or other receptors.*

The site is located in an urbanized area and the commercial usage of the site and surrounding area are not expected to change in the future. The site area is served by a piped drinking water supply. Shallow (less than 25 feet) site groundwater is not expected to be utilized as a drinking water source.

Deeper aquifer zones are not threatened by the remaining concentrations as indicated by the analytical results of deeper discrete groundwater samples. As discussed above, no water wells or surface waters are threatened by the remaining hydrocarbons in groundwater beneath the site.

4. *The total pollutant mass remaining in ground water is decreasing at predicated rates and neither creates, nor threatens to create, a risk to human health and safety or future beneficial uses of the aquifer.*

Quarterly groundwater monitoring and results of fate and transport modeling indicate dissolved TPHg and MTBE are attenuating naturally over time at predictable rates. Dissolved TPHg concentrations are continually decreasing by natural attenuation processes and will continue to attenuate and eventually attain background levels in a reasonable time. The reported MTBE concentrations in groundwater are below the primary and secondary California EPA Primary Drinking Water Standards of 13 ppb and 5 ppb, respectively.

RECOMMENDATIONS

Concentrations of TPHg in shallow groundwater would likely be intermittently detected above the reporting limit of 50 ppb in a localized volume of groundwater for some time. This time period could be from three to ten years. The residual dissolved TPHg and MTBE groundwater hydrocarbon plumes, as shown on Figure 5, are relatively stable, will remain localized and continue to undergo natural attenuation. It is Horizon's opinion that the local, shallow groundwater will attain, in a reasonable time period, background groundwater quality that is consistent with the maximum benefit to the State. The residual, but diminishing, TPHg concentrations will not adversely affect usable groundwater resources of the State and do not currently, and will not in the future, pose a threat to sensitive receptors or the public health. Therefore, Horizon recommends that the site be granted a *no further action required* status, and abandonment of the existing site groundwater monitoring wells.

DISTRIBUTION

A copy of this report should be forwarded to:

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Regional Water Quality Control Board
Central Valley Region
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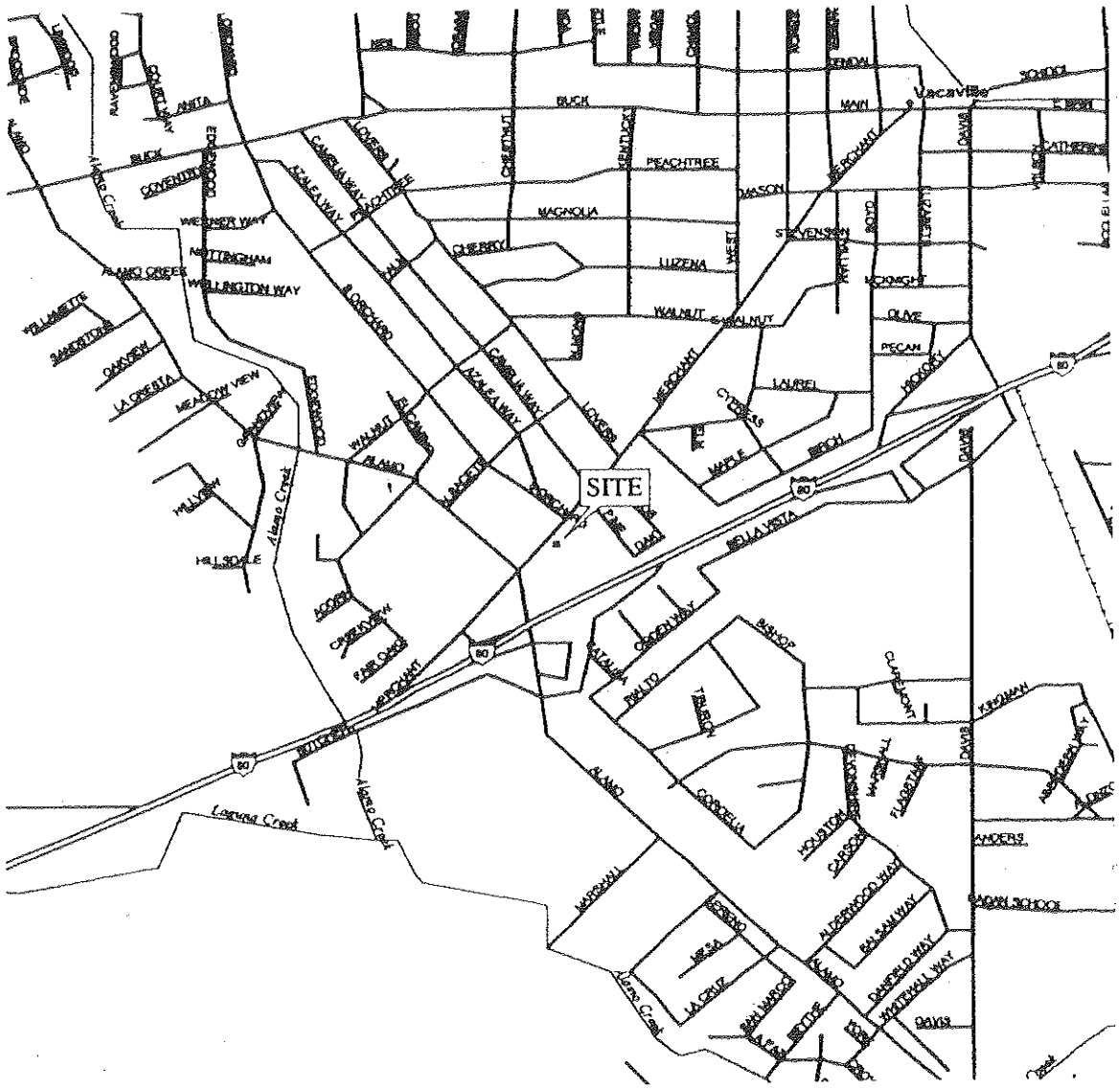
Rancho Cordova, California 95760



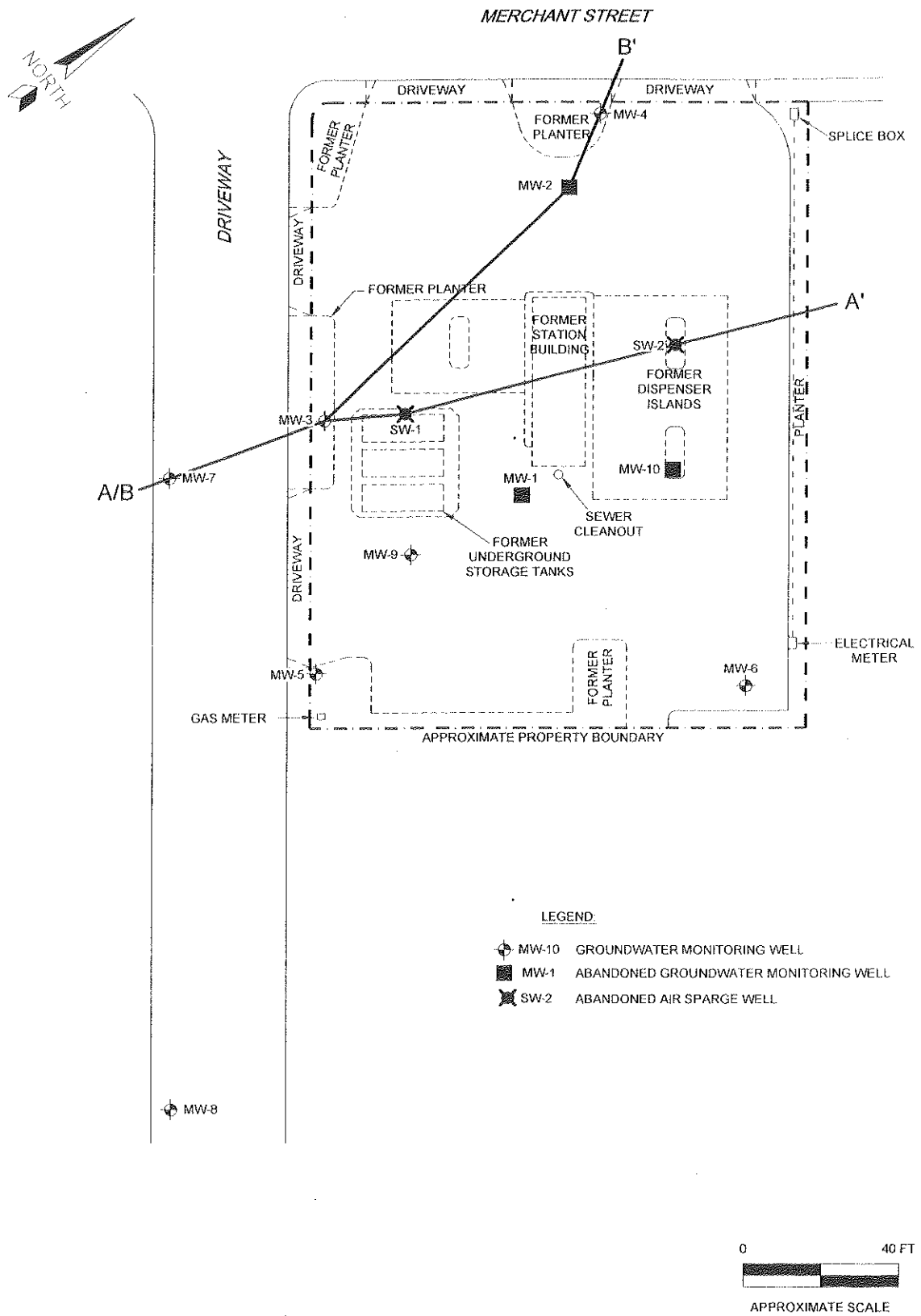
NORTH

0 0.25 0.5

Approximate Scale In Miles

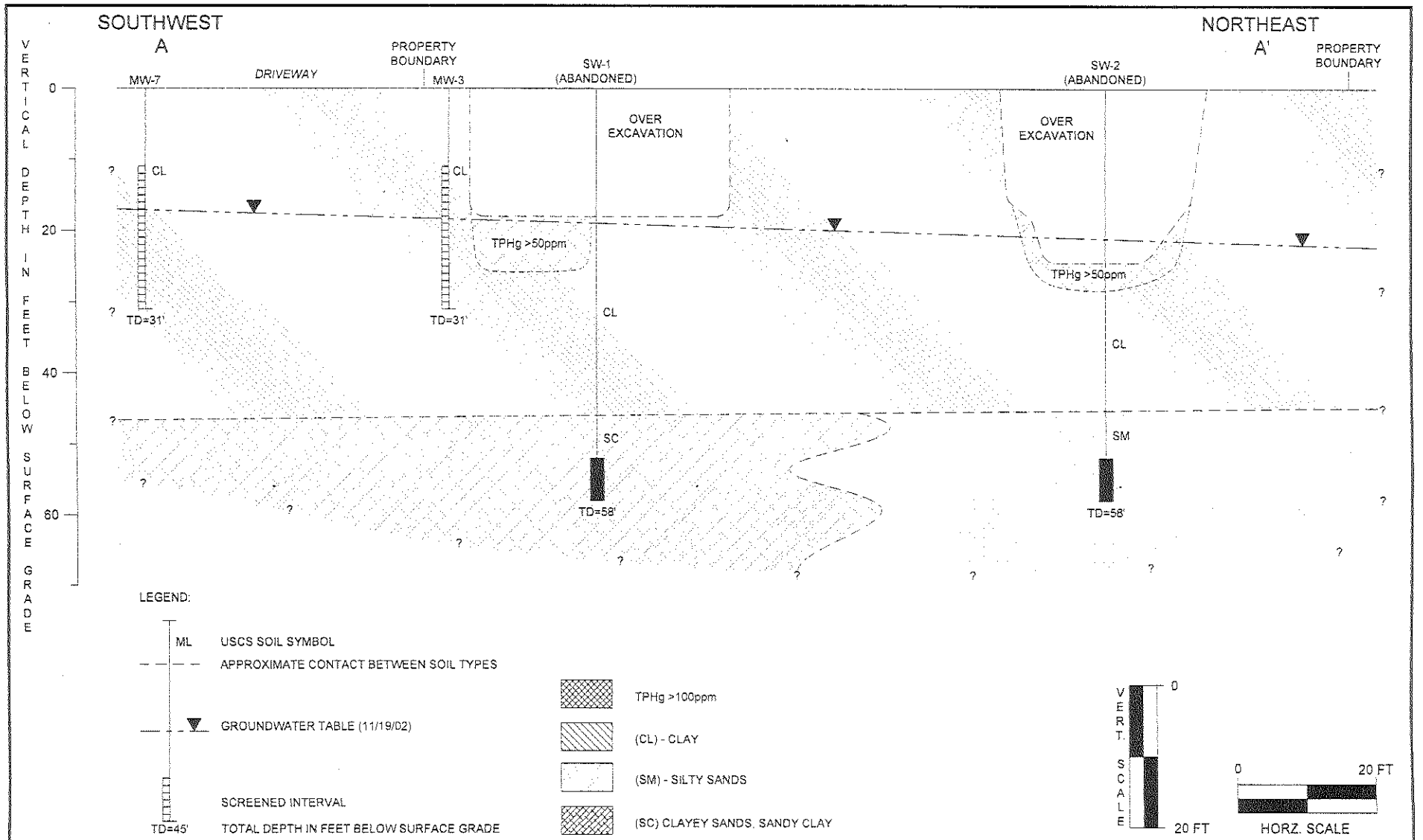
Source: Figure Modified From Street Atlas USA, Delorme (1995).

HORIZON ENVIRONMENTAL INC.		SITE VICINITY MAP FORMER BEACON STATION 3699 921 Merchant Street Vacaville, California	FIGURE 1
Project Number: 1699.45 Prepared by: K. Liptak Reviewed by: R. Smith	Drawn By: D. Alston Date: 2/96 Revised Date:		



HORIZON ENVIRONMENTAL INC.

Project Number: 1699.24 Prepared By: R. Smith Reviewed By: G. Barker	Drawn By: M. LaCoste Date: 12/30/02 Revised Date:	SITE PLAN FORMER BEACON STATION NO. 3699 921 MERCHANT STREET VACAVILLE, CALIFORNIA	FIGURE 2



HORIZON ENVIRONMENTAL INC.

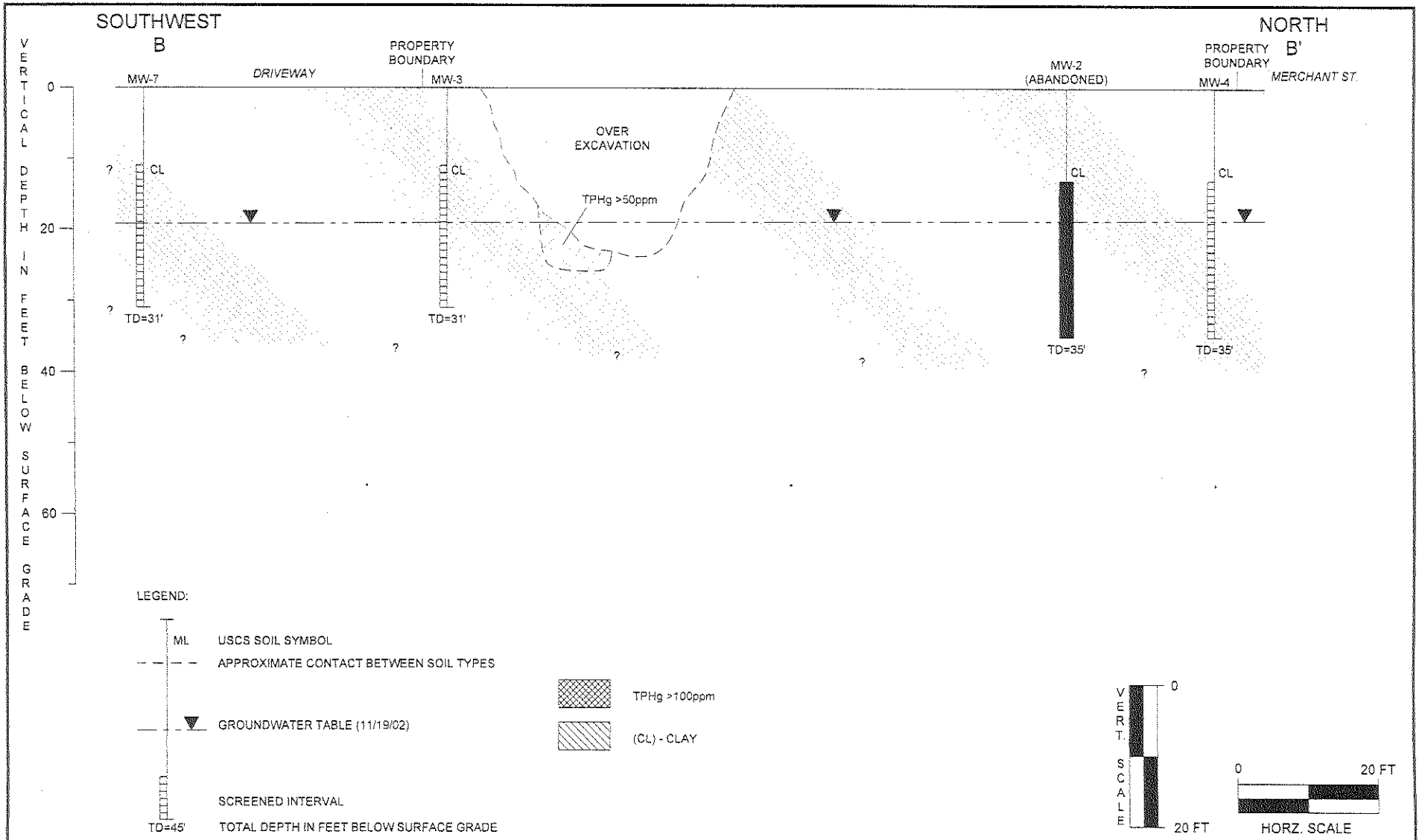
Project Number: 1699.27	Drawn By: M. LaCoste
Prepared By: R. Smith	Date: 12/30/02
Reviewed By: G. Barker	Revised Date:

CROSS SECTION A-A'

FORMER BEACON STATION NO. 3699
921 MERCHANT STREET
VACAVILLE, CALIFORNIA

FIGURE

3



HORIZON ENVIRONMENTAL INC.

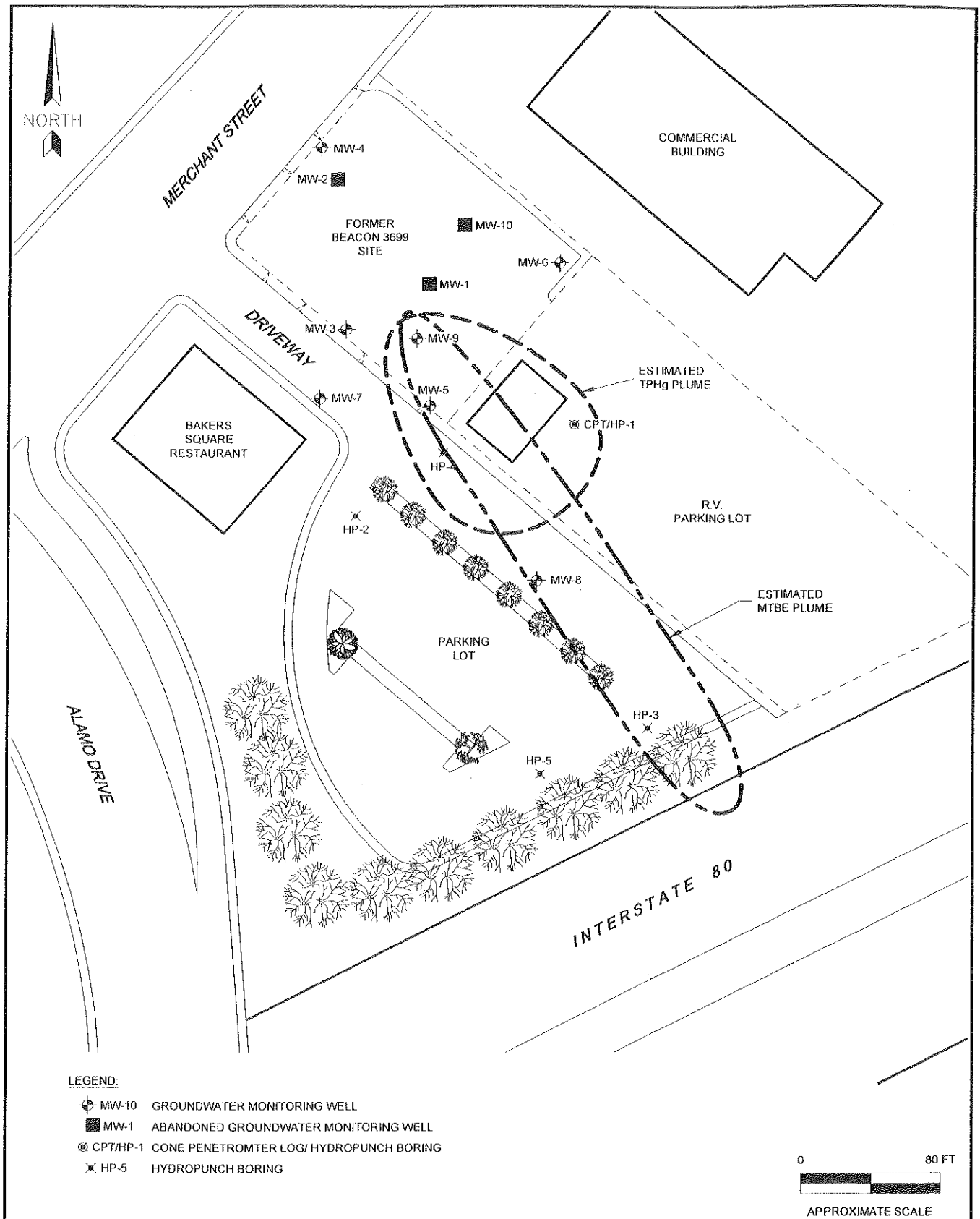
Project Number: 1699.27	Drawn By: M. LaCoste
Prepared By: R. Smith	Date: 12/30/02
Reviewed By: G. Barker	Revised Date:

CROSS SECTION B-B'

FORMER BEACON STATION NO. 3699
921 MERCHANT STREET
VACAVILLE, CALIFORNIA

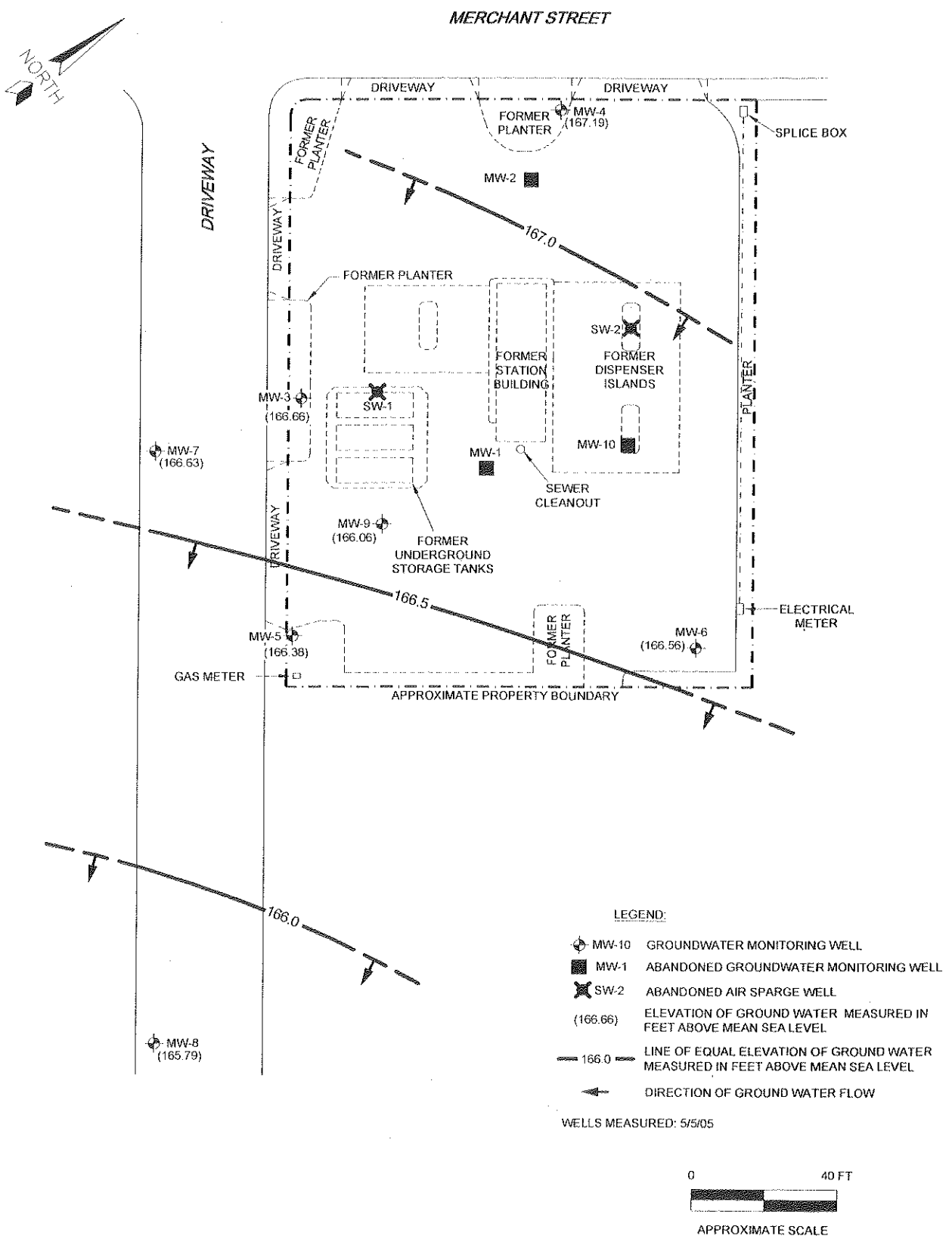
FIGURE

4



HORIZON ENVIRONMENTAL INC.

Project Number: 1699.16 Prepared By: R. Smith Reviewed By: G. Barker	Drawn By: M. LaCoste Date: 2/9/04 Revised Date: 6/28/05	SITE AREA MAP FORMER BEACON STATION NO. 3699 921 MERCHANT STREET VACAVILLE, CALIFORNIA	FIGURE 5



HORIZON ENVIRONMENTAL INC.

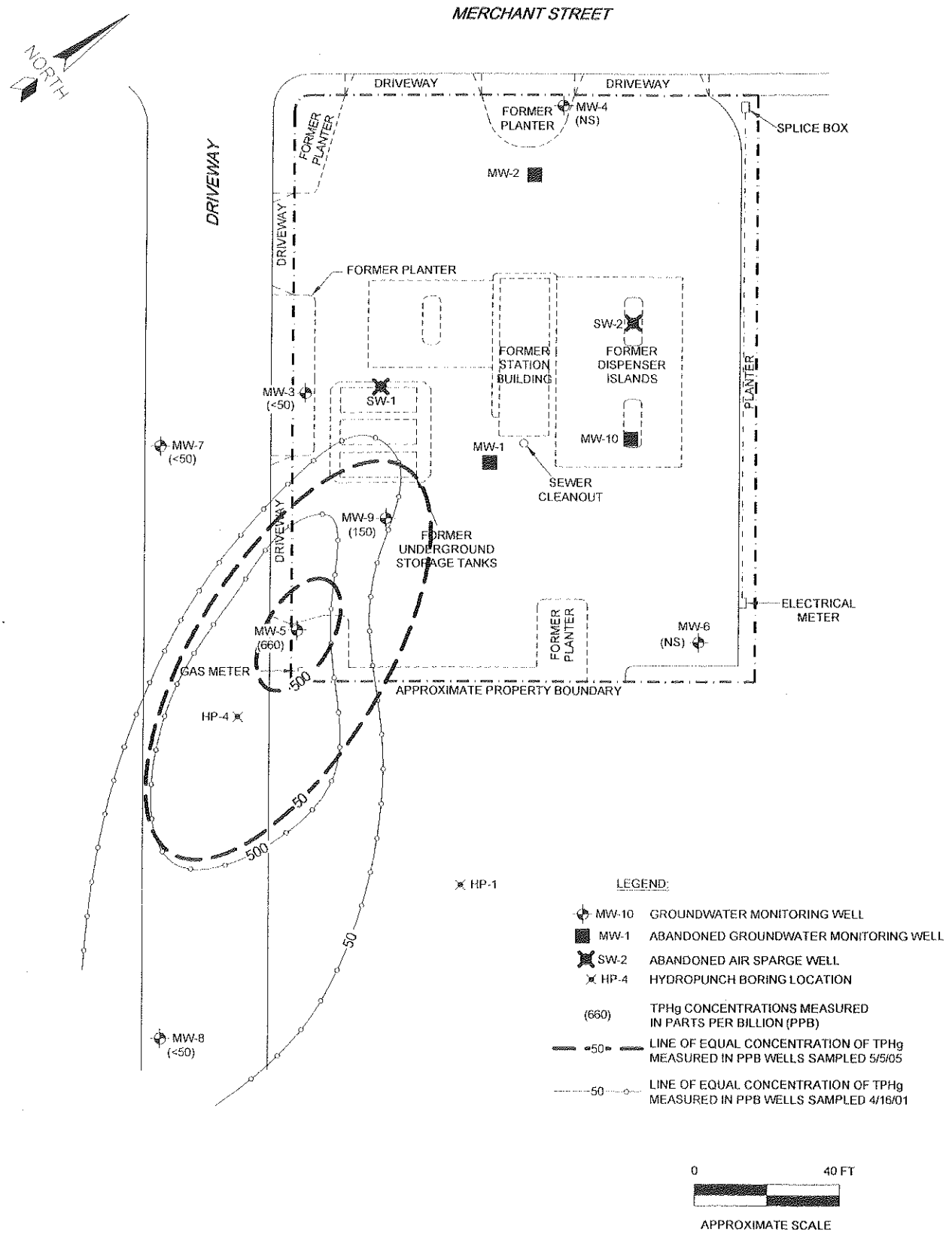
Project Number: 1699.46	Drawn By: M. LaCoste
Prepared By: K. Liptak	Date: 6/16/05
Reviewed By: R. Smith	Revised Date: 6/28/05

SITE PLAN/ GROUND WATER CONTOUR MAP

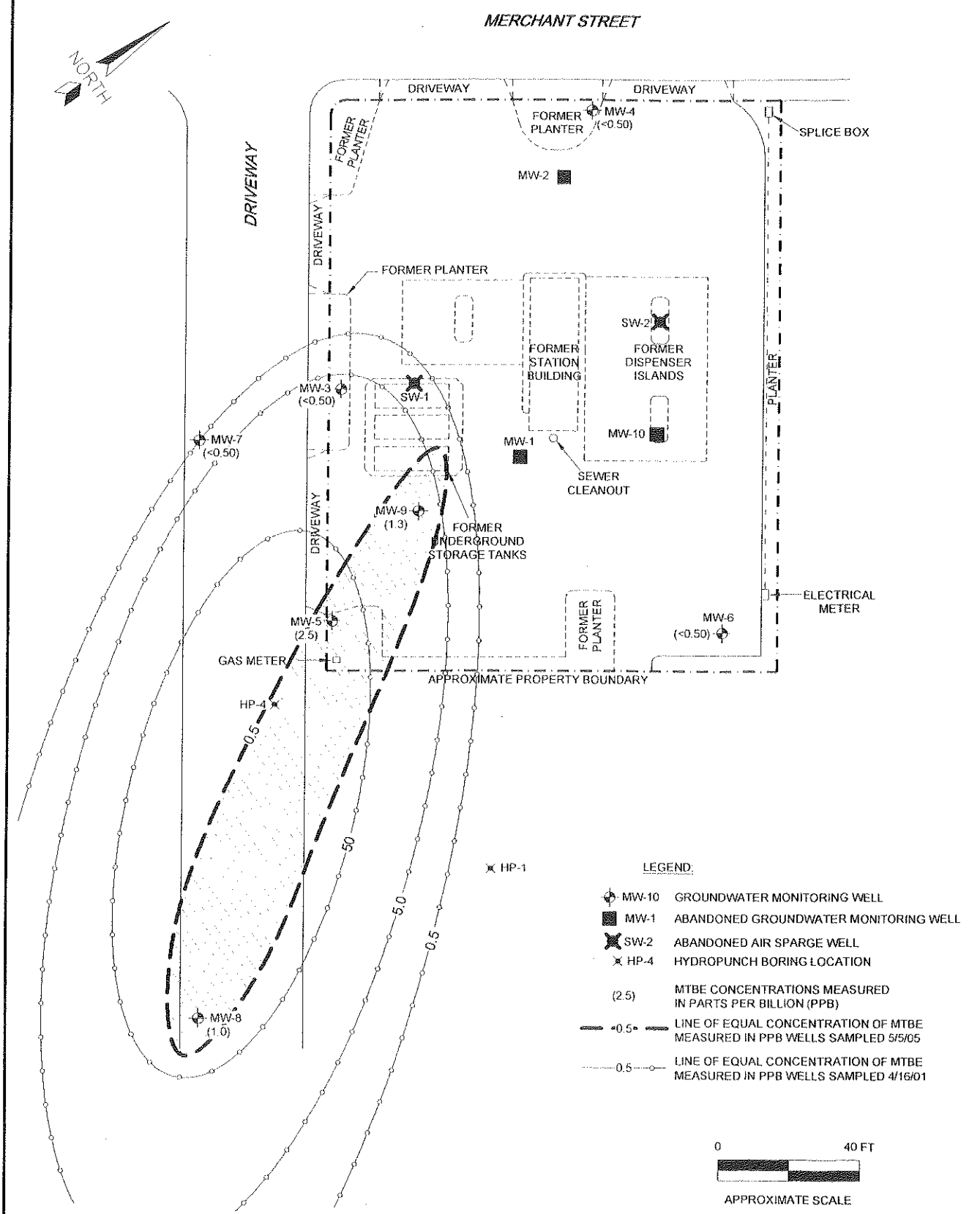
FORMER BEACON STATION NO. 3699
921 MERCHANT STREET
VACAVILLE, CALIFORNIA

FIGURE

6



HORIZON ENVIRONMENTAL INC.		TPHg IN GROUNDWATER ISO-CONCENTRATION MAP	FIGURE
Project Number: 1699.28	Drawn By: M. LaCoste	FORMER BEACON STATION NO. 3699	7
Prepared By: E. Kruck	Date: 5/24/05	921 MERCHANT STREET	
Reviewed By: R. Smith	Revised Date: 6/28/05	VACAVILLE, CALIFORNIA	



HORIZON ENVIRONMENTAL INC.

Project Number: 1699.28 Prepared By: E. Kruck Reviewed By: R. Smith	Drawn By: M. LaCoste Date: 5/24/05 Revised Date: 6/28/05	MTBE IN GROUNDWATER ISO-CONCENTRATION MAP FORMER BEACON STATION NO. 3699 921 MERCHANT STREET VACAVILLE, CALIFORNIA	FIGURE 8

TABLE 1
GROUNDWATER MONITORING DATA
Fomer Beacon Station No. 3699, Vacaville, California

Well Number	Date	TPHg (ppb)	benzene (ppb)	toluene (ppb)	ethylbenzene (ppb)	xylenes (ppb)	MTBE (ppb)	Depth to GW (feet)	TOC Elevation (feet msl)	GW Elevation (feet msl)	Comments
MW-1	01/26/98	300	0.51	1.4	7.5	12	330	9.52	99.87	90.35	odor, no sheen
screened	05/05/98	77	<0.50	<0.50	<0.50	<0.50	20	9.37		90.5	petroleum odor, no sheen
interval	07/22/98	<50	<0.50	<0.50	<0.50	<0.50	21	21.02		78.85	petroleum odor, no sheen
10-25'	11/11/98	<50	<0.50	<0.50	<0.50	<0.50	8	15.91		83.96	slight odor, no sheen
	12/14/98	ns	ns	ns	ns	ns	ns	nm	99.84		new survey
	01/27/99	<50	<0.50	<0.50	<0.50	<0.50	20	11.34		88.5	slight odor, no sheen
	05/21/99	na	<0.50	<0.50	<0.50	<0.50	67	10.27		89.57	slight odor, no sheen
	08/16/99	<50	<0.50	<0.50	<0.50	<0.50	77	15.41		84.43	slight odor, no sheen
	11/17/99	<50	<0.50	<0.50	<0.50	<0.50	43	13.85		85.99	
	03/06/00	<50	<0.50	<0.50	<0.50	<0.50	6.9	7.96		91.88	
	05/09/00	<50	<0.50	<0.50	<0.50	<0.50	7.4	10.11		89.73	sample clear
	08/21/00	<50	<0.50	<0.50	<0.50	<0.50	24	13.03		86.81	sample clear
	10/27/00	<50	<0.50	<0.50	<0.50	<0.50	17	13.46		86.38	
	12/20/00	--	--	--	--	--	--	--		--	well destroyed
MW-2	01/26/98	<50	<0.50	<0.50	<0.50	<0.50	6.6	8.06	98.66	90.6	odor, no sheen
screened	05/05/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	7.76		90.9	petroleum odor, no sheen
interval	07/22/98	<50	<0.50	<0.50	<0.50	<0.50	8.8	9.56		89.1	petroleum odor, no sheen
10-25'	11/11/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	11.13		87.53	slight odor, no sheen
	12/14/98	ns	ns	ns	ns	ns	ns	nm	98.64		new survey
	01/27/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	9.84		88.8	slight odor, no sheen
	05/21/99	na	<0.50	<0.50	<0.50	<0.50	<0.50	8.69		89.95	slight odor, no sheen
	08/16/99	<50	2.3	1.1	<0.50	1.4	<5.0	11.3		87.34	slight odor, no sheen
	11/17/99	<50	<0.50	<0.50	<0.50	<0.50	<0.50	12.4		86.24	
	03/06/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.4		92.24	
	05/09/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	8.56		90.08	
	08/21/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	11.55		87.09	sample clear
	10/27/00	<50	<0.50	<0.50	<0.50	<0.50	<0.50	12.01		86.63	sample clear
	12/20/00	--	--	--	--	--	--	--		--	well destroyed

TABLE 1
GROUNDWATER MONITORING DATA
Fomer Beacon Station No. 3699, Vacaville, California

Well Number	Date	TPHg (ppb)	benzene (ppb)	toluene (ppb)	ethylbenzene (ppb)	xylenes (ppb)	MTBE (ppb)	Depth to GW (feet)	TOC Elevation (feet msl)	GW Elevation (feet msl)	Comments
MW-3	01/26/98	<50	1.8	<0.50	2.3	3.3	120	9.73	100.05	90.32	no odor, no sheen
screened	05/05/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	9.48		90.57	no odor, no sheen
interval	07/22/98	51	<0.50	<0.50	<0.50	<0.50	15	11.28		88.77	no odor, no sheen
10-25'	11/11/98	95	<0.50	<0.50	<0.50	<0.50	63	12.4		87.65	no odor, no sheen
	12/14/98	ns	ns	ns	ns	ns	ns	nm	100.07		new survey
	01/27/99	<50	<0.50	<0.50	<0.50	<0.50	250	11.56		88.51	no odor, no sheen
	05/21/99	na	<0.50	<0.50	<0.50	<0.50	8	10.42		89.65	no odor, no sheen
	08/16/99	69	<0.50	<0.50	<0.50	<0.50	14	12.99		87.08	no odor, no sheen
	11/17/99	61	<0.50	<0.50	<0.50	<0.50	97	14.03		86.04	
	03/06/00	<50	<0.50	<0.50	<0.50	<0.50	210	8.16		91.91	
	05/09/00	<50	<0.50	<0.50	<0.50	<0.50	20	10.32		89.75	
	08/21/00	<50	<0.50	<0.50	<0.50	<0.50	12	13.21		86.86	sample clear
	10/27/00	<50	<0.50	<0.50	<0.50	<0.50	21	13.65		86.42	sample clear
	02/12/01	<50	<0.50	<0.50	<0.50	<0.50	10	11.15		88.92	sample clear
	04/16/01	<50	<0.50	<0.50	<0.50	<0.50	5.1	10.82		89.25	sample clear
	07/24/01	<50	<0.50	<0.50	<0.50	<0.50	15	13.85		86.22	sample clear
	11/06/01	<50	<0.50	<0.50	<0.50	<0.50	17	15.22		84.85	sample clear
	01/30/02	<50	<0.50	<0.50	<0.50	<0.50	35	9.91		90.16	sample clear
	05/02/02	<50	<0.50	<0.50	<0.50	<0.50	1.3	11.05	176.66	165.61	sample clear
	07/29/02	<50	<0.50	<0.50	<0.50	<0.50	3.4	13.41		163.25	sample clear
	11/19/02	<50	<0.50	<0.50	<0.50	<0.50	6.3	13.84		162.82	sample clear
	03/03/03	<50	<0.50	<0.50	<0.50	<0.50	0.51	9.94		166.72	sample clear
	05/29/03	<50	<0.50	<0.50	<0.50	<0.50	<0.50	10.72		165.94	sample clear
	07/28/03	<50	<0.50	<0.50	<0.50	<0.50	<0.50	12.55		164.11	sample clear
	11/05/03	<50	<0.50	<0.50	<0.50	<0.50	0.88	13.80		162.86	sample clear
	02/23/04	<50	<0.50	<0.50	<0.50	<0.50	<0.50	9.12		167.54	sample clear
	04/21/04	<50	<0.50	<0.50	<0.50	<0.50	<0.50	10.45		166.21	sample clear
	07/12/04	<50	<0.50	<0.50	<0.50	<0.50	<0.50	12.84		163.82	sample clear
	11/18/04	<50	<0.50	<0.50	<0.50	<0.50	<0.50	12.91		163.75	sample clear
	01/18/05	<50	<0.50	<0.50	<0.50	<0.50	0.63	9.65		167.01	sample clear
	05/05/05	<50	<0.50	<0.50	<0.50	<0.50	<0.50	10.00		166.66	sample clear

TABLE 1
GROUNDWATER MONITORING DATA
Fomer Beacon Station No. 3699, Vacaville, California

Well Number	Date	TPHg (ppb)	benzene (ppb)	toluene (ppb)	ethylbenzene (ppb)	xylenes (ppb)	MTBE (ppb)	Depth to GW (feet)	TOC Elevation (feet msl)	GW Elevation (feet msl)	Comments
MW-4	01/26/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	8.59	99.29	90.7	no odor, no sheen
screened	05/05/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	8.32		90.97	no odor, no sheen
interval	07/22/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	10.13		89.16	no odor, no sheen
10-25'	11/11/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	11.73		87.56	no odor, no sheen
	12/14/98	ns	ns	ns	ns	ns	ns	nm	99.28		new survey
	01/27/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	10.41		88.87	no odor, no sheen
	05/21/99	na	<0.50	<0.50	<0.50	<0.50	<0.50	9.28		90	no odor, no sheen
	08/16/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	11.89		87.39	no odor, no sheen
	11/17/99	<50	<0.50	<0.50	<0.50	<0.50	<0.50	12.98		86.3	
	03/06/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	6.98		92.3	
	05/09/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	9.13		90.15	
	08/21/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	12.13		87.15	sample clear
	10/27/00	<50	<0.50	<0.50	<0.50	<0.50	<0.50	12.59		86.69	sample clear
	02/12/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	9.98		89.30	sample clear
	04/16/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	9.65		89.63	sample clear
	07/24/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	12.75		86.53	sample clear
	11/06/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	14.11		85.17	sample clear
	01/30/02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	8.69		90.59	sample clear
	05/02/02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	9.83	175.93	166.10	sample clear
	07/29/02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	12.25		163.68	sample clear
	11/19/02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	12.73		163.20	no comment
	03/03/03	<50	<0.50	<0.50	<0.50	<0.50	<0.50	8.71		167.22	sample clear
	05/29/03	<50	<0.50	<0.50	<0.50	<0.50	<0.50	9.47		166.46	sample clear
	07/28/03	<50	<0.50	<0.50	<0.50	<0.50	<0.50	11.31		164.62	sample clear
	11/05/03	ns	ns	ns	ns	ns	ns	12.76		163.17	
	02/23/04	<50	<0.50	<0.50	<0.50	<0.50	<0.50	7.88		168.05	sample clear
	04/21/04	ns	ns	ns	ns	ns	ns	9.23		166.70	sample clear
	07/12/04	<50	<0.50	<0.50	<0.50	<0.50	<0.50	11.62		164.31	sample clear
	11/18/04	ns	ns	ns	ns	ns	ns	11.70		164.23	not sampled
	01/18/05	<50	<0.50	<0.50	<0.50	<0.50	<0.50	8.41		167.52	sample clear
	05/05/05	ns	ns	ns	ns	ns	ns	8.74		167.19	not sampled

TABLE 1
GROUNDWATER MONITORING DATA
Fomer Beacon Station No. 3699, Vacaville, California

Well Number	Date	TPHg (ppb)	benzene (ppb)	toluene (ppb)	ethylbenzene (ppb)	xylenes (ppb)	MTBE (ppb)	Depth to GW (feet)	TOC Elevation (feet msl)	GW Elevation (feet msl)	Comments
MW-5	01/26/98	1300	12	0.78	50	150	83	10.76	100.58	89.82	odor, no sheen
screened	05/05/98	2200	12	0.74	200	100	140	10.6		89.98	petroleum odor, no sheen
interval	07/22/98	3000	11	1.4	60	200	74	22.67		77.91	petroleum odor, no sheen
10-25'	11/11/98	260	1	<0.50	3.1	15	25	20.16		80.42	petroleum odor, no sheen
	12/14/98	ns	ns	ns	ns	ns	ns	nm	100.89		new survey
	01/27/99	730	5.2	0.74	58	64	47	15.17		85.72	slight odor, no sheen, pumping
	05/21/99	na	<10	<10	40	150	1100	11.54		89.35	slight odor, no sheen
	08/16/99	2500	5	1.9	14	29	750	16.68		84.21	slight odor, no sheen
	11/17/99	2800	1.8	<0.50	5.2	16	130	15.08		85.81	
	03/06/00	1800	1.2	<0.50	0.92	24	69	9.26		91.63	
	05/09/00	940	<0.50	<0.50	2.8	13	300	11.39		89.5	
	08/21/00	3300	1.7	<1.0	3.8	9.5	120	14.25		86.64	sample clear
	10/27/00	1800	1.1	<0.50	3.0	11	83	14.66		86.23	sample clear
	02/12/01	900	1.1	<0.50	1.4	3.1	31	12.15		88.74	sample clear
	04/16/01	1300	1.1	<0.50	2.2	3.2	90	11.88		89.01	sample clear
	07/24/01	1800	1.1	<0.50	1.1	2.3	65	14.89		86.00	sample clear
	11/06/01	770	<0.50	<0.50	<0.50	<0.50	19	16.21		84.68	sample clear
	01/30/02	1700	0.63	<0.50	9.9	5.7	16	11.02		89.87	sample clear
	05/02/02	1900	<0.50	<0.50	5.9	5.6	14	12.15	177.50	165.35	sample clear
	07/29/02	1800	0.59	<0.50	2.5	2.3	14	14.50		163.00	sample clear
	11/19/02	1100	<0.50	<0.50	1.4	<0.50	13	14.87		162.63	sample clear
	03/03/03	520	<0.50	<0.50	1.1	0.63	17	11.05		166.45	sample clear
	05/29/03	910	<0.50	<0.50	1.2	1.5	23	11.81		165.69	sample clear
	07/28/03	1100	<0.50	<0.50	<0.50	0.60	10	13.61		163.89	sample clear
	11/05/03	1000	<0.50	<0.50	<0.50	<0.50	5.5	14.79		162.71	sample clear
	02/23/04	250	<0.50	<0.50	<0.50	<0.50	1.8	10.25		167.25	sample clear
	04/21/04	900	<0.50	<0.50	0.69	0.75	7.4	11.55		165.95	sample clear
	07/12/04	1000	<0.50	<0.50	<0.50	<0.50	2.8	13.91		163.59	sample clear
	11/18/04	410	<0.50	<0.50	<0.50	<0.50	1.2	13.99		163.51	sample clear
	01/18/05	290	<0.50	<0.50	<0.50	<0.50	0.64	10.74		166.76	sample clear
	05/05/05	660	<0.50	<0.50	<0.50	<0.50	2.5	11.12		166.38	sample clear

TABLE 1
GROUNDWATER MONITORING DATA
Fomer Beacon Station No. 3699, Vacaville, California

Well Number	Date	TPHg (ppb)	benzene (ppb)	toluene (ppb)	ethylbenzene (ppb)	xylenes (ppb)	MTBE (ppb)	Depth to GW (feet)	TOC Elevation (feet msl)	GW Elevation (feet msl)	Comments
MW-6	01/26/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	10.47	100.68	90.21	no odor, no sheen
screened	05/05/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	10.31		90.37	no odor, no sheen
interval	07/22/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	12.06		88.62	no odor, no sheen
7-22'	11/11/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	13.51		87.17	no odor, no sheen
	12/14/98	ns	ns	ns	ns	ns	ns	nm	100.66		new survey
	01/27/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	12.26		88.4	no odor, no sheen
	05/21/99	na	<0.50	<0.50	<0.50	<0.50	<0.50	11.23		89.43	no odor, no sheen
	08/16/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	16.35		84.31	no odor, no sheen
	11/17/99	<50	<0.50	<0.50	<0.50	<0.50	<0.50	14.74		85.92	
	03/06/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	8.93		91.73	
	05/09/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	11.04		89.62	
	08/21/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	13.95		86.71	sample clear
	10/27/00	<50	<0.50	<0.50	<0.50	<0.50	<0.50	14.32		86.34	sample clear
	02/12/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	11.75		88.91	sample clear
	04/16/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	11.56		89.10	sample clear
	07/24/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	14.55		86.11	sample clear
	11/06/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	15.87		84.79	sample clear
	01/30/02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	10.69		89.97	sample clear
	05/02/02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	11.81	177.35	165.54	sample clear
	07/29/02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	14.16		163.19	sample clear
	11/19/02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	14.55		162.80	sample clear
	03/03/03	<50	<0.50	<0.50	<0.50	<0.50	<0.50	10.72		166.63	sample clear
	05/29/03	<50	<0.50	<0.50	<0.50	<0.50	<0.50	11.50		165.85	sample clear
	07/28/03	<50	<0.50	<0.50	<0.50	<0.50	<0.50	13.27		164.08	sample clear
	11/05/03	ns	ns	ns	ns	ns	ns	14.52		162.83	
	02/23/04	<50	<0.50	<0.50	<0.50	<0.50	<0.50	9.90		167.45	sample clear
	04/21/04	ns	ns	ns	ns	ns	ns	11.25		166.10	sample clear
	07/12/04	<50	<0.50	<0.50	<0.50	<0.50	<0.50	13.57		163.78	sample clear
	11/18/04	ns	ns	ns	ns	ns	ns	13.62		163.73	not sampled
	01/18/05	<50	<0.50	<0.50	<0.50	<0.50	<0.50	10.40		166.95	sample clear
	05/05/05	ns	ns	ns	ns	ns	ns	10.79		166.56	not sampled

TABLE 1
GROUNDWATER MONITORING DATA
Fomer Beacon Station No. 3699, Vacaville, California

Well Number	Date	TPHg (ppb)	benzene (ppb)	toluene (ppb)	ethylbenzene (ppb)	xylenes (ppb)	MTBE (ppb)	Depth to GW (feet)	TOC Elevation (feet msl)	GW Elevation (feet msl)	Comments
MW-7	01/26/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	9.84	100.07	90.23	no odor, no sheen
screened	05/05/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	9.57		90.5	no odor, no sheen
interval	07/22/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	11.34		88.73	no odor, no sheen
7-22'	11/11/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	12.88		87.19	no odor, no sheen
	12/14/98	ns	ns	ns	ns	ns	ns	nm	100.07		new survey
	01/27/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	11.64		88.43	no odor, no sheen
	05/21/99	na	<0.50	<0.50	<0.50	<0.50	<0.50	10.51		89.56	no odor, no sheen
	08/16/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	13.05		87.02	no odor, no sheen
	11/17/99	<50	<0.50	<0.50	<0.50	<0.50	<0.50	14.15		85.92	
	03/06/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	8.4		91.67	
	05/09/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	10.28		89.79	
	08/21/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	13.25		86.82	sample clear
	10/27/00	<50	<0.50	<0.50	<0.50	<0.50	<0.50	13.71		86.36	sample clear
	02/12/01	<50	<0.50	<0.50	<0.50	<0.50	<0.50	11.30		88.77	sample clear
	04/16/01	<50	<0.50	<0.50	<0.50	<0.50	7.9	10.90		89.17	sample clear
	07/24/01	<50	<0.50	<0.50	<0.50	<0.50	0.63	13.70		86.37	sample clear
	11/06/01	<50	<0.50	<0.50	<0.50	<0.50	1.6	15.29		84.78	sample clear
	01/30/02	<50	<0.50	<0.50	<0.50	<0.50	0.97	9.98		90.09	sample clear
	05/02/02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	11.09	176.71	165.62	sample clear
	07/29/02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	13.28		163.43	sample clear
	11/19/02	<50	<0.50	<0.50	<0.50	<0.50	<0.50	13.94		162.77	sample clear
	03/03/03	<50	<0.50	<0.50	<0.50	<0.50	<0.50	9.96		166.75	sample clear
	05/29/03	<50	<0.50	<0.50	<0.50	<0.50	<0.50	10.75		165.96	sample clear
	07/28/03	<50	<0.50	<0.50	<0.50	<0.50	<0.50	12.55		164.16	sample clear
	11/05/03	<50	<0.50	<0.50	<0.50	<0.50	<0.50	13.83		162.88	sample clear
	02/23/04	<50	<0.50	<0.50	<0.50	<0.50	<0.50	9.40		167.31	sample clear
	04/21/04	<50	<0.50	<0.50	<0.50	<0.50	<0.50	10.41		166.30	sample clear
	07/12/04	<50	<0.50	<0.50	<0.50	<0.50	<0.50	12.86		163.85	sample clear
	11/18/04	<50	<0.50	<0.50	<0.50	<0.50	<0.50	12.97		163.74	sample clear
	01/18/05	<50	<0.50	<0.50	<0.50	<0.50	<0.50	9.75		166.96	sample clear
	05/05/05	<50	<0.50	<0.50	<0.50	<0.50	<0.50	10.08		166.63	sample clear

TABLE 1
GROUNDWATER MONITORING DATA
Fomer Beacon Station No. 3699, Vacaville, California

Well Number	Date	TPHg (ppb)	benzene (ppb)	toluene (ppb)	ethylbenzene (ppb)	xylenes (ppb)	MTBE (ppb)	Depth to GW (feet)	TOC Elevation (feet msl)	GW Elevation (feet msl)	Comments
MW-8	01/26/98	<50	<0.50	<0.50	<0.50	<0.50	110	8.01	97.5	89.49	no odor, no sheen
screened	05/05/98	<50	<0.50	<0.50	<0.50	<0.50	110	7.84		89.66	no odor / no sheen
interval	07/22/98	290	<0.50	<0.50	<0.50	<0.50	120	9.55		87.95	no odor / no sheen
5-20'	11/11/98	<50	<0.50	<0.50	<0.50	<0.50	<5.0	10.92		86.58	no odor / no sheen
	01/27/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	9.73		87.77	no odor, no sheen
	05/21/99	na	<0.50	<0.50	<0.50	<0.50	89	8.74		88.76	no odor, no sheen
	08/16/99	<50	<0.50	<0.50	<0.50	<0.50	320	11.16		86.34	no odor, no sheen
	11/17/99	64	<0.50	<0.50	<0.50	<0.50	240	12.12		85.38	
	03/06/00	84	<0.50	<0.50	<0.50	<0.50	77	6.49		91.01	
	05/09/00	71	<0.50	<0.50	<0.50	<0.50	83	8.57		88.93	
	08/21/00	<50	<0.50	<0.50	<0.50	<0.50	120	11.32		86.18	sample clear
	10/27/00	<50	<0.50	<0.50	<0.50	<0.50	3.0	11.87		85.63	sample clear
	02/12/01	<50	<0.50	<0.50	<0.50	<0.50	34	9.20		88.30	sample clear
	04/16/01	81	<0.50	<0.50	<0.50	<0.50	58	9.04		88.46	sample clear
	07/24/01	<50	<0.50	<0.50	<0.50	<0.50	29	11.92		85.58	sample clear
	11/06/01	69	<0.50	<0.50	<0.50	<0.50	31	13.21		84.29	sample clear
	01/30/02	69	<0.50	<0.50	<0.50	<0.50	25	8.19		89.31	sample clear
	05/02/02	75	<0.50	<0.50	<0.50	<0.50	22	9.28	174.10	164.82	sample clear
	07/29/02	<50	<0.50	<0.50	<0.50	<0.50	14	11.52		162.58	sample clear
	11/19/02	72	<0.50	<0.50	<0.50	<0.50	7.3	11.88		162.22	sample clear
	03/03/03	57	<0.50	<0.50	<0.50	<0.50	5.4	8.23		165.87	sample clear
	05/29/03	60	<0.50	<0.50	<0.50	<0.50	4.7	8.97		165.13	sample clear
	07/28/03	<50	<0.50	<0.50	<0.50	<0.50	7.5	10.66		163.44	sample clear
	11/05/03	<50	<0.50	<0.50	<0.50	<0.50	7.0	11.66		162.44	sample clear
	02/23/04	<50	<0.50	<0.50	<0.50	<0.50	0.82	7.44		166.66	sample clear
	04/21/04	69	<0.50	<0.50	<0.50	<0.50	2.4	8.72		165.38	sample clear
	07/12/04	<50	<0.50	<0.50	<0.50	<0.50	2.2	10.96		163.14	sample clear
	11/18/04	<50	<0.50	<0.50	<0.50	<0.50	2.1	10.98		163.12	sample clear
	01/18/05	<50	<0.50	<0.50	<0.50	<0.50	0.64	7.91		166.19	sample clear
	05/05/05	<50	<0.50	<0.50	<0.50	<0.50	1.0	8.32		165.78	sample clear

TABLE 1
GROUNDWATER MONITORING DATA
Fomer Beacon Station No. 3699, Vacaville, California

Well Number	Date	TPHg (ppb)	benzene (ppb)	toluene (ppb)	ethylbenzene (ppb)	xylenes (ppb)	MTBE (ppb)	Depth to GW (feet)	TOC Elevation (feet msl)	GW Elevation (feet msl)	Comments
MW-9	12/14/98	810	0.51	0.75	0.59	1.9	13		99.79		new survey
screened	01/27/99	58	<0.50	<0.50	<0.50	<0.50	<5.0	11.28		88.51	no odor, no sheen
interval	05/21/99	na	<0.50	<0.50	7.6	0.74	430	10.29		89.5	no odor, no sheen
5-25'	08/16/99	690	<0.50	<0.50	0.76	<0.50	670	12.82		86.97	no odor, no sheen
	11/17/99	450	<0.50	<0.50	<0.50	<0.50	340	13.87		85.92	
	03/06/00	<50	<0.50	<0.50	<0.50	<0.50	34	8.05		91.74	
	05/09/00	<50	<0.50	<0.50	<0.50	<0.50	56	10.17		89.62	
	08/21/00	130	<0.50	<0.50	<0.50	<0.50	110	13.04		86.75	sample clear
	10/27/00	<50	<0.50	<0.50	<0.50	<0.50	34	13.48		86.31	sample clear
	02/12/01	<50	<0.50	<0.50	<0.50	<0.50	23	11.15		88.64	sample clear
	04/16/01	<50	<0.50	<0.50	<0.50	<0.50	25	10.65		89.14	sample clear
	07/24/01	<50	<0.50	<0.50	<0.50	<0.50	31	13.68		86.11	sample clear
	11/06/01	<50	<0.50	<0.50	<0.50	<0.50	11	15.01		84.78	sample clear
	01/30/02	850	<0.50	<0.50	<0.50	<0.50	8.7	9.69		90.10	sample clear
	05/02/02	250	<0.50	<0.50	<0.50	<0.50	4.9	10.81	176.30	165.49	sample clear
	07/29/02	<50	<0.50	<0.50	<0.50	<0.50	16	13.15		163.15	
	11/19/02	<50	<0.50	<0.50	<0.50	<0.50	2.4	13.56		162.74	sample clear
	03/03/03	<50	<0.50	<0.50	<0.50	<0.50	2.0	9.70		166.60	sample clear
	05/29/03	<50	<0.50	<0.50	<0.50	<0.50	1.4	10.46		165.84	sample clear
	07/28/03	210	<0.50	<0.50	<0.50	<0.50	16	12.28		164.02	sample clear
	11/05/03	<50	<0.50	<0.50	<0.50	<0.50	9.3	13.55		162.75	sample clear
	02/23/04	<50	<0.50	<0.50	<0.50	<0.50	<0.50	8.89		167.41	sample clear
	04/21/04	250	<0.50	<0.50	<0.50	<0.50	5.7	10.24		166.06	sample clear
	07/12/04	150	<0.50	<0.50	<0.50	<0.50	5.5	12.56		163.74	sample clear
	11/18/04	72	<0.50	<0.50	<0.50	<0.50	<0.50	12.62		163.68	sample clear
	01/18/05	<50	<0.50	<0.50	<0.50	<0.50	0.76	9.41		166.89	sample clear
	05/05/05	150	<0.50	<0.50	<0.50	<0.50	1.3	9.67		166.63	sample clear

TABLE 1
GROUNDWATER MONITORING DATA
Fomer Beacon Station No. 3699, Vacaville, California

Well Number	Date	TPHg (ppb)	benzene (ppb)	toluene (ppb)	ethylbenzene (ppb)	xylenes (ppb)	MTBE (ppb)	Depth to GW (feet)	TOC Elevation (feet msl)	GW Elevation (feet msl)	Comments
MW-10	12/14/98	350	3.4	0.88	<0.50	0.83	<5.0		99.12		new survey
screened	01/27/99	<50	<0.50	<0.50	<0.50	<0.50	7.9	10.54		88.58	no odor, no sheen
interval	05/21/99	na	<0.50	<0.50	<0.50	<0.50	15	9.45		89.67	no odor, no sheen
5-25'	08/16/99	<50	<0.50	<0.50	<0.50	<0.50	<5.0	14.61		84.51	no odor, no sheen
	11/17/99	<50	<0.50	<0.50	<0.50	<0.50	0.92	13.04		86.08	
	03/06/00	<50	<0.50	<0.50	<0.50	<0.50	8.3	7.15		91.97	
	05/09/00	<50	<0.50	<0.50	<0.50	<0.50	27	9.3		89.82	
	08/21/00	<50	<0.50	<0.50	<0.50	<0.50	<5.0	12.24		86.88	sample clear
	10/27/00	<50	<0.50	<0.50	<0.50	<0.50	<0.50	12.64		86.48	sample clear
	12/20/00	--	--	--	--	--	--	--		--	well destroyed

Notes:
TPHg = total petroleum hydrocarbons as gasoline
MTBE = methyl tert-butyl ether
GW = groundwater
TOC = top of casing
msl = mean sea level

< = less than indicated reporting limit
ns = not sampled
nm = not measured

APPENDIX A

SOLANO COUNTY CORRESPONDENCE

SOLANO COUNTY
Department of Resource Management
Environmental Health Division
675 Texas Street, Suite 5500
Fairfield, CA 94533
www.solanocounty.com

Telephone No: (707) 784-6765
Fax: (707) 784-4805

Birgitta Corsello, Director
Cliff Covey, Asst Director

FEB 0 2 2005

January 28, 2005

Ultramar, Inc.
685 West 3rd Street
Hanford, CA 93232-0466

Re: Approval of 4QMR2004 and review of additional off site assessment, dated March 4, 2004, for 921 Merchant St., Vacaville, CA 95688, SCDRM File No. 50025

Dear Mr. Aldridge:

We received your 4QMR for 2004, dated November 18, 2004 on January 18, 2005, for the above referenced site. We have reviewed and approved it. After evaluating the last monitoring and sampling report in concert with the additional off-site assessment, the following recommendations are suggested:

1. According to the results of the Additional Off-Site Assessment Report, dated March 4, 2004, the groundwater concentrations of TPHg in the borings, HP-1 & HP-4, exceeded the Central Valley RWQCB Water Quality Objectives. These are consistent with the groundwater TPHg concentrations reported in MW5 (monitoring well that is nearest to the borings) from the sampling years of 2002 to 2004. A source of impact may be present on site that continues to affect groundwater. This source may consist of residual impacted soil or other.

   In addition, a trend is evident in MW-5 whereby the concentrations of TPHg appear to fluctuate. Further evaluation is warranted regarding the potential of residual source of impact and remedial options accordingly, to reduce these concentrations of TPHg to acceptable levels to meet water quality objectives within a reasonable timeframe. Groundwater at the site is designated by the RWQCB basin plan for municipal and domestic purposes. Therefore, groundwater quality shall be maintained to protect all current and future beneficial uses. It is this Department's recommendation that remedial

action be implemented to reduce the contamination found primarily at or near MW-5 and hp-4 where the TPHg concentrations have consistently exceeded water quality objectives.

2. If necessary provide a work plan for review and approval along with applications for any further borings or wells that may be advanced.

If you have any questions please contact me or Misty Kolderup, RG at (707) 784-0705.

Sincerely,

Max G. Clark

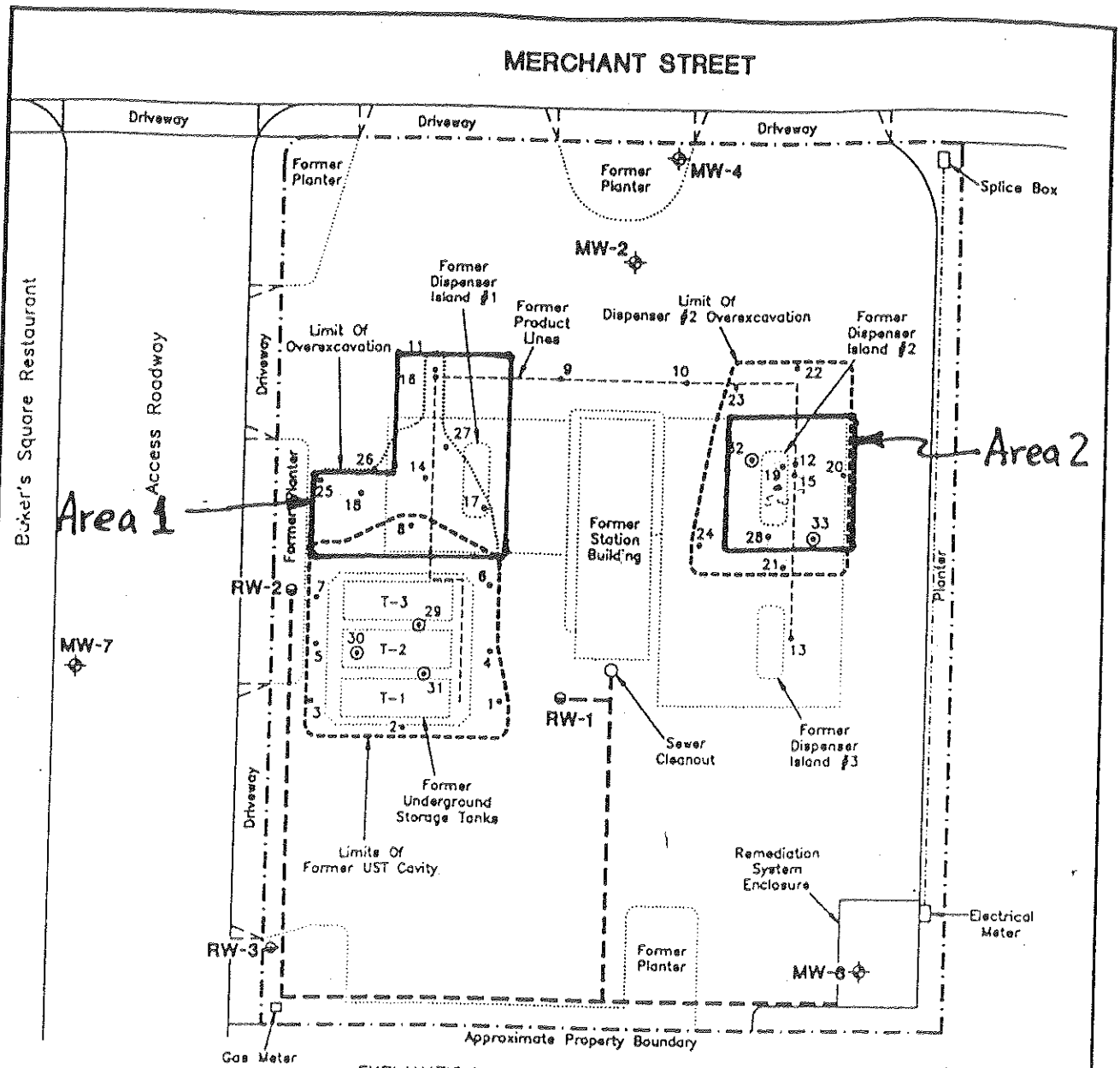
Max G. Clark, REHS, MS
Senior Hazardous Materials Specialist

cc: Rex Smith, Horizon Environmental, Inc.
Jim Barton CRWQCB, Central Valley Region

921MerchantUpdateLtrJan.28.05,#50025

APPENDIX B

HISTORICAL SITE INVESTIGATION DATA



EXPLANATION:

MW-7 ⊕ Groundwater Monitoring Well

RW-3 ⊖ Groundwater Extraction Well

28 • Soil Sample

33 ⊙ Groundwater Sample

1: T-1-E-11	15: D-2-12.5
2: T-1-S-11	16: D-1-12
3: T-1-W-11	17: D-1-A-E-12
4: T-2-E-11	18: D-1-A-W-12
5: T-2-W-11	19: D-2-15
6: T-3-E-11	20: D-2-E-12
7: T-3-W-11	21: D-2-S-12
8: T-3-N-11	22: D-2-N-12
9: PL-1-4	23: D-2-NW-12
10: PL-2-4	24: D-2-SW-12
11: D-1-4	25: D-1-B-12
12: D-2-4	26: D-1-C-12
13: D-3-4	27: D-1-D-12
14: D-1-A-17	28: D-2-20

29: W-1222-EXCV
30: W-1223-EXCV
31: W-1229-TP
32: W-1229-ED
33: W-1229-DE

NORTH

0 30

Approximate Scale In Feet

HORIZON ENVIRONMENTAL INC.

Project Number: 1699.21	Drawn By: D. Alston
Prepared By: G. Barker	Date: 01/98
Reviewed By:	Revised Date:

SITE PLAN

BEACON STATION NO. 699
921 MERCHANT STREET
VACAVILLE, CALIFORNIA

FIGURE

2

Table 1 Analytical Results for Soil Samples

Sample Number	Fig. 2 #	Sample Date	TPHg (ppm)	MTBE 8020 (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl benzene (ppm)	Xylenes (ppm)	Total Lead (ppm)
UST CAVITY:									
T-1-E-11'	1	12/19/97	<1.0	0.28	<0.0050	<0.0050	<0.0050	<0.0050	13
T-1-S-11'	2	12/19/97	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	10
T-1-W-11'	3	12/19/97	<1.0	0.090	<0.0050	<0.0050	<0.0050	<0.0050	12
T-2-E-11'	4	12/19/97	<1.0	0.55	<0.0050	0.0093	<0.0050	0.014	13
T-2-W-11'	5	12/19/97	<1.0	0.026	<0.0050	<0.0050	<0.0050	<0.0050	13
T-3-E-11'	6	12/19/97	<2.0	0.21	<0.020	<0.020	<0.020	<0.020	20
T-3-W-11'	7	12/19/97	1.1	1.4	0.0069	<0.0050	<0.0050	0.0064	11
T-3-N-11'	8	12/19/97	650	2.4	1.1	0.22	9.6	48	10
PRODUCT LINES:									
PL-1-4'	9	12/19/97	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	12
PL-2-4'	10	12/19/97	<1.0	0.044	<0.0050	<0.0050	<0.0050	<0.0050	12
DISPENSERS:									
D-1-4'	11	12/19/97	20	<0.0050	<0.0050	0.028	0.69	0.073	13
D-2-4'	12	12/19/97	72	9.7	0.79	4.6	1.4	7.7	11
D-3-4'	13	12/19/97	<1.0	0.028	<0.0050	<0.0050	<0.0050	<0.0050	12
OVER EXCAVATION: UST/Dispenser 1									
D-1-A-17'	14	12/22/97	<1.0	<0.050	<0.0050	<0.0050	<0.0050	<0.0050	4.3
D-1-12'	16	12/22/97	4.4	0.034	0.0064	<0.0050	0.033	0.016	4.7
D-1-A-E-12'	17	12/22/97	1.4	<0.0050	0.0053	<0.0050	0.023	0.057	4.1
D-1-A-W-12'	18	12/22/97	190	4.1	0.80	0.98	2.2	12	5.0
D-1-B-12'	25	12/23/97	5.6	<0.0050	0.0079	<0.0050	0.021	0.017	<10
D-1-C-12'	26	12/23/97	<1.0	0.039	<0.0050	<0.0050	<0.0050	0.026	<10
D-1-D-12'	27	12/23/97	31	0.026	<0.0050	0.0088	0.040	0.024	<10

Table 1 (cont.) Analytical Results for Soil Samples

Sample Number	Fig. 2 #	Sample Date	TPHg (ppm)	MTBE 8020 (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl benzene (ppm)	Xylenes (ppm)	Total Lead (ppm)
OVER EXCAVATION: Dispenser 2									
D-2-12½'	15	12/22/97	570	32	4.5	1.2	23	95	0.68
D-2-15'	19	12/23/97	1,300	0.78	12	38	33	140	<10
D-2-E-12'	20	12/23/97	16	0.45	1.2	4.2	0.29	1.0	<10
D-2-S-12'	21	12/23/97	<1.0	0.020	<0.0050	<0.0050	0.013	<0.0050	<10
D-2-N-12'	22	12/23/97	<1.0	0.018	<0.0050	<0.0050	<0.0050	<0.0050	<10
D-2-NW-12'	23	12/23/97	<1.0	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<10
D-2-SW-12'	24	12/23/97	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	10
D-2-20'	28	12/29/97	270	3.0	0.94	0.68	2.5	13	na
STOCKPILES:									
SP-A-1,2,3,4		12/19/97	1,900	<0.50	3.0	<0.50	30	150	12
SP-A-5,6,7,8		12/19/97	720	<0.20	1.3	<0.20	13	11	10
SP-A-9,10,11,12		12/19/97	310	<0.050	0.37	<0.050	4.4	4.4	12
SP-A-13,14,15,16		12/19/97	410	1.6	1.1	<0.20	5.8	23	6.7
SP-A-17,18,19,20		12/19/97	1,300	<0.20	3.4	<0.20	29	26	11
SP-A-21,22,23,24		12/19/97	86	<0.050	0.27	0.28	1.5	2.8	11
SP-A-25,26,27,28		12/19/97	290	<0.050	0.59	<0.050	2.3	5.0	10
SP-A-29, 30,31,32		12/19/97	1,900	<0.50	4.7	<0.50	32	22	16
SP-B-1,2,3,4		12/22/97	71	4.4	0.26	0.37	1.5	5.5	4.6
SP-B-5,6,7,8		12/22/97	58	<0.050	0.078	<0.050	0.30	1.2	3.1
SP-B-9,10,11,12		12/22/97	99	<0.050	0.078	0.058	1.1	12	3.1
SP-C-1,2,3,4		12/22/97	15	0.095	0.14	0.20	0.62	2.0	3.5
SP-D-,1,2,3,4		12/23/97	120	<0.20	<0.20	<0.20	0.52	1.3	11
SP-D-5,6,7,8		12/23/97	120	<0.20	<0.20	0.32	1.0	4.9	<10
SP-E-1,2,3,4		12/23/97	740	10	0.54	6.3	15	61	<10
SP-E-5,6,7,8		12/23/97	77	4.5	0.50	1.2	1.6	6.3	<10
SP-F-1,2,3,4		12/23/97	29	0.35	0.071	0.020	0.64	3.0	<10
SP-F-5,6,7,8		12/23/97	25	1.1	0.13	0.41	0.35	2.2	<10

TPHg = total petroleum hydrocarbons as gasoline
MTBE = methyl tertiary butyl-ether

ppm = parts per million
na = not analyzed

Table 2 - Groundwater Data

Sample No.	Fig. 2 No.	GROUNDWATER LEVEL MEASUREMENTS				LABORATORY ANALYTICAL DATA						
		Sampling Date	Sample Location	Depth to Water (feet)	Ground-water Elevation (feet)	TPHg (ppb)	MTBE (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)	Total Lead (ppm)
W-1222-EXCV	29	12/22/97	tank cavity	~13	na	5,100	1,440	23	<5.0	<5.0	440	0.011
W-1223-EXCV	30	12/23/97	tank cavity	~12	na	3,500	950	18	6.2	5.7	400	<0.005
W-1229-TP	31	12/29/97	tank cavity	~11	na	6,700	2,200	31	6.8	<5.0	440	na
W-1229-ED	32	12/29/97[1]	dispenser excavation	~11	na	16,000	7,000	10	10	<5.0	570	na
W-1229-DE	33	12/29/97[2]	dispenser excavation	~11	na	34,000	3,100	82	300	1,800	5,300	na

TPHg = Total Petroleum Hydrocarbons as gasoline
[1] sampled before deepening excavation to 20 feet bsg

MTBE = methyl tertiary butyl-ether by EPA Method 8020
[2] sampled after deepening excavation to 20 feet bsg

ppm = parts per million
ppb = parts per billion

na = not analyzed

TABLE 1

SOIL SAMPLE ANALYTICAL RESULTS
Concentrations in parts per million (ppm)

Sample Identification	Date	Depth Below Grade (ft)	Benzene	Toluene	Ethyl-benzene	Xylenes	TPH[a]
VV-SB/MW-1-10[b]	02/13/91	10	<0.005	<0.005	<0.005	<0.005	<1.0
VV-SB/MW-1-15[b]	02/13/91	15	0.036	0.029	0.17	0.35	10
VV-SB/MW-2-10[b]	02/14/91	10	<0.005	<0.005	0.020	0.020	3.5
VV-SB/MW-2-14[b]	02/14/91	14	<0.005	0.008	0..010	0.060	9.4
VV-SB/MW-3-10[b]	02/14/91	10	0.012	<0.005	0.006	<0.005	<1.0
VV-SB/MW-3-15[b]	02/14/91	15	0.36	0.41	8.0	38	500

RPT086.TA

TABLE 1-Continued

SOIL SAMPLE ANALYTICAL RESULTS
Concentrations in parts per million (ppm)

Sample Identification	Date	Depth Below Grade (ft)	Benzene	Toluene	Ethyl-benzene	Xylenes	TPH[a]
MW-4-1	11/18/91	5	<0.005	<0.005	<0.005	<0.005	<1.0
MW-4-2	11/18/91	10	<0.005	<0.005	<0.005	<0.005	<1.0
MW-5-2	11/18/91	10	0.094	0.027	0.080	0.80	19
MW-5-3	11/18/91	15	1.8	2.5	4.7	29	510
MW-6-5	02/01/93	5	<0.005	<0.005	<0.005	<0.005	<0.5
MW-6-10	02/01/93	10	<0.005	<0.005	<0.005	<0.005	<0.5
MW-7-5	02/01/93	5	<0.005	<0.005	<0.005	<0.005	2.5
MW-7-10	02/01/93	10	<0.005	<0.005	<0.005	<0.005	1.1
MW-8-5	02/01/93	5	<0.005	<0.005	<0.005	<0.005	<0.5

[a] Total petroleum hydrocarbons.
[b] Sampled by Groundwater Resources Inc.

TABLE 2
GROUNDWATER ANALYTICAL RESULTS
Former Beacon Station No. 3699
921 Merchant Street
Vacaville, California

Sample Number*	Date	TPHg (ug/L)	benzene (ug/L)	toluene (ug/L)	ethyl-benzene (ug/L)	xylenes (ug/L)	MTBE (ug/L)
HP1-11	12/10/03	410	<0.50	<0.50	<0.50	<0.50	<5.0
HP1-35	12/10/03	<50	<0.50	<0.50	<0.50	<0.50	<5.0
HP2-15	12/10/03	<50	<0.50	<0.50	<0.50	<0.50	<5.0
HP2-44	12/10/03	<50	<0.50	<0.50	<0.50	<0.50	<5.0
HP3-15	12/11/03	<50	<0.50	<0.50	<0.50	<0.50	9.2
HP3-43	12/11/03	<50	<0.50	<0.50	<0.50	<0.50	<5.0
HP4-17	12/10/03	1200	<0.50	<0.50	11	2.7	<5.0
HP4-40	12/10/03	<50	<0.50	<0.50	1.9	<0.50	<5.0
HP5-15	12/11/03	<50	<0.50	<0.50	<0.50	<0.50	<5.0
HP5-46	12/11/03	<50	<0.50	<0.50	<0.50	<0.50	<5.0

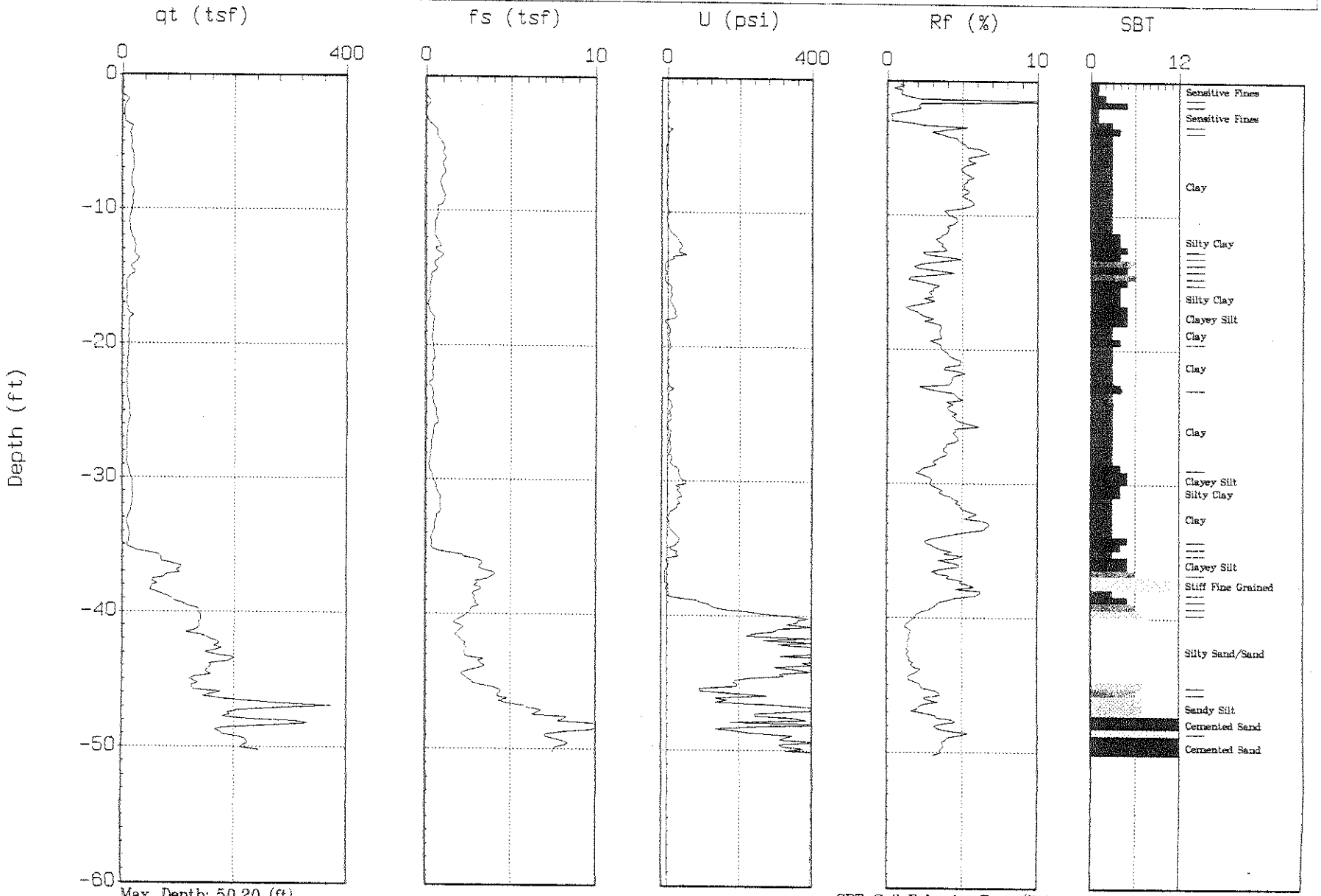
Notes:
* = sample number indicates hydropunch boring and depth, in feet, of groundwater sample
TPHg = total petroleum hydrocarbons as gasoline
MTBE = methyl-t-butyl ether
ug/L = micrograms per liter = parts per billion (ppb)
< = less than indicated reporting limit

GREGG

Horizon

Site : Former Beacon 3699
Location : CPT-01

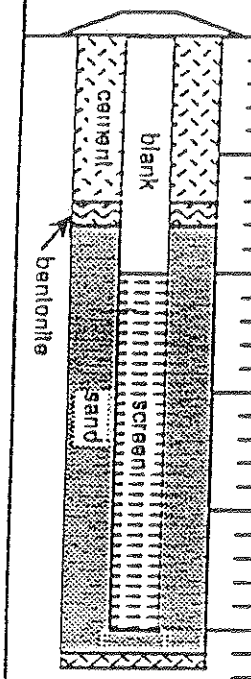
Geologist : C. Roth
Date : 12:10:03 09:42



Max. Depth: 50.20 (ft)

Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

WELL COMPLETION	ANALYSES Lab Benzene TPH ppm	ANALYSES Field Hnu P.I.D. ppm	BLOWCOUNT	DEPTH (feet)	SAMPLE INTERVAL	SAMPLE NUMBER	lithology symbol	u.s.c.s.-desig.	SOIL DESCRIPTION
				0					ASPHALT & BASE ROCK
			18 22 30	5				CL	Lean Clay: black, med - high dry strth, med plasticity, sl product odor, moist, rootlets, homogeneous.
	ND ND	5 50	20 25 20	10		SB/MW 1-10		CL	Lean Clay: gm black - olive gm, med-high dry strth, low-med plasticity, moderate product odor, no organics, moist, mottled.
	0.36 10	70	12 8 10	15		SB/MW 1-15		CL	Lean Clay w/Sand & Silt: gm gry, med dry strth, med plasticity, 20% snd, fn grn,mod - sl product odor, no orgaincs, moist, wet at 15', homogeneous
		0	12 15 15	20 25 30 35 40 45 50					

WELL/ BORING NO.: SB/MW - 1 DATE DRILLED: 2/13/91 LOGGED BY: J A D SURFACE ELEVATION: N. S.
DRILLING COMPANY: RESNA DRILLER: M. VOREES METHOD: HOLLOW STEM AUGER
BORE HOLE DIAMETER: 8 IN. DEPTH DRILLED: 26.5 ' DEPTH TO WATER: INITIAL - 15' ; STATIC -14.3'
CASING TYPE: PVC DIAMETER: 2" SCHEDULE: 40 INTERVAL: 0' TO 10'
SCREEN TYPE: PVC DIAMETER: 2" SLOT SIZE: 0.010 INTERVAL: 10' TO 25'
FILTER PACK TYPE: #2/12 LONESTAR SAND INTERVAL: 26' TO 8
SURFACE SEAL TYPE: NEAT CEMENT OVER BENTONITE INTERVAL: 8' TO .5'

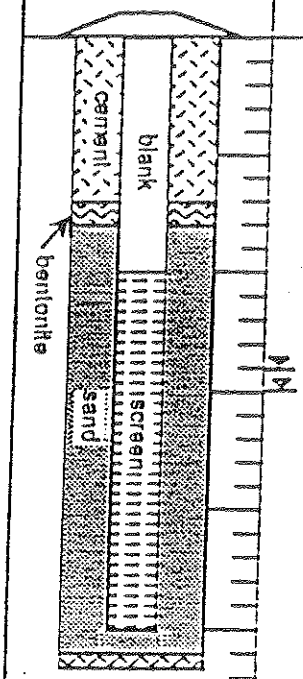
GROUNDWATER RESOURCES, INC.
(805)835-7700
environmental/geotechnical services

PROJECT NUMBER: 2561 - 3

PROJECT NAME: Ultramar - Station #699
BORING LOCATION: 921 MERCHANT AVE, VACAVILLE, CA

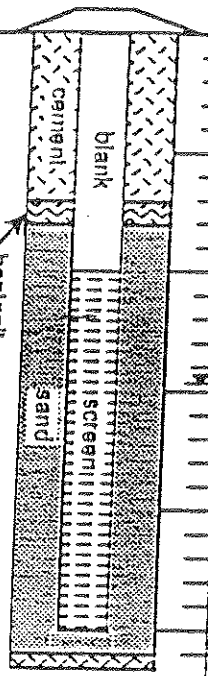
LOG OF BORING SB/MW - 1

PLATE 3

WELL COMPLETION	ANALYSES Lab Benzene TPH ppm	ANALYSES Field Hnu P.I.D. ppm	BLOWCOUNT	DEPTH (feet)	SAMPLE INTERVAL	SAMPLE NUMBER	lithology symbol	u.s.c.s.-desig.	SOIL DESCRIPTION
				0					ASPHALT & BASE ROCK
			22 25 30	5				CL	Lean Clay: dk grn black, med - high dry strth, med plasticity, no product odor, moist, rootlets, homogeneous.
		0							
	ND 3.5	30	10 10 25	10		SB/MW2-10'		CL	Lean Clay: grn black - olive grn, med-high dry strth, low-med plasticity, sl product odor, no organics, moist, mottled.
	ND 9.4	40	9 10 12	15		SB/MW2-14'		CL	Lean Clay w/Sand & Silt: grn gry, med dry strth, med plasticity, 20% snd, fn grn, mod - sl product odor, no orgaincs, moist, tr FeOx staining, homogeneous, wet at 15',
		0		20					
				25					
				30					
				35					
				40					
				45					
				50					

WELL/ BORING NO.: SB/MW - 2 DATE DRILLED: 2/14/91 LOGGED BY: J A D SURFACE ELEVATION: N. S
DRILLING COMPANY: RESNA DRILLER: M. VOREES METHOD: HOLLOW STEM AUGER
BORE HOLE DIAMETER: 8 IN. DEPTH DRILLED: 26.5' DEPTH TO WATER: INITIAL - 15' ; STATIC -14.1'
CASING TYPE: PVC DIAMETER: 2" SCHEDULE: 40 INTERVAL: 0' TO 10'
SCREEN TYPE: PVC DIAMETER: 2" SLOT SIZE: 0.010 INTERVAL: 10' TO 25'
FILTER PACK TYPE: #2/12 LONESTAR SAND INTERVAL: 26' TO 8
SURFACE SEAL TYPE: NEAT CEMENT OVER BENTONITE INTERVAL: 8' TO .5'

GROUNDWATER RESOURCES, INC. (805)835-7700 environmental/geotechnical services PROJECT NUMBER: 2561 - 3	PROJECT NAME: Ultramar - Station #699 BORING LOCATION: 921 MERCHANT AVE, VACAVILLE, CA LOG OF BORING SB/MW - 2	PLATE 4 page 1 of 1

WELL COMPLETION	ANALYSES Lab Benzene TPH ppm	ANALYSES Field Hnu P.I.D. ppm	BLOWCOUNT	DEPTH (feet)	SAMPLE INTERVAL	SAMPLE NUMBER	lithology symbol	u.s.c.s.-desig.	SOIL DESCRIPTION
				0					
			12 18 18	5				CL	Lean Clay: black, med - high dry strth, med plasticity, sl product odor, moist, rootlets, homogeneous.
		10							
	.012 ND	22	12 14 13	10		SB/MW3-10'		CL	Lean Clay: gm black - olive gm, med-high dry strth, low-med plasticity, moderate product odor, no organics, moist, mottled.
	.36 500	120	8 12 15	15		SB/MW3-15'		CL	Lean Clay w/Sand & Silt: gm gry, med dry strth, med plasticity, 15-20% snd, fn gm, mod - strng product odor, no orgainc, moist, wet at 15', homogeneous
		0	14 18 21	20					
				25					
				30					
				35					
				40					
				45					
				50					

WELL/ BORING NO.: SB/MW - 3 DATE DRILLED: 2/14/91 LOGGED BY: J A D SURFACE ELEVATION: N. S.
DRILLING COMPANY: RESNA DRILLER: M. VOREES METHOD: HOLLOW STEM AUGER
BORE HOLE DIAMETER: 8 IN. DEPTH DRILLED: 26.5' DEPTH TO WATER: INITIAL - 15'; STATIC -14.8'
CASING TYPE: PVC DIAMETER: 2" SCHEDULE: 40 INTERVAL: 0' TO 10'
SCREEN TYPE: PVC DIAMETER: 2" SLOT SIZE: 0.010 INTERVAL: 10' TO 25'
FILTER PACK TYPE: #2/12 LONESTAR SAND INTERVAL: 26' TO 8
SURFACE SEAL TYPE: NEAT CEMENT OVER BENTONITE INTERVAL: 8' TO .5'

GROUNDWATER RESOURCES, INC.
(805)835-7700
environmental/geotechnical services

PROJECT NUMBER: 2561 - 3

PROJECT NAME: Ultramar - Station #699
BORING LOCATION: 921 MERCHANT AVE, VACAVILLE, CA

LOG OF BORING SB/MW - 3

PLATE 5

PROJECT NAME/LOCATION	Project Number: 40-91-833	Boring Number: MW-4
Beacon Station No. 699 921 Merchant Street Vacaville, California	Contractor: Woodward Drilling	Drilling Method: HSA
	Driller: Wayne Woodward	Drilling Rig: Mobile B-57
	Start: 10:30 a.m. 11/18/91	Completed: 12:30 p.m. 11/18/91
Landowner: Ultramar Inc.	Surface Elev.: 99.01	Logged By: Kirk T. Larson

Sample Type	Sample No.	Blow Count	Sample Interval (ft)	Sample Recovery (in.)	Depth Scale 1"=4"	Descriptions of Materials and Conditions	Observations: Instrument: OVA Units: ppm	Observations: General Observation Notes
					1	TOPSOIL		
					2	BACKFILL		
					3			
					4			
CA	MW-4-1	3/5/6	5-6.5	18	5	SILTY CLAY; fine grained, dark grey, moist (CL)	0	
					6			
					7			
					8			
					9			
CA	MW-4-2	3/3/5	10-11.5	18	10	SANDY CLAY; fine grained, greenish grey, moist (CL)	40	
					11			
					12			
					13			
					14			
CA	MW-4-3	1/2/3	15-16.5	18	15	SILTY CLAY; fine grained, brown, saturated (CL)	0	
					16			
					17			
					18			
					19			
CA	MW-4-4	2/4/6	20-21.5	12	20	SILTY CLAY; fine grained, brown grey, saturated (CL)		
					21			
					22			
					23			

BOREHOLE WATER LEVEL DATA			
Date	11/18/91		
Time	1:17 p.m.		
GWL	14.98		
Casing Depth	25 ft.		

Delta Environmental Consultants, Inc.

PROJECT NAME/LOCATION:	Project Number:	40-91-833	Boring Number:	MW-4
Beacon Station No. 699 921 Merchant Street Vacaville, California	Contractor:	Woodward Drilling	Drilling Method:	HSA
	Driller:	Wayne Woodward	Drilling Rig:	Mobile B-57
	Start:	10:30 a.m. 11/18/91	Completed:	12:30 p.m. 11/18/91
Landowner: Ultramar Inc.	Surface Elev.:	99.01	Logged By:	Kirk T. Larson

Sample Type	Sample No.	Blow Count	Sample Interval (ft)	Sample Recovery (in.)	Depth Scale 1" = 4'	Descriptions of Materials and Conditions	Observations: Instrument OVA Units: ppm	Observations: General Observation Notes
CA	MW-4-5	3/3/4	25-26.5	18	24	SILTY CLAY; fine grained, grey, saturated (CL)		
					25	Total Depth at 25 ft. Converted to Monitoring Well		
					26			
					27			
					28			
					29			
					30			
					31			
					32			
					33			
					34			
					35			
					36			
					37			
					38			
					39			
					40			
					41			
					42			
					43			
					44			
					45			
					46			

BOREHOLE WATER LEVEL DATA			
Date	11/18/91		
Time	1:17 p.m.		
GWL	14.98		
Casing Depth	25 ft.		

Delta Environmental Consultants, Inc.

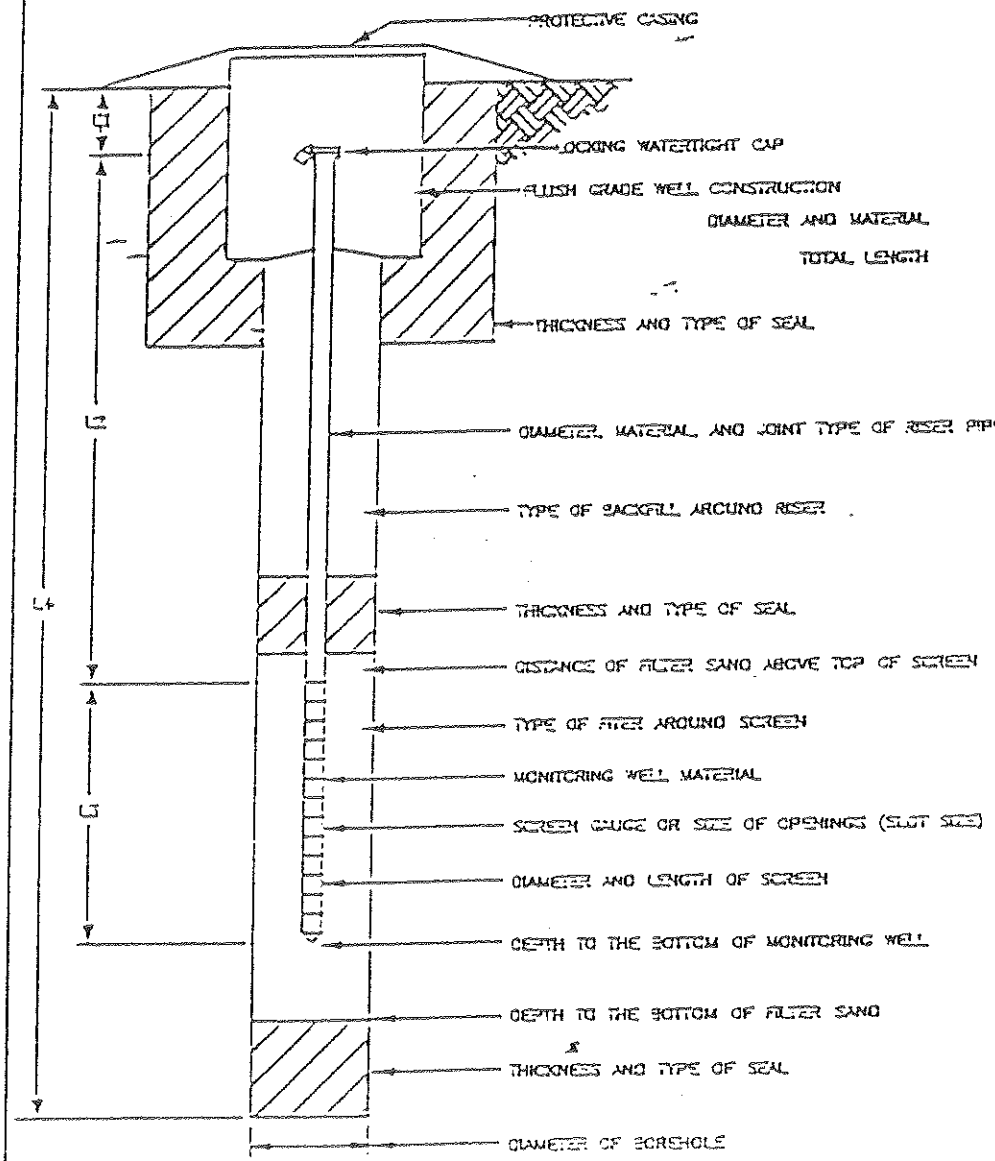
INSTALLATION OF FLUSH GRADE MONITORING WELL

PROJECT: Beacon Station #699
921 Merchant Street, Vacaville, CA

DELTA NO. 40-91-833

MONITORING WELL NO. MW-4

ELEVATIONS:
TOP OF RISER 98.71 feet
GROUND LEVEL 99.01 feet



DIAMETER AND MATERIAL	12-inch concrete
TOTAL LENGTH	
THICKNESS AND TYPE OF SEAL	12-inch concrete
DIAMETER, MATERIAL, AND JOINT TYPE OF RISER PIPE	2-inch Sch 40 PVC flush mounted threads
TYPE OF BACKFILL AROUND RISER	Cement grout w/ < 5% bentonite
THICKNESS AND TYPE OF SEAL	2-feet bentonite
DISTANCE OF FILTER SAND ABOVE TOP OF SCREEN	2 feet
TYPE OF FILTER AROUND SCREEN	#2/12 Lonestar sand
MONITORING WELL MATERIAL	Sch 40 PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT SIZE)	0.010 inch
DIAMETER AND LENGTH OF SCREEN	2 inch x 15 feet
DEPTH TO THE BOTTOM OF MONITORING WELL	25 feet
DEPTH TO THE BOTTOM OF FILTER SAND	25 feet
THICKNESS AND TYPE OF SEAL	None
DIAMETER OF BOREHOLE	8 inches

L1 = 0.3 FT
L2 = 9.7 FT
L3 = 15 FT
L4 = 25 FT

MONITORING WELL WATER LEVEL MEASUREMENTS

DATE	TIME	WATER LEVEL *
11/18/91		14.66
11/18/91		14.08

INSTALLATION COMPLETED:
DATE: 11/18/91
TIME: 00:30

Delta Environmental Consultants, Inc.

* MEASURE POINT: Top of Riser

PROJECT NAME/LOCATION	Project Number	40-91-833	Boring Number	MW-5
Beacon Station No. 699 921 Merchant Street Vacaville, California	Contractor	Woodward Drilling	Drilling Method	HSA
	Driller	Wayne Woodward	Drilling Rig	Mobile B-57
	Start	7:45 a.m. 11/18/91	Completed	2:30 p.m. 11/18/91
Landowner: Ultramar Inc.	Surface Elev.	100.44	Logged By	Kirk T. Larson

Sample Type	Sample No.	Blow Count	Sample Interval (ft)	Sample Recovery (in.)	Depth Scale 1"=4"	Descriptions of Materials and Conditions	Observations: Instrument OVA Units: ppm	Observations: General Observation Note
					1	TOPSOIL		
					2	BACKFILL		
					3			
					4			
CA	MW-5-1	3/5/7	5-6.5	18	5	SILTY CLAY; dense, brown, wet (CL)	0	
					6			
					7			
					8			
					9			
CA	MW-5-2	3/4/6	10-11.5	18	10	SILTY CLAY; dense, brown-black, wet (CL)	25	
					11			
					12			
					13			
					14			
CA	MW-5-3	2/3/5	15-16.5	18	15	SANDY CLAY; fine grained, dark grey, wet (CL)	450	
					16			
					17			
					18			
					19			
CA	MW-5-4	3/6/7	20-21.5	18	20	SILTY CLAY; fine grained, grey, saturated (CL)	0	
					21			
					22			
					23			

BOREHOLE WATER LEVEL DATA			
Date	11/18/91		
Time	3:14 p.m.		
GWL	17.09 ft.		
Casing Depth	25 ft.		

Delta Environmental Consultants, Inc.

PROJECT NAME/LOCATION	Project Number	40-91-833	Boring Number	MW-5
Beacon Station No. 699 921 Merchant Street Vacaville, California	Contractor	Woodward Drilling	Drilling Method	HSA
	Driller	Wayne Woodward	Drilling Rig	Mobile B-57
	Start	7:45 a.m. 11/18/91	Completed	2:30 p.m. 11/18/91
Landowner: Ultramar Inc.d	Surface Elev.	100.44	Logged By	Kirk T. Larson

Sample Type	Sample No.	Blow Count	Sample Interval (ft)	Sample Recovery (in.)	Depth Scale 1" = 4'	Descriptions of Materials and Conditions	Observations Instrument OVA Units: ppm	Observations General Observation Notes
					24	SILTY CLAY; fine grained, grey, saturated (CL)		
					25	Total Depth at 25 ft		No sample collected
					26			
					27			
					28			
					29			
					30			
					31			
					32			
					33			
					34			
					35			
					36			
					37			
					38			
					39			
					40			
					41			
					42			
					43			
					44			
					45			
					46			

BOREHOLE WATER LEVEL DATA			
Date	11/18/91		
Time	3:14 p.m.		
GWL	17.09 ft.		
Casing Depth	25 ft.		

Delta Environmental Consultants, Inc.

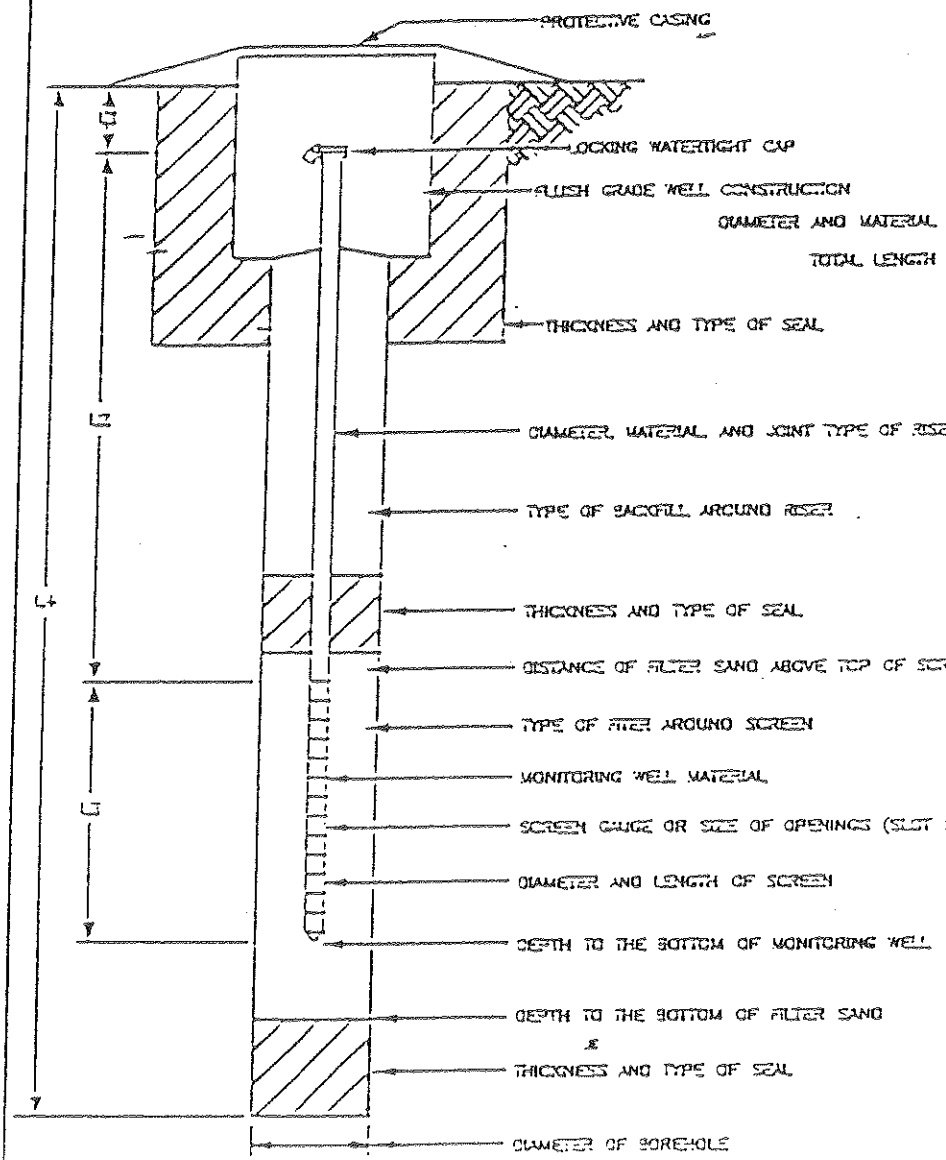
INSTALLATION OF FLUSH GRADE MONITORING WELL

PROJECT: Beacon Station #699
921 Merchant Street, Vacaville, CA

DELTA NO. 40-91-833

MONITORING WELL NO. MW-5

ELEVATIONS:
TOP OF RISER 100.44 feet
GROUND LEVEL 100.14 feet



DIAMETER AND MATERIAL	12-inch dia. metal
TOTAL LENGTH	12 inches
THICKNESS AND TYPE OF SEAL	12-inch concrete
DIAMETER, MATERIAL, AND JOINT TYPE OF RISER PIPE	2-inch Sch 40 PVC Flush mounted threads
TYPE OF BACKFILL AROUND RISER	Neat cement w/ < 5% bentonite
THICKNESS AND TYPE OF SEAL	2-feet bentonite
DISTANCE OF FILTER SAND ABOVE TOP OF SCREEN	2 feet
TYPE OF FILTER AROUND SCREEN	#2/12 Lonestar sand
MONITORING WELL MATERIAL	Sch 40 PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT SIZE)	0.010 inch
DIAMETER AND LENGTH OF SCREEN	2 inch x 15 feet
DEPTH TO THE BOTTOM OF MONITORING WELL	25 feet
DEPTH TO THE BOTTOM OF FILTER SAND	25 feet
THICKNESS AND TYPE OF SEAL	None
DIAMETER OF BOREHOLE	8 inches

L1 = 0.3 FT
L2 = 9.7 FT
L3 = 15 FT
L4 = 25 FT

MONITORING WELL WATER LEVEL MEASUREMENTS

DATE	TIME	WATER LEVEL *
11/18/91		17.09

* MEASURE POINT: Top of Riser

INSTALLATION COMPLETED:
DATE: 11/18/91
TIME: 14:30

Delta Environmental Consultants, Inc.

PROJECT NAME/LOCATION	Project Number	40-91-333	Boring Number	MW-5
Ultramar Station No. 699 921 Merchant Street Vacaville, CA	Contractor	Woodward Drilling	Drilling Method	8" HSA
	Driller		Drilling Rig	
	Start	8:40 a.m. 02/01/93	Completed	9:20 a.m. 02/01/93
Landowner: Ultramar Inc.	Surface Elev.	—	Logged By	Richard Chandler

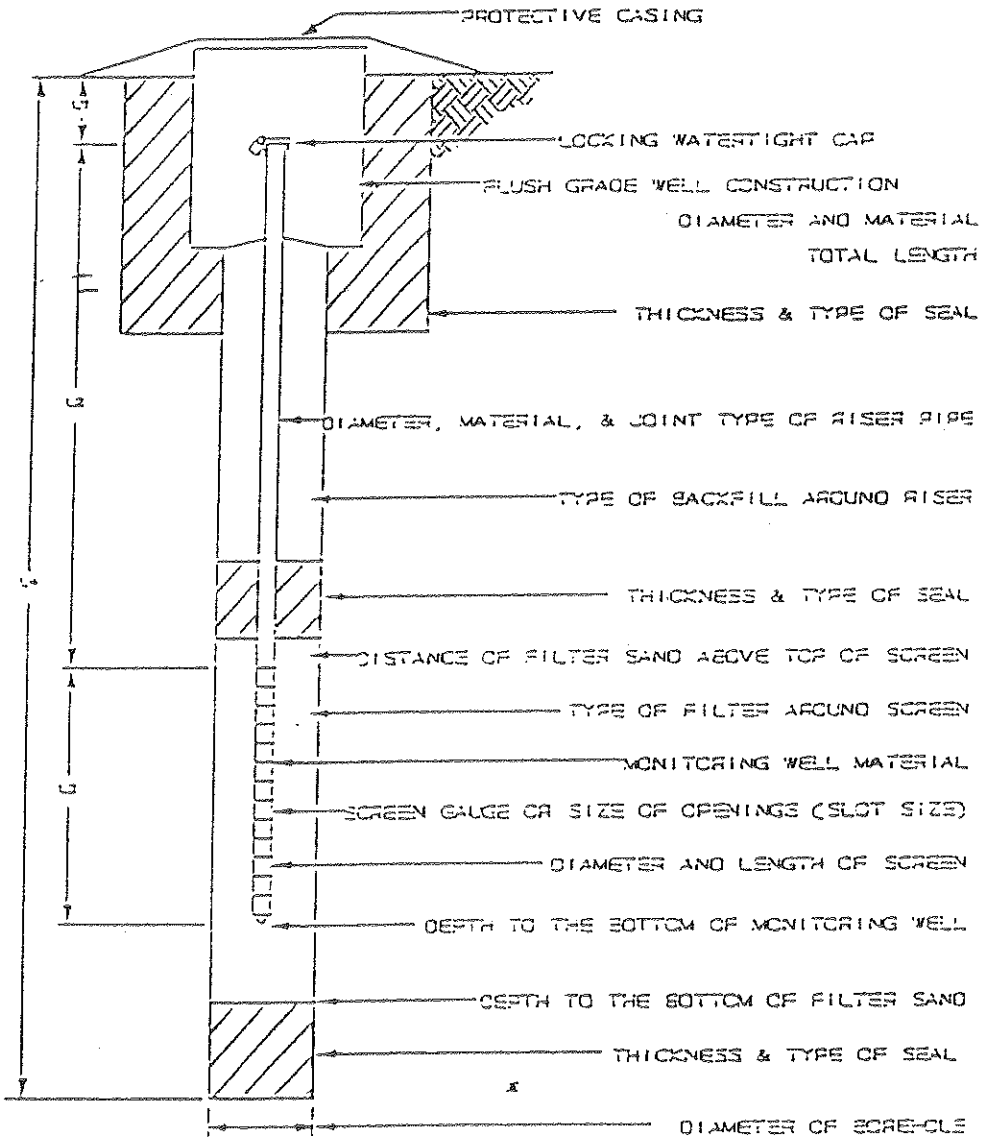
Sample Type	Sample No.	Blow Count	Sample Interval (ft)	Sample Recovery (in.)	Depth Scale 1" = 4'	Descriptions of Materials and Conditions	Observations Instrument Units	Observations hNu ppm	Observations Com
					0	ASPHALT/SURFACE			Fill m to app 4 ft.
					1	SILTY SAND WITH GRAVEL; yellow brown, fine grained, moist (SM)			
					2				
					3				
					4				
		22 22 25		8	5	SILTY CLAY; dark brown, moist, weakly cemented (CL/ML)		0	
					6				
					7				
					8				
					9				
		5 6 6		18	10	SANDY LEAN CLAY; brown, fine grained sand, moist (CL)		0	
					11				
					12				
					13				
					14				
		4 5 6		18	15	SANDY LEAN CLAY; green, fine grained sand, saturated (CL)		3	
					16				
					17				
					x18				
					19				
		5 6 8		18	20	SILTY CLAY; brown, saturated (CL/ML)		0	
					21				
					22	Total depth at 22 ft.			
					23				

BOREHOLE WATER LEVEL DATA			
Date	02/01/93		
Time	12:15 p.m.		
GWL	9.92 ft.		
Casing Depth	22 ft.		

Delta Environmental Consultants, Inc.

INSTALLATION OF FLUSH GRADE MONITORING WELL

Project	Ultramar Station No. 699	Monitoring Well No.	MW-6
	921 Merchant Street	Elevations:	
	Vacaville, CA	Top of Riser:	100.6
Delta No.	40-91-833	Ground Level:	



DIAMETER AND MATERIAL	3-inch steel
TOTAL LENGTH	1 foot
THICKNESS & TYPE OF SEAL	1 foot,concrete
DIAMETER, MATERIAL, & JOINT TYPE OF RISER PIPE	2-inch SCH 40 PVC flush threaded
TYPE OF BACKFILL AROUND RISER	Cement grout with 5% bentonite
THICKNESS & TYPE OF SEAL	1 foot bentonite
DISTANCE OF FILTER SAND ABOVE TOP OF SCREEN	1 foot
TYPE OF FILTER AROUND SCREEN	#3 Lonestar sand
MONITORING WELL MATERIAL	Schedule 40 PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT SIZE)	0.020-inch
DIAMETER AND LENGTH OF SCREEN	2 inch x 15 feet
DEPTH TO THE BOTTOM OF MONITORING WELL	22 feet
DEPTH TO THE BOTTOM OF FILTER SAND	22 feet
THICKNESS & TYPE OF SEAL	N/A
DIAMETER OF BORE-HOLE	8 inches

L1 =	0.5	FT
L2 =	6.5	FT
L3 =	15.0	FT
L4 =	22.0	FT

Installation Completed

Date: 02/01/93

Time: 10:00 a.m.

Delta

Monitoring Well Water Level Measurements		
Date	Time	Water Level*
02/01/93	12:15 p.m.	9.92 feet

* Measure Point Top of riser

PROJECT NAME/LOCATION	Project Number: 40-91-333	Boring Number: MW-7
Ultramar Station No. 699 921 Merchant Street Vacaville, CA	Contractor: Woodward Drilling	Drilling Method: 8" HSA
	Driller: Eric	Drilling Rig: Mobile B-53
	Started: 10:45 a.m. 02/01/93	Completed: 02/01/93
Landowner: Ultramar Inc.	Surface Elev.: —	Logged By: Richard Chandler

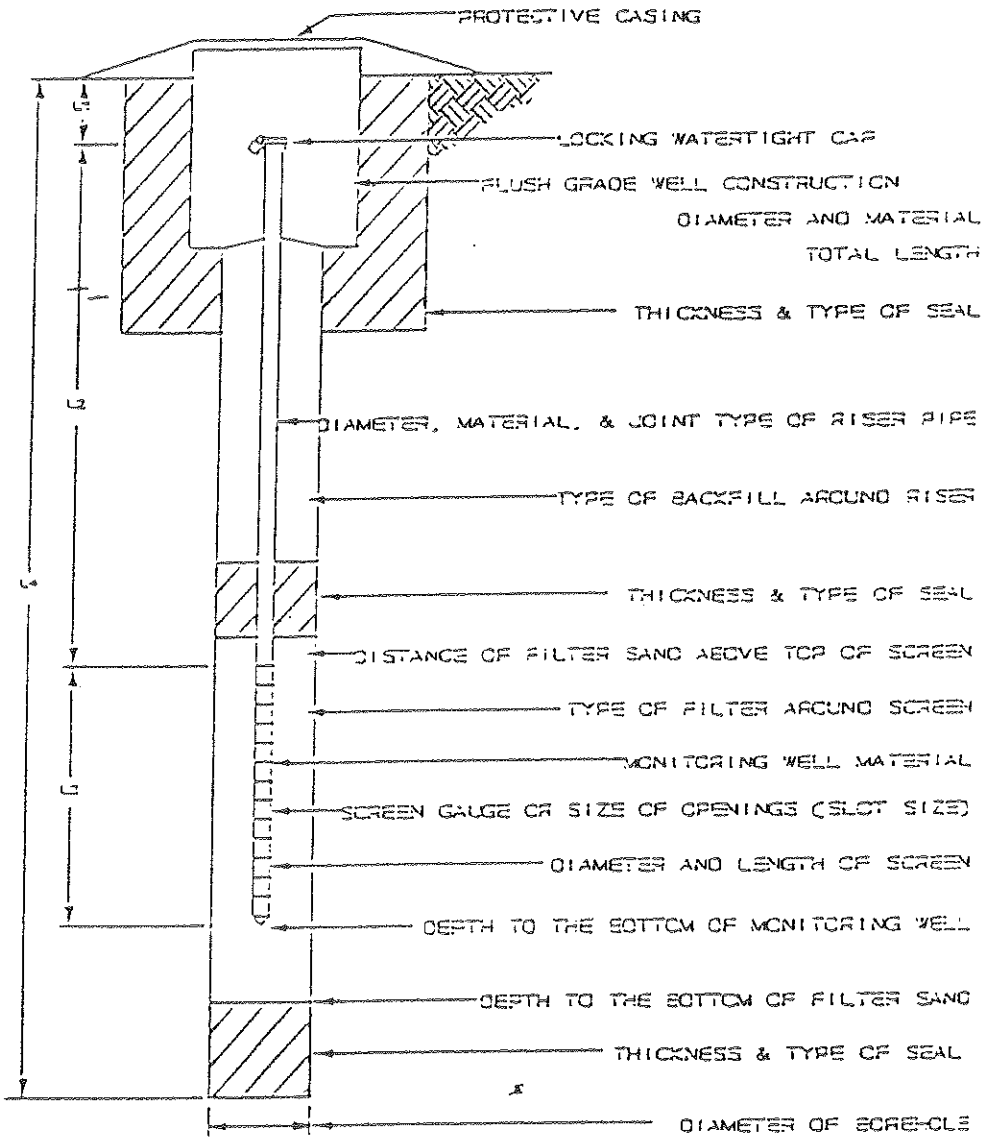
Samples Type	Samples No.	Blows Count	Samples Interval (ft)	Samples Recovery (in.)	Depth Scale 1" = 1'	Descriptions of Materials and Conditions	Observations Instrument Units ppm	Observations Co
					0	ASPHALT/SURFACE		Fill to ap 3 ft.
					1	SANDY LEAN CLAY WITH GRAVEL; green-gray, fine to coarse grained sand, moist (CL/ML)		
					2			
					3			
					4			
		10 16 25		18	5	SILTY CLAY; dark gray-brown, moist (CL/ML)	4	
					6			
					7			
					8			
					9			
		4 6 6		18	10	SANDY LEAN CLAY; green, fine grained sand, moist (CL)	10	
					11			
					12			
					13			
					14			
		3 4 6		18	15	SANDY LEAN CLAY; brown, fine grained sand, saturated (CL/SC)	0	
					16			
					17			
					18			
					19			
				18	20	SANDY LEAN CLAY; brown, fine grained sand, saturated (CL)	0	
					21			
					22	Total depth at 22 ft.		
					23			

BOREHOLE WATER LEVEL DATA			
Date	02/01/93		
Time	1:45 p.m.		
GWL	9.25 ft.		
Casing Depth	22 ft.		

Delta Environmental Consultants, Inc.

INSTALLATION OF FLUSH GRADE MONITORING WELL

Project	Ultramar Station No. 699	Monitoring Well No.	MW-
	921 Merchant Street	Elevations:	
	Vacaville, CA	Top of Riser:	100.
Delta No.	40-91-833	Ground Level:	



DIAMETER AND MATERIAL	8-inch steel
TOTAL LENGTH	1 foot
THICKNESS & TYPE OF SEAL	1 foot concrete
DIAMETER, MATERIAL, & JOINT TYPE OF RISER PIPE	2-inch SCH 40 PVC flush threaded
TYPE OF BACKFILL AROUND RISER	Cement grout with 5% bentonite
THICKNESS & TYPE OF SEAL	1 foot bentonite
DISTANCE OF FILTER SAND ABOVE TOP OF SCREEN	1 foot
TYPE OF FILTER AROUND SCREEN	#3 Lonestar sand
MONITORING WELL MATERIAL	Schedule 40 PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT SIZE)	0.020-inch
DIAMETER AND LENGTH OF SCREEN	2 inch x 15 feet
DEPTH TO THE BOTTOM OF MONITORING WELL	22 feet
DEPTH TO THE BOTTOM OF FILTER SAND	22 feet
THICKNESS & TYPE OF SEAL	N/A
DIAMETER OF BOREHOLE	8 inches

L1 =	0.5	FT
L2 =	6.5	FT
L3 =	15.0	FT
L4 =	22.0	FT

Installation Completed

Date: 02/01/93

Time: 12:15 p.m.

Delta

Monitoring Well Water Level Measurements

Date	Time	Water Leve
02/01/93	1:45 p.m.	9.25 feet

* Measure Point Top of riser

PROJECT NAME/LOCATION	Project Number	40-91-433	Boring Number	MW-3
Ultramar Station No. 699 921 Merchant Street Vacaville, CA	Contractor	Woodward Drilling	Drilling Method	8" HSA
	Driller	Erie	Drilling Rig	
	Start	02/01/93	Completed	02/01/93
Landowner: Ultramar Inc.	Surface Elev.	—	Logged By	Richard Chandler

Sample Type	Sample No.	Blow Count	Sample Interval (ft)	Sample Recovery (in)	Depth Scale 1" = 4'	Descriptions of Materials and Conditions	Observation Instrument Units	Observation Ppm	Observation C
					0	ASPHALT/SURFACE			Fil to s LS
					1	SANDY LEAN CLAY WITH GRAVEL; dark gray-brown, fine grained sand, moist (CL)			
					2				
					3				
					4				
		NR		6	5	SILTY CLAY; brown, moist (CL/ML)		NS	
					6				
					7				
					8				
					9				
		3 4 5		18	10	CLAYEY SAND; green-brown, fine grained, saturated (SC)		19	
					11				
					12				
					13				
					14				
		2 5 8		18	15	SILTY CLAY; green-brown, saturated (CL/ML)		160	
					16				
					17				
					*18				
					19				
		2 6 8		18	20	SILTY CLAY; brown, saturated (CL/ML)		7	
					21	Total depth at 20 ft.			
					22				
					23				

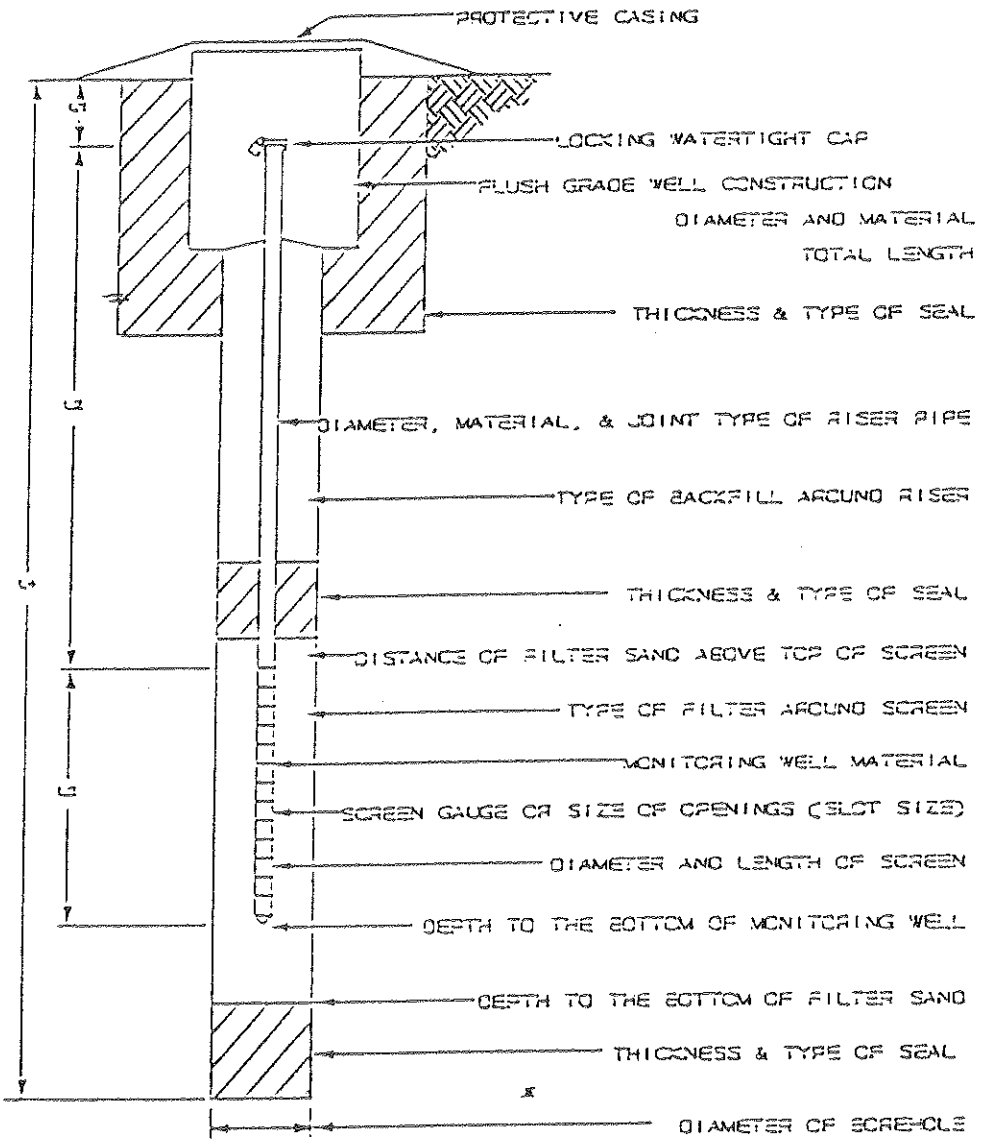
BOREHOLE WATER LEVEL DATA			
Date	02/01/93		
Time	3:10 p.m.		
GWL	7.47 ft.		
Casing Depth	20 ft.		

Delta Environmental Consultants, Inc.

Sheet 1 o

INSTALLATION OF FLUSH GRADE MONITORING WELL

Project	Ultramar Station No. 699	Monitoring Well No.	MW-8
	921 Merchant Street	Elevations:	
	Vacaville, CA	Top of Riser:	97.50
Delta No.	40-91-833	Ground Level:	



DIAMETER AND MATERIAL	8-inch steel
TOTAL LENGTH	1 foot
THICKNESS & TYPE OF SEAL	1 foot concrete
DIAMETER, MATERIAL, & JOINT TYPE OF RISER PIPE	2-inch SCH 40 PVC flush threaded
TYPE OF BACKFILL AROUND RISER	Cement grout with 5% bentonite
THICKNESS & TYPE OF SEAL	1 foot bentonite
DISTANCE OF FILTER SAND ABOVE TOP OF SCREEN	1 foot
TYPE OF FILTER AROUND SCREEN	#3 Lonestar sand
MONITORING WELL MATERIAL	Schedule 40 PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT SIZE)	0.020-inch
DIAMETER AND LENGTH OF SCREEN	2 inch x 15 feet
DEPTH TO THE BOTTOM OF MONITORING WELL	20 feet
DEPTH TO THE BOTTOM OF FILTER SAND	20 feet
THICKNESS & TYPE OF SEAL	N/A
DIAMETER OF BOREHOLE	8 inches

L1 =	0.5	FT
L2 =	4.5	FT
L3 =	15.0	FT
L4 =	20.0	FT

Installation Completed

Date: 02/01/93

Time: 2:30 p.m.

Delta

Monitoring Well Water Level Measurements

Date	Time	Water Level*
02/01/93	3:10 p.m.	7.47 feet

* Measure Point Top of riser

Boring Number: MW-9

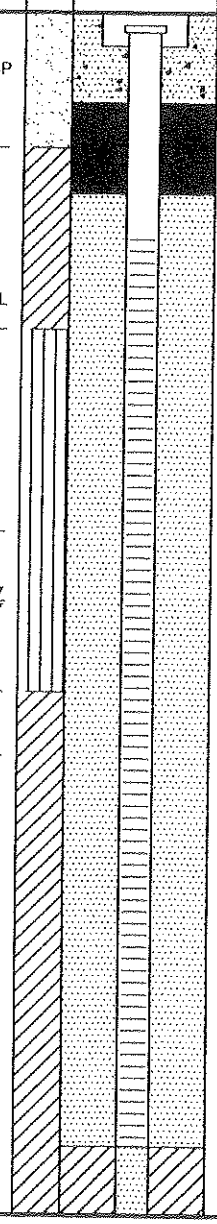
HORIZON ENVIRONMENTAL INC.

Job Number: 1699.24
Site Location: Beacon #699, Vacaville, CA
Drilling Company: V & W Drilling
Drilled By: Robert & Larry
Date Drilled: 11/16/98
Logged By: L. Smith

Drilling Method: 10-inch Hollow Stem Auger
Sampling Method: Split-Spoon Sampler
Total Depth: 26.5 Feet
Depth To Groundwater: 13 Feet

Depth In Feet	Sample Number	Blow Count	Inches Driven	Inches Recovered	PID Reading In PPM	Sampling Interval	Soil Description	USCS Classification
1						1	GRAVELLY SAND, yellowish brown, moist: FILL, no odor.	SP
2						2		
3						3		
4						4		
5						5		
6	S-5	11 14 15	18	18	0	6	SILTY CLAY, black, moist, hard, no odor.	CL
7						7		
8						8		
9						9		
10						10		
11	S-11	10 11 11	18	18	0	11	SANDY SILT WITH CLAY, dark reddish brown, moist, medium dense, no odor.	ML
12						12		
13						13		▽
14						14		
15						15		
16	S-16	2 2 3	18	18	9	16	SILTY CLAY, greenish blue, wet, firm, medium plasticity, no odor.	CL
17						17		
18						18		
19						19		
20						20		
21	S-21	10 10 8	18	18	0	21	SANDY CLAY, dark yellowish brown, wet, very stiff, low to medium plasticity, slight odor.	
22						22		
23						23		
24						24		
25						25		
26	S-26	15 18 24	18	18	0	26	With sand stringers.	
27						27	Total depth = 26.5 feet bgs.	
28						28		
29						29		
30						30		

Graphic Representation



Well Construction

Comments

Casing Installation Data:

4-inch PVC
0.020-inch screen

Boring Number: MW-10

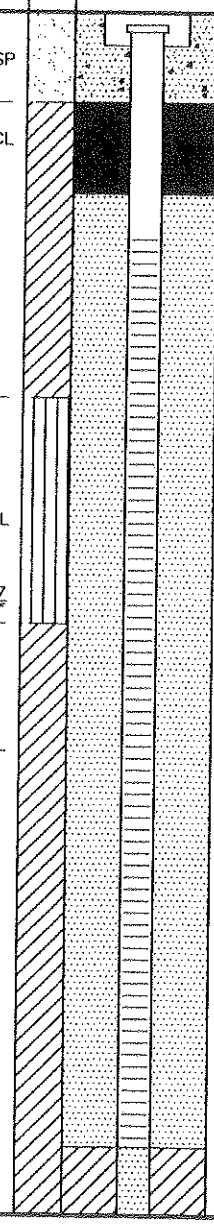
HORIZON ENVIRONMENTAL INC.

Job Number: 1699.24
Site Location: Beacon #699, Vacaville, CA
Drilling Company: V & W Drilling
Drilled By: Robert & Larry
Date Drilled: 11/16/98
Logged By: L. Smith

Drilling Method: 10-inch Hollow Stem Auger
Sampling Method: Split-Spoon Sampler
Total Depth: 26.5 Feet
Depth To Groundwater: 13 Feet

Depth In Feet	Sample Number	Blow Count	Inches Driven	Inches Recovered	PID Reading In PPM	Sampling Interval	Soil Description	USCS Classification
1						1	GRAVELLY SAND, yellowish brown, moist: FILL.	SP
2						2		
3						3	SILTY CLAY, black, moist, hard, no odor.	CL
4						4		
5						5		
6	S-6	11 19 24	18	0	–	6	No recovery.	
7						7		
8						8		
9						9		
10						10		
11	S-11	10 11 14	18	18	0	11	SANDY SILT WITH CLAY, dark reddish brown, moist, medium dense, no odor.	ML
12						12		
13						13	▽	
14						14	SILTY CLAY, blueish gray, wet, medium plasticity, slight odor.	
15						15		
16	S-16	2 3 5	18	18	0	16	Dark yellowish brown, wet, firm, no odor.	CL
17						17		
18						18		
19						19		
20						20		
21	S-21	10 10 10	18	18	0	21	Very stiff.	
22						22		
23						23		
24						24		
25						25		
26	S-26	15 16 1	18	18	0	26	SANDY CLAY, dark yellowish brown, wet, low plasticity, hard, no odor.	
27						27	Total depth = 26.5 feet bgs.	
28						28		
29						29		
30						30		

Graphic Representation / Well Construction



Comments

Casing Installation Data:

4-inch PVC
0.020-inch screen

Boring Number: SW-1

HORIZON ENVIRONMENTAL INC.

Job Number: 1699.24
Site Location: Beacon #699, Vacaville, CA
Drilling Company: V & W Drilling
Drilled By: Robert & Larry
Date Drilled: 11/16/98
Logged By: L. Smith

Drilling Method: 8-inch Hollow Stem Auger
Sampling Method: Split-Spoon Sampler
Total Depth: 41 Feet
Depth To Groundwater: 13 Feet

Depth In Feet	Sample Number	Blow Count	Inches Driven	Inches Recovered	PID Reading In PPM	Sampling Interval	Soil Description	USCS Classification	Graphic Representation	Well Construction	Comments
1						1	SANDY GRAVEL, dark gray, damp to moist, loose to medium dense; tank pit backfill.	GW			Casing Installation Data: 2-inch PVC 0.010-inch screen
2						2					
3						3					
4						4					
5						5					
6						6					
7						7					
8						8					
9						9					
10						10					
11						11					
12						12					
13						13	Wet at 13 feet.	▽			
14						14					
15						15					
16						16					
17						17					
18						18					
19						19	3/4" Aggregate.				
20						20					
21	S-21	5 5 5	18	12	0	21	SANDY CLAY, dark yellowish brown with gray mottling, wet, stiff, slight odor.	CL			
22						22					
23						23					
24						24					
25						25					
26	S-26	9 11 13	18	18	0	26	Reddish yellow-brown, no odor.				
27						27					
28						28					
29						29					
30						30					

(Boring Continued On Next Page)

Boring Number: SW-1

HORIZON ENVIRONMENTAL INC.

Job Number: 1699.24
Site Location: Beacon #699, Vacaville, CA
Drilling Company: V & W Drilling
Drilled By: Robert & Larry
Date Drilled: 11/16/98
Logged By: L. Smith

Drilling Method: 8-inch Hollow Stem Auger
Sampling Method: Split-Spoon Sampler
Total Depth: 41 Feet
Depth To Groundwater: 13 Feet

Depth In Feet	Sample Number	Blow Count	Inches Driven	Inches Recovered	PID Reading In PPM	Sampling Interval	Soil Description	USCS Classification	Graphic Representation	Well Construction	Comments
31	S-31	15 20 26	18	1	–	31	SANDY CLAY, reddish yellow-brown, wet, stiff, no odor.	CL			Casing Installation Data: 2-inch PVC 0.010-inch screen
32						32					
33						33					
34						34					
35						35					
36	S-36	11 21 30	18	18	0	36	CLAYEY SAND, dark yellowish brown, red staining in sand stringers, wet, very dense, no odor.	SC			
37						37					
38						38					
39						39					
40						40					
41	S-41	40 50	12	12	0	41	With gravel.				
42						42					
43						43					
44						44					
45						45					
46						46					
47						47					
48						48					
49						49					
50						50					
51						51					
52						52					
53						53					
54						54					
55						55					
56						56					
57						57					
58						58					
59						59					
60						60					

Total depth = 41 feet bgs.

Boring Number: SW-2

HORIZON ENVIRONMENTAL INC.

Job Number: 1699.24
Site Location: Beacon #699, Vacaville, CA
Drilling Company: V & W Drilling
Drilled By: Robert & Larry
Date Drilled: 11/16/98
Logged By: L. Smith

Drilling Method: 8-inch Hollow Stem Auger
Sampling Method: Split-Spoon Sampler
Total Depth: 41.5 Feet
Depth To Groundwater: 13 Feet

Depth In Feet	Sample Number	Blow Count	Inches Driven	Inches Recovered	PID Reading In PPM	Sampling Interval	Soil Description	USCS Classification	Graphic Representation	Well Construction	Comments
1							SANDY GRAVEL, dark gray, damp to moist, loose to medium dense: tank pit backfill.	GW			Casing Installation Data: 2-inch PVC 0.010-inch screen
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13							Wet at 13 feet.	▽			
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26	S-26	10 11 14	18	6	–		3/4" Aggregate.				
27											
28							SANDY CLAY, reddish brown, wet, very stiff, no odor.	CL			
29											
30											

(Boring Continued On Next Page)

Boring Number: SW-2

HORIZON ENVIRONMENTAL INC.

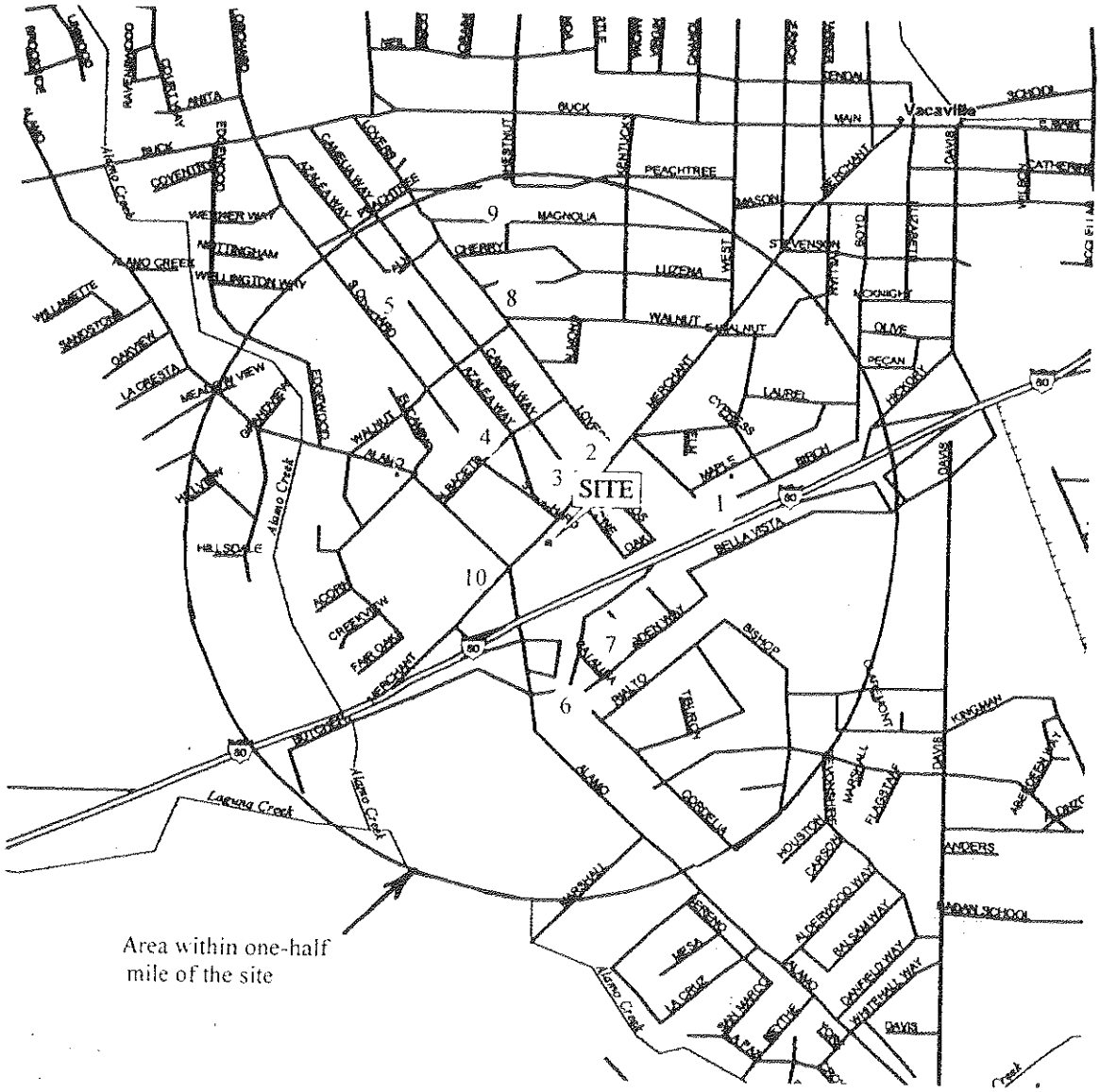
Job Number: 1699.24
Site Location: Beacon #699, Vacaville, CA
Drilling Company: V & W Drilling
Drilled By: Robert & Larry
Date Drilled: 11/16/98
Logged By: L. Smith

Drilling Method: 8-inch Hollow Stem Auger
Sampling Method: Split-Spoon Sampler
Total Depth: 41.5 Feet
Depth To Groundwater: 13 Feet

Depth In Feet	Sample Number	Blow Count	Inches Driven	Inches Recovered	PID Reading In PPM	Sampling Interval	Soil Description	USCS Classification	Graphic Representation	Well Construction	Comments
31	S-31	10 13 18	18	12	0	31	SANDY CLAY, reddish brown, wet, very stiff, no odor.	CL			Casing Installation Data: 2-inch PVC 0.010-inch screen
32						32					
33						33					
34						34					
35						35					
36	S-36	19 21 41	18	14	0	36	SILTY SAND WITH GRAVEL, dark yellowish brown, wet, very dense, no odor.	SM			
37						37					
38						38					
39						39					
40						40					
41	S-41	13 14 16	18	16	0	41					
42						42	Total depth = 41.5 feet bgs.				
43						43					
44						44					
45						45					
46						46					
47						47					
48						48					
49						49					
50						50					
51						51					
52						52					
53						53					
54						54					
55						55					
56						56					
57						57					
58						58					
59						59					
60						60					

APPENDIX C

WELL SURVEY DATA



Source: Figure Modified From Street Atlas USA, Delorme (1995).

HORIZON ENVIRONMENTAL INC.

Project Number: 1699.21 Prepared By: G. Barker Reviewed By:	Drawn By: D. Alston Date: 2/96 Revised Date:	**SITE VICINITY MAP** BEACON STATION NO. 699 921 MERCHANT STREET VACAVILLE, CALIFORNIA

FIGURE

1

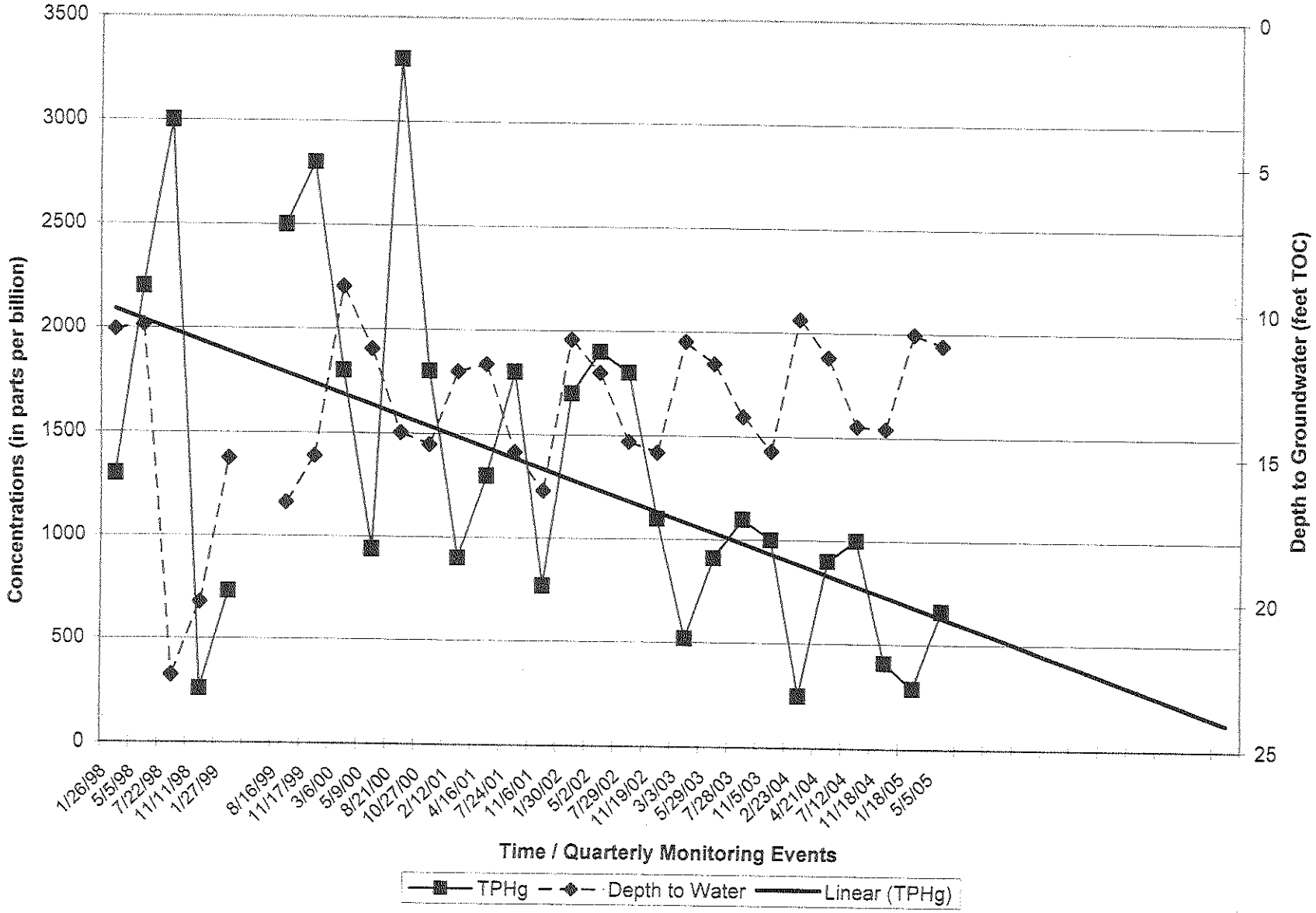
TABLE 4
Well Survey Data
Former Beacon 3699
921 Merchant Street
Vacaville, California

Map Location/Well Owner	Well Type	Well Location	Year Drilled	Total Depth (feet)	Well Diameter (inches)	Screened Interval (feet)	Distance (ft) / Direction from Site
1 / Dominick Alonzo		T6N/1W-20: 2,600 ft north and 1,150 ft west of the southeast corner of Section 20.	1943	60	12		1,254 / NE
2 / Mike Abasete	Irrigation	Merchant St. at Lovers Ln., west of Lovers Ln.	1950	64	14	28 to 64	752 / NE
2 / Mike Abasete	Irrigation	Merchant St. at Lovers Ln., 500 ft north of Merchant St., 75 ft west of Lovers Ln.	1950	64	14	28 to 64	422 / NE
3 / Beacon Oil	Test Well	60 ft west of Merchant St., 30 ft south of Camelia Wy.	1983	23	4		422 / NE
4 / Mike Albacete	Irrigation	Albacete Dr.	1956	47	12	27 to 47	884 / NW
5 / Bethany Lutheran Church	Domestic	500 Azalea Wy., 55 ft south of Azalea Wy.	1958	48	8	28 to 48	2,218 / NW
6 / Frank Bonifacio	Domestic	T6N/1W-20Q02	1956	60	6	40 to 60	1,135 / S
7 / C. Almonte	Irrigation	T6N/1W-20R01	1951	56	6	31 to 56	950 / SE
8 / Earl H. Chamberlain	Domestic	625 Lovers Ln., T6N/1W-20D	1953	58	6	28 to 58	1,848 / NW
9 / William Whaley	Domestic	Chestnut St.	1954	66	6	46 to 66	2,508 / NW
10 / Shell Oil	8 Test Wells	Merchant St. at Alamo St.	1989-90	20 to 30			436 / W

APPENDIX D

CONCENTRATION VS. TIME GRAPHS

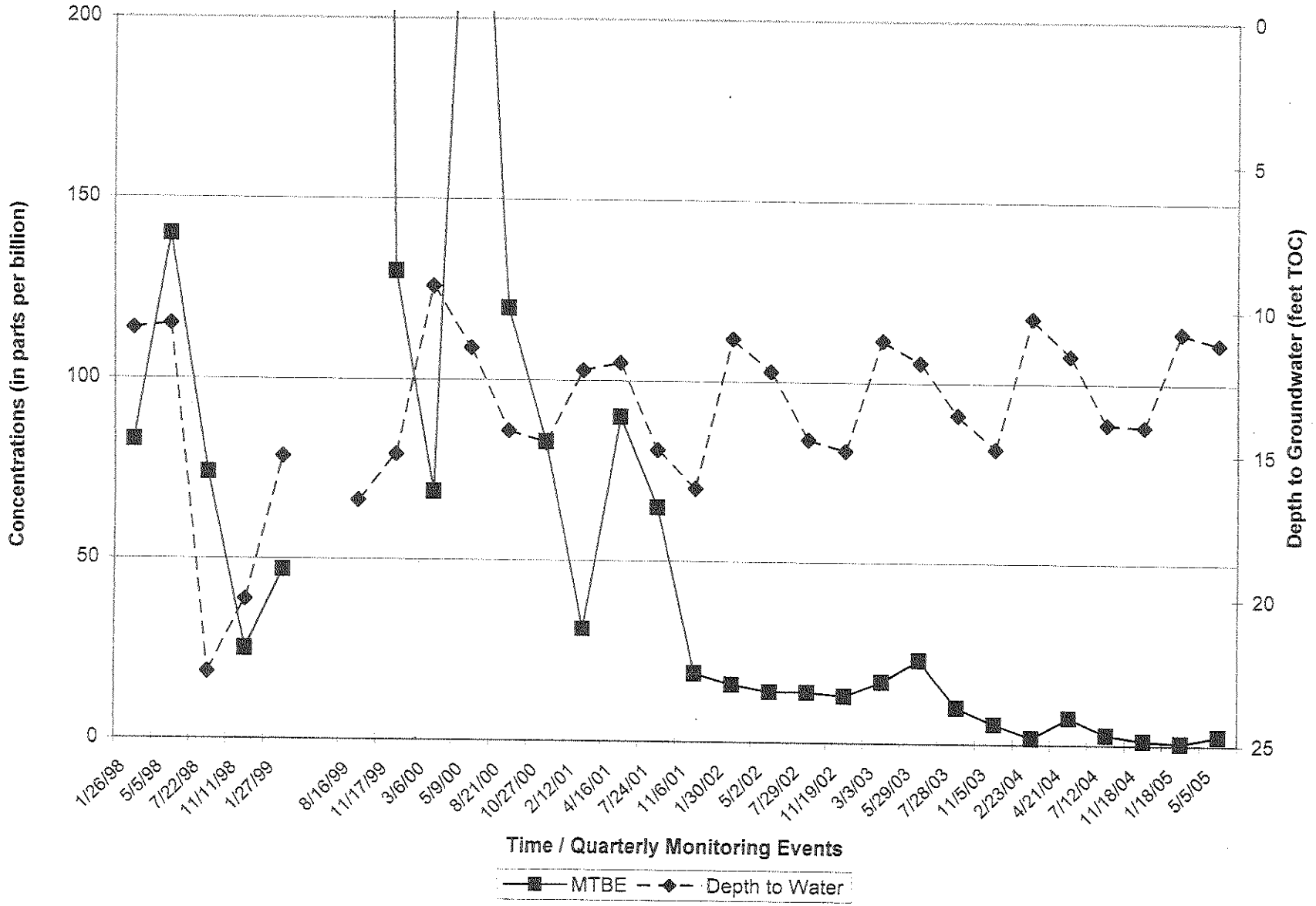
MW-5 (screen interval 10-25' bsg)
TPHg and Depth to Groundwater vs. Time
Former Beacon Station No. 3699, Vacaville, California



699graphs
Project No. 1699.28

HORIZON ENVIRONMENTAL INC.

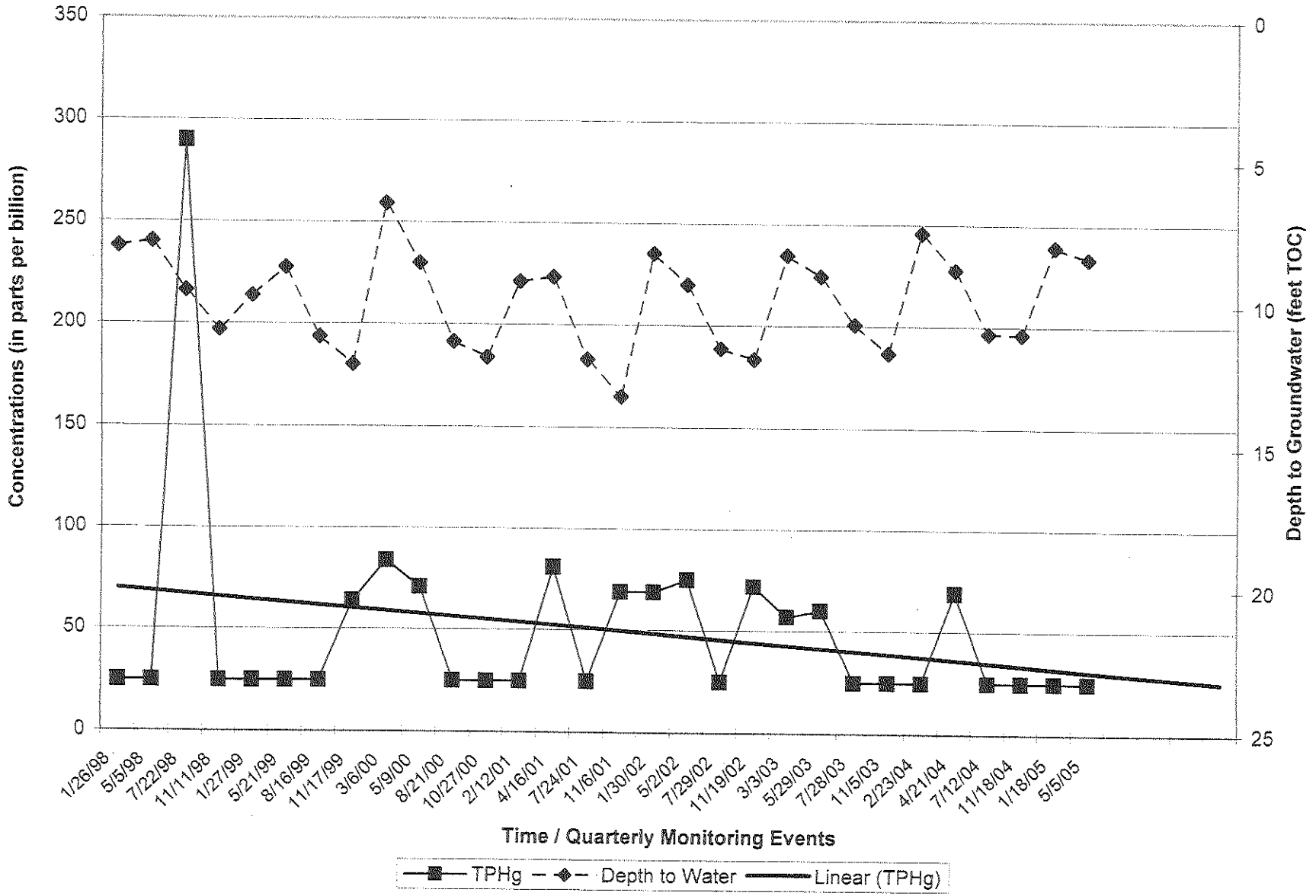
MW-5 (screen interval 10-25' bsg)
MTBE and Depth to Groundwater vs. Time
Former Beacon Station No. 3699, Vacaville, California



699graphs
Project No. 1699.28

HORIZON ENVIRONMENTAL INC.

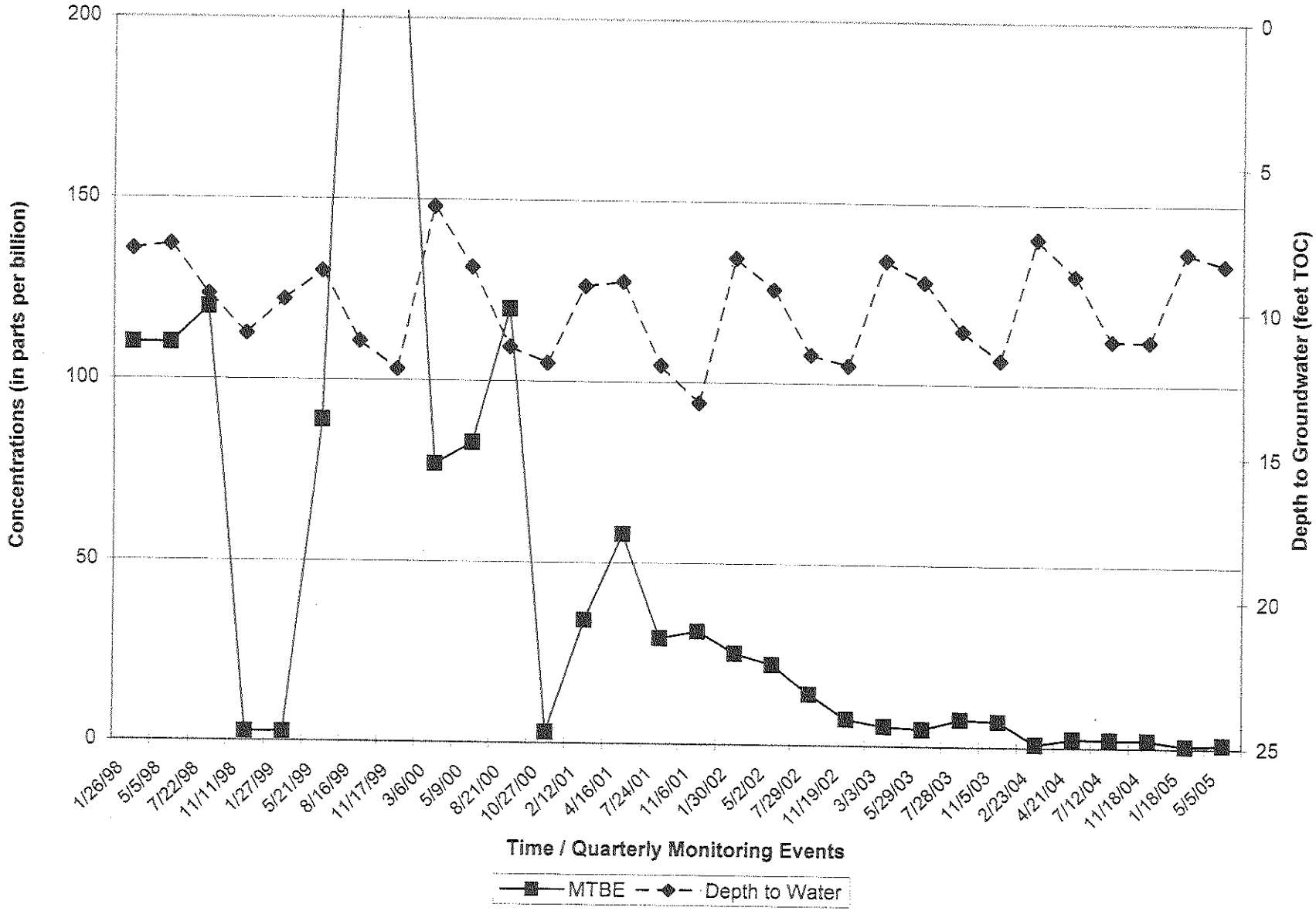
MW-8 (screen interval 5-20' bsg)
TPHg and Depth to Groundwater vs.Time
Former Beacon Station No. 3699, Vacaville, California



699graphs
Project No. 1699.28

HORIZON ENVIRONMENTAL INC.

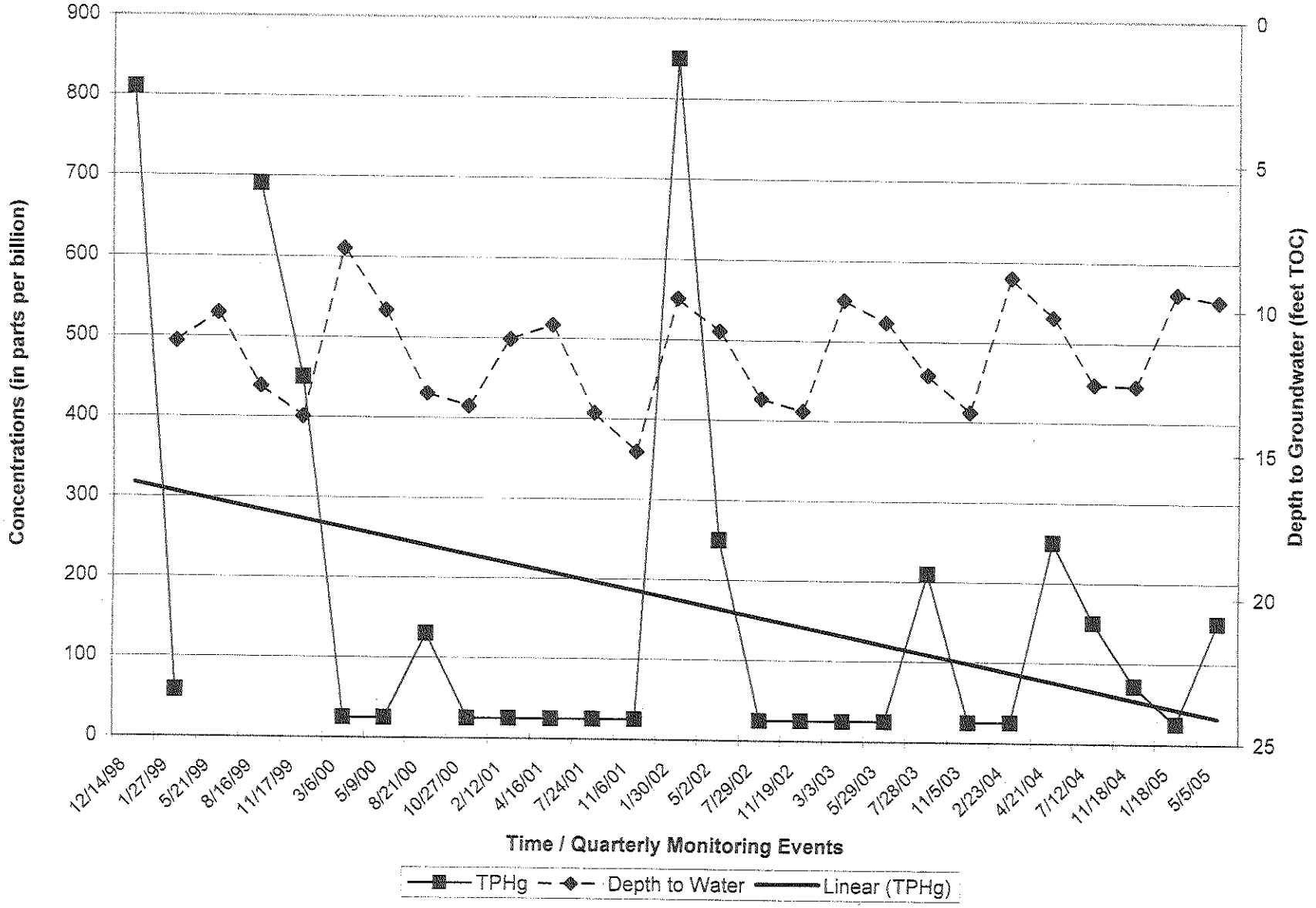
MW-8 (screen interval 5-20' bsg)
MTBE and Depth to Groundwater vs. Time
Former Beacon Station No. 3699, Vacaville, California



699graphs
Project No. 1699.28

HORIZON ENVIRONMENTAL INC.

MW-9 (screen interval 5-25' bsg)
TPHg and Depth to Groundwater vs. Time
Former Beacon Station No. 3699, Vacaville, California



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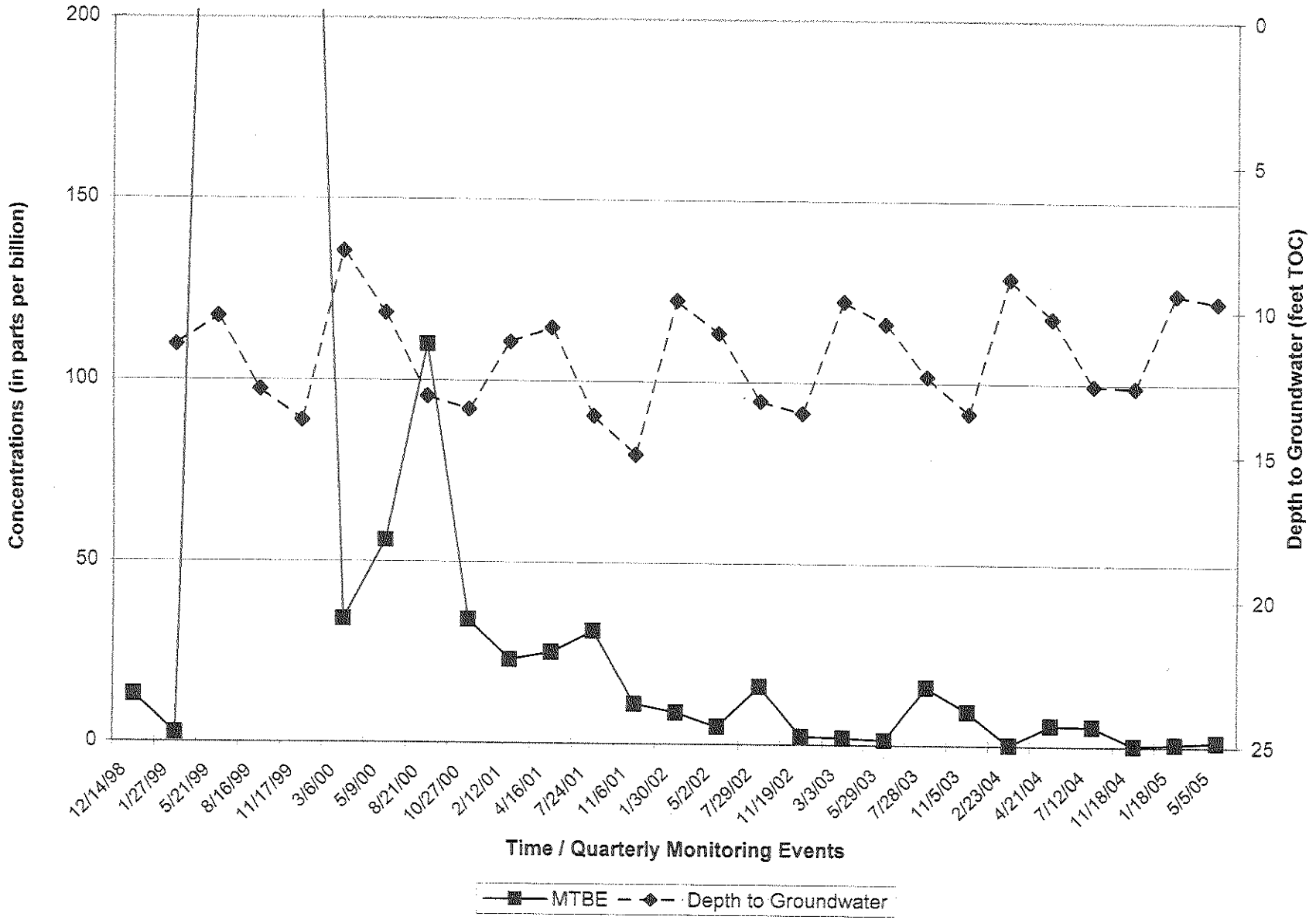
MW-9 (screen interval 5-25' bsg)
MTBE and Groundwater Elevation vs. Time
Former Beacon Station No. 3699, Vacaville, California



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