March 4, 2011

Jerry Wickham, CEG
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Subject: **Addendum to Corrective Action Plan**
Sunol Tree Gas
3004 Andrade Road, Sunol
Fuel Leak Case No. RO0002448

Dear Mr. Wickham:

This Addendum to the *Draft Corrective Action Plan* (CAP) for the subject site dated December 15, 2010 is submitted in response to your technical comments regarding this document contained in a letter dated January 26, 2011. For ease of your review, responses to your comments are provided in the same order that you presented them.

Responses to Technical Comments

1. ***Plume Stability and Degradation of MtBE-*** [Based on the Quarterly Monitoring Report, Second Quarter 2010, dated May 19, 2010] *MtBE concentrations appear to be increasing in the intermediate and/or deep zones of several CMT wells (CMT-1, -2, -4, -5, -6, -7 and -12). Based on the increases in MtBE concentrations in the intermediate and deep well, the decreases in MtBE concentrations noted in several shallow wells are more likely related to plume migration rather than degradation of MtBE. Given the absence of other evidence of MtBE degradation such as degradation daughter products (tBA), it is not clear that MtBE is degrading at a significant rate. Although overall MtBE concentrations can be expected to decrease as a result of plume expansion and use of the T-Bear water well as a pump and treat system, an MNA alternative that allows continued expansion of the plume in a sole source aquifer is not protective of human health or groundwater beneficial uses. We request that you incorporate these factors into the evaluation and revise the Draft CAP.*

   It is true that when groundwater analytical data from the April 2010 sampling event are compared to the previous sampling event (October 2006), MtBE concentrations increased in 13 sampling points, decreased in 11 sampling points and were below laboratory detection limits in the remaining 18 sampling points. It is also true that when groundwater data from the October 2010 sampling event (Quarterly Monitoring Report, Fourth Quarter 2010) are compared to the April 2010 sampling event, MtBE concentrations increased in 5 sampling points, decreased in 3 sampling points and were below laboratory detection limits in the remaining 11 sampling points. MtBE concentration increases in the October 2010 data were primarily in the intermediate depth sampling points (30-45 fbg). It is true that in the April 2010 data, tBA was not detected in many sampling points with detectable MtBE

concentrations. It is also true that in the October 2010 data, tBA was detected in 5 sampling points where MtBE was detected (CMT-3-2, 6-1, 6-2, 7-1 and PZ-2a). In addition, tBA was detected in sampling point CMT-3-1 when MtBE was below the laboratory detection limit. In this same October 2010 data set, tBA was not detected when MtBE was detected in two sampling points (CMT-1-2 and 6-3).

The increase in MtBE concentrations in some intermediate depth sampling points is likely due to migration of the MtBE plume from the upgradient source area through the A-A' transect which is approximately 150 feet downgradient of the former USTs. It is well documented that MtBE is a persistent chemical contaminant in aquifers when compared to hydrocarbon constituents such as BTEX. However, MtBE does degrade over time to daughter products such as tBA. The presence of tBA in sampling points where MtBE occurs in the October 2010 data suggests that natural attenuation is occurring and that the MtBE plume is migrating at low concentrations. The highest MtBE concentration detected in the April 2010 data was 180 ug/l in sampling point CMT-4-2. The highest MtBE concentration detected in the October 2010 data was 180 ug/l in sampling point CMT-7-2.

You mention that the carbon treatment system on the T-Bear water well is used as a pump and treat system. This was never the intention for this treatment system, which was installed for the interim protection of water quality. This well is used as a drinking water source and MtBE concentrations at one time exceeded the environmental screening level (ESL) for MtBE of 5 ug/l, which is based on aesthetic considerations (taste and odor) rather than toxicity. MtBE was not detected above the laboratory detection limit of 0.5 ug/L in the influent to the treatment system on the T-Bear Ranch water supply well on January 1, 2011, the last sampling event for which we have data (Weber, Hayes & Associates, February 22, 2011). The existing body of data from the T-Bear Ranch water supply well indicates that MtBE concentrations are decreasing. Over the last three years, MtBE was not detected in 6 of 14 water samples from this well. The highest MtBE concentration in the remaining 8 samples was 2.9 ug/l (October 2008). MtBE in influent samples has remained below the ESL for since September 26, 2007 when it was detected in the influent at 5.4 ug/l.

In conclusion, MtBE concentrations are above the ESL in some intermediate depth sampling points along transect A-A'. The presence of tBA in many of these same sampling points indicates that natural attenuation is occurring and is responsible for the decreased MtBE concentrations in some sampling points. MtBE concentrations are relatively low (less than 180 ug/l), MtBE concentrations will likely decrease with time given the increase in tBA concentrations in October 2010. At present, MtBE is not posing a health risk to the T-Bear water supply well. Based on these findings, we support MNA as the preferred remedial alternative.

2. ***Exposure Pathways, Page 14*** *–The on-site Sunol Tree water supply well is within 60 feet of the soil sample that contained the highest concentration of MtBE (PT-2-4'); however, this on-site well is not discussed as a potential exposure pathway. In the revised Draft CAP requested below, please include the on-site well in the evaluation of exposure pathways. Please present the well construction, current and historic pumping rates, current use of the well, and all sampling data for the on-site water supply well as part of the evaluation.*

The Sunol Tree water supply well was omitted from the Exposure Pathway evaluation of the Draft CAP in error. The Clearwater Group (Clearwater) first investigated the Sunol Tree water supply well in a Preliminary Assessment Report dated March 14, 2003. Clearwater determined that the well was a 10-inch diameter well drilled in 1964. The well is approximately 55 feet northwest of the former USTs and about 30 feet west of the dispenser islands. A well log provided construction details could not be located. Clearwater collected a sample (FW-1) from a faucet on the southern side of the gas station which is connected to this well on August 20, 2002. The sample was analyzed for TPH-g, BTEX and MtBE by EPA method 8260B. All analytes were below laboratory detection limits.

On December 11, 2002, Gregg Drilling Company removed the submersible pump from this well and determined the well is 154.6 feet deep. They measured the static water level at approximately 20 feet fbg. The submersible pump is set at approximately 100 fbg and is produces about 15 gallons per minute.

On December 12, 2002, WellSpy Water Well Surveyors surveyed the well with a downhole video camera. The static water level was at 19 fbg and the first evidence of Mills knife perforations in the 10-inch diameter steel casing were observed at 60 fbg and other Mills knife perforations were observed at 62, 67, 101 and 103 fbg. Their report lists the bottom of the well at 153 fbg. Although the WellSpy report does not state it, this well is most likely perforated continuously from 60 to 153 fbg.

Data on the Geotracker website indicates that the Sunol water supply well was sampled on December 10, 2004 for TPH-g, BTEX and fuel oxygenates. Fuel constituents were not detected above laboratory detection limits.

Well construction and sampling data suggests that the Sunol water supply well is perforated between 60 and 153 fbg and that fuel constituents have not migrated to this depth as of December 10, 2004. We recommend that this well be re-sampled during the next groundwater monitoring event to determine if this well provides an exposure pathway from the MtBE plume to human receptors.

3. ***Hotspot Remains at Site, Page 21*** – *We concur with the statement in the first paragraph on Page 21 that, "MNA works best where pollution hot spots have been removed and contaminant concentrations are near the cleanup goals. However, we do not concur with the statement in the next sentence indicating this is true for the Sunol Tree Gas site. The highest concentration of MtBE detected in soil samples collected during the tank removal were soil samples collected from the piping trenches(PT-2-4' and PT-3-4'). In addition, the portions of the plume with the highest hydrocarbon concentrations appear to be directly downgradient from the product line and dispenser area rather than the USTs. Soil over-excavation occurred in the area above and around the tanks rather than the product line area. Therefore, a source or "hotspot" remains beneath the product lines. Please revise Draft CAP accordingly to address the remaining source or "hotspot".*

   Clearwater's *Preliminary Site Assessment Report* dated March 14, 2003 reported TPH-g at 150 mg/kg and MtBE at 5.9 mg/kg in pipe trench soil sample PT-2. TPH-d was detected at 80 mg/kg in pipe trench soil sample PT-1. TPH-d was detected at 1,300 mg/kg in diesel dispenser soil sample DSP7. There is no mention of soil sample PT-3-4' in Clearwater's

report. A review of data posted on the Geotracker website found no mention of pipe trench soil sample results. Soil samples collected from the UST tank pit detected TPH-g at concentrations ranging from 65 to 170 mg/kg and MtBE concentrations ranging from 73 to 190 mg/kg. We concur that hydrocarbon concentrations in soil from the product line trenches and dispenser area are equal to are greater than soil concentrations in the former UST pit and if this area was not removed during soil excavation activities, the "hotspot" may be a source for downgradient contamination.

Approximately 4,000 cubic yards of soil were excavated during UST replacement and remediation activities during May 2002. Soil was excavated from the tank pit area and stockpiled behind the store for several years. In addition, approximately 160,000 gallons of water was removed from the excavation and stored in temporary tanks. TPH-g was detected in the temporary tanks at 170 ug/l and MtBE was detected at 190 ug/l. We could not locate any maps or sketches submitted by Clearwater to show the extent of the excavation nor was there mention of excavating contaminated soil from the pipe trenches. Additionally, we could not locate maps or sketches (in the owner's records or on the Geotracker website) showing the location of pipe trench samples. Please provide data to support your concern that this hotspot remains at the site.

4. ***Tables 3 through 6, Cost Estimates*** – *In several of the cost estimates, the cost for some items which appear to be fixed costs such as Design, Pilot Testing, and Well Abandonment, are increased over time. Please revise the cost estimates as necessary to keep fixed costs the same for both low and upper estimates. In addition, please add the costs for treating and sampling water at the T-Bear Ranch well to the cost estimates.*

   Tables 3 through 7 have been revised to reflect constant fixed costs for line items such as design, pilot testing and well abandonment. The revised tables are included as **Attachment A**. Note that estimated costs for MNA (Table 6) remain significantly less than costs for the remaining three alternatives.

5. ***Table 7 - Evaluation of Remedial Alternatives; Description of Alternatives*** – *As previously noted, it has not been demonstrated that MtBE is being degraded by native microbes. Please revise the description of Alternative 4 to state, "Monitor concentrations of petroleum hydrocarbons and oxygenates over time."*

   We do not concur. Based on recent evidence from the October 2010 sampling event discussed previously, MtBE is being actively degraded by native microbes. The increased concentration of tBA at sample points CMT-3-1, 3-2, 6-1, 6-2, 7-1 and PZ-2a in the October 2010 data support this conclusion.

6. ***Table 7 - Evaluation of Remedial Alternatives; Level of Protection*** – *We do not concur that all four alternatives provide an equal level of protection of human health, the environment, and beneficial uses of groundwater. Based on the discussion in the technical comments 1 through 3, Alternative 4 does not provide an adequate level of protection of human health, the environment, and beneficial uses of groundwater. Please revise the entry in Table 7 for Alternative 4 accordingly.*

   The entry for Level of Protection in Table 7 has been revised. The revised Table 7 is included in **Attachment A**.

7. ***Table 7 - Evaluation of Remedial Alternatives; Reduction of Hydrocarbon Mass*** – *Alternative 4 should have a lower ranking for Reduction of Hydrocarbon Mass than the other alternatives. Alternative 4 does not address the remaining hotspot in the product line area discussed in technical comment 3. Please revise the Draft CAP accordingly.*

   Please see our response to comment #3. We are interested to review your records so that we can determine the exact location of the hotspot and whether this hotspot was removed during removal of 4,000 cubic yards of contaminated soil. If the hotspot has not been removed, we recommend remedial action to remove the hotspot.

8. ***Table 7 - Evaluation of Remedial Alternatives; Compliance with Regulatory Guidelines*** – *We do not concur that Alternative 4 can be implemented within regulatory guidelines.*

   If natural attenuation is occurring as suggested by the October 2010 data, the site will be in compliance with regulatory guidelines (i.e., reduction of MtBE concentrations to less than 5 ug/l) within a reasonable time period.

9. ***Table 7 - Evaluation of Remedial Alternatives; Long-term Effectiveness.*** – *Based on the continued migration of the plume and evidence of MtBE degradation, Alternative 4 is not expected to have long-term effectiveness. Please revise Table 7 accordingly.*

   For this analysis, we define long-term effectiveness as $\geq$ 7 years. If natural attenuation is occurring (as is suggested by the October 2010 data) we anticipate that MtBE concentrations will be reduced to below the ESL (5 ug/l) within this time period.

TECHNICAL COMMENTS ON CARBON TREATMENT SYSTEM REPORT

10. ***Well EB-2.*** – *Sampling location EB-2 is identified as a Replacement Well on Figure 2 of the September 10, 2010 report entitled, "Carbon System Test Results for the Well Head Carbon Treatment System," dated September 2010. In the revised Draft CAP requested below, please discuss whether a well is present at EB-2 and its status.*

    Well EB-2 was installed by Weber-Hayes Associates in March 2006. This well was intended to be a replacement water supply well for the T-Bear Ranch and was drilled using resonant sonic technology. The technology provided undisturbed cores that yielded a very good description of subsurface lithology. The well was completed with a 4-inch diameter, PVC casing and is 135 feet deep and is screened through sandy gravel water bearing zones from 80.5 to 95.5 fbg, from 100.5 to 105.5 fbg and from 110.5 to 125.5 fbg. The well log for EB-2 is provided in **Attachment B**.

    Depth discrete sampling was conducted prior to installation of a submersible pump. MtBE was detected at depth in this well (see **Table 4** in **Attachment B**). The use of this well as a replacement well was put on hold until the MtBE plume is cleaned up. Currently, BE-2 is considered a backup, emergency supply to be used only if the shallow T-Bear well will not provide an adequate water supply.

11. ***Continued Sampling and Treatment of T-Bear Ranch Well.*** – *We request that you continue maintenance and operation of the T-Bear Ranch water supply well treatment system and quarterly sampling of the influent and effluent. Please present these results in the quarterly reports requested below.*

The treatment system on the T-Bear Ranch water supply well will continue to be maintained and monitored until such time that it can be shown that the MtBE plume from the site poses no risk to human health, the environment and beneficial uses of groundwater. The most recent quarterly report for this well dated February 22, 2011 was uploaded to the Alameda County FTP site on March 3, 2011.

Please call me at (925) 478-8390 if you have questions or comments in regards to the technical content of this report.

Very truly yours,

Cook Environmental Services, Inc.

Tim Cook
President

cc: Jennifer Rice, Esq
Obaid Abdullah, Kahn Petroleum

ATTACHMENT A
Revised Tables 3 through 7

Table 3. Cost Estimate for Alternative 1 AS/SVE
Kahn Petroleum, Sunol, California

Duration	Lower Estimate 2 years	Upper Estimate 3 years
Install AS/SVE System		
Design System	$ 10,000	$ 10,000
Procure/Rent Materials	$ 35,000	$ 50,000
Permitting	$ 15,000	$ 15,000
Install AS/SVE Wells	$ 15,000	$ 15,000
Pilot Testing	$ 15,000	$ 15,000
Project Management and Reporting	$ 15,000	$ 20,000
Subtotal	$ 105,000	$ 125,000
Operation of AS/SVE System		
O&M Labor, Utilities, Sampling, Analysis, Reporting, Expenses ($7,500/mo)	$ 180,000	$ 270,000
Operation of T-Bear Ranch Treatment System		
O&M Labor, Sampling, Analysis, Reporting, Expenses ($3,500/qtr)	$ 28,000	$ 42,000
Monitoring and Reporting		
Quarterly GW Gauging, Sampling, Analysis, Reporting, Expenses (16 sampling points, $8,000/qtr)	$ 64,000	$ 96,000
AS/SVE System Decommissioning and Well Abandonment	$ 50,000	$ 50,000
Total Cost	$ 532,000	$ 708,000

Table 4. Cost Estimate for Alternative 2 - Insitu Chemical Oxidation
Kahn Petroleum, Sunol, California

	Lower Estimate	Upper Estimate
Duration	2 years	3 years
Install Ozone Sparge System		
Design System	$ 7,000	$ 7,000
Procure/Rent Materials	$ 32,000	$ 50,000
Permitting	$ 5,000	$ 5,000
Install Sparge Wells	$ 15,000	$ 15,000
Pilot Testing	$ 15,000	$ 15,000
Project Management and Reporting	$ 15,000	$ 20,000
Subtotal	$ 89,000	$ 112,000
Operation of AS/SVE System		
O&M Labor, Utilities, Reporting, Expenses ($4,000/mo)	$ 96,000	$ 144,000
Operation of T-Bear Ranch Treatment System		
O&M Labor, Sampling, Analysis, Reporting, Expenses ($3,500/qtr)	$ 28,000	$ 42,000
Monitoring and Reporting		
Quarterly GW Gauging, Sampling, Analysis, Reporting, Expenses (16 sampling points, $8,000/qtr)	$ 64,000	$ 96,000
Ozone System Decommissioning and Well Abandonment	$ 35,000	$ 35,000
Total Cost	$ 401,000	$ 541,000

Table 5. Cost Estimate for Alternative 3 - DPE
Kahn Petroleum, Sunol, California

Duration	Lower Estimate 2 years	Upper Estimate 3 years
Install DPE System		
Design System	$ 15,000	$ 15,000
Procure/Rent Materials	$ 45,000	$ 65,000
Permitting	$ 20,000	$ 20,000
Install DPE Wells	$ 15,000	$ 15,000
Pilot Testing	$ 25,000	$ 25,000
Project Management and Reporting	$ 15,000	$ 25,000
Subtotal	$ 135,000	$ 165,000
Operation of DPE System		
O&M Labor, Utilities, Sampling, Analysis, Reporting, Expenses ($8,000/mo)	$ 192,000	$ 288,000
Operation of T-Bear Ranch Treatment System		
O&M Labor, Sampling, Analysis, Reporting, Expenses ($3,500/qtr)	$ 28,000	$ 42,000
Monitoring and Reporting		
Quarterly GW Gauging, Sampling, Analysis, Reporting, Expenses (16 sampling points, $8,000/qtr)	$ 64,000	$ 96,000
DPE System Decommissioning and Well Abandonment	$ 50,000	$ 50,000
Total Cost	$ 604,000	$ 806,000

Table 6. Cost Estimate for Alternative 4 - MNA
Kahn Petroleum, Sunol, California

	Lower Estimate	Upper Estimate
Duration	4 years	7 years
Monitoring and Reporting		
Semi-Annual GW Gauging, Sampling, Analysis, Reporting, Expenses (16 sampling points, $16,000/yr)	$ 64,000	$ 112,000
Operation of T-Bear Ranch Treatment System		
O&M Labor, Sampling, Analysis, Reporting, Expenses ($3,500/qtr)	$ 56,000	$ 98,000
Well Abandonment	$ 25,000	$ 25,000
Total Cost	$ 145,000	$ 235,000

Table 7. Evaluation of Remedial Alternatives
Khan Petroleum, Sunol, California

Evaluation Criteria	Alt 1 Air Sparge Soil Vapor Extraction	Alt 2 Insitu Chemical Oxidation	Alt 3 Dual Phase Extraction	Alt 4 Monitored Natural Attenuation
1. Description of Alternative	SVE used to extract hydrocarbons from soil and soil vapor, AS used to assist SVE and promote insitu bioremediation	Ozone sparging will be used to oxidize residual hydrocarbons insitu	DVE will be used to extract hydrocarbons from soil, soil vapor and groundwater	MNA will monitor the degradation of hydrocarbons by native microbes
2. Level of Protection of Human Health, the Environment and Beneficial Uses of Water	MtBE concentrations will decrease rapidly but not as rapidly as the dual phase extraction alternative	MtBE concentrations could increase (due to desorption) before they decrease	MtBE concentrations will decrease most rapidly with this alternative	MtBE concentrations will degrade more slowly than with the other alternatives
3. Reduction of Hydrocarbon Mass	Good for reduction of mass in soil and soil vapor, poor for reduction of mass in groundwater	Very good for reduction in groundwater mass, fair for soil and soil vapor	Good for reduction of mass in soil, soil vapor and groundwater.	Good for reduction of mass in soil, soil vapor and groundwater.
4. Ease of Implementation and Operation	Rank = 3 Moderately difficult to implement	Rank = 2 Moderately difficult to implement	Rank = 4 Very difficult to implement due to permitting treated effluent discharge (NPDES or WDRs)	Rank = 1 Easy to implement
5. Cost - Effectiveness	Rank = 3 $532,000 to $708,000	Rank = 2 $401,000 to $541,000	Rank = 4 $604,000 to $806,000	Rank = 1 $145,000 to $235,000
6. Compliance with Regulatory Guidelines	Can be implemented within regulatory guidelines	Can be implemented within regulatory guidelines	Can be implemented within regulatory guidelines	Can be implemented within regulatory guidelines
7. Short-term Effectiveness	Rank = 3 This alternative would address soil contamination quickly, groundwater contamination slowly	Rank = 1 This alternative would address site contamination quickly	Rank = 1 This alternative would address site contamination quickly	Rank = 4 This alternative would address site contamination slowly
8. Long-term Effectiveness	Long-term $\geq$ 7 yrs. All 4 alternatives are equal for this criterion	Long-term $\geq$ 7 yrs. All 4 alternatives are equal for this criterion	Long-term $\geq$ 7 yrs. All 4 alternatives are equal for this criterion	Long-term $\geq$ 7 yrs. All 4 alternatives are equal for this criterion
9. Impacts to Community and Environment	Rank = 3 disruption during construction and removal, blower noise during operation phase	Rank = 2 disruption during construction and removal, compressor noise during operation phase	Rank = 3 disruption during construction and removal, blower noise during operation phase	Rank = 1 no impact
10. Impacts on Water Conservation	Rank = 1 no impact	Rank = 1 no impact	Rank = 3 moderate impact, groundwater extraction will lower the water table.	Rank = 1 no impact

ATTACHMENT B
Well Log and Sampling Data for Replacement Well EB-2

Depth (ft. bgs)	Elevation (ft.msl)	Sample Interval	Sample Analyzed	Sample Identification & Groundwater Analytical Results	Groundwater Bearing Zone	Lithologic Pattern	USCS Symbol	LITHOLOGIC DESCRIPTION
0	?						CL	**CLAY,** black (10YR 2/1), dry, very stiff to hard, friable, non plastic, 90% silt and clay fines, 10% fine sand clasts within clay, no odor no discoloration.
1-19								- Color changes to very dark grayish brown, (10YR 3/2).
20								- Color changes to brown (10YR 4/3 - 5/3) clasts decrease to 5%. - Gradational contact.
21								**Sandy Silty CLAY,** brown (10YR 5/3), with gray (10YR 5/1) mottling, dry, medium stiff, moderate to high plasticity, slightly sticky, 70% clay fines, 30% silts and fine sands. - Abrupt contact.
22					Zone #1 Similar to Zone 2 in EB-1			**Sandy Gravelly FAT CLAY**, yellowish brown (10YR 5/4), very wet, soft, low plasticity, sticky, 70% clay binder, 20% medium to coarse subrounded gravel clsats, 10% fine to medium sands. At 22' bgs, formation dries, becomes medium stiff to soft. - Gradational contact.
25								**Sandy Clayey SILT**, yellowish brown (10YR 5/4), wet to moist, medium stiff to soft, moderate to high plasticity, slightly sticky, 70% silts, 20% clay binder, 10% fine sands, gradational contact.
28								**Silty SAND,** yellowish brown, (10YR 5/4), moist, slightly dense to soft, low plasticity, non to slightly sticky, 75% medium to fine sand, 25% silt fines, gradational contact. -Trace coarse subrounded gravels in medium sands, medium dense, abrupt contact.
32					Zone #2			**Clayey Sandy GRAVEL**, dark grayish brown (10YR 4/2) dry, medium dense, friable, 70% medium to coarse subrounded to subangular gravels, 20% medium to fine sands, 10% clay binder.
34								**Sandy GRAVEL**, yellowish brown (10YR 5/4), saturated, loose, 80% medium to coarse subrounded to rounded gravels and medium rounded cobbles, 20% medium to fine sands grading to 70% medium to coarse subrounded gravels and medium to fine rounded cobbles, 30% medium to coarse rounded sands.
41								**Sandy Gravelly CLAY**, yellowish brown (10YR 5/4) damp, medium stiff to stiff, moderate to high plasticity, slightly sticky, 70% clay binder with 20% fine to medium subrounded gravels, 10% fine to medium sands, increase in fine subrounded cobbles at 39' bgs. - Gradational contact.
44					Zone #3			**Clayey Sandy GRAVEL,** dark yellowish brown (10YR 3/4), moist to wet, medium dense, friable, low to no plasticity, slightly sticky, 70% fine to coarse subrounded gravels, and fine to medium subrounded cobbles, 20% fine to medium sands, 10% clay binder.
52								- Thin, very moist and soft sand silt lens at 52.5 to 53.5' bgs,
54								- Gradational contact.
59								**Sandy Gravelly CLAY,** dark yellowish brown (10YR 3/4) with abrupt color change to dark bluish gray (5B 3/1) at 59.5' bgs, damp to moist at gravel to gravel contact, otherwise dry, stiff to hard, friable, low to no plasticity, non sticky, 70% clay binder, 20% medium to coarse subrounded gravel and cobble clasts and 10% fine sands in clayey matrix, gradational contact.
65				Hydro-Punch 65-69' bgs EB-2-d65 TPH-G: ND BTEX: ND MTBE: 99 ppb Fuel Oxygenates: ND Lead Scavengers: ND	Zone #4			**Clayey Sandy GRAVEL**, dark bluish gray (5B 3/1), saturated, medium dense to slightly loose, 75% medium to coarse subrounded to rounded gravels and cobbles, 15% fine to coarse subrounded sands, 10% clay binder, sticky. - Gradational contact.
70								**Sandy Gravelly CLAY,** dark bluish gray (5B 3/1) damp at upper contact otherwise dry, stiff to hard, friable, no plasticity, non sticky, 70% clay binder, 20% medium to coarse subrounded gravel and cobble clasts and 10% fine sand, abrupt contact.
74								**Sandy CLAY,** dark bluish gray (5B 3/1), moist to damp, very stiff, high plasticity, slightly sticky, 75% clay fines, 25 fine to medium sands, with thin (0.5') Clayey GRAVEL lens at 79.5-80' bgs, very moist. - Gradational contact.
80				Hydro-Punch 80-85' bgs EB-2-d80 TPH-G: ND BTEX: ND MTBE: 1.4 ppb Fuel Oxygenates: ND Lead Scavengers: ND	Zone #5			**Sandy Gravelly CLAY,** dark bluish gray (5B 3/1) dry, stiff to hard, friable, no plasticity, non sticky, 70% clay binder, 20% medium to coarse subrounded gravel and cobble clasts and 10% fine sand, abrupt contact.
84								**Well Graded GRAVEL,** dark bluish gray (5B 3/1), saturated, loose, 80% medium to coarse subrounded to rounded gravels and cobbles, 15% fine to coarse subrounded sands, 5% clay fines, - 1.5' thick zone of Clayey GRAVEL at 83-85 feet bgs, wet, medium dense, friable.
90								- Coarse cobble at 90' pulverized. - Unit becoming wet vs saturated, and medium dense vs loose.
95								- Increase in clay content to 15%, with decrease in fine sands to 10%, with 75% subrounded gravels and cobbles, unit drying, becoming moist, medium dense - Gradational contact.
100								**Sandy Gravelly CLAY,** dark bluish gray (5B 3/1) dry, stiff to hard, friable, no plasticity, non sticky, 70% clay binder, 20% medium to coarse subrounded gravel and cobble clasts and 10% fine sand, abrupt contact.
102				Hydro-Punch 101-106' bgs EB-2-d101 TPH-G: ND BTEX: ND MTBE: 2.5 ppb Fuel Oxygenates: ND Lead Scavengers: ND	Zone #6			**Sandy Clayey GRAVEL**, dark bluish gray (5B 3/1), wet, medium dense, friable, sticky, 75% medium to coarse subrounded to rounded gravels and cobbles, 15% fines as binder, 10% fine to coarse sands, gradational contact.
106								**Cemented Sandy Gravelly CLAY,** dark bluish gray (5B 3/1) dry, stiff to hard, friable, no plasticity, non sticky, 70% clay binder, 20% medium to coarse subrounded gravel and cobble clasts and 10% fine sand. - Thin wet zone of sandy clayey gravel at 108.5-109' bgs - Abrupt contact.
112				Hydro-Punch 112-117' bgs EB-2-d112 TPH-G: ND BTEX: ND MTBE: ND Fuel Oxygenates: ND Lead Scavengers: ND	Zone #7			**Poorly Graded SAND** dark bluish gray (5B 3/1), saturated, very loose - flowing, 95% fine to medium sand subangular to subrounded sands, 5% fines, with gradational coarsening downward sequence to coarse sands.
116								**Poorly Graded Gravel**, dark bluish gray (5B 3/1), saturated, loose, 95% fine to medium subangular to subrounded to rounded gravels, coarsening downward to fine subrounded cobbles, abrupt contact.
118								**Sandy Clayey GRAVEL**, dark bluish gray (5B 3/1), wet, medium dense, friable, sticky, 75% medium to coarse subrounded to rounded gravels and cobbles, 15% fines as binder, 10% fine to coarse sands, abrupt contact.
123								**Sandy SILT**, dark bluish gray, (5B 3/1) wet, soft, slightly sticky, moderate to high plasticity, 80% silts and fines, 20% fine sands, gradational contact.
125								**Sandy Silty CLAY,** dark bluish gray (5B 3/1), damp, very stiff, high plasticity, slightly sticky, upper 70% clay fines, 20% silts, 10% fine sands.
139								- Dry, hard, non plastic, non sticky.
149								- Dry, hard, non plastic, non sticky. - Gradational contact.
153								**Cemented Silt and CLay with Fine Sand,** dark bluish gray (5B 3/1), dry, hard, slightly friable, 80% fines, 20% fine to medium sands.
164								- Same as above, dry, very hard.

WELL CONSTRUCTION 4-INCH DIA. PVC

- 0 to 74.5' Blank 0.5'-75' & Portland Cement from 0' to 75'
- 75' to 78' 3/4" chips 75'-78'
- 80.5' to 95.5' 15' of 0.040 Screen 80.5'-95.5' & #8 Mesh Filter Pack 78'-96'
- 95.5' to 100.5' 5' Blank 95.5'-100.5' & 3/4" chips 96'-100'
- 100.5' to 105.5' 5' of 0.040 Screen 100.5'-105.5' & #8 Mesh Filter Pack 100'-106'
- 105.5' to 110.5' 5' Blank 105.5'-110.5' & 3/4" chips 106'-109.5'
- 110.5' to 125.5' 15' of 0.040 Screen 110.5'-125.5' & #8 Mesh Filter Pack 109.5'-130.5'
- 125.5' to 130.5' 5' Bullnose 125.5'-130.5'
- TD @ 130.5' bgs
- Formation Backfill during Wash-Down Operations

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EB-2 (Replacement Well) LITHOLOGY & WELL CONSTRUCTION DETAILS
T-BEAR RANCH DOMESTIC WELL
SUNOL TREE GAS STATION PROJECT
3004 Andrade Road,
Sunol, Alameda County, California

TABLE 4

Groundwater Results - Water Wells, Exploratory Borings, & Piezometers

Sunol Tree Gas Station Fuel Release
3004 Andrade Road, Sunol
All water results in parts per billion (ug/kg)

Investigation	*Date*	*Sample Identification*	*Pumping Well(s) Totalizer Data*	*Sample Depth (feet, bgs)*	*Total Petroleum Hydrocarbons as GASOLINE*	*Volatile Organic Compounds*										*COMMENTS*
						Benzene	*Toluene*	*Ethylbenzene*	*Xylenes*	FUEL OXYGENATES						
										MTBE (2)	*TBA*	*ETBE*	*DIPE*	*TAME*	*Ethanol*	
Replacement Well Packer Installation & Sampling	3/22/2006	RW-1	62,790 gal. (Sensus Meter)	10.15'	ND	ND	3.8	ND	ND	6.6	ND	ND	ND	ND	ND	Dynamic Sampling (pump on at 12 - 11 gpm) & Bacterialogical Analysis Results dated 3/21/06: Absent for Total Coliform and E-Coli
	3/20/2006	RW-1	59,530 gal. (Sensus Meter)	10'	ND	ND	2.1	ND	ND	8.7	ND	ND	ND	ND	ND	
	3/17/2006	RW-1	53,119.9 gal. (Sensus Meter)	2.95'	ND	ND	2.3	ND	ND	5.8	ND	ND	ND	ND	ND	
	3/16/2006	RW-1	50,177.5 gal. (Sensus Meter)	11.23'	37	ND	6.8	ND	ND	2.4	ND	ND	ND	ND	ND	
PG&E Trench Groundwater Sampling	8/29/2005	Trench Sample #1	Not Applicalbe	5.5'	----	< 0.5	< 0.5	< 0.5	< 0.5	2.2	----					Grab Groundwater Samples
		Trench Sample #3	Not Applicalbe	5.5'	----	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5						
Replacement Well Development and Sampling (Ambinet and Dynamic Sampling)	3/31/2005	RW-1	48,990.8 gal. (Sensus Meter)	Composite	----	< 0.5	1.2	< 0.5	< 0.5	**14**	----					Dynamic Sampling (pump on at 8.5 gpm)
				81'		< 0.5	< 0.5	< 0.5	< 0.5	**78**						
				87'		< 0.5	2.6	< 0.5	< 0.5	**14**						
	8/29/2005	RW-1	19,294.5 gal. (Sensus Meter)	Composite	----	< 0.5	1.2	< 0.5	< 0.5	**14**	----					Dynamic Sampling (pump on at 8.5 gpm)
				81'		< 0.5	< 0.5	< 0.5	< 0.5	**78**						
				87'		< 0.5	2.6	< 0.5	< 0.5	**14**						
	8/26/2005	RW-1	_____gal. (Sensus Meter)	Composite	----	< 0.5	0.71	< 0.5	< 0.5	10	----					Dynamic Sampling (pump on 8.5 gpm)
				81'		< 0.5	6.7	< 0.5	< 0.5	**17**						
				88'		< 0.5	3.0	< 0.5	< 0.5	9.2						
				95'		< 0.5	2.2	< 0.5	< 0.5	**13**						
	8/24/2005	RW-1	_____gal. (Sensus Meter)	Composite	----	< 0.5	0.76	< 0.5	< 0.5	7.3	----					Dynamic Sampling (pump on at 8.5 gpm)
				81'		0.87	< 0.5	< 0.5	< 0.5	**34**						
				88'		< 0.5	7.3	< 0.5	< 0.5	5.6						
				95'		< 0.5	4.0	< 0.5	< 0.5	11						
	8/22/2005	RW-1	20 gal. (Sensus Meter)	Composite	----	< 25	< 25	< 25	**500**	< 50 (<500, by 8260)						First Dynamic Sampling (pump on at 8.5 gpm)
			0 gal. (Sensus Meter)	81	----	< 0.5	< 0.5	< 0.5	< 0.5	8.6	----					Discrete, Ambient Sampling & Installation of Sensus Meter on potential Replacement Well
				86'		0.57	< 0.5	< 0.5	< 0.5	**15**						
				95'		< 0.5	< 0.5	< 0.5	< 0.5	**13**						
Exploratory Boring (EB-2) & Potential Replacement Well (RW)	12/13/2004	EB-2	Not Applicable	65'	100 (3)	< 0.5	< 0.5	< 0.5	< 1	**99**	< 10	< 5	< 5	< 5	< 100	Hydropunch Sampling Drilling Supply Water = ND
				80'	31 (3)	< 0.5	< 0.5	< 0.5	< 1	1.4	< 10	< 5	< 5	< 5	< 100	
	12/14/2004			101'	58 (3)	< 0.5	< 0.5	< 0.5	< 1	2.5	< 10	< 5	< 5	< 5	< 100	
				112'	< 25	< 0.5	< 0.5	< 0.5	< 1	< 1	< 10	< 5	< 5	< 5	< 100	
PIEZOMETER GROUNDWATER SAMPLING	12/3/2004	PZ-1	Not Applicalbe	1A @ 10.5'	180	< 1	< 1	< 1	< 2	**190**	< 20	< 10	< 10	< 10	< 200	screened from 12-17 ft
				1B @ 14.3'	38	< 0.5	< 0.5	< 0.5	< 1	**28**	< 10	< 5	< 5	< 5	< 100	screened from 41.5 - 46.5 ft
	7/12/2005	PZ-2	Not Applicalbe	2A @ 29'	120	< 1	< 1	< 1	< 1	**110**	**21**	< 10	< 10	< 10	< 200	screened from 24-29 ft & screened from 44-49 ft
				2B @ 49'	ND	ND	ND	ND	ND	**15**	ND	ND	ND	ND	ND	
	12/3/2004			2A @ 6.5'	270	< 2.5	< 2.5	< 2.5	< 5	**280**	< 50	< 25	< 25	< 25	< 500	
				2B @ 8'	160	< 1	< 1	< 1	< 2	**150**	< 20	< 10	< 10	< 10	< 200	
	12/3/2004	PZ-3	Not Applicalbe	3A @ 9'	29	< 0.5	< 0.5	< 0.5	< 1	< 1	< 10	< 5	< 5	< 5	< 100	screened from 16-21 ft
				3B @ 11'	< 25	< 0.5	< 0.5	< 0.5	< 1	< 1	< 10	< 5	< 5	< 5	< 100	screened from 44-49 ft
T-BEAR WELL -Discrete Sampling-	7/19/2004	**T-Bear Well**	0 gal. (Master Meter)	8'	< 25	< 0.5	< 0.5	< 0.5	< 1	**15**	< 10	< 5	< 5	< 5	---	Discrete, Ambient Sampling & Installation of Master Meter on T-Bear Well
	6/29/2004		2,350,150 gal. (Neptune Meter)	15'	< 25	< 0.5	< 0.5	< 0.5	< 1	11	< 10	< 5	< 5	< 5	---	
	6/29/2004			22'	< 25	< 0.5	< 0.5	< 0.5	< 1	**17**	< 10	< 5	< 5	< 5	---	
	6/29/2004			30'	< 25	< 0.5	< 0.5	< 0.5	< 1	**19**	< 10	< 5	< 5	< 5	---	
	6/29/2004			38'	< 25	< 0.5	< 0.5	< 0.5	< 1	**20**	< 10	< 5	< 5	< 5	---	
Regulatory Limits for Groundwater (AIs or MCLs) (1) :					Not Established	1	150	300	1750	13	12	Not Established				
Laboratory's Practical Quantitation Limits (PQL's) (2) :					*25*	*0.5*	*0.5*	*0.5*	*0.5*	*1*	*10*	*5*	*5*	*5*	*100*	

NOTES:

Bold FONT = *Bold FONTindicates concentrations are above regulatory Action Levels.*
< # = *Detection limit elevated due to sample dilution and compound not detected at or above detection limit reported.*
ND = *Not detected at or above the lab's practical quantitation limit.*
---- = *Sample not analyzed for this compound(s).*
1 = *Water quality goals for groundwater are based on State DHS-established Maximum Contaminant Levels (MCLs) or Action Levels (ALs).*

2 = *All analysis completed during the Replacement Well Development and Sampling Investigation Phase and PG&E Trench Groundwater Sampling were analyzed by EPA Method #8031 (Gas Chromatograph) and all MTBE detections are confirmed by EPA Method #8260.*
3 = *Lab notes that all the TPH-gas value is due to MTBE. There are no other quantifiable compounds contributing to the gasoline numbers (confirmed by EPA Method #8260).*

MTBE = Methyl-tert-Butyl Ether
TAME = Tert-amyl methyl ether
ETBE = Ethyl tert-butyl ether
DIPE = Di-isopropyl ether
TBA = Tert-butyl alcohol

B

B'

CMT-1 CMT-2 CMT-3 CMT-4 CMT-6 PZ-1a,b CMT-5 EB-1 CMT-7 CMT-8 CMT-9 CB-1

Feet Below Ground Surface

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145 150

Dry CLAY

Dry Sandy CLAY

Dry Gravelly CLAY

Saturated Sandy GRAVEL

Saturated Sandy CLAY

Saturated Sandy GRAVEL

Dry CLAY

Saturated Sandy GRAVEL

Dry CLAY

Saturated Sandy GRAVEL

ND 13 ND 10 5.3 180 79 12 10 3.7

2.7 4.6 69 66 38 15 37 320

ND ND ND 11 4.7 ND 1.1

?

No Lithology below 24' bgs for CB-1

Hydropunch Sampling

Hydropunch Sampling

JULY 2005

Unsaturated Soils and Aquitards

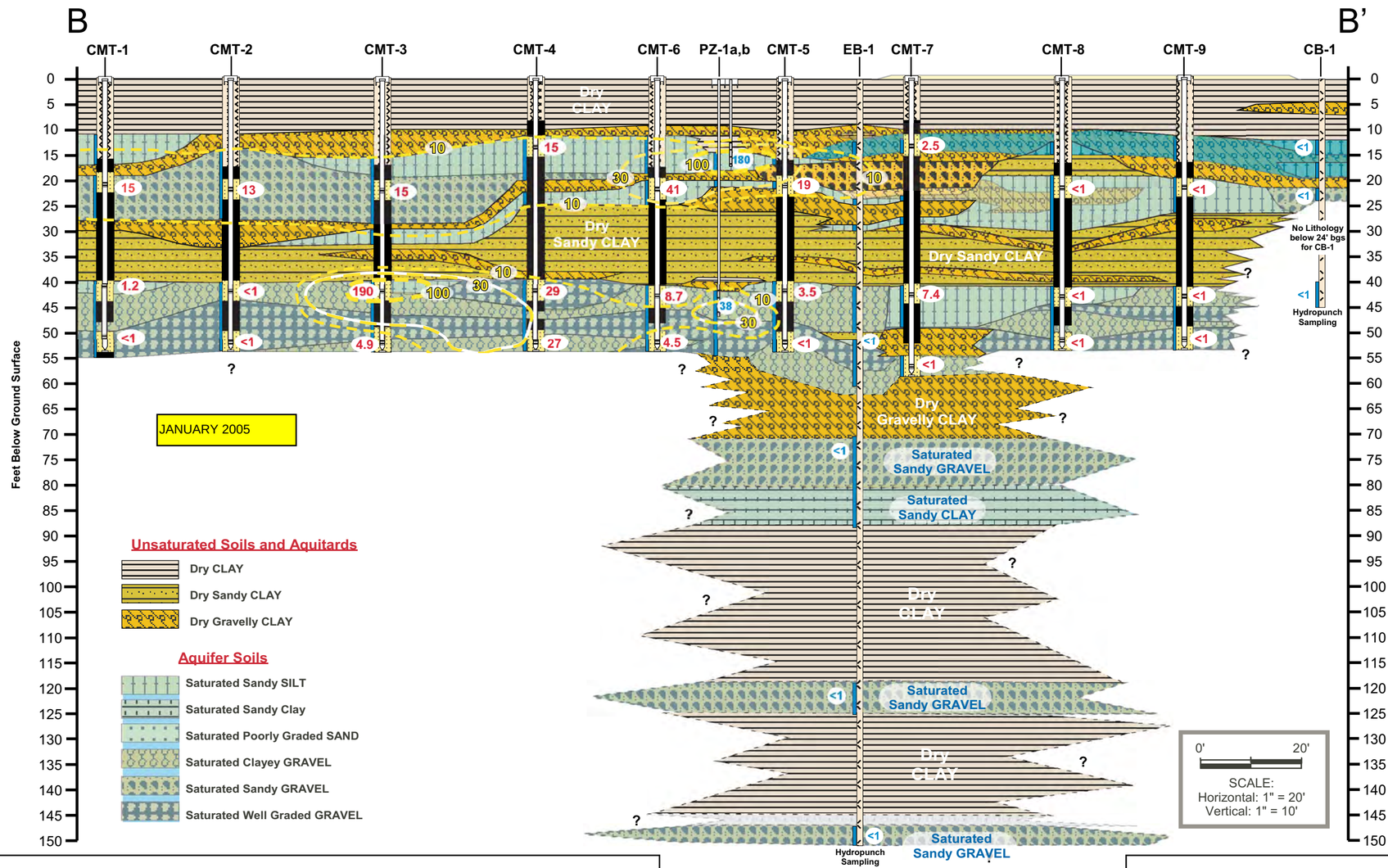
- Dry CLAY
- Dry Sandy CLAY
- Dry Gravelly CLAY

Aquifer Soils

- Saturated Sandy SILT
- Saturated Sandy Clay
- Saturated Poorly Graded SAND
- Saturated Clayey GRAVEL
- Saturated Sandy GRAVEL
- Saturated Well Graded GRAVEL

0' 20'

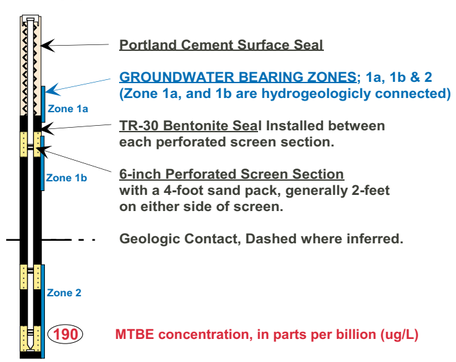
SCALE:
Horizontal: 1" = 20'
Vertical: 1" = 10'



EXPLANATION

CONTINUOUS MULTI-CHAMBER TUBING WELLS
(CMT-1 through CMT-12 - Drilled Dec. '04 and Jan. '05)

CMT WELL DESIGN



Portland Cement Surface Seal

GROUNDWATER BEARING ZONES: 1a, 1b & 2
(Zone 1a, and 1b are hydrogeologicly connected)

TR-30 Bentonite Seal Installed between each perforated screen section.

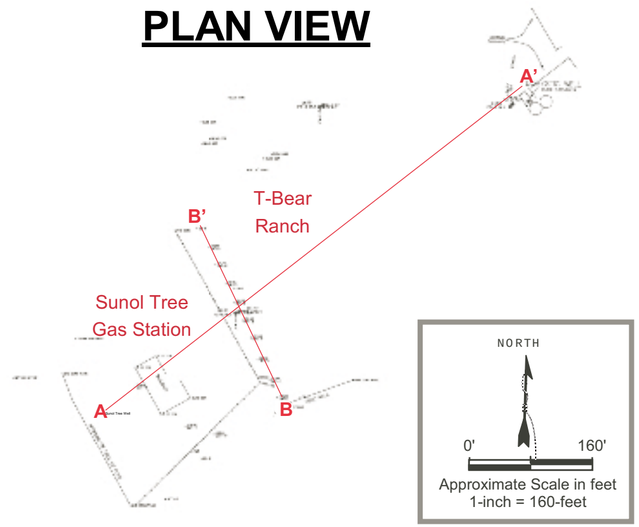
6-inch Perforated Screen Section with a 4-foot sand pack, generally 2-feet on either side of screen.

Geologic Contact, Dashed where inferred.

MTBE concentration, in parts per billion (ug/L)

23027\Figures\B-B'.cnv

PLAN VIEW



FIGURE

Job # 23022

GEOLOGIC CROSS SECTION B-B'
SUNOL TREE GAS STATION
3004 Andrade Road
Sunol, Alameda County

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