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November 9, 2007

Mr. Jerry Wickham  
Department of Environmental Health  
Alameda County Health Agency  
1131 Harbor Bay Parkway  
Alameda, California 94502

Dear Mr. Wickham:

I declare, under penalty of perjury, that the information and/or recommendations contained in URS' report titled "**SLIC Case No. RO0002892, Chevron Sunol Pipeline, 2793 Calaveras Road, Sunol, CA – Third Quarter 2007 Groundwater and Soil Vapor Extraction System Monitoring Report**" are true and correct to the best of my knowledge at the present time.

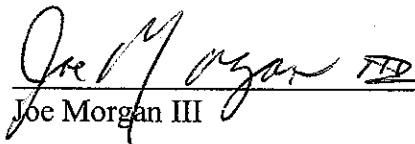
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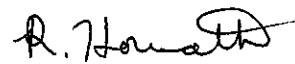
Jeffrey Cosgray  
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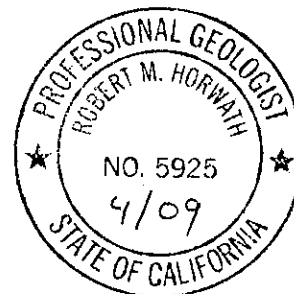
This letter report ("Third Quarter 2007 Groundwater and Soil Vapor Extraction System Monitoring Report") was prepared under my direct supervision. The information presented in this report is based on our review of available data obtained during our additional monitoring well installation and quarterly sampling activities and our previous subsurface investigation efforts. To the best of our knowledge, we have incorporated into our recommendations all relevant data pertaining to the Chevron Pipeline Release site in Sunol, California.

The additional monitoring well installation report discussed herein was developed in accordance with the standard of care used to develop this type of report. The assumptions that were made and the recommendations for continued field activities were based on our professional experience and protocols reported in the literature for similar investigations.

**URS Corporation**  
Approved by:

  
Joe Morgan III

  
Robert Horwath, P.G.





November 15, 2007

Mr. Jerry Wickham  
Department of Environmental Health  
Alameda County Health Agency  
1131 Harbor Bay Parkway  
Alameda, California 94502

**Subject: SLIC Case No. RO0002892, Chevron Pipeline Company, Sunol Spill, 2793 Calaveras Rd, Sunol, CA, Third Quarter 2007 Groundwater and Soil Vapor Extraction System Monitoring Report**

Dear Mr. Wickham:

A December 30, 2005 letter provided by the Alameda County Environmental Health staff (ACEH) requested the initiation of a Quarterly Groundwater Monitoring Program. A January 17, 2007 ACEH letter requested the initiation of a Quarterly Soil Vapor Extraction (SVE) System Monitoring Program. In response to these requests, URS, on behalf of Chevron Pipe Line Company (CPL), has prepared this joint groundwater and SVE system monitoring report for the CPL Sunol spill site (Site) for the third quarter of 2007. A Site vicinity map is included as Figure 1.

Section 1 of this report discusses the groundwater monitoring program and details measured groundwater levels, sampling methodologies, and groundwater analytical results. Section 2 discusses the SVE system monitoring program and presents the operation and monitoring of the SVE system, the soil-vapor analytical results, and evaluates the performance of the SVE system. Section 3 provides the findings and Section 4 presents the recommendations for both the groundwater and SVE system monitoring programs. Section 5 describes the limitations applicable to this report.

If you have any questions on our report please call Mr. Joe Morgan of URS at 510-874-3201.

Sincerely yours,

URS Corporation

Joe Morgan III  
Senior Project Manager

Cc: Mr. Jeff Cosgray, Chevron Pipeline Company  
Mr. Jacob Henry, URS Oakland  
Ms. Amber Koster, URS Oakland

R E P O R T

THIRD QUARTER 2007  
GROUNDWATER AND SOIL  
VAPOR EXTRACTION SYSTEM  
MONITORING REPORT

SLIC CASE #RO0002892  
CHEVRON PIPELINE COMPANY  
SUNOL SPILL  
2793 CALAVERAS RD.  
SUNOL, CA

*Prepared for*

Alameda County Health Agency  
1131 Harbor Bay Parkway  
Alameda, CA 94502

November 15, 2007

**URS**

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On September 12, 2007, URS conducted field activities to assess the groundwater conditions at the Site. URS measured the fluid levels and attempted to collect analytical samples from Site groundwater monitoring wells (MW-1 through MW-11). URS also collected a surface water sample for analysis from the very small stream, located northwest of the release location, at the Site. The monitoring wells and surface water sampling location are provided on Figure 2.

## 1.1 SITE HYDROGEOLOGY

Prior to collecting groundwater samples, the water levels were measured at each well from the top of casing using an electronic oil/water interface meter. Free product was measured in MW-1 and MW-9 with a thickness of 0.12 and 0.08 feet, respectively. Product or sheen was not detected in the other ten wells (MW-2 through MW-8, and MW-10 and MW-11) during quarterly monitoring activities. The measured water levels are displayed in Table 1 and the calculated groundwater and product elevations are displayed in Table 2.

### **Unconfined Water Bearing Zone**

Due to unusually dry winter and spring conditions, the groundwater level within the unconfined water-bearing zone was the lowest it has been since the initiation of the groundwater monitoring program in February of 2006. Because of the low water table, MW-2, MW-3, and MW-4 were hydraulically disconnected from the unconfined water-bearing zone. The standing water levels in MW-2, MW-3, and MW-4 were 290.53, 290.94, and 290.74 feet above average mean sea level (msl), respectively.

Newly installed wells MW-10 and MW-11 were also gauged during third quarter monitoring activities. MW-10 contained standing water within the sump below the siltstone bedrock contact and MW-11 was dry. The elevation of the standing water within MW-10 was 281.03 feet above msl. These wells have not been developed due to the lack of groundwater

The groundwater elevations for the remaining unconfined water-bearing zone wells (MW-1 and MW-9), were 290.37 and 289.98 feet above msl, respectively. The groundwater elevation for MW-8, which screens an apparent hillside groundwater recharge source for the Valley Crest Tree Company's (nursery) unconfined water-bearing zone, was 312.46 feet above msl.

Because MW-1 and MW-9 were the only wells hydraulically connected to the unconfined water-bearing zone, the local groundwater flow direction and hydraulic gradient could not be calculated. The groundwater recharge from the hillside appears to flow from the confined water-bearing zone into the unconfined nursery water-bearing zone in a northwesterly direction with a steep hydraulic gradient. The hydraulic gradient for the hillside has not been calculated because MW-8 is the only well screened in the apparent hillside groundwater recharge source area. Figure 3 provides groundwater elevations for the local recharge source and the unconfined water-bearing zone wells and bedrock surface contours for the overburden-siltstone contact.

### **Confined Water Bearing Zone**

The potentiometric surface elevations for the confined sandstone water-bearing zone wells (MW-5 through MW-7), located along the eastern shoulder of Calaveras Road, range from 308.92 to 319.16 ft above msl, with the highest groundwater elevation measured from MW-5, the middle well. The groundwater flow direction and hydraulic gradient have not been calculated for the confined sandstone water-bearing zone because these wells were installed in essentially a straight

line along Calaveras Road for monitoring purposes. The relative groundwater elevations for these wells are similar with previous quarterly groundwater levels. The groundwater elevations for these wells are displayed on Figure 4.

## 1.2 QUARTERLY MONITORING ACTIVITIES

After measuring the fluid levels at each well, URS conducted groundwater sampling. Third quarter sampling efforts were influenced by the seasonally low groundwater levels and the presence of free product. The rationale for the method used at each well is described below:

- MW-1 and MW-9 were not sampled due to the presence of measurable free product (0.12 and 0.08 feet, respectively).
- MW-2 through MW-4, MW-10, and MW-11 were not sampled because they were hydraulically disconnected from the unconfined water-bearing zone.
- MW-5 was purged using low-flow methods and then sampled.
- MW-6 through MW-8 were purged dry due to the slow recharge and then sampled.

Pumping was conducted using disposable low-density polyethylene tubing and a stainless steel electronic submersible continuous discharge pump. Bailing was conducted using disposable clear polyvinyl chloride (PVC) bailers.

A surface water sample was also collected from the very small stream northwest of the release location (Figure 2).

### 1.2.1 MW-1 and MW-9 Sorbent Booms

URS installed sorbent booms (booms) in MW-1 and MW-9 as an interim remedial measure. The purpose of installing the booms were to passively collect and facilitate degradation of hydrocarbon product within the wells and allow for future quarterly groundwater samples to be collected when measurable product is not present. MW-1 and MW-9 were gauged several times after the booms were installed and product was not measured. However, during third quarter fluid level measurements, product returned to the groundwater surface at both wells shortly after the booms were removed. Because measurable product was present after the booms were removed, the wells were not sampled. Both booms were reinstalled after groundwater and product gauging.

### 1.2.2 MW-5

After re-measuring the groundwater level at MW-5, the pump intake was slowly lowered into position in the center of the well screen. Low-flow purging rates were between 150 and 200 milliliters per minute (mL/min). During low-flow purging, the water level was measured periodically to monitor draw down. Although the draw down was greater than 0.33 feet, the water level stabilized at 0.65 feet below the static water level after an initial drop when purging began. The static and final groundwater levels before and after sampling are provided on the low-flow groundwater sampling form, included in Attachment A.

In addition to monitoring the water level during low-flow sampling, parameters such as temperature, pH, conductivity, oxygen reduction potential (ORP), dissolved oxygen (DO) and



turbidity of the groundwater were monitored using an in-line flow-through cell and multi-parameter device. The multi-parameter device was calibrated prior to sampling. During purging, the parameter readings described above were recorded every 3 minutes until the parameters stabilized.

The parameters were considered to be stable when three consecutive readings were within the following guidelines: pH +/- 0.2 pH units, conductivity +/- 3% of reading, ORP +/- 20 millivolts (mV), DO +/- 0.2 milligrams per liter (mg/L), turbidity +/- 1.0 nephelometric turbidity units (NTU) (Attachment A).

After monitoring the field parameters, the flow through cell was detached from the pump and tubing assembly. The groundwater sample was collected directly from the pump tubing.

### 1.2.3 MW-6 through MW-8

Because of slow recharge rates at MW-6 through MW-8, low-flow purging methods could not be used. Instead, the monitoring wells were purged dry. At MW-6, MW-7, and MW-8, approximately 27, 30, and 1.5 gallons were removed from each well, respectively. After the wells were purged dry, the recharging water levels were monitored until sufficient water was present to collect the groundwater samples.

### 1.2.4 MW-10 and MW-11

No groundwater was detected in either MW-10 or MW-11. Monitoring efforts will continue to determine if any impacts are present. If impacts are observed in MW-10 or MW-11, optional monitoring wells proposed will be installed.

### 1.2.5 Surface Water Sample

The sampling location along the very small stream is located at the base of the alluvial terrace within the Alameda Creek floodplain and is shown on Figure 2. The former sampling point (SW-Creek, sampled prior to the first quarter of 2007) is also provided on Figure 2 for reference. To the west, beyond the sampling location, the very small stream fans out into the floodplain and surface flow terminates within floodplain grasses. The stream does not reach the eastern channel of Alameda Creek, which has been noted as dry during recent Site visits.

## 1.3 ANALYTICAL PROGRAM

The groundwater samples from each well were collected in clean laboratory provided containers and placed on ice in a cooler immediately after collection. The sample cooler included a trip blank and was submitted to Lancaster Analytical Laboratory in Lancaster, Pennsylvania, a California Certified Laboratory, under URS chain-of-custody procedures. The samples were analyzed on a standard turn around time.

As discussed in URS' *February 2006 Groundwater Monitoring Report*, groundwater and surface water samples collected during quarterly sampling activities are analyzed for the following parameters:

- Benzene, toluene, ethylbenzene, xylenes (BTEX) by U.S. Environmental Protection Agency (USEPA) Method 8260B
- Total petroleum hydrocarbons – gasoline range organics (TPH-GRO) by N. CA LUFT GRO

## 1.4 GROUNDWATER ANALYTICAL RESULTS

A summary of the analytical results for the gasoline compounds and associated environmental screening levels (ESLs) developed by RWQCB (2005) are presented in Table 3 and the complete laboratory analytical results and chain of custodies are included as Attachment B.

### 1.4.1 Unconfined Water-Bearing Zone Wells

The unconfined water bearing zone wells include nursery unconfined water-bearing zone wells (MW-1 through MW-4 and MW-9 through MW-11) and the Calaveras Road shallow unconfined water-bearing zone well (MW-8), the apparent hillside groundwater recharge source for the nursery. The third quarter groundwater sample results are as follows:

- MW-1 and MW-9 contained measurable free product during third quarter 2007 groundwater monitoring activities and were not sampled.
- MW-2, MW-3, MW-4, MW-10, and MW-11 were hydraulically disconnected from the unconfined water-bearing zone and were not sampled.
- The MW-8 sample contained TPH-GRO at 4,200 micrograms per liter ( $\mu\text{g/L}$ ), benzene at 470  $\mu\text{g/L}$ , toluene at 230  $\mu\text{g/L}$ , ethylbenzene at 630  $\mu\text{g/L}$ , and xylenes at 320  $\mu\text{g/L}$ .

### 1.4.2 Confined Water-Bearing Zone Wells

The confined water-bearing zone wells include MW-5 through MW-7 located along Calaveras Road. The third quarter groundwater sample results are as follows:

- The MW-5 sample concentrations were below laboratory reporting limits for all of the constituents.
- The MW-6 sample concentrations were below laboratory reporting limits for all of the constituents.
- The MW-7 and its duplicate sample concentrations were below laboratory reporting limits for all of the constituents.

Because groundwater samples collected from MW-5 through MW-7 have remained below the most stringent ESLs for all of the constituents for four quarters, URS proposes to close these three monitoring wells and discontinue the monitoring program for the confined water-bearing zone. Closing out the groundwater monitoring program for the confined water-bearing zone includes the proper destruction of monitoring wells MW-5 through MW-7, per Zone 7 Alameda County Flood Control and Water Conservation District requirements.

### 1.4.3 Surface Water Sample

The surface water sampling location is shown on Figure 2. Surface water concentrations were below laboratory reporting limits for all constituents.

## 1.5 SUMMARY OF QA/QC REVIEW PARAMETERS

The certified analytical reports from the analytical laboratory were subjected to a quality assurance/quality control (QA/QC) review and data validation by URS. Laboratory and field QC sample results were evaluated to assess the quality of the individual sample results and overall method performance. The data evaluation performed included review of:

- Blanks (laboratory method blanks and trip blanks)
- Spikes (laboratory control spikes, matrix control spikes and surrogate spikes)
- Duplicates (laboratory control spike duplicates, matrix control spike duplicates and field duplicates)
- Sample integrity (chain-of-custody documentation, sample preservation, and holding time compliance)

All reported results for the laboratory method blanks were nondetect (less than the laboratory reporting limit), indicating no evidence of contamination from laboratory instrumentation. All reported results for the trip blank were non-detect (less than the laboratory reporting limit), indicating no evidence of contamination during shipping of the laboratory samples. One field duplicate sample, MW-X (MW-7-DUP), was collected during this sampling event. All reported results for samples MW-X and MW-7 were non-detect (less than the laboratory reporting limit), so the heterogeneity of the matrices could not be evaluated.

All reported laboratory control spike (LCS) sample recoveries, matrix control spike (MS) sample recoveries, and surrogate spike recoveries were within laboratory QC limits.

Chain-of-custody documentation was complete and consistent. Samples were preserved as required per method specifications. All samples were analyzed within the method-specified holding times.

The data quality evaluation indicated that no systematic problems were detected, and the overall data objectives for sample contamination, precision, accuracy, and sample integrity were met. These analytical data are of acceptable quality and may be used for their intended purposes.

This section summarizes the design of the SVE system and the monitoring and analysis program implemented at the Site.

## 2.1 SVE SYSTEM DESIGN

URS installed four SVE wells (SVE-1D, SVE-2S, SVE-3S, and SVE-4D) on the dirt road in November 2005, as shown in Figure 2. The system operated for 3 months and removed a total of 7,294 pounds (approximately 1,042 gallons) during the period from November 8, 2005 through February 13, 2006. Upon ACEH's request, URS installed five additional SVE wells (SVE-5 through SVE 9) below the dirt road on the steep hillside in November 2006. The updated system was restarted on November 28, 2006. The well construction details for the nine SVE wells are presented in Table 4.

The SVE treatment system was installed by URS subcontractor Stratus, Inc. (Stratus). The system consists of the following components:

- A trailer-mounted 200-cubic-feet-per-minute (cfm) thermal oxidizer (manufactured by CBA Equipment, LLC) that includes a 15-horsepower (hp) liquid ring blower and a 100-gallon knockout pot
- A 49-hp-rated propane electrical generator
- Conveyance pipes and manifolds
- A 1000-gallon propane tank

The SVE treatment system was located north of the release location on San Francisco Public Utilities Commission (SFPUC) property (Figure 2). The SFPUC property is fenced and has a locked gate for security. An additional separate 8-foot-high, slatted chain-link fence with a locked gate encloses the SVE equipment compound. Vapors are extracted from the SVE wells with the liquid ring blower and conveyed to the treatment compound through two separate sets of piping. The first set of piping connects SVE-1D through SVE-5 to the treatment system and the second set of piping connects SVE-6 through SVE-9 to the treatment system. Both sets of piping consist of 2-inch-diameter Schedule 40 PVC conveyance pipes that run from each wellhead to the appropriate manifold. The manifold for each set of piping consists of valves to regulate the flow to each well. A single 1.5-inch diameter Schedule 40 PVC conveyance pipe connects each manifold to the treatment system. The extracted vapor stream is conveyed from the manifold to the knockout pot, which separates and collects moisture from the vapor stream. Hydrocarbon-impacted vapors are abated by the thermal oxidizer before discharge to the atmosphere.

The required notification letter to the Bay Area Air Quality Management District (BAAQMD) is included in Attachment C. A copy of the permit for the SVE system from the BAAQMD is provided in Attachment D.

## 2.2 MONITORING AND ANALYSIS PROGRAM

Photoionization detector (PID) readings at each SVE wellhead and at the system influent and effluent points were recorded every week during this reporting period.

Grab vapor samples for laboratory analysis were collected at each wellhead and at the system influent and effluent points approximately every two to three weeks for confirmation purposes.

All vapor samples for chemical analysis were transported under URS chain-of-custody to Lancaster Laboratories via FedEx. The vapor samples were analyzed for the following:

- Hydrocarbon concentrations as hexane by USEPA Method 25 Modified
- BTEX by USEPA Method TO-14A

Attachment B provides the complete laboratory analytical results.

### 2.3 SVE SYSTEM OPERATION AND MONITORING RESULTS

This section contains the operation and monitoring results of the SVE system from November 28<sup>th</sup>, 2006 through August 17<sup>th</sup>, 2007. The operational parameters, sampling results, and mass removal calculations for wells SVE-1D through SVE-9 are presented in Table 5A through 5I, respectively. Figure 5 shows the PID readings at each well. Figure 6 shows the cumulative mass of hydrocarbons removed from each well. Figure 7 shows the mass removal rate as pounds per day (lbs/day) at each well. Figure 8 shows the mass removal rate as lbs/day for the SVE system. Gasoline mass removal was calculated based on the PID readings collected at the wellheads and on the analytical lab data.

After system start-up and stabilization, URS collected vapor samples on the first day of operation (November 28, 2006), and then once a week for the first two weeks of the SVE system operation. Site visits were conducted twice a week for the first two weeks of operation to confirm that the system was operating properly and to record system readings.

During the site visit on November 30, 2006, ice and water was observed in both extraction piping runs, which restricted airflow to the SVE System. Airflow from the lower piping run network, which connects wells SVE-6 through SVE-9, was completely stopped due to perched groundwater pulled from SVE-8. Ice and water were drained from the piping, and SVE-8 was closed. Airflow from the upper piping run network, which connects wells SVE-1D through SVE-5, was not at its full capacity. The restriction of airflow might have resulted from extreme ambient temperature fluctuations. After both piping runs were cleared, the system was restarted and monitored to ensure that the system re-stabilized. SVE-8 has remained closed since November 30, 2006 due to perched water at this location.

On December 19, 2006, ice was observed again in both piping runs which caused blockage. Piping moisture traps were installed in both piping runs to divert and collect moisture condensate from the piping runs. The piping traps are drained weekly during site visits. The system has been running smoothly since the installation of the piping traps.

Due to decreased PID readings and mass removals reaching asymptotic values at SVE-1D and SVE-2S (Figure 5 and Figure 7), the well valves were closed on January 19, 2007. URS re-opened SVE-1D and SVE-2S on March 22, 2007, to evaluate whether or not the period of inactivity would cause a surge in mass removal rates. The mass removal rates at both wells remained low and the well valves were closed again on April 20, 2007. On July 13, 2007, SVE-1D and SVE-2S were once again re-opened to evaluate whether or not mass removal rates would rebound. SVE-2S was closed due to very low PID readings, and it has remained closed since July 13, 2007. SVE-1D exhibited low mass removal rates but remained open until August 17, 2007.

### 2.3.1 SVE Removal Results

During the initial operation of the SVE system from November 8, 2005, through February 13, 2006, utilizing only SVE-1D, SVE-2S, SVE-3S, and SVE-4D, an estimated 7,294 pounds (approximately 1,042 gallons) of product were removed. The average product removal rate during this time period was 99.58 pounds per day (lbs/day).

During the additional operation of the SVE system from November 28<sup>th</sup>, 2006, through August 17<sup>th</sup>, 2007, utilizing SVE-1D, SVE-2S, SVE-3S, SVE-4D, and SVE-5 through SVE-9, an estimated 9,742 pounds (approximately 1,597 gallons) of product were removed. The average removal rate during this entire time period was 44.21 lbs/day. However, the system mass removal rate has continued to steadily decrease over time, with an average removal rate of 27.8 lbs/day during the period from June 8, 2007, to August 17, 2007 (Figure 8).

Comparing the mass removal rates from the initial system operation beginning in November 2005 (99.58 lbs/day) to the most recent operational period from June 8, 2007, to August 17, 2007 (27.8 lbs/day), indicates that the current SVE system vapor collection efficiency has dropped to 27% of its original efficiency. Figure 8 illustrates the marked decrease in system efficiency since the restart of the system in November 2006.

### 2.3.2 SVE System Shutdown

URS ceased SVE system operations on August 17<sup>th</sup>, 2007 and removed the SVE system and associated equipment, per the discussion at our meeting on July 19, 2007. URS recommends that the SVE system not be restarted at the Site based on the following reasons.

- Diminishing SVE product removal rates averaging less than 30 lbs/day from June 2007, to August 17, 2007.
- The purpose of operating the SVE system is to remove contaminant mass from the soil along the hillside to prevent impacts to down gradient groundwater. Based on the previous two years of groundwater monitoring well installation and monitoring results, URS feels that the spill's groundwater impacts are well-characterized and appear to be stable. URS will continue monitoring the down gradient wells in order to identify any future impacts to groundwater. If groundwater impacts become significantly worse with time, continued SVE system operation and/or other treatment options would need to be reevaluated.
- No indication of deep groundwater impacts.
- No indication of surface water impacts.
- Site is well characterized.
- Shallow groundwater plume identified and routinely monitored, as mentioned in Section 1.2.4 of this report. If the new monitoring wells, MW-10 and MW-11, show significant gasoline impacts during future monitoring events, Chevron is ready to install one or more of the optional wells discussed in our groundwater monitoring workplan.
- Health and safety risks posed by the local terrain.
- Residual impacts to the soil along the hillside will attenuate over time.

## 2.4 MASS REMOVAL CALCULATIONS

The assumptions used in the mass removal calculations were as follows:

- The relative vapor density of gasoline is approximately 3.3 (unitless).
- The vapor density of pure, dry air is 1,200 grams per cubic meter ( $\text{g/m}^3$ ) at 68° Fahrenheit (°F).

The vapor density of gasoline is therefore calculated as  $3.3 \times 1,200 \text{ g/m}^3 = 3,960 \text{ g/m}^3$  at 68°F.

Air flow in standard cubic foot per minute (SCFM) at 14.7 pounds per square inch atmosphere (psia) and 68°F is converted from air flow in cubic feet per minute as follows:

$$SCFM \text{ (at 14.7psia and 68°F)} = CFM \times [(Pg + Patm)/(Patm)] \times [(68 + 460)/(Tact + 460)]$$

Where

- $Pg$  is the gauge pressure at the wellhead
- $Patm$  is the atmospheric pressure
- $Tact$  is the actual temperature
- 460 is the temperature conversion factor from Fahrenheit to Rankin.

The mass removed in pounds is calculated as follows:

$$\text{Pounds of Petroleum Hydrocarbons Removed} = (\text{flowrate in SCFM}) \times (\text{average concentration in ppmv}) \times (60 \text{ min/hr}) \times (106.88 \text{ lbs/molecule}) \times (\text{Operation Time in hr}) / 1000000 / 379$$

- Measurable free product was observed in MW-1 and MW-9. No product or sheen was observed in any of the other monitoring wells (MW-2 through MW-8, MW-10, and MW-11).
- Due to unusually dry winter and spring conditions, the water table elevation continues to decrease, hydraulically disconnecting MW-2, MW-3, and MW-4 from the unconfined water-bearing zone. Newly installed monitoring wells MW-10 and MW-11 also appear to be disconnected from the unconfined water-bearing zone due to dry seasonal conditions. As a result of the low water table, none of these wells were sampled during third quarter monitoring activities.
- No gasoline compounds were detected above their respective laboratory reporting limits in wells MW-5 through MW-7 and the surface water sample.
- The MW-8 sample contained TPH-GRO at 4,200 µg/L, benzene at 470 µg/L, toluene at 230 µg/L, ethylbenzene at 630 µg/L, and xylenes at 320 µg/L.
- The updated SVE system was restarted on November 28, 2006 and ran continuously until August 17, 2007. During this time the system removed a total of 9,742 pounds (approximately 1,597 gallons). The system mass removal rates have decreased steadily over time to approximately 27% of the original efficiency.



- Continue quarterly groundwater monitoring to further assess the effect of seasonal groundwater fluctuations on groundwater behavior and contaminant transport within the unconfined water-bearing zone.
- If no impacts are observed in MW-10 and MW-11, optional wells proposed will not be installed.
- Sorbent booms will continue to be used as an interim remediation measure in wells containing hydrocarbon sheen or measurable product. Currently sorbent booms are installed in MW-1 and MW-9.
- MW-5 through MW-7 groundwater sample concentrations have remained below the most stringent TPH-GRO and BTEX ESLs for four quarters, URS proposes to close these three wells and discontinue the monitoring program for the confined water-bearing zone. Closing out the groundwater monitoring program for the confined water-bearing zone includes the proper destruction of monitoring wells MW-5 through MW-7, per Zone 7 Alameda County Flood Control and Water Conservation District requirements.
- URS requests ACEH approval to terminate operation of the SVE system. URS does not believe that continued operation of the SVE system at the site is warranted given the following:
  - There has been a substantial decline in system recovery rates.
  - Residual contamination in the soil along the hillside will naturally remediate and will likely not significantly affect down gradient impacts.
  - Area impacts have been well-characterized and will continue to be regularly monitored. Should continued monitoring of the down gradient wells identify future impacts to groundwater, continued SVE system operation and/or other treatment options would be reevaluated.
  - Observed impacts do not pose a risk to human health or the environment.
- With the discontinuation of the SVE system operation, URS recommends abandonment of the SVE Wells SVE-1D, SVE-2S, SVE-3S, SVE-4D, and SVE-5 through SVE-9, and removal of the stairs installed, allowing for the installation of wells SVE-6 through SVE-9.

No evaluation is thorough enough to preclude the possibility that materials that are currently considered hazardous or materials that may be considered hazardous in the future may be present at a site. Because regulatory evaluation criteria are constantly changing, concentrations of contaminants presently considered nonhazardous may, in the future, fall under different regulatory standards and require remediation. Opinions and judgments expressed herein, which are based on understanding and interpretation of current regulatory standards, should not be construed as legal opinions. This document and the information contained herein have been prepared solely for CPL's use, and reliance on this report by third parties will be at such party's sole risk.

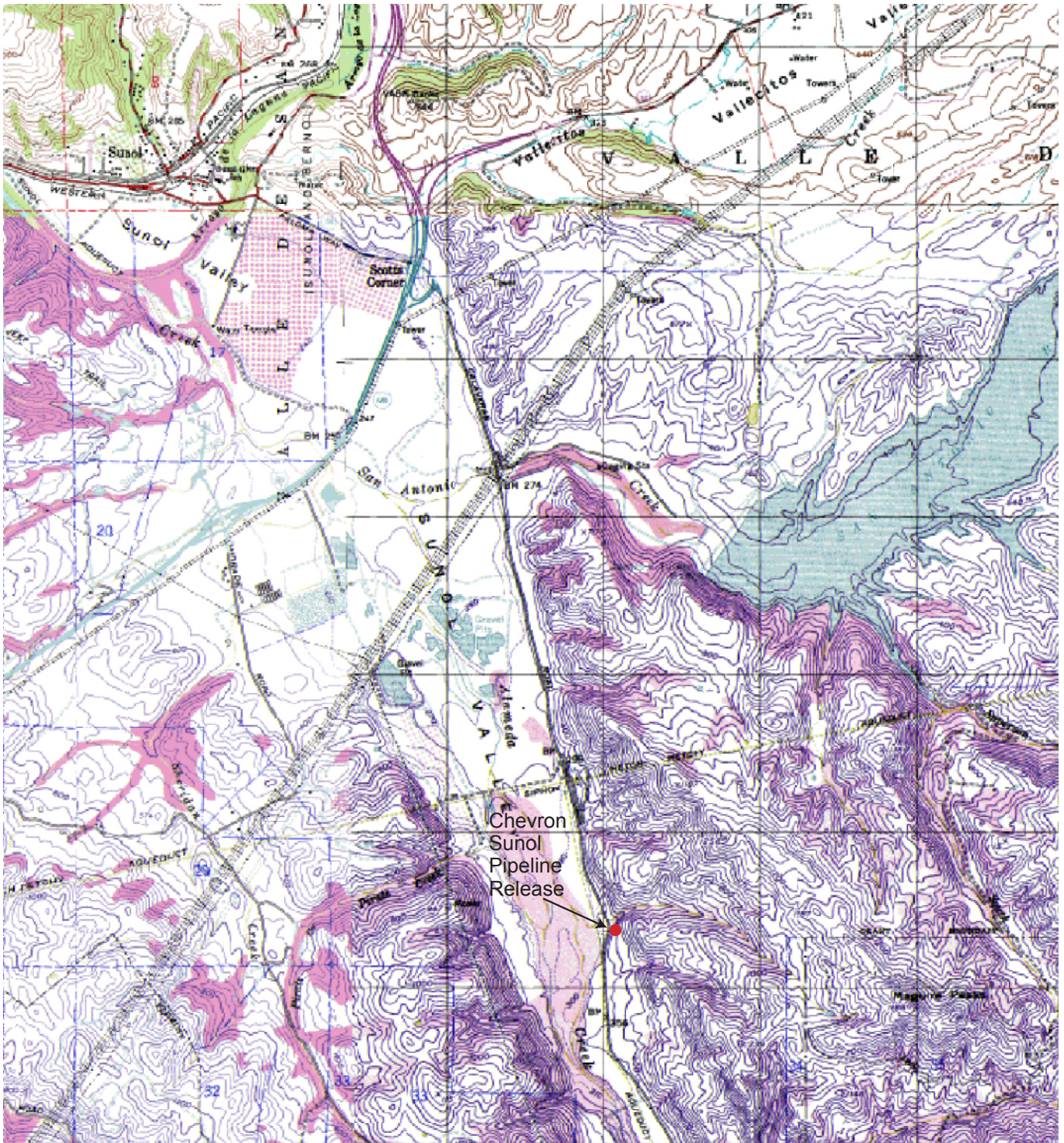
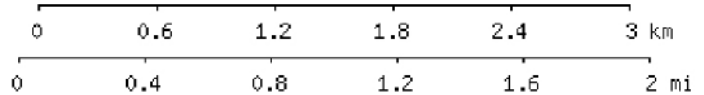


Image obtained from topozone.com



**MAP REFERENCE:**

PORTION OF U.S.G.S. QUADRANGLE MAP  
 7 1/2 MINUTE SERIES (TOPOGRAPHIC)  
 LA COSTA VALLEY QUADRANGLE



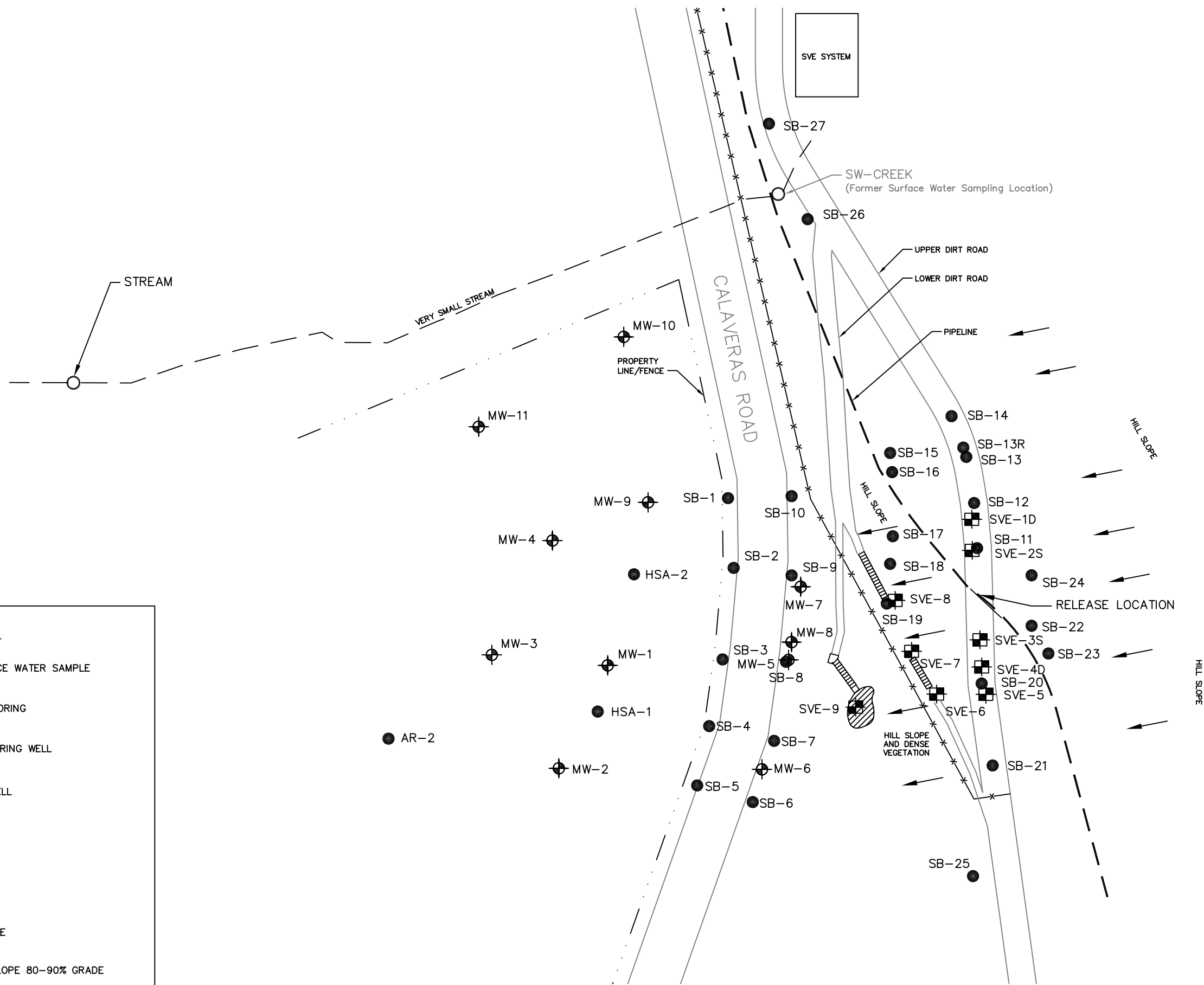
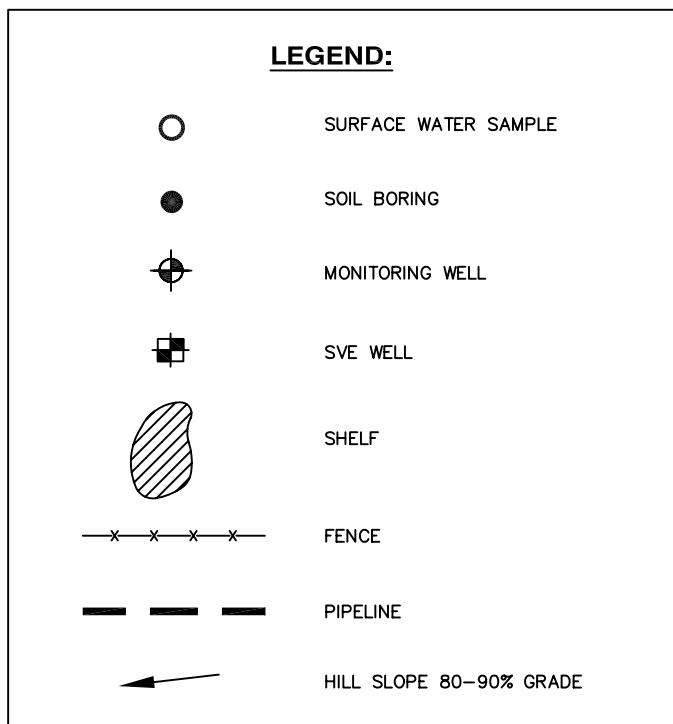
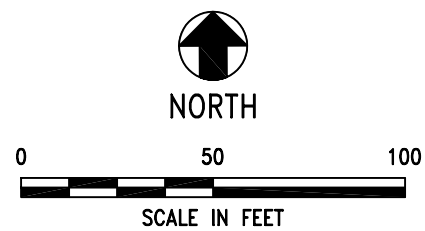
Chevron Pipeline Company

Project No. 26815217

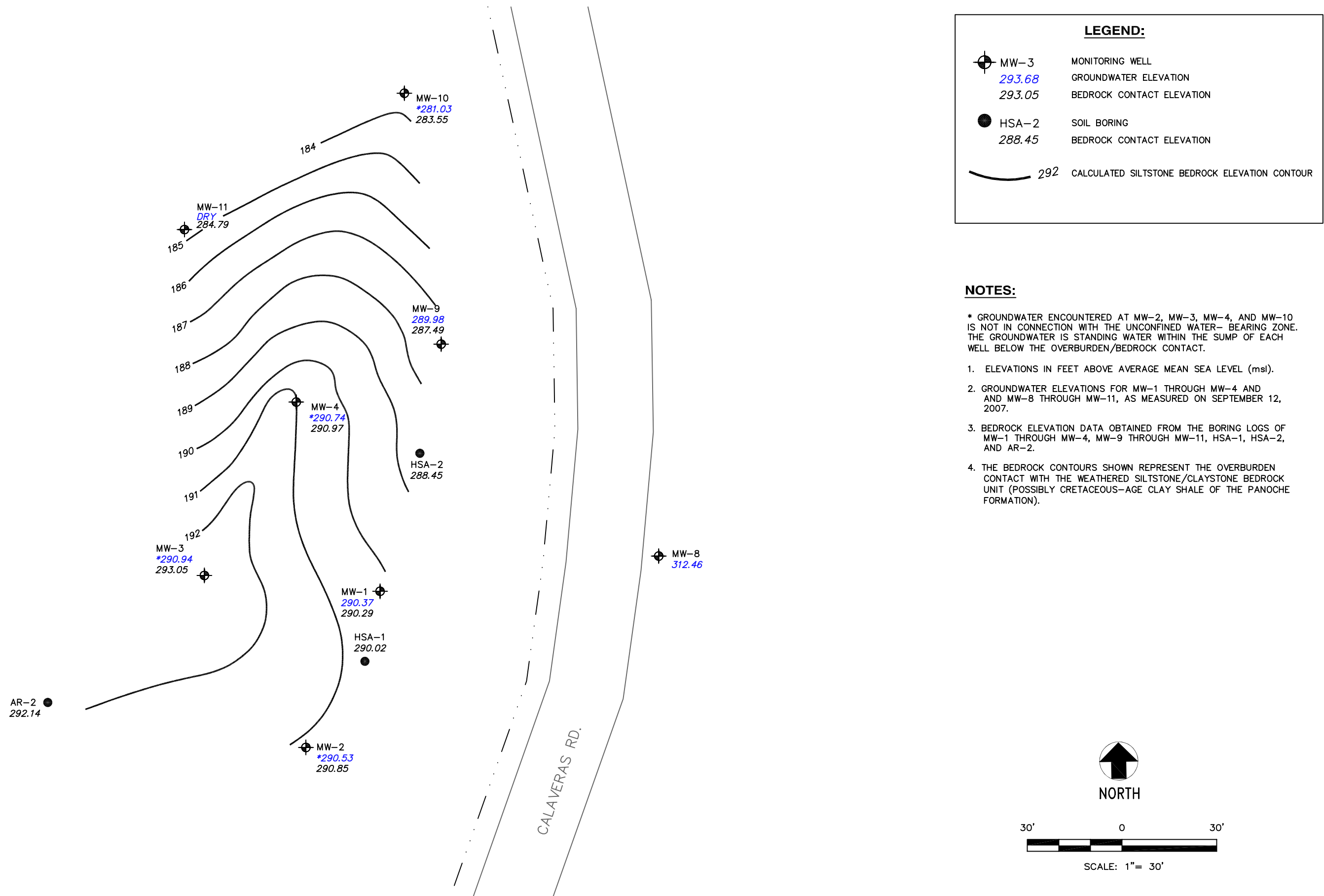
**SITE VICINITY MAP  
 CHEVRON SUNOL PIPELINE  
 SUNOL, CALIFORNIA**

**Figure  
 1**

Oct 03, 2007 - 1:21pm  
 X:\x\_env\waste\Chevron Pipeline Company\Sunol Spill\Additional Well Installation 1-06\Add. Investigation Report\Figures\Figure 2\_SVE-GW Locations.dwg



PLOTTED October 10, 2007 BY: Ranstead, Brian. CTB USED: D:\epc2\ctb PAPER SPACE TAB Bedrock And Gnc Dwg PATH: I:\Greg White\Chevron Figures\3\_Bedrock Contours\_Unconfined Water-Bearing Zone.dwg





MW-9

MW-4

MW-7  
314.46

**LEGEND:**

 MW-3  
293.68      MONITORING WELL WITH GROUNDWATER ELEVATION

**NOTES:**

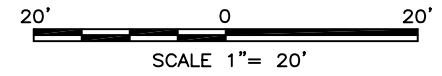
- 1.) ELEVATIONS IN FEET ABOVE AVERAGE MEAN SEA LEVEL (msl).
- 2.) GROUNDWATER ELEVATIONS FOR MW-5 THROUGH MW-7 AS MEASURED ON SEPTEMBER 12, 2007.

MW-3

MW-1

MW-8

MW-5  
319.16

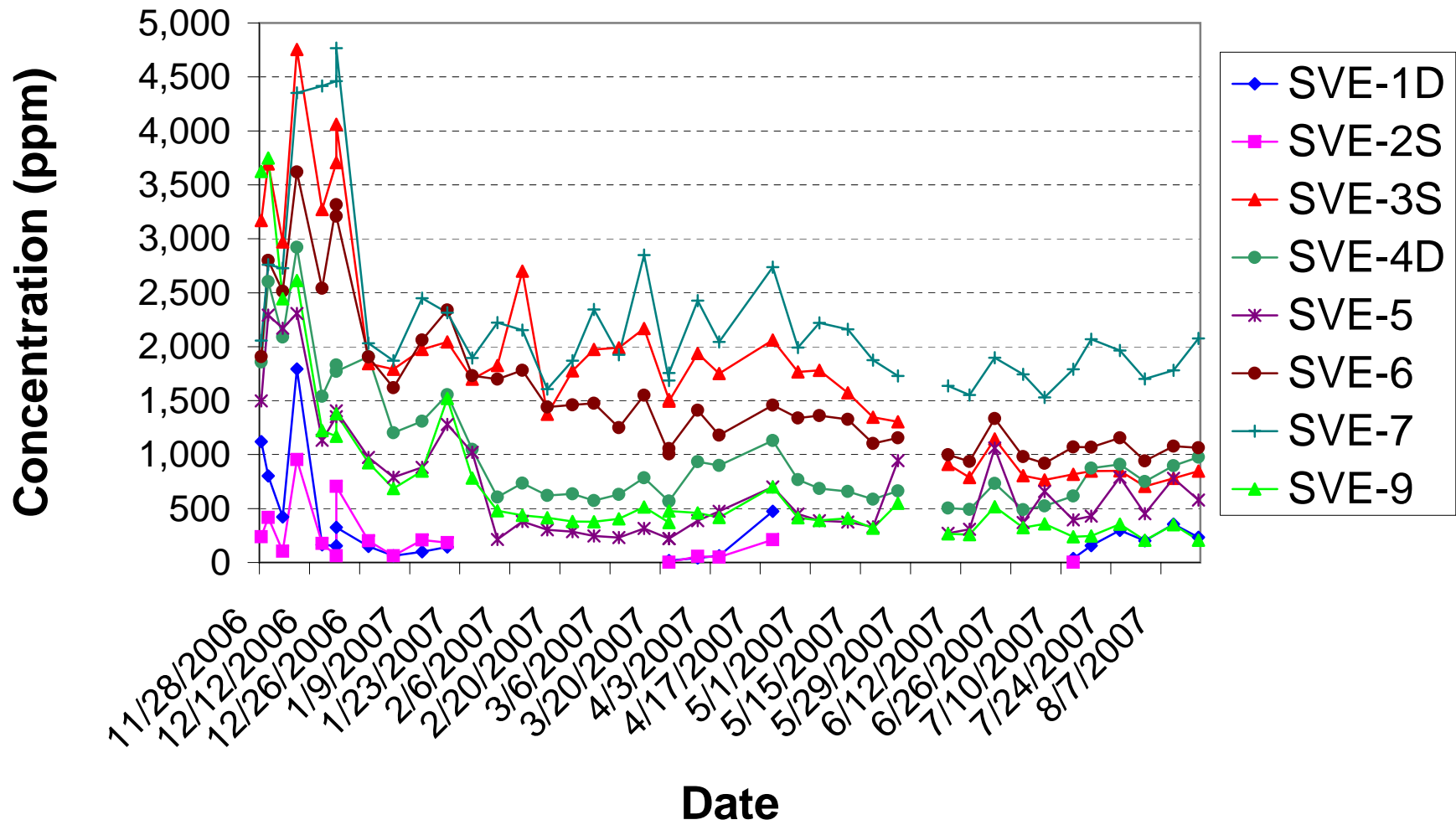


MW-2

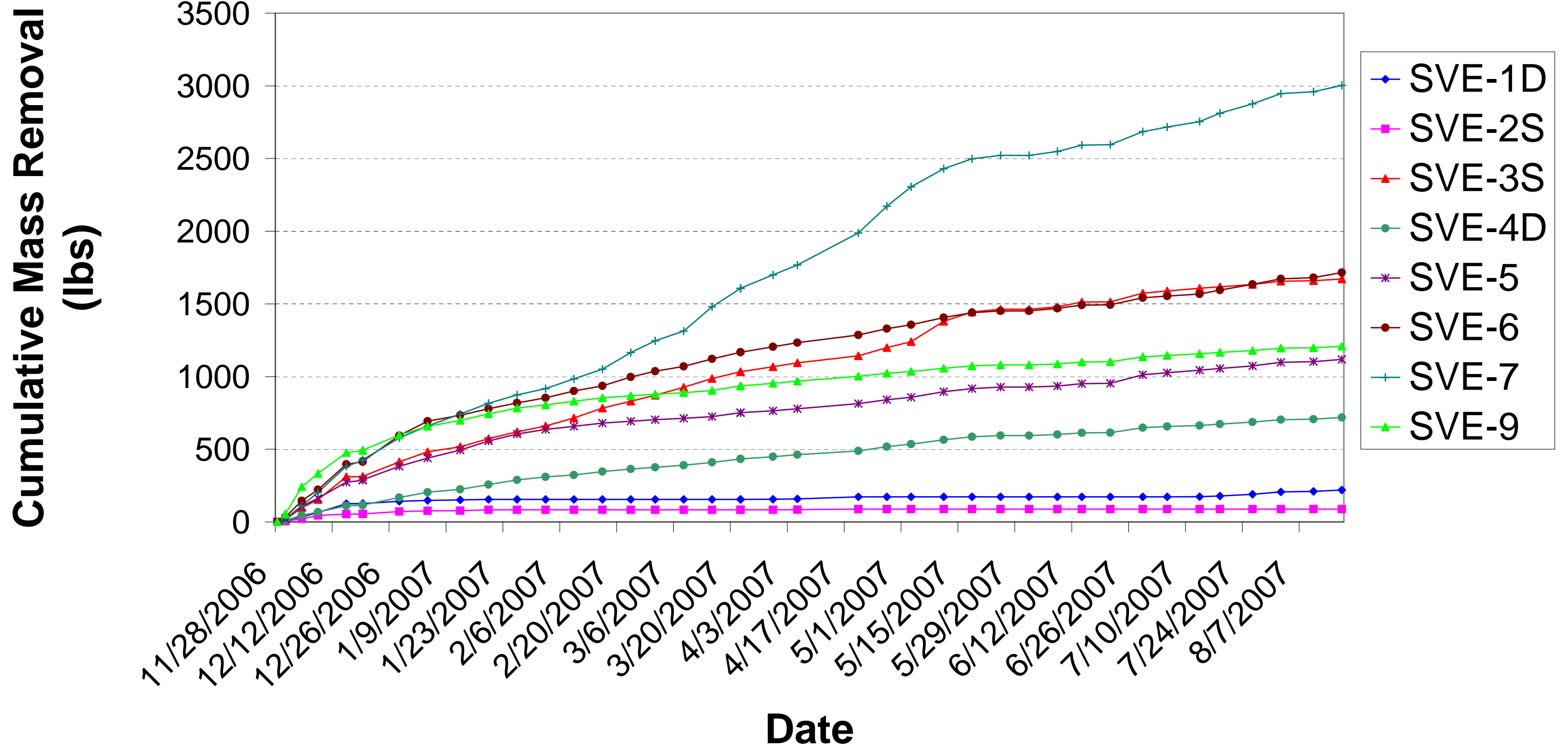
MW-6  
308.92

CALAVERAS RD.

# Figure 5 - Field Concentrations



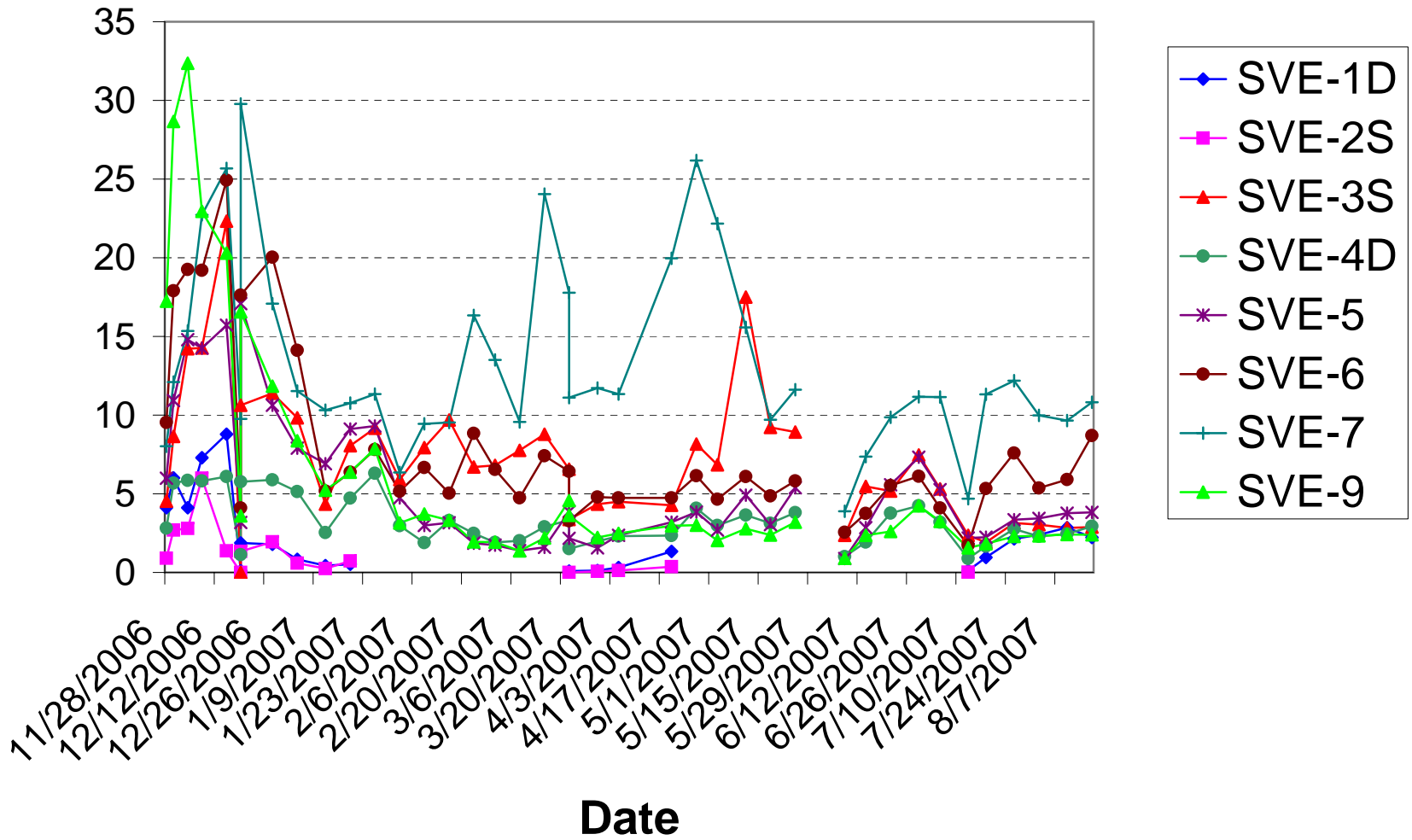
# Figure 6 - Cumulative Mass Removal





# Figure 7 - Mass Removal Rate

Mass Removal Rate (lbs/day)



### Figure 8-System Mass Removal

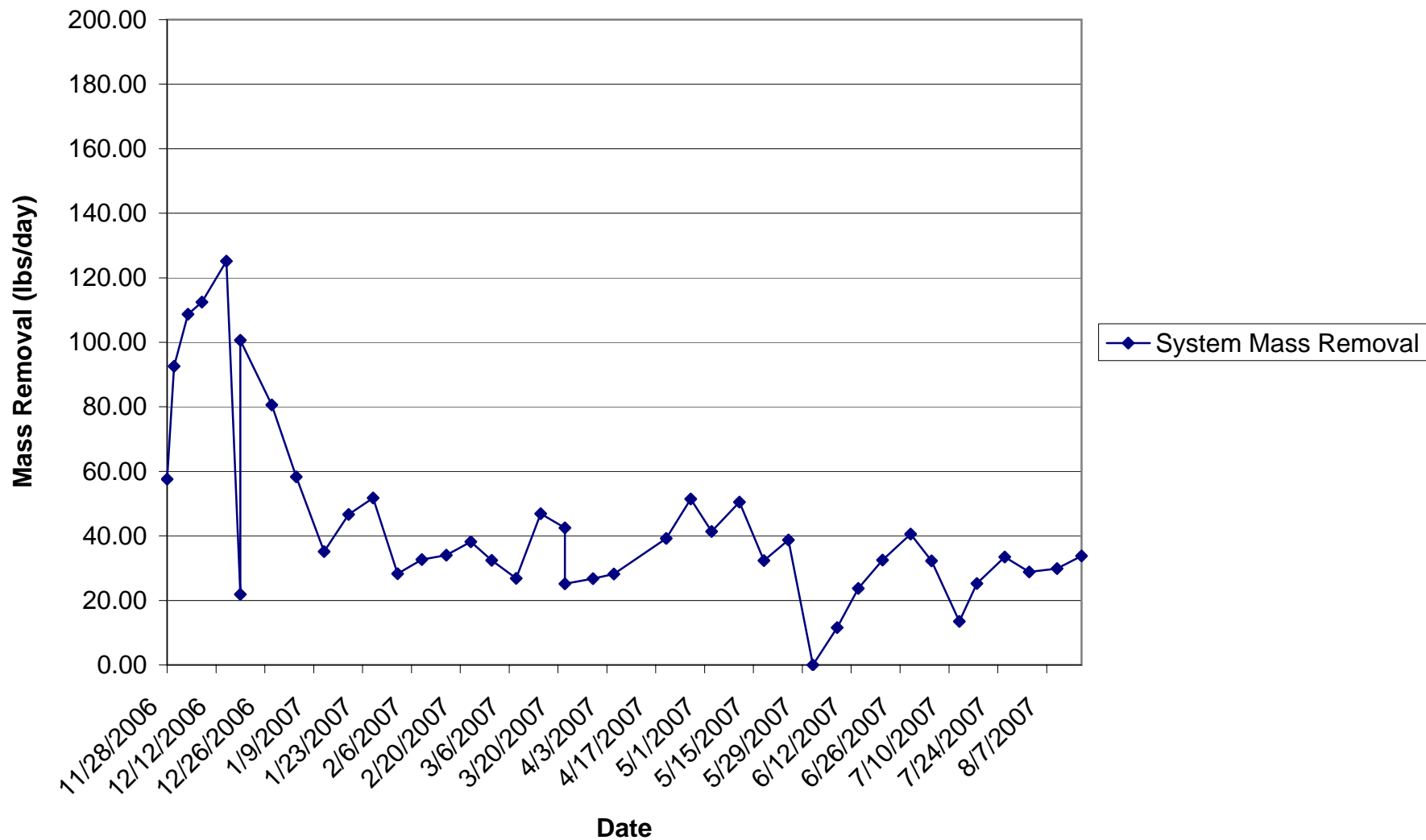


TABLE 1  
Monitoring Well Groundwater Levels  
Third Quarter 2007 Groundwater and Soil Vapor Extraction System Monitoring Report  
Chevron Sunol Pipeline

Well ID	Screen Interval (feet bgs)	Date	Depth to Groundwater (feet TOC-N)	Depth to Product (feet TOC-N)	Product Thickness (feet)
MW-1	29.3-39.3	2/21/2006	36.34	--	--
		6/7/2006	34.28	--	--
		8/22/2006	37.11	37.08	0.03
		11/14/2006	37.05	--	--
		2/20/2007	36.14	--	--
		6/5/2007	37.21	--	--
		9/12/2007	37.67	37.55	0.12
MW-2	23.3-38.3	2/21/2006	32.19	--	--
		6/7/2006	30.23	--	--
		8/22/2006	33.11	--	--
		11/14/2006	33.01	--	--
		2/20/2007	31.93	--	--
		6/5/2007	33.23	--	--
		9/12/2007	33.62	--	--
MW-3	21.3-36.3	2/21/2006	31.97	--	--
		6/7/2006	30.91	--	--
		8/22/2006	34.66	--	--
		11/14/2006	34.71	--	--
		2/20/2007	31.66	--	--
		6/5/2007	34.63	--	--
		9/12/2007	34.71	--	--
MW-4	30.7-40.7	2/21/2006	36.72	--	--
		6/7/2006	35.76	--	--
		8/22/2006	38.79	--	--
		11/14/2006	38.84	--	--
		2/20/2007	36.54	--	--
		6/5/2007	38.77	--	--
		9/12/2007	38.93	--	--
MW-5	39.5-49.5	2/21/2006	11.48	--	--
		6/7/2006	10.61	--	--
		8/22/2006	11.93	--	--
		11/14/2006	11.37	--	--
		2/20/2007	11.41	--	--
		6/5/2007	13.59	--	--
		9/12/2007	15.65	--	--
MW-6	34.7-49.7	2/21/2006	18.02	--	--
		6/7/2006	16.83	--	--
		8/22/2006	18.66	--	--
		11/14/2006	17.37	--	--
		2/20/2007	17.51	--	--
		6/5/2007	19.44	--	--
		9/12/2007	23.46	--	--
MW-7	34.7-49.7	2/21/2006	15.43	--	--
		6/7/2006	16.68	--	--
		8/22/2006	16.77	--	--
		11/14/2006	16.99	--	--
		2/20/2007	18.34	--	--
		6/5/2007	19.88	--	--
		9/12/2007	21.76	--	--
MW-8	14.5-24.5	8/22/2006	18.71	--	--
		11/14/2006	18.73	--	--
		2/20/2007	19.23	--	--
		6/5/2007	20.48	--	--
		9/12/2007	21.47	--	--
MW-9	36.0-46.0	8/22/2006	42.59	42.55	0.04
		11/14/2006	42.62	42.54	0.08
		2/20/2007	41.91	41.86	0.05
		6/5/2007	42.71	42.69	0.02
		9/12/2007	43.09	43.01	0.08
MW-10	40.3-55.3	9/5/2007	54.86	--	--
MW-11	37.0-47.0	9/6/2007	Dry	--	--

**Notes:**

Groundwater and product levels measured from top of casing - north (TOC-N).  
Screen intervals measured from feet below ground surface (feet bgs)

TABLE 2  
Monitoring Well Groundwater Elevations  
Third Quarter 2007 Groundwater and Soil Vapor Extraction System Monitoring Report  
Chevron Sunol Pipeline

Well ID	Date Completed	Ground Surface Elevation (feet msl)	Top of Casing Elevation (feet msl)	Date Measured	Groundwater Elevation (feet msl)	Product Elevation (feet msl)	Product Thickness (feet)
MW-1	10/20/2005	328.49	328.04	2/21/2006	291.70	--	--
				6/7/2006	293.76	--	--
				8/22/2006	290.93	290.96	0.03
				11/14/2006	290.99	--	--
				2/20/2007	291.90	--	--
				6/5/2007	290.83	--	--
MW-2	10/21/2005	324.85	324.15	2/21/2006	291.96	--	--
				6/7/2006	293.92	--	--
				8/22/2006	291.04	--	--
				11/14/2006	291.14	--	--
				2/20/2007	292.22	--	--
				6/5/2007	290.92	--	--
MW-3	10/21/2005	326.05	325.65	2/21/2006	293.68	--	--
				6/7/2006	294.74	--	--
				8/22/2006	290.99	--	--
				11/14/2006	290.94	--	--
				2/20/2007	293.99	--	--
				6/5/2007	291.02	--	--
MW-4	1/31/2006	329.97	329.67	2/21/2006	292.95	--	--
				6/7/2006	293.91	--	--
				8/22/2006	290.88	--	--
				11/14/2006	290.83	--	--
				2/20/2007	293.13	--	--
				6/5/2007	290.90	--	--
MW-5	1/27/2006	335.14	334.81	2/21/2006	323.33	--	--
				6/7/2006	324.20	--	--
				8/22/2006	322.88	--	--
				11/14/2006	323.44	--	--
				2/20/2007	323.40	--	--
				6/5/2007	321.22	--	--
MW-6	1/27/2006	332.61	332.38	2/21/2006	314.36	--	--
				6/7/2006	315.55	--	--
				8/22/2006	313.72	--	--
				11/14/2006	315.01	--	--
				2/20/2007	314.87	--	--
				6/5/2007	312.94	--	--
MW-7	1/27/2006	336.46	336.22	2/21/2006	320.79	--	--
				6/7/2006	319.54	--	--
				8/22/2006	319.45	--	--
				11/14/2006	319.23	--	--
				2/20/2007	317.88	--	--
				6/5/2007	316.34	--	--
MW-8	8/15/2006	335.23	333.93	8/22/2006	315.22	--	--
				11/14/2006	315.20	--	--
				2/20/2007	314.70	--	--
				6/5/2007	313.45	--	--
MW-9	8/16/2006	333.49	333.07	8/22/2006	290.48	290.52	0.04
				11/14/2006	290.45	290.53	0.08
				2/20/2007	291.16	291.21	0.05
				6/5/2007	290.36	290.38	0.02
MW-10	9/5/2007	336.55	335.89	9/12/2007	281.03	--	--
MW-11	9/6/2007	330.29	329.89	9/12/2007	Dry	--	--

**Notes:**

All elevations displayed in feet above average mean sea level (msl).  
Groundwater and product elevations calculated from depths as measured from top of casing - north.  
MW-1 through MW-3 surveyed on October 31, 2005.  
MW-4 through MW-7 surveyed on February 14, 2006.  
MW-8 and MW-9 surveyed on November 10, 2006.  
MW-10 and MW-11 surveyed on September 13, 2007.

TABLE 3  
Summary of Groundwater Analytical Results  
Gasoline Compounds  
Third Quarter 2007 Groundwater and Soil Vapor Extraction System Monitoring Report  
Chevron Sunol Pipeline

Well ID	Date	Gasoline Compounds				
		TPH-GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)
ESL <sup>1)</sup>		100	1	40	30	20
MW-1	2/22/2006	57,000	38	2,700	3,000	8,700
	6/8/2006	37,000	10	330	120	8,200
	Q3 2006 <sup>3)</sup>	NS	NS	NS	NS	NS
	11/15/2006	38,000	14	110	38	5,900
	2/21/2007	18,000	4	7	8	1,600
	6/5/2007	17,000	3	7	4	1,100
	Q3 2007 <sup>3)</sup>	NS	NS	NS	NS	NS
MW-2	2/21/2006 <sup>2)</sup>	<50 / <50	<0.5 / <0.5	<0.5 / <0.5	<0.5 / <0.5	<0.5 / <0.5
	6/7/2006	<50	<0.5	<0.5	<0.5	<0.5
	8/23/2006	<50	0.5	<0.5	<0.5	<0.5
	11/14/2006	<50	0.7	<0.5	<0.5	<0.5
	2/21/2007	<50	<0.5	<0.5	<0.5	<0.5
	6/5/2007	<50	<0.5	<0.5	<0.5	<0.5
	Q3 2007 <sup>4)</sup>	NS	NS	NS	NS	NS
	2/21/2006	<50	<0.5	<0.5	<0.5	<0.5
MW-3	6/7/2006	<50	<0.5	<0.5	<0.5	<0.5
	8/23/2006	170	<0.5	<0.5	<0.5	<0.5
	11/14/2006	86	<0.5	1	<0.5	<0.5
	2/21/2007	<50	<0.5	<0.5	<0.5	<0.5
	Q2 2007 <sup>4)</sup>	NS	NS	NS	NS	NS
	Q3 2007 <sup>4)</sup>	NS	NS	NS	NS	NS
	2/21/2006	<50	<0.5	<0.5	<0.5	<0.5
	6/7/2006	<50	<0.5	<0.5	<0.5	<0.5
MW-4	8/23/2006	70	0.6	<0.5	<0.5	1
	11/15/2006	<50	<0.5	<0.5	<0.5	0.5
	2/21/2007	<50	<0.5	<0.5	<0.5	<0.5
	Q2 2007 <sup>4)</sup>	NS	NS	NS	NS	NS
	Q3 2007 <sup>4)</sup>	NS	NS	NS	NS	NS
	2/22/2006	<50	<0.5	0.6	<0.5	1
	6/8/2006	<50	<0.5	<0.5	<0.5	<0.5
	8/24/2006	<50	<0.5	<0.5	<0.5	<0.5
MW-5	11/16/2006	<50	<0.5	2	<0.5	<0.5
	2/20/2007	<50	<0.5	<0.5	<0.5	<0.5
	6/6/2007	<50	<0.5	<0.5	<0.5	<0.5
	9/12/2007	<50	<0.5	<0.5	<0.5	<0.5
	2/22/2006	<50	<0.5	<0.5	<0.5	<0.5
	6/7/2006	<50	<0.5	<0.5	<0.5	<0.5
	8/22/2006	<50	<0.5	<0.5	<0.5	<0.5
MW-6	11/16/2006	<50	<0.5	<0.5	<0.5	<0.5
	2/20/2007	<50	<0.5	<0.5	<0.5	<0.5
	6/6/2007	<50	<0.5	<0.5	<0.5	<0.5
	9/12/2007	<50	<0.5	<0.5	<0.5	<0.5
	2/22/2006	<50	0.7	2	0.9	5
	6/8/2006	<50	0.7	<0.5	1	4
	8/22/2006 <sup>2)</sup>	<50 / <50	2 / 2	<0.5 / <0.5	1 / 0.6 J	3 / 2 J
	11/16/2006	<50	0.7	2	0.6	2
MW-7	2/20/2007 <sup>2)</sup>	<50 / <50	0.7 / 0.6	1 / 0.9	0.9 / 0.6 J	3 / 2 J
	6/6/2007	<50	0.7	0.8	0.8	2
	9/12/2007 <sup>2)</sup>	<50 / <50	<0.5 / <0.5	<0.5 / <0.5	<0.5 / <0.5	<0.5 / <0.5
	8/24/2006	18,000	190	2,600	590	2,800
	11/16/2006	990	76	80	69	190
	2/20/2007	2,000	180	57	170	74
	6/6/2007	3,600	340	92	370	210
MW-8	9/12/2007	4,200	470	230	630	320
	Q3 2006 <sup>3)</sup>	NS	NS	NS	NS	NS
	11/15/2006	74,000	480	12,000	2,200	17,000
	Q1 2007 <sup>3)</sup>	NS	NS	NS	NS	NS
	Q2 2007 <sup>3)</sup>	NS	NS	NS	NS	NS
MW-9	Q3 2007 <sup>4)</sup>	NS	NS	NS	NS	NS
	Q3 2007 <sup>4)</sup>	NS	NS	NS	NS	NS
MW-10	Q3 2007 <sup>4)</sup>	NS	NS	NS	NS	NS
SW-Creek	Q3 2007 <sup>4)</sup>	NS	NS	NS	NS	NS
	6/7/2006	<50	<0.5	<0.5	<0.5	<0.5
	8/22/2006	<50	<0.5	<0.5	<0.5	<0.5
Stream	11/15/2006	<50	<0.5	<0.5	<0.5	<0.5
	2/21/2007	<50	<0.5	<0.5	<0.5	<0.5
	6/5/2007	<50	<0.5	<0.5	<0.5	<0.5
	9/12/2007	<50	<0.5	<0.5	<0.5	<0.5

Notes:

Bold values exceed laboratory reporting limits.

J qualifier - The reported value is the approximate concentration of the analyte in the sample due to sample heterogeneity.

µg/L - micrograms per liter

NS - Not Sampled

TPH-GRO - Total Petroleum Hydrocarbons as Gasoline Range Organics

1) Environmental Screening Levels (ESLs) for groundwater as a current or potential source of drinking water were obtained from the San Francisco Regional Water Quality Control Board (RWQCB) Interim Final: Table A, February 2005.

2) Both sample and duplicate concentrations from well location are displayed.

3) Sample not collected during quarterly monitoring due to the presence of measurable free product.

4) Sample not collected during quarterly monitoring because well is not hydraulically connected to unconfined water-bearing zone.

TABLE 4  
 Summary of Groundwater Analytical Results  
 Geochemical Indicators and Other Parameters  
 Fourth Quarter 2006 Groundwater Monitoring Report  
 Chevron Sunol Pipeline

Well ID	Date	Geochemical Indicators and Other Parameters											
		DO <sup>1)</sup>	ORP <sup>1)</sup>	Nitrate	Manganese	Ferrous Iron	Dissolved Iron	Sulfate	Methane	pH <sup>1)</sup>	TDS	Alkalinity to pH 4.5	Alkalinity to pH 8.3
		(mg/L)	(mV)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)		(mg/L)	(mg/L) as CaCO <sub>3</sub>	(mg/L) as CaCO <sub>3</sub>
MW-1	6/8/2006	0.28	88.15	2.60	0.116	<0.008	<0.052	48.30	<0.002	6.62	494.00	317.00	<0.46
	Q3 2006	NM <sup>4)</sup>	NM <sup>4)</sup>	NM <sup>4)</sup>	NM <sup>4)</sup>	NM <sup>4)</sup>	NM <sup>4)</sup>	NM <sup>4)</sup>	NM <sup>4)</sup>	NM <sup>4)</sup>	NM <sup>4)</sup>	NM <sup>4)</sup>	NM <sup>4)</sup>
	11/15/2006	4.87 <sup>6)</sup>	25.00	0.37 J	1.000	0.220	0.079	108.00	<0.002	6.67	882.00	597.00	<0.46
MW-2	6/7/2006	NR <sup>3)</sup>	36.43	11.90	0.003	<0.008	<0.052	47.50	<0.002	6.56	465.00	286.00	<0.46
	8/23/2006	0.32	25.69	7.00	0.024	0.015	<0.052	121.00	0.005	6.63	811.00	470.00	<0.46
	11/14/2006	0.20	220.84	4.00	0.021	0.021	<0.052 UJ	126.00 J	0.004	6.72	867.00	530.00	<0.46
MW-3	6/7/2006	0.37	31.23	10.90	0.005	<0.008	<0.052	45.10	<0.002	6.56	446.00	274.00	<0.46
	8/23/2006	0.30	-1.80	<0.25	0.368	0.240	<0.052	26.30	1.500	6.60	711.00	421.00	<0.46
	11/14/2006	0.12	-17.57	NM <sup>5)</sup>	NM <sup>5)</sup>	NM <sup>5)</sup>	NM <sup>5)</sup>	NM <sup>5)</sup>	0.42	6.95	NM <sup>5)</sup>	NM <sup>5)</sup>	NM <sup>5)</sup>
MW-4	6/7/2006	0.28	29.57	9.20	0.020	0.059	<0.052	60.20	<0.002	6.65	423.00	282.00	<0.46
	8/23/2006	NR <sup>3)</sup>	-22.49	<0.25	0.226	0.700	<0.052	78.40	0.003	6.62	590.00	396.00	<0.46
	11/15/2006	3.46 <sup>6)</sup>	106.00	0.34 J	0.137	0.470	<0.052	90.30	0.003	6.74	672.00	490.00	<0.46
MW-5	6/8/2006	0.19	12.05	<0.25	0.029	0.120	<0.052	71.30	0.004	7.24	502.00	313.00	2.60
	8/24/2006	NR <sup>3)</sup>	-151.92	<0.25	0.021	0.280	<0.052	72.20	0.0054 J	7.32	506.00	320.00	<0.46
	11/16/2006	0.08	-48.11	<0.25	0.020 J	0.280	<0.052	73.80 J	0.005	7.45	513.00	320.00	<0.46
MW-6	6/7/2006	NM <sup>2)</sup>	NM <sup>2)</sup>	<0.25	0.599	12.600	<0.052	41.60	<0.002	NM <sup>2)</sup>	531.00	364.00	3.70
	8/22/2006	NM <sup>2)</sup>	NM <sup>2)</sup>	<0.25	0.600	5.500	<0.052	36.90	5.800	NM <sup>2)</sup>	553.00	375.00	<0.46
	11/16/2006	0.04	-71.00	<0.25	0.203 J	0.700	<0.052	38.30 J	5.700	7.92	541.00	366.00	<0.46
MW-7	6/8/2006	NM <sup>2)</sup>	NM <sup>2)</sup>	<0.25	0.706	13.400	<0.052	70.40	0.022	NM <sup>2)</sup>	542.00	310.00	5.90
	8/22/2006	NM <sup>2)</sup>	NM <sup>2)</sup>	<0.25	0.160	0.910	<0.052	75.70	0.094	NM <sup>2)</sup>	534.00	335.00	<0.46
	11/16/2006	0.06	-24.00	<0.25	0.376	5.800	<0.052	77.60 J	0.061	7.42	533.00	358.00	<0.46
MW-8	8/24/2006	NM <sup>2)</sup>	NM <sup>2)</sup>	<0.25	0.171	0.140	<0.052	90.20	<0.002 UJ	NM <sup>2)</sup>	563.00	362.00	<0.46
	11/16/2006	0.05	-74.00	<0.25	0.123	0.800	<0.052	78.60 J	0.002	7.22	564.00	350.00	<0.46
MW-9	Q3 2006	NM <sup>4)</sup>	NM <sup>4)</sup>	NM <sup>4)</sup>	NM <sup>4)</sup>	NM <sup>4)</sup>	NM <sup>4)</sup>	NM <sup>4)</sup>	NM <sup>4)</sup>	NM <sup>4)</sup>	NM <sup>4)</sup>	NM <sup>4)</sup>	NM <sup>4)</sup>
	11/15/2006	3.01 <sup>6)</sup>	4.00	<0.25 UJ	4.410	1.200	0.496	29.50	0.009	6.92	836.00	657.00	<0.46

**Notes:**

- DO = Dissolved oxygen
- ORP = Oxygen reduction potential
- TDS = Total dissolved solids
- CaCO<sub>3</sub> = Calcium Carbonate
- NM = Not measured
- NR = Not Reported
- J = Estimated result
- UJ = Estimated result

- 1) DO, ORP, and pH values were obtained in the field using a flow-through cell and a multi-parameter meter unless otherwise noted.
- 2) Field data was not collected for DO, ORP, and pH because groundwater was removed from the well without using the in-line flow-through cell due to insufficient recharge.
- 3) DO meter did not appear to be functioning correctly.
- 4) The well was not sampled and parameters were not measured due to the presence of free product at this location.
- 5) The well was purged dry and recharge was insufficient to collect groundwater for geochemical analysis.
- 6) DO readings were artificially high because purge water was poured into the multi-parameter meter from a bailer.

TABLE 5A  
SVE-1D  
Operation Parameters, Sampling Results, and Mass Removal Calculations, Chevron Sunol Pipeline

Sample Date	Flowrate (fpm)	Temp (F)	Vacuum (inch water)	Flowrate (cfm)	Flowrate (scfm)	Total Operation Time (hr)	Total Operation Time (days)	Field TPH-g Concentration (ppm)	Mass Removal Rate (lbs/hr)	Mass Removal Rate (lbs/day)	Mass Removed Since Last Sampling Event (lbs)	Cumulative Mass Removal (lbs)
11/28/06	465	54	3.4	10.14	10.33	2.4	0.1	1,120	0.17	4.12	0.41	0.41
11/30/06	808	61	6.85	17.63	17.56	44.6	1.9	803	0.25	6.01	11.17	11.59
12/04/06	864	58	8.08	18.85	18.83	138.8	5.8	422	0.17	4.11	23.34	34.93
12/08/06	854	62	7.4	18.63	18.50	234.6	9.8	1,793	0.30	7.30	29.12	64.05
12/15/06	1180	64	11.05	25.74	25.24	403.3	16.8	163	0.37	8.79	61.77	125.81
12/19/06	82	42	0.47	1.79	1.88	499.4	20.8	155	0.00	0.11	0.43	126.24
12/19/06	1022	62	11.02	22.30	21.94	503.9	21.0	325	0.08	1.87	0.35	126.59
12/28/06	974	59	10.46	21.25	21.06	715.4	29.8	150	0.07	1.78	15.69	142.29
01/04/07	1035	60	10.56	22.58	22.33	884.5	36.9	61	0.03	0.84	5.91	148.20
01/12/07	693	57	10	15.12	15.06	1075.8	44.8	100	0.02	0.43	3.44	151.64
01/19/07	536	48	12	11.69	11.80	1241.5	51.7	145	0.02	0.51	3.55	155.19
01/26/07	0					1363.7						155.19
02/02/07	0					1528.5						155.19
02/09/07	0					1697.0						155.19
02/16/07	0					1865.7						155.19
02/23/07	0					2033.3						155.19
03/01/07	0					2177.9						155.19
03/08/07	0					2346.2						155.19
03/15/07	0					2512.4						155.19
03/22/07	0					2684.2						155.19
03/22/07	1398	80	6.8	30.50	29.32	2684.9	111.9	17	0.004	0.09	0.00	155.193
03/30/07	512	52	8.3	11.17	11.28	2872.9	119.7	42	0.00	0.12	0.93	156.12
04/05/07	775	64	7.8	16.91	16.71	3017.4	125.7	62	0.01	0.31	1.86	157.98
04/20/07	637	59	6.9	13.90	13.90	3283.6	136.8	475	0.06	1.33	14.74	172.72
04/27/07	0					3451.4						172.72
05/03/07	0					3595.8						172.72
05/11/07	0					3787.9						172.72
05/18/07	0					3955.7						172.72
05/25/07	0					4004.2						172.72
06/01/07	0					4149.7						172.72
06/08/07	0					4316.0						172.72
06/14/07	0					4460.7						172.72
06/21/07	0					4468.2						172.72
06/29/07	0					4660.2						172.72
07/05/07	0					4728.3						172.72
07/13/07	835	67	3.1	18.22	18.11	4920.8	205.0	38	0.01	0.12	0.98	173.70
07/18/07	1276	68	4.4	27.84	27.54	5041.7	210.1	156	0.04	0.95	4.79	178.49
07/26/07	1220	68	4.5	26.62	26.32	5170.1	215.4	299	0.09	2.13	11.41	189.89
08/02/07	1250	68	4.3	27.27	26.98	5338.8	222.5	201	0.10	2.40	16.88	206.78
08/10/07	1340	69	4.8	29.23	28.84	5370.9	223.8	355	0.12	2.85	3.82	210.59
08/17/07	972	62	4.8	21.21	21.20	5467.0	227.8	234	0.09	2.22	8.90	219.49

Note:

- Inlet pipe diameter is 2".
- Shaded areas indicate that measurements were not taken because flow to the well was shut off.

Assumptions:

- Relative vapor density of gasoline is approximately 3.3.
- Vapor density of pure, dry air is 1,200 g/m<sup>3</sup> at 20C.
- Vapor density of gasoline is calculated to be 3,960 g/m<sup>3</sup> at 20C.
- SCFM(at 14.7psia and 68°F) = CFM x [(Pg + Patm)/(Patm)] x [(68 +460)/(Tact +460)]

5. **Mass Removed Since Last Sampling Event (lbs)** = (flowrate scfm)\*(avg. conc. ppmv)\*(60 min/hr)\*(106.88 lbs/molecule)\*(Operation Time hr)/1000000/379

TABLE 5B  
SVE-2S  
Operation Parameters, Sampling Results, and Mass Removal Calculations, Chevron Sunol Pipeline

Sample Date	Flowrate (fpm)	Temp (F)	Vacuum (inch water)	Flowrate (cfm)	Flowrate (scfm)	Total Operation Time (hr)	Total Operation Time (days)	Field TPH-g Concentration (ppm)	Mass Removal Rate (lbs/hr)	Mass Removal Rate (lbs/day)	Mass Removed Since Last Sampling Event (lbs)	Cumulative Mass Removal (lbs)
11/28/06	475	53	3.2	10.36	10.58	2.4	0.1	239	0.038	0.90	0.09	0.09
11/30/06	1056	60	6.74	23.04	23.01	44.6	1.9	417	0.112	2.69	4.99	5.08
12/04/06	1377	56	7.82	30.04	30.15	138.8	5.8	104	0.117	2.80	15.89	20.97
12/08/06	1453	57	7.1	31.70	31.81	234.6	9.8	953	0.249	5.99	23.89	44.87
12/15/06	317	62	11.50	6.92	6.80	403.3	16.8	177	0.057	1.37	9.61	54.48
12/19/06	0	62	0.6	0.00	0.00	499.4	20.8	63	0.000	0.00	0.00	54.48
12/19/06	455	62	11.49	9.93	9.76	503.9	21.0	705	0.06	1.33	0.25	54.73
12/28/06	555	55	10.83	12.11	12.08	715.4	29.8	200	0.08	1.95	17.16	71.88
01/04/07	579	58	11.03	12.63	12.53	884.5	36.9	61	0.024	0.58	4.10	75.98
01/12/07	226	56	10	4.93	4.92	1075.8	44.8	208	0.010	0.24	1.88	77.86
01/19/07	473	45	13	10.32	10.44	1241.5	51.7	183	0.030	0.73	5.02	82.88
01/26/07	0					1363.7						82.88
02/02/07	0					1528.5						82.88
02/09/07	0					1697.0						82.88
02/16/07	0					1865.7						82.88
02/23/07	0					2033.3						82.88
03/01/07	0					2177.9						82.88
03/08/07	0					2346.2						82.88
03/15/07	0					2512.4						82.88
03/22/07	0					2684.2						82.88
03/22/07	299	81	6.9	6.52	6.26	2684.9	111.9	2.3	0.000	0.00	0.00	82.88
03/30/07	314	50	8.5	6.85	6.94	2872.9	119.7	57	0.003	0.07	0.57	83.46
04/05/07	312	62	8	6.81	6.75	3017.4	125.7	50	0.005	0.13	0.77	84.23
04/20/07	364	57	7	7.94	7.97	3283.6	136.8	210	0.015	0.37	4.09	88.32
04/27/07	0					3451.4						88.32
05/03/07	0					3595.8						88.32
05/11/07	0					3787.9						88.32
05/18/07	0					3955.7						88.32
05/25/07	0					4004.2						88.32
06/01/07	0					4149.7						88.32
06/08/07	0					4316.0						88.32
06/14/07	0					4460.7						88.32
06/21/07	0					4468.2						88.32
06/29/07	0					4660.2						88.32
07/05/07	0					4728.3						88.32
07/13/07	575	67.9	3.2	12.54	12.45	4920.8	0.5	2	0.001	0.01	88.33	88.33
07/18/07	0					5041.7						88.33
07/26/07	0					5170.1						88.33
08/02/07	0					5338.8						88.33
08/10/07	0					5370.9						88.33
08/17/07	0					5467.0						88.33

Note:

- Inlet pipe diameter is 2".
- Shaded areas indicate that measurements were not taken because flow to the well was shut off.

Assumptions:

- Relative vapor density of gasoline is approximately 3.3.
- Vapor density of pure, dry air is 1,200 g/m<sup>3</sup> at 20C.
- Vapor density of gasoline is calculated to be 3,960 g/m<sup>3</sup> at 20C.
- SCFM(at 14.7psia and 68°F) = CFM x [(Pg + Patm)/(Patm)] x [(68 + 460)/(Tact + 460)]

5. **Mass Removed Since Last Sampling Event (lbs)** = (flowrate scfm)\*(avg. conc. ppmv)\*(60 min/hr)\*(106.88 lbs/molecule)\*(Operation Time hr)/1000000/379



TABLE 5C  
SVE-3S  
Operation Parameters, Sampling Results, and Mass Removal Calculations, Chevron Sunol Pipeline

Sample Date	Flowrate (fpm)	Temp (F)	Vacuum (inch water)	Flowrate (cfm)	Flowrate (scfm)	Total Operation Time (hr)	Total Operation Time (days)	Field TPH-g Concentration (ppm)	Mass Removal Rate (lbs/hr)	Mass Removal Rate (lbs/day)	Mass Removed Since Last Sampling Event (lbs)	Cumulative Mass Removal (lbs)
11/28/06	180	52	3.3	3.93	4.02	2.4	0.1	3,170	0.19	4.53	0.45	0.45
11/30/06	325	60	7.1	7.09	7.07	44.6	1.9	3,694	0.36	8.64	16.06	16.52
12/04/06	547	55	8.47	11.93	11.98	138.8	5.8	2,971	0.59	14.21	80.79	97.30
12/08/06	474	56	7.8	10.34	10.38	234.6	9.8	4,754	0.59	14.27	56.97	154.27
12/15/06	726	60	11.50	15.84	15.63	403.3	16.8	3,270	0.93	22.32	156.91	311.19
12/19/06	0	63	0.62	0.00	0.00	499.4	20.8	3,705	0.00	0.00	0.00	311.19
12/19/06	359	63	11.47	7.83	7.68	503.9	21.0	4,060	0.44	10.62	1.99	313.18
12/28/06	495	52	10.81	10.80	10.84	715.4	29.8	1,844	0.47	11.39	100.41	413.59
01/04/07	700	57	11.01	15.27	15.17	884.5	36.9	1,791	0.41	9.82	69.19	482.77
01/12/07	297	56	10	6.48	6.47	1075.8	44.8	1,974	0.18	4.33	34.55	517.33
01/19/07	510	45	13	11.13	11.26	1241.5	51.7	2,045	0.34	8.06	55.63	572.95
01/26/07	648	63	15	14.14	13.75	1363.7	56.8	1,700	0.38	9.16	46.66	619.62
02/02/07	435	49	18	9.49	9.41	1528.5	63.7	1,825	0.25	5.90	40.54	660.16
02/09/07	463	60	16.5	10.10	9.84	1697.0	70.7	2,700	0.33	7.93	55.65	715.81
02/16/07	625	56	17.6	13.64	13.35	1865.7	77.7	1,373	0.40	9.68	68.04	783.85
02/23/07	550	45	18.8	12.00	11.97	2033.3	84.7	1,775	0.28	6.71	46.83	830.68
03/01/07	473	50	18.2	10.32	10.21	2177.9	90.7	1,975	0.28	6.81	41.05	871.73
03/08/07	510	53	16.5	11.13	10.99	2346.2	97.8	1,990	0.32	7.76	54.39	926.11
03/15/07	545	49	15.8	11.89	11.86	2512.4	104.7	2,169	0.37	8.78	60.78	986.89
03/22/07	486	80	14.2	10.60	10.01	2684.2	111.8	1,511	0.27	6.55	46.92	1033.82
03/22/07	300	81	6.8	6.54	6.28	2684.9	111.9	1,496	0.14	3.36	0.10	1033.91
03/30/07	320	49	8.4	6.98	7.09	2872.9	119.7	1,937	0.18	4.33	33.95	1067.87
04/05/07	316	61	7.9	6.89	6.85	3017.4	125.7	1,751	0.19	4.50	27.08	1094.95
04/20/07	288	57	7.1	6.28	6.30	3283.6	136.8	2,061	0.18	4.28	47.46	1142.40
04/27/07	559	57	15.9	12.20	11.97	3451.4	143.8	1,765	0.34	8.15	56.99	1199.40
05/03/07	502	54	15.4	10.95	10.82	3595.8	149.8	1,782	0.28	6.83	41.12	1240.52
05/11/07	1364	59	13	29.76	29.31	3787.9	157.8	1,572	0.73	17.50	140.06	1380.58
05/18/07	825	59	12.8	18.00	17.74	3955.7	164.8	1,347	0.38	9.22	64.43	1445.01
05/25/07	894	63	15.8	19.50	18.93	4004.2	166.8	1,303	0.37	8.93	18.04	1463.06
06/01/07	0					4149.7						1463.06
06/08/07	673	56	12.5	14.68	14.56	4316.0	179.8	909	0.10	2.36	16.33	1479.38
06/14/07	874	81	11	19.07	18.11	4460.7	185.9	787	0.23	5.47	32.96	1512.34
06/21/07	701	59	14.2	15.29	15.02	4468.2	186.2	1,146	0.22	5.17	1.61	1513.96
06/29/07	1022	72	12	22.30	21.48	4660.2	194.2	806	0.31	7.46	59.69	1573.65
07/05/07	905	72	12.4	19.74	19.00	4728.3	197.0	764	0.22	5.31	15.08	1588.72
07/13/07	388	67.6	3.3	8.46	8.40	4920.8	205.0	816	0.10	2.36	18.96	1607.68
07/18/07	299	67	4.5	6.52	6.46	5041.7	210.1	848	0.08	1.91	9.64	1617.33
07/26/07	483	68	4.7	10.54	10.42	5170.1	215.4	850	0.13	3.15	16.84	1634.17
08/02/07	508	68	4.5	11.08	10.96	5338.8	222.5	705	0.13	3.03	21.33	1655.50
08/10/07	499	69	5	10.89	10.73	5370.9	223.8	779	0.12	2.84	3.79	1659.29
08/17/07	456	62	5	9.95	9.94	5467.0	227.8	848	0.12	2.88	11.53	1670.81

Note:

- Inlet pipe diameter is 2".
- Shaded areas indicate that measurements were not taken. System was found shut down because there was no propane.

Assumptions:

- Relative vapor density of gasoline is approximately 3.3.
- Vapor density of pure, dry air is 1,200 g/m<sup>3</sup> at 20C.
- Vapor density of gasoline is calculated to be 3,960 g/m<sup>3</sup> at 20C.
- SCFM(at 14.7psia and 68°F) = CFM x(((Pg + Patm)/(Patm)) x [(68 + 460)/(Tact + 460)])

5. Mass Removed Since Last Sampling Event (lbs) = (flowrate scfm)\*(avg. conc. ppmv)\*(60 min/hr)\*(106.88 lbs/molecule)\*(Operation Time hr)/1000000/379

TABLE 5D  
SVE-4D  
Operation Parameters, Sampling Results, and Mass Removal Calculations, Chevron Sunol Pipeline

Sample Date	Flowrate (fpm)	Temp (F)	Vacuum (inch water)	Flowrate (cfm)	Flowrate (scfm)	Total Operation Time (hr)	Total Operation Time (days)	Field TPH-g Concentration (ppm)	Mass Removal Rate (lbs/hr)	Mass Removal Rate (lbs/day)	Mass Removed Since Last Sampling Event (lbs)	Cumulative Mass Removal (lbs)
11/28/06	190	51	3.30	4.15	4.25	2.4	0.1	1,857	0.12	2.81	0.28	0.28
11/30/06	327	57	7.16	7.13	7.16	44.6	1.9	2,602	0.24	5.68	10.56	10.84
12/04/06	316	48	8.54	6.89	7.02	138.8	5.8	2,088	0.24	5.86	33.87	44.71
12/08/06	296	53	7.9	6.46	6.52	234.6	9.8	2,921	0.24	5.81	23.20	67.91
12/15/06	354	56	11.50	7.72	7.68	403.3	16.8	1,540	0.25	6.10	42.87	110.78
12/19/06	82	38	0.66	1.79	1.89	499.4	20.8	1,830	0.05	1.14	4.55	115.33
12/19/06	421	64	11.54	9.18	8.99	503.9	21.0	1,770	0.24	5.76	1.08	116.41
12/28/06	410	51	10.89	8.94	9.00	715.4	29.8	1,908	0.25	5.89	51.90	168.31
01/04/07	427	55	11.06	9.32	9.29	884.5	36.9	1,202	0.21	5.14	36.24	204.55
01/12/07	260	55	10.00	5.67	5.67	1075.8	44.8	1,308	0.11	2.53	20.20	224.75
01/19/07	418	44	12.00	9.12	9.27	1241.5	51.7	1,555	0.20	4.73	32.63	257.38
01/26/07	640	62	15.00	13.96	13.60	1363.7	56.8	1,049	0.26	6.31	32.11	289.49
02/02/07	467	49	18.00	10.19	10.10	1528.5	63.7	606	0.12	2.98	20.44	309.92
02/09/07	373	59	16.50	8.14	7.94	1697.0	70.7	736	0.08	1.90	13.32	323.25
02/16/07	640	55	17.70	13.96	13.69	1865.7	77.7	620	0.14	3.31	23.23	346.48
02/23/07	512	45	18.70	11.17	11.14	2033.3	84.7	635	0.10	2.49	17.38	363.86
03/01/07	410	49	18.10	8.94	8.87	2177.9	90.7	575	0.08	1.91	11.51	375.37
03/08/07	435	52	16.60	9.49	9.39	2346.2	97.8	630	0.08	2.01	14.12	389.49
03/15/07	527	48	15.80	11.50	11.49	2512.4	104.7	786	0.12	2.90	20.05	409.54
03/22/07	672	80	14.20	14.66	13.84	2684.2	111.8	567	0.14	3.33	23.85	433.39
03/22/07	358	81	6.80	7.81	7.50	2684.9	111.9	570	0.06	1.52	0.04	433.44
03/30/07	333	48	8.50	7.26	7.39	2872.9	119.7	934	0.08	1.98	15.51	448.94
04/05/07	326	60	8.00	7.11	7.08	3017.4	125.7	900	0.10	2.31	13.92	462.86
04/20/07	297	57	7.10	6.48	6.50	3283.6	136.8	1,129	0.10	2.35	26.05	488.91
04/27/07	564	56	15.90	12.30	12.10	3451.4	143.8	768	0.17	4.09	28.57	517.48
05/03/07	536	54	15.40	11.69	11.56	3595.8	149.8	686	0.12	2.99	18.00	535.47
05/11/07	708	58	13.00	15.45	15.24	3787.9	157.8	658	0.15	3.65	29.19	564.66
05/18/07	658	59	13.00	14.36	14.14	3955.7	164.8	587	0.13	3.13	21.91	586.57
05/25/07	807	62	15.9	17.61	17.11	4004.2	166.8	663	0.16	3.81	7.70	594.27
06/01/07	0					4149.7						594.27
06/08/07	514	55	12.70	11.21	11.14	4316.0	179.8	505	0.04	1.00	6.94	601.20
06/14/07	526	81	11.00	11.48	10.90	4460.7	185.9	492	0.08	1.93	11.66	612.86
06/21/07	804	58	14.20	17.54	17.26	4468.2	186.2	733	0.16	3.76	1.18	614.04
06/29/07	926	71	12.00	20.20	19.50	4660.2	194.2	490	0.18	4.24	33.95	647.99
07/05/07	841	71	12.50	18.35	17.68	4728.3	197.0	525	0.13	3.20	9.07	657.06
07/13/07	200	67.9	3.40	4.36	4.33	4920.8	205.0	615	0.04	0.88	7.04	664.11
07/18/07	292	67	4.60	6.37	6.31	5041.7	210.1	875	0.07	1.67	8.43	672.54
07/26/07	404	68	4.70	8.81	8.71	5170.1	215.4	908	0.12	2.77	14.79	687.33
08/02/07	360	67	4.50	7.85	7.78	5338.8	222.5	751	0.10	2.30	16.15	703.49
08/10/07	387	68	5.10	8.44	8.34	5370.9	223.8	897	0.10	2.45	3.27	706.76
08/17/07	404	62	5.10	8.81	8.80	5467.0	227.8	975	0.12	2.93	11.75	718.50

Note:

- Inlet pipe diameter is 2".
- Shaded areas indicate that measurements were not taken. System was found shut down because there was no propane.

Assumptions:

- Relative vapor density of gasoline is approximately 3.3.
- Vapor density of pure, dry air is 1,200 g/m<sup>3</sup> at 20C.
- Vapor density of gasoline is calculated to be 3,960 g/m<sup>3</sup> at 20C.
- SCFM(at 14.7psia and 68°F) = CFM x [(Pg + Patm)/(Patm)] x [(68 + 460)/(Tact + 460)]
- Mass Removed Since Last Sampling Event (lbs)** = (flowrate scfm)\*(avg. conc. ppmv)\*(60 min/hr)\*(106.88 lbs/moleculer)\*(Operation Time hr)/1000000/379

TABLE 5E  
SVE-5  
Operation Parameters, Sampling Results, and Mass Removal Calculations, Chevron Sunol Pipeline

Sample Date	Flowrate (fpm)	Temp (F)	Vacuum (inch water)	Flowrate (cfm)	Flowrate (scfm)	Total Operation Time (hr)	Total Operation Time (days)	Field TPH-g Concentration (ppm)	Mass Removal Rate (lbs/hr)	Mass Removal Rate (lbs/day)	Mass Removed Since Last Sampling Event (lbs)	Cumulative Mass Removal (lbs)
11/28/06	500	50	3.10	10.91	11.21	2.4	0.1	1,499	0.25	5.98	0.60	0.60
11/30/06	734	54	6.63	16.01	16.18	44.6	1.9	2,292	0.46	10.92	20.29	20.89
12/04/06	835	47	7.83	18.22	18.61	138.8	5.8	2,172	0.62	14.79	85.51	106.40
12/08/06	807	51	7.2	17.61	17.87	234.6	9.8	2,307	0.59	14.25	56.87	163.28
12/15/06	1177	55	10.40	25.68	25.65	403.3	16.8	1,132	0.65	15.71	110.39	273.67
12/19/06	310	35	0.66	6.76	7.20	499.4	20.8	1,350	0.13	3.18	12.74	286.41
12/19/06	1622	63	10.44	35.39	34.81	503.9	21.0	1,407	0.71	17.08	3.20	289.62
12/28/06	1133	48	9.82	24.72	25.07	715.4	29.8	973	0.44	10.62	93.61	383.23
01/04/07	1149	53	9.92	25.07	25.17	884.5	36.9	789	0.33	7.90	55.63	438.86
01/12/07	1060	55	8.00	23.13	23.24	1075.8	44.8	882	0.29	6.91	55.11	493.97
01/19/07	1067	43	12.00	23.28	23.72	1241.5	51.7	1,278	0.38	9.12	62.96	556.93
01/26/07	1064	60	14.00	23.21	22.76	1363.7	56.8	1,020	0.39	9.31	47.41	604.33
02/02/07	996	48	18.00	21.73	21.59	1528.5	63.7	214	0.20	4.74	32.56	636.89
02/09/07	1327	59	16.20	28.95	28.28	1697.0	70.7	380	0.12	2.99	21.00	657.89
02/16/07	1215	56	17.40	26.51	25.96	1865.7	77.7	304	0.13	3.16	22.22	680.11
02/23/07	814	44	18.70	17.76	17.75	2033.3	84.7	285	0.08	1.86	13.00	693.11
03/01/07	846	48	17.90	18.46	18.34	2177.9	90.7	245	0.07	1.73	10.43	703.53
03/08/07	756	51	16.30	16.49	16.36	2346.2	97.8	230	0.06	1.38	9.70	713.23
03/15/07	755	47	15.60	16.47	16.50	2512.4	104.7	315	0.07	1.60	11.08	724.32
03/22/07	1966	80	14.10	42.89	40.49	2684.2	111.8	221	0.16	3.86	27.65	751.97
03/22/07	1314	81	6.80	28.67	27.51	2684.9	111.9	222	0.09	2.17	0.06	752.03
03/30/07	648	47	8.50	14.14	14.42	2872.9	119.7	387	0.07	1.56	12.24	764.28
04/05/07	709	59	7.90	15.47	15.43	3017.4	125.7	475	0.10	2.37	14.26	778.53
04/20/07	695	56	7.00	15.16	15.25	3283.6	136.8	701	0.13	3.19	35.41	813.94
04/27/07	871	55	15.90	19.00	18.72	3451.4	143.8	450	0.16	3.84	26.82	840.76
05/03/07	836	54	15.10	18.24	18.04	3595.8	149.8	388	0.11	2.69	16.19	856.95
05/11/07	1678	57	13.00	36.61	36.19	3787.9	157.8	375	0.20	4.92	39.35	896.30
05/18/07	1127	59	12.80	24.59	24.23	3955.7	164.8	330	0.13	3.04	21.26	917.56
05/25/07	1117	61	15.7	24.37	23.74	4004.2	166.8	943	0.22	5.38	10.87	928.43
06/01/07	0					4149.7						928.43
06/08/07	856	56	12.50	18.68	18.52	4316.0	179.8	270	0.04	0.89	6.17	934.60
06/14/07	1333	81	11.00	29.08	27.62	4460.7	185.9	309	0.12	2.85	17.16	951.76
06/21/07	1064	58	14.10	23.21	22.84	4468.2	186.2	1,061	0.23	5.57	1.74	953.50
06/29/07	1351	65	12.00	29.47	28.77	4660.2	194.2	369	0.31	7.32	58.57	1012.07
07/05/07	1368	70	12.40	29.85	28.83	4728.3	197.0	657	0.22	5.27	14.95	1027.03
07/13/07	540	68.3	3.40	11.78	11.68	4920.8	205.0	396	0.09	2.19	17.55	1044.58
07/18/07	708	68	4.60	15.45	15.27	5041.7	210.1	430	0.09	2.25	11.31	1055.89
07/26/07	715	67	4.70	15.60	15.45	5170.1	215.4	789	0.14	3.35	17.93	1073.83
08/02/07	722	67	4.50	15.75	15.61	5338.8	222.5	451	0.14	3.45	24.22	1098.04
08/10/07	799	68	5.00	17.43	17.22	5370.9	223.8	779	0.16	3.77	5.04	1103.09
08/17/07	729	64	5.10	15.90	15.82	5467.0	227.8	579	0.16	3.83	15.32	1118.40

Note:

- Inlet pipe diameter is 2".
- Shaded areas indicate that measurements were not taken. System was found shut down because there was no propane.

Assumptions:

- Relative vapor density of gasoline is approximately 3.3.
  - Vapor density of pure, dry air is 1,200 g/m<sup>3</sup> at 20C.
  - Vapor density of gasoline is calculated to be 3,960 g/m<sup>3</sup> at 20C.
  - SCFM(at 14.7psia and 68°F) = CFM x [(Pg + Patm)/(Patm)] x [(68 +460)/(Tact +460)]
5. **Mass Removed Since Last Sampling Event (lbs)** = (flowrate scfm)\*(avg. conc. ppmv)\*(60 min/hr)\*(106.88 lbs/moleculer)\*(Operation Time hr)/1000000/379

TABLE 5F  
SVE-6  
Operation Parameters, Sampling Results, and Mass Removal Calculations, Chevron Sunol Pipeline

Sample Date	Flowrate (fpm)	Temp (F)	Vacuum (inch water)	Flowrate (cfm)	Flowrate (scfm)	Total Operation Time (hr)	Total Operation Time (days)	Field TPH-g Concentration (ppm)	Mass Removal Rate (lbs/hr)	Mass Removal Rate (lbs/day)	Mass Removed Since Last Sampling Event (lbs)	Cumulative Mass Removal (lbs)
11/28/06	640	53	9.60	13.96	14.03	2.4	0.1	1,908	0.40	9.53	0.95	0.95
11/30/06	987	54	14.20	21.53	21.35	44.6	1.9	2,800	0.75	17.89	33.25	34.20
12/04/06	935	46	17.84	20.40	20.35	138.8	5.8	2,514	0.80	19.25	111.35	145.55
12/08/06	808	47	17.1	17.63	17.59	234.6	9.8	3,619	0.80	19.20	76.64	222.19
12/15/06	1060	55	16.80	23.13	22.73	403.3	16.8	2,542	1.04	24.93	175.24	397.43
12/19/06	169	33	2.43	3.69	3.93	499.4	20.8	3,316	0.17	4.09	16.39	413.82
12/19/06	714	62	15.08	15.58	15.17	503.9	21.0	3,210	0.73	17.63	3.30	417.13
12/28/06	1006	47	15.23	21.95	22.00	715.4	29.8	1,906	0.83	20.04	176.58	593.71
01/04/07	1042	54	14.97	22.73	22.49	884.5	36.9	1,619	0.59	14.11	99.45	693.16
01/12/07	359	49	11.00	7.83	7.91	1075.8	44.8	2,062	0.22	5.18	41.29	734.45
01/19/07	360	43	5.00	7.85	8.14	1241.5	51.7	2,339	0.27	6.38	44.05	778.49
01/26/07	505	64	12.00	11.02	10.77	1363.7	56.8	1,732	0.33	7.81	39.76	818.25
02/02/07	383	45	14.00	8.36	8.44	1528.5	63.7	1,700	0.21	5.15	35.39	853.64
02/09/07	500	58	13.70	10.91	10.74	1697.0	70.7	1,782	0.28	6.66	46.76	900.40
02/16/07	410	57	15.50	8.94	8.79	1865.7	77.7	1,440	0.21	5.04	35.43	935.83
02/23/07	785	46	17.00	17.13	17.12	2033.3	84.7	1,460	0.37	8.84	61.74	997.57
03/01/07	580	51	17.50	12.65	12.51	2177.9	90.7	1,475	0.27	6.54	39.39	1036.95
03/08/07	455	54	17.00	9.93	9.77	2346.2	97.8	1,250	0.20	4.74	33.24	1070.19
03/15/07	686	50	16.70	14.97	14.86	2512.4	104.7	1,550	0.31	7.41	51.29	1121.48
03/22/07	686	80	15.00	14.97	14.09	2684.2	111.8	1,007	0.27	6.42	45.93	1167.41
03/22/07	431	79	13.00	9.40	8.92	2684.9	111.9	1,056	0.14	3.27	0.10	1167.50
03/30/07	502	50	15.40	10.95	10.91	2872.9	119.7	1,411	0.20	4.79	37.53	1205.03
04/05/07	483	62	14.70	10.54	10.27	3017.4	125.7	1,181	0.20	4.74	28.54	1233.57
04/20/07	471	58	14.50	10.28	10.10	3283.6	136.8	1,457	0.20	4.74	52.61	1286.19
04/27/07	576	57	16.10	12.57	12.33	3451.4	143.8	1,340	0.26	6.14	42.91	1329.10
05/03/07	448	54	15.10	9.77	9.67	3595.8	149.8	1,362	0.19	4.65	27.98	1357.08
05/11/07	592	59	13.20	12.92	12.71	3787.9	157.8	1,327	0.25	6.09	48.71	1405.79
05/18/07	524	58	13.90	11.43	11.25	3955.7	164.8	1,102	0.20	4.87	34.03	1439.81
05/25/07	684	62	16.3	14.92	14.49	4004.2	166.8	1,155	0.24	5.82	11.76	1451.58
06/01/07	0					4149.7						1451.58
06/08/07	666	56	15.00	14.53	14.32	4316.0	179.8	999	0.11	2.55	17.65	1469.22
06/14/07	525	80	12.20	11.45	10.86	4460.7	185.9	936	0.16	3.74	22.56	1491.79
06/21/07	639	58	15.50	13.94	13.67	4468.2	186.2	1,333	0.23	5.52	1.73	1493.51
06/29/07	706	70	13.40	15.40	14.84	4660.2	194.2	981	0.25	6.11	48.89	1542.40
07/05/07	578	71	13.90	12.61	12.11	4728.30	197.0	918	0.17	4.09	11.63	1554.03
07/13/07	231	73.3	11.10	5.04	4.85	4920.80	205.0	1,071	0.07	1.72	13.78	1567.81
07/18/07	656	67	9.90	14.31	13.99	5041.70	210.1	1,068	0.22	5.33	26.84	1594.64
07/26/07	900	67	10.50	19.63	19.16	5170.10	215.4	1,154	0.32	7.58	40.56	1635.20
08/02/07	678	70	10.50	14.79	14.36	5338.80	222.5	942	0.22	5.36	37.65	1672.85
08/10/07	775	69	11.50	16.91	16.40	5370.90	223.8	1,077	0.25	5.89	7.88	1680.74
08/17/07	1071	64	12.00	23.37	22.85	5467.00	227.8	1,063	0.36	8.70	34.86	1715.59

Note:

- Inlet pipe diameter is 2".
- Shaded areas indicate that measurements were not taken. System was found shut down because there was no propane.

Assumptions:

- Relative vapor density of gasoline is approximately 3.3.
- Vapor density of pure, dry air is 1,200 g/m<sup>3</sup> at 20C.
- Vapor density of gasoline is calculated to be 3,960 g/m<sup>3</sup> at 20C.
- SCFM(at 14.7psia and 68°F) = CFM x(((Pg + Patm)/(Patm)) x ((68 + 460)/(Tact + 460)))
- Mass Removed Since Last Sampling Event (lbs)** = (flowrate scfm)\*(avg. conc. ppmv)\*(60 min/hr)\*(106.88 lbs/moleculer)\*(Operation Time hr)/1000000/379

TABLE 5G  
SVE-7  
Operation Parameters, Sampling Results, and Mass Removal Calculations, Chevron Sunol Pipeline

Sample Date	Flowrate (fpm)	Temp (F)	Vacuum (inch water)	Flowrate (cfm)	Flowrate (scfm)	Total Operation Time (hr)	Total Operation Time (days)	Field TPH-g Concentration (ppm)	Mass Removal Rate (lbs/hr)	Mass Removal Rate (lbs/day)	Mass Removed Since Last Sampling Event (lbs)	Cumulative Mass Removal (lbs)
11/28/06	500	54	9.50	10.91	10.94	2.4	0.1	2,057	0.33	8.01	0.80	0.80
11/30/06	647	50	14.08	14.12	14.11	44.6	1.9	2,760	0.50	12.10	22.48	23.28
12/04/06	720	45	17.60	15.71	15.71	138.8	5.8	2,727	0.64	15.35	88.77	112.05
12/08/06	833	50	16.8	18.17	18.04	234.6	9.8	4,351	0.95	22.73	90.72	202.77
12/15/06	762	52	16.50	16.62	16.45	403.3	16.8	4,417	1.07	25.67	180.47	383.24
12/19/06	266	33	2.45	5.80	6.18	499.4	20.8	4,460	0.41	9.76	39.09	422.33
12/19/06	849	60	14.75	18.52	18.13	503.9	21.0	4,767	1.24	29.77	5.58	427.91
12/28/06	641	44	15.01	13.98	14.11	715.4	29.8	2,033	0.71	17.08	150.52	578.44
01/04/07	765	52	14.69	16.69	16.59	884.5	36.9	1,871	0.48	11.53	81.24	659.67
01/12/07	610	50	11.00	13.31	13.41	1075.8	44.8	2,448	0.43	10.31	82.15	741.83
01/19/07	560	42	5.00	12.22	12.69	1241.5	51.7	2,315	0.45	10.76	74.30	816.13
01/26/07	707	62	12.00	15.42	15.14	1363.7	56.8	1,894	0.47	11.35	57.77	873.89
02/02/07	394	46	14.00	8.60	8.66	1528.5	63.7	2,224	0.26	6.35	43.60	917.49
02/09/07	564	58	13.60	12.30	12.12	1697.0	70.7	2,154	0.39	9.45	66.33	983.83
02/16/07	665	58	15.50	14.51	14.23	1865.7	77.7	1,607	0.40	9.52	66.95	1050.77
02/23/07	1208	45	17.10	26.35	26.40	2033.3	84.7	1,870	0.68	16.34	114.10	1164.87
03/01/07	833	50	17.40	18.17	18.01	2177.9	90.7	2,345	0.56	13.51	81.42	1246.29
03/08/07	585	53	16.80	12.76	12.59	2346.2	97.8	1,925	0.40	9.57	67.13	1313.43
03/15/07	1306	50	16.60	28.49	28.30	2512.4	104.7	2,848	1.00	24.04	166.49	1479.91
03/22/07	1075	82	14.80	23.45	22.02	2684.2	111.8	1,687	0.74	17.77	127.23	1607.15
03/22/07	878	80	13.00	19.15	18.13	2684.9	111.9	1,756	0.46	11.11	0.32	1607.47
03/30/07	724	50	15.60	15.80	15.73	2872.9	119.7	2,427	0.49	11.71	91.73	1699.20
04/05/07	668	62	14.00	14.57	14.23	3017.4	125.7	2,044	0.47	11.33	68.21	1767.41
04/20/07	1093	58	14.20	23.85	23.46	3283.6	136.8	2,736	0.83	19.96	221.40	1988.81
04/27/07	1453	57	16.00	31.70	31.10	3451.4	143.8	1,993	1.09	26.18	183.06	2171.87
05/03/07	1373	55	15.10	29.95	29.57	3595.8	149.8	2,220	0.92	22.18	133.44	2305.31
05/11/07	928	58	13.20	20.25	19.97	3787.9	157.8	2,160	0.65	15.57	124.62	2429.93
05/18/07	629	58	13.80	13.72	13.51	3955.7	164.8	1,875	0.40	9.71	67.87	2497.79
05/25/07	854	62	16.3	18.63	18.09	4004.2	166.8	1,729	0.48	11.61	23.46	2521.25
06/01/07	0					4149.7						2521.25
06/08/07	621	56	15.00	13.55	13.35	4316.0	179.8	1,636	0.16	3.89	26.95	2548.19
06/14/07	626	80	12.20	13.66	12.95	4460.7	185.9	1,553	0.31	7.35	44.34	2592.53
06/21/07	750	58	15.50	16.36	16.04	4468.2	186.2	1,898	0.41	9.86	3.08	2595.61
06/29/07	819	70	13.30	17.87	17.22	4660.2	194.2	1,744	0.47	11.16	89.29	2684.89
07/05/07	913	71	13.90	19.92	19.13	4728.3	197.0	1,530	0.46	11.15	31.66	2716.55
07/13/07	374	73	7.40	8.16	7.94	4920.8	205.0	1,792	0.20	4.69	37.64	2754.20
07/18/07	772	67	10.00	16.84	16.46	5041.7	210.1	2,070	0.47	11.32	57.01	2811.20
07/26/07	798	68	10.40	17.41	16.97	5170.1	215.4	1,965	0.51	12.19	65.19	2876.40
08/02/07	720	68	10.50	15.71	15.30	5338.8	222.5	1,701	0.42	9.99	70.20	2946.59
08/10/07	739	71	11.50	16.12	15.58	5370.9	223.8	1,780	0.40	9.65	12.91	2959.51
08/17/07	740	65	12.00	16.14	15.76	5467.0	227.8	2,077	0.45	10.82	43.32	3002.83

Note:

- Inlet pipe diameter is 2".
- Shaded areas indicate that measurements were not taken. System was found shut down because there was no propane.

Assumptions:

- Relative vapor density of gasoline is approximately 3.3.
- Vapor density of pure, dry air is 1,200 g/m<sup>3</sup> at 20C.
- Vapor density of gasoline is calculated to be 3,960 g/m<sup>3</sup> at 20C.
- SCFM(at 14.7psia and 68°F) = CFM x [(Pg + Patm)/(Patm)] x [(68 + 460)/(Tact + 460)]
- Mass Removed Since Last Sampling Event (lbs)** = (flowrate scfm)\*(avg. conc. ppmv)\*(60 min/hr)\*(106.88 lbs/moleculer)\*(Operation Time hr)/1000000/379

TABLE 5H  
SVE-8  
Operation Parameters, Sampling Results, and Mass Removal Calculations, Chevron Sunol Pipeline

Sample Date	Flowrate (fpm)	Temp (F)	Vacuum (inch water)	Flowrate (cfm)	Flowrate (scfm)	Total Operation Time (hr)	Total Operation Time (days)	Field TPH-g Concentration (ppm)	Mass Removal Rate (lbs/hr)	Mass Removal Rate (lbs/day)	Mass Removed Since Last Sampling Event (lbs)	Cumulative Mass Removal (lbs)
11/28/06	300	53	10.00	6.54	6.57	2.4	0.1	1,923	0.19	4.50	0.45	0.45
11/30/06	0											0.45
12/04/06	0											0.45
12/08/06	0											0.45
12/15/06	0											0.45
12/19/06	0											0.45
12/19/06	0											0.45
12/28/06	0											0.45
01/04/07	0											0.45
01/12/07	0											0.45
01/19/07	0											0.45
01/26/07	0											0.45
02/02/07	0											0.45
02/09/07	0											0.45
02/16/07	0											0.45
02/23/07	0											0.45
03/01/07	0											0.45
03/08/07	0											0.45
03/15/07	0											0.45
03/22/07	0											0.45
03/22/07	0											0.45
03/30/07	0											0.45
04/05/07	0											0.45
04/20/07	0											0.45
04/27/07	0											0.45
05/03/07	0											0.45
05/11/07	0											0.45
05/18/07	0											0.45
05/25/07	0											0.45
06/01/07	0											0.45
06/08/07	0											0.45
06/14/07	0											0.45
06/21/07	0											0.45
06/29/07	0											0.45
07/05/07	0											0.45
07/13/07	0											0.45
07/18/07	0											0.45
07/26/07	0											0.45
08/02/07	0											0.45
08/10/07	0											0.45
08/17/07	0											0.45

Note:

1. Inlet pipe diameter is 2".
2. Shaded areas indicate that measurements were not taken because the well was shut off due to the presence of perched groundwater within the well.

Assumptions:

1. Relative vapor density of gasoline is approximately 3.3.
2. Vapor density of pure, dry air is 1,200 g/m<sup>3</sup> at 20C.
3. Vapor density of gasoline is calculated to be 3,960 g/m<sup>3</sup> at 20C.
4. SCFM(at 14.7psia and 68°F) = CFM x (((Pg + Patm)/(Patm)) x [(68 + 460)/(Tact + 460)])
5. **Mass Removed Since Last Sampling Event (lbs)** = (flowrate scfm)\*(avg. conc. ppmv)\*(60 min/hr)\*(106.88 lbs/molecule)\*(Operation Time hr)/1000000/379

TABLE 51  
SVE-9  
Operation Parameters, Sampling Results, and Mass Removal Calculations, Chevron Sunol Pipeline

Sample Date	Flowrate (fpm)	Temp (F)	Vacuum (inch water)	Flowrate (cfm)	Flowrate (scfm)	Total Operation Time (hr)	Total Operation Time (days)	Field TPH-g Concentration (ppm)	Mass Removal Rate (lbs/hr)	Mass Removal Rate (lbs/day)	Mass Removed Since Last Sampling Event (lbs)	Cumulative Mass Removal (lbs)
11/28/06	610	53	10.00	13.31	13.36	2.4	0.1	3,623	0.72	17.23	1.72	1.72
11/30/06	1010	55	13.30	22.03	21.85	44.6	1.9	3,747	1.19	28.67	53.28	55.00
12/04/06	1357	52	15.50	29.61	29.37	138.8	5.8	2,443	1.35	32.36	187.16	242.16
12/08/06	1179	53	15	25.72	25.50	234.6	9.8	2,612	0.96	22.95	91.59	333.75
12/15/06	1386	57	15.20	30.24	29.73	403.3	16.8	1,223	0.85	20.30	142.66	476.41
12/19/06	362	31	2.15	7.90	8.45	499.4	20.8	1,170	0.15	3.60	14.41	490.82
12/19/06	1717	63	13.90	37.46	36.53	503.9	21.0	1,378	0.69	16.57	3.11	493.92
12/28/06	1325	50	13.86	28.91	28.91	715.4	29.8	924	0.49	11.85	104.40	598.32
01/04/07	1353	55	13.70	29.52	29.24	884.5	36.9	685	0.35	8.38	59.02	657.34
01/12/07	865	48	10.00	18.87	19.13	1075.8	44.8	848	0.22	5.22	41.62	698.96
01/19/07	677	44	10.00	14.77	15.09	1241.5	51.7	1,521	0.27	6.37	43.95	742.90
01/26/07	900	65	12.00	19.63	19.17	1363.7	56.8	783	0.33	7.86	40.02	782.93
02/02/07	632	45	13.00	13.79	13.96	1528.5	63.7	480	0.13	3.14	21.55	804.47
02/09/07	1060	58	13.50	23.13	22.79	1697.0	70.7	436	0.15	3.72	26.09	830.56
02/16/07	1020	58	15.00	22.25	21.85	1865.7	77.7	416	0.14	3.31	23.29	853.85
02/23/07	628	45	17.10	13.70	13.72	2033.3	84.7	380	0.08	1.94	13.58	867.43
03/01/07	664	52	17.50	14.49	14.30	2177.9	90.7	378	0.08	1.93	11.62	879.06
03/08/07	448	45	17.10	9.77	9.79	2346.2	97.8	405	0.06	1.36	9.57	888.63
03/15/07	621	52	16.90	13.55	13.39	2512.4	104.7	515	0.09	2.19	15.19	903.81
03/22/07	1410	80	14.90	30.76	28.98	2684.2	111.8	371	0.19	4.57	32.72	936.53
03/22/07	1160	77	13.10	25.31	24.08	2684.9	111.9	476	0.15	3.63	0.11	936.64
03/30/07	614	50	15.60	13.40	13.34	2872.9	119.7	460	0.09	2.22	17.41	954.04
04/05/07	744	62	14.20	16.23	15.85	3017.4	125.7	418	0.10	2.48	14.91	968.96
04/20/07	693	58	14.20	15.12	14.87	3283.6	136.8	701	0.12	2.96	32.86	1001.82
04/27/07	709	58	16.00	15.47	15.15	3451.4	143.8	416	0.13	3.01	21.06	1022.88
05/03/07	659	55	15.00	14.38	14.20	3595.8	149.8	390	0.08	2.04	12.26	1035.13
05/11/07	905	59	13.20	19.74	19.44	3787.9	157.8	411	0.12	2.77	22.18	1057.31
05/18/07	856	59	13.70	18.68	18.36	3955.7	164.8	317	0.10	2.38	16.64	1073.95
05/25/07	979	62	16.2	21.36	20.74	4004.2	166.8	548	0.13	3.19	6.46	1080.40
06/01/07	0					4149.7						1080.40
06/08/07	900	57	15.00	19.63	19.31	4316.0	179.8	265	0.04	0.91	6.31	1086.72
06/14/07	1226	80	12.30	26.75	25.36	4460.7	185.9	259	0.10	2.37	14.26	1100.98
06/21/07	886	59	15.50	19.33	18.92	4468.2	186.2	516	0.11	2.61	0.82	1101.80
06/29/07	1353	71	13.30	29.52	28.39	4660.2	194.2	322	0.18	4.24	33.88	1135.67
07/05/07	1280	72	13.90	27.93	26.77	4728.3	197.0	358	0.14	3.24	9.20	1144.87
07/13/07	685	71.4	5.30	14.94	14.66	4920.8	205.0	239	0.06	1.56	12.49	1157.37
07/18/07	996	67	10.00	21.73	21.24	5041.7	210.1	245	0.08	1.83	9.22	1166.58
07/26/07	1008	68	10.40	21.99	21.43	5170.1	215.4	356	0.10	2.29	12.27	1178.85
08/02/07	1090	69	8.40	23.78	23.25	5338.8	222.5	207	0.10	2.33	16.38	1195.22
08/10/07	1149	71	11.50	25.07	24.22	5370.9	223.8	351	0.10	2.41	3.22	1198.44
08/17/07	1133	66	11.80	24.72	24.09	5467.0	227.8	206	0.10	2.39	9.57	1208.01

Note:

- Inlet pipe diameter is 2".
- Shaded areas indicate that measurements were not taken. System was found shut down because there was no propane.

Assumptions:

- Relative vapor density of gasoline is approximately 3.3.
- Vapor density of pure, dry air is 1,200 g/m<sup>3</sup> at 20C.
- Vapor density of gasoline is calculated to be 3,960 g/m<sup>3</sup> at 20C.
- SCFM(at 14.7psia and 68°F) = CFM x [(Pg + Patm)/(Patm)] x [(68 +460)/(Tact +460)]
- Mass Removed Since Last Sampling Event (lbs)** = (flowrate scfm)\*(avg. conc. ppmv)\*(60 min/hr)\*(106.88 lbs/molecul)\*(Operation Time hr)/1000000/379

**Appendix A**  
**Groundwater Sampling Forms**





Troll 9000  
09/12/07

Low-Flow System  
ISI Low-Flow Log

**Project Information:**

Operator Name Renee McFarlan  
Company Name URS  
Project Name Chevron Sunol Pipeline  
Site Name Sunol

**Pump Information:**

Pump Model/Type Mega Typhoon  
Tubing Type LDPE  
Tubing Diameter 0.38 [in]  
Tubing Length 44.5 [ft]  
Pump placement from TOC 44.5 [ft]

**Well Information:**

Well Id MW-5  
Well diameter 4 [in]  
Well total depth 49.8 [ft]  
Depth to top of screen 39.5 [ft]  
Screen length 10 [ft]  
Depth to Water 15.65 [ft]

**Pumping information:**

Final pumping rate 0 [mL/min]  
Flowcell volume 1083.48 [mL]  
Calculated Sample Rate 32505 [sec]  
Sample rate 180 [sec]  
Stabilized drawdown 0.65 [in]

**Low-Flow Sampling Stabilization Summary**

	Time	Turb [NTU]	pH [pH]	RDO []	Cond [µS/cm]	DO [mg/L]	ORP [mV]
<b>Stabilization Settings</b>			+/-0	+/-0	+/-0	+/-0	+/-0
Last 5 Readings	9:07:12	1.54	7.28		768.07	9.04	-57.55
	0:57:36	1.16	7.29		774.84	8.86	-67.43
	13:40:48	1.57	7.29		771.76	8.99	-74.43
	21:07:12	1.54	7.29		774.45	8.91	-83.58
	0:14:24	0.93	7.30		775.35	8.87	-88.67
<b>Variance in last 3 readings</b>	13:40:48	0.41	0.00		-3.08	0.13	-7.01
	21:07:12	-0.03	0.00		2.69	-0.08	-9.15
	0:14:24	-0.61	0.01		0.90	-0.04	-5.09

**Notes:** Initial Depth to Water = 15.65 feet  
Final Depth to Water = 16.30  
Initial Pumping Rate = 150 mL/min  
Final Pumping Rate = 200 mL/min  
Total Volume Purged = 2 gallons

**Appendix B**  
**Laboratory Analytical Results**

## ANALYTICAL RESULTS

Prepared for:

Chevron Pipeline Co.  
4800 Fournace Place - E320 D  
Bellaire TX 77401

713-432-3335

Prepared by:

Lancaster Laboratories  
2425 New Holland Pike  
Lancaster, PA 17605-2425SAMPLE GROUP

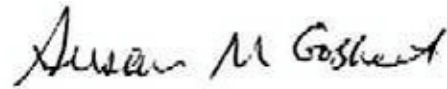
The sample group for this submittal is 1056034. Samples arrived at the laboratory on Thursday, September 13, 2007. The PO# for this group is 0015010091 and the release number is COSGRAY.

<u>Client Description</u>	<u>Lancaster Labs Number</u>
Stream Grab Water	5154827
MW-6 Grab Water	5154828
MW-5 Grab Water	5154829
MW-8 Grab Water	5154830
MW-7 Grab Water	5154831
MW-X Grab Water	5154832
Trip-09-12-07 NA Water	5154833

ELECTRONIC COPY TO	URS	Attn: Joe Morgan
ELECTRONIC COPY TO	URS	Attn: April Giangerelli
ELECTRONIC COPY TO	URS	Attn: Jacob Henry
ELECTRONIC COPY TO	URS	Attn: Joe Petsche
ELECTRONIC COPY TO	URS	Attn: Renee McFarlan
ELECTRONIC COPY TO	URS	Attn: Amber Koster
ELECTRONIC COPY TO	URS Corporation	Attn: Greg White

Questions? Contact your Client Services Representative  
Megan A Moeller at (717) 656-2300

Respectfully Submitted,



Susan M. Goshert  
Group Leader



# Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Lancaster Laboratories Sample No. WW 5154827

**Stream Grab Water**

NA URSO

Sunol Pipeline SL0600100443 Stream

Collected: 09/12/2007 09:15 by GW

Account Number: 11875

Submitted: 09/13/2007 09:30

Chevron Pipeline Co.

Reported: 09/28/2007 at 12:51

4800 Fournace Place - E320 D

Discard: 10/29/2007

Bellaire TX 77401

STREM

I 5E w

CAT No.	Analysis Name	CAS Number	As Received	As Received	Units	Dilution Factor
			Result	Method		
01728	TPH-GRO - Waters	n.a.	N.D.	Detection Limit 50.	ug/l	1
The reported concentration of TPH-GRO does not include MTBE or other gasoline constituents eluting prior to the C6 (n-hexane) TPH-GRO range start time.						
06053	BTEX by 8260B					
05401	Benzene	71-43-2	N.D.	0.5	ug/l	1
05407	Toluene	108-88-3	N.D.	0.5	ug/l	1
05415	Ethylbenzene	100-41-4	N.D.	0.5	ug/l	1
06310	Xylene (Total)	1330-20-7	N.D.	0.5	ug/l	1

State of California Lab Certification No. 2116

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Analysis			Dilution Factor
			Trial#	Date and Time	Analyst	
01728	TPH-GRO - Waters	SW-846 8015B modified	1	09/18/2007 11:11	Steven A Skiles	1
06053	BTEX by 8260B	SW-846 8260B	1	09/21/2007 20:41	Michael A Ziegler	1
01146	GC VOA Water Prep	SW-846 5030B	1	09/18/2007 11:11	Steven A Skiles	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	09/21/2007 20:41	Michael A Ziegler	1



# Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Lancaster Laboratories Sample No. WW 5154828

**MW-6 Grab Water**

NA URSO

Sunol Pipeline SL0600100443 MW-6

Collected: 09/12/2007 11:00 by GW

Account Number: 11875

Submitted: 09/13/2007 09:30

Chevron Pipeline Co.

Reported: 09/28/2007 at 12:52

4800 Fournace Place - E320 D

Discard: 10/29/2007

Bellaire TX 77401

MW-6-

I 5E w

CAT No.	Analysis Name	CAS Number	As Received Result	As Received		Units	Dilution Factor
				Method	Detection Limit		
01728	TPH-GRO - Waters	n.a.	N.D.	50.		ug/l	1
	The reported concentration of TPH-GRO does not include MTBE or other gasoline constituents eluting prior to the C6 (n-hexane) TPH-GRO range start time.						
06053	BTEX by 8260B						
05401	Benzene	71-43-2	N.D.	0.5		ug/l	1
05407	Toluene	108-88-3	N.D.	0.5		ug/l	1
05415	Ethylbenzene	100-41-4	N.D.	0.5		ug/l	1
06310	Xylene (Total)	1330-20-7	N.D.	0.5		ug/l	1

State of California Lab Certification No. 2116

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Analysis			Dilution Factor
			Trial#	Date and Time	Analyst	
01728	TPH-GRO - Waters	SW-846 8015B modified	1	09/18/2007 11:40	Steven A Skiles	1
06053	BTEX by 8260B	SW-846 8260B	1	09/21/2007 21:04	Michael A Ziegler	1
01146	GC VOA Water Prep	SW-846 5030B	1	09/18/2007 11:40	Steven A Skiles	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	09/21/2007 21:04	Michael A Ziegler	1



# Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Lancaster Laboratories Sample No. WW 5154829

**MW-5 Grab Water**

NA URSO

Sunol Pipeline SL0600100443 MW-5

Collected: 09/12/2007 11:35 by GW

Account Number: 11875

Submitted: 09/13/2007 09:30

Chevron Pipeline Co.

Reported: 09/28/2007 at 12:52

4800 Fournace Place - E320 D

Discard: 10/29/2007

Bellaire TX 77401

MW-5-

I 5E w

CAT No.	Analysis Name	CAS Number	As Received Result	As Received		Units	Dilution Factor
				Method	Detection Limit		
01728	TPH-GRO - Waters	n.a.	N.D.	50.		ug/l	1
	The reported concentration of TPH-GRO does not include MTBE or other gasoline constituents eluting prior to the C6 (n-hexane) TPH-GRO range start time.						
06053	BTEX by 8260B						
05401	Benzene	71-43-2	N.D.	0.5		ug/l	1
05407	Toluene	108-88-3	N.D.	0.5		ug/l	1
05415	Ethylbenzene	100-41-4	N.D.	0.5		ug/l	1
06310	Xylene (Total)	1330-20-7	N.D.	0.5		ug/l	1

State of California Lab Certification No. 2116

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Analysis			Dilution Factor
			Trial#	Date and Time	Analyst	
01728	TPH-GRO - Waters	SW-846 8015B modified	1	09/18/2007 12:10	Steven A Skiles	1
06053	BTEX by 8260B	SW-846 8260B	1	09/21/2007 21:27	Michael A Ziegler	1
01146	GC VOA Water Prep	SW-846 5030B	1	09/18/2007 12:10	Steven A Skiles	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	09/21/2007 21:27	Michael A Ziegler	1



# Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Lancaster Laboratories Sample No. WW 5154830

MW-8 Grab Water

NA URSO

Sunol Pipeline SL0600100443 MW-8

Collected: 09/12/2007 12:25 by GW

Account Number: 11875

Submitted: 09/13/2007 09:30

Chevron Pipeline Co.

Reported: 09/28/2007 at 12:52

4800 Fournace Place - E320 D

Discard: 10/29/2007

Bellaire TX 77401

MW-8-

I 5E w

CAT No.	Analysis Name	CAS Number	As Received Result	As Received	Units	Dilution Factor
				Method		
				Detection Limit		
01728	TPH-GRO - Waters	n.a.	4,200.	250.	ug/l	5
The reported concentration of TPH-GRO does not include MTBE or other gasoline constituents eluting prior to the C6 (n-hexane) TPH-GRO range start time.						
06053	BTEX by 8260B					
05401	Benzene	71-43-2	470.	5.	ug/l	10
05407	Toluene	108-88-3	230.	5.	ug/l	10
05415	Ethylbenzene	100-41-4	630.	5.	ug/l	10
06310	Xylene (Total)	1330-20-7	320.	0.5	ug/l	1

State of California Lab Certification No. 2116

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis		Analyst	Dilution Factor
				Date	Time		
01728	TPH-GRO - Waters	SW-846 8015B modified	1	09/18/2007	12:39	Steven A Skiles	5
06053	BTEX by 8260B	SW-846 8260B	1	09/25/2007	05:14	Michael A Ziegler	1
06053	BTEX by 8260B	SW-846 8260B	1	09/25/2007	05:38	Michael A Ziegler	10
01146	GC VOA Water Prep	SW-846 5030B	1	09/18/2007	12:39	Steven A Skiles	5
01163	GC/MS VOA Water Prep	SW-846 5030B	1	09/25/2007	05:14	Michael A Ziegler	1
01163	GC/MS VOA Water Prep	SW-846 5030B	2	09/25/2007	05:38	Michael A Ziegler	10



**Lancaster Laboratories Sample No. WW 5154831**
**MW-7 Grab Water**
**NA URSO**
**Sunol Pipeline SL0600100443 MW-7**

Collected: 09/12/2007 14:00 by GW

Account Number: 11875

Submitted: 09/13/2007 09:30

Chevron Pipeline Co.

Reported: 09/28/2007 at 12:52

4800 Fournace Place - E320 D

Discard: 10/29/2007

Bellaire TX 77401

MW7--

I 5E w

CAT No.	Analysis Name	CAS Number	As Received	As Received	Units	Dilution Factor
			Result	Method Detection Limit		
01728	TPH-GRO - Waters	n.a.	N.D.	50.	ug/l	1
	The reported concentration of TPH-GRO does not include MTBE or other gasoline constituents eluting prior to the C6 (n-hexane) TPH-GRO range start time.					
06053	BTEX by 8260B					
05401	Benzene	71-43-2	N.D.	0.5	ug/l	1
05407	Toluene	108-88-3	N.D.	0.5	ug/l	1
05415	Ethylbenzene	100-41-4	N.D.	0.5	ug/l	1
06310	Xylene (Total)	1330-20-7	N.D.	0.5	ug/l	1

State of California Lab Certification No. 2116

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Chronicle

CAT No.	Analysis Name	Method	Analysis			Dilution Factor
			Trial#	Date and Time	Analyst	
01728	TPH-GRO - Waters	SW-846 8015B modified	1	09/18/2007 13:08	Steven A Skiles	1
06053	BTEX by 8260B	SW-846 8260B	1	09/25/2007 06:01	Michael A Ziegler	1
01146	GC VOA Water Prep	SW-846 5030B	1	09/18/2007 13:08	Steven A Skiles	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	09/25/2007 06:01	Michael A Ziegler	1



# Analysis Report

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 • 717-656-2300 Fax: 717-656-2681 • www.lancasterlabs.com

Lancaster Laboratories Sample No. WW 5154832

MW-X Grab Water

NA URSO

Sunol Pipeline SL0600100443 MW-X

Collected: 09/12/2007 by GW

Account Number: 11875

Submitted: 09/13/2007 09:30

Reported: 09/28/2007 at 12:52

Discard: 10/29/2007

Chevron Pipeline Co.

4800 Fournace Place - E320 D

Bellaire TX 77401

MW-X-

I 5E w

CAT No.	Analysis Name	CAS Number	As Received Result	As Received		Units	Dilution Factor
				Method	Detection Limit		
01728	TPH-GRO - Waters	n.a.	N.D.	50.		ug/l	1
	The reported concentration of TPH-GRO does not include MTBE or other gasoline constituents eluting prior to the C6 (n-hexane) TPH-GRO range start time.						
06053	BTEX by 8260B						
05401	Benzene	71-43-2	N.D.	0.5		ug/l	1
05407	Toluene	108-88-3	N.D.	0.5		ug/l	1
05415	Ethylbenzene	100-41-4	N.D.	0.5		ug/l	1
06310	Xylene (Total)	1330-20-7	N.D.	0.5		ug/l	1

State of California Lab Certification No. 2116

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

## Laboratory Chronicle

CAT No.	Analysis Name	Method	Trial#	Analysis		Analyst	Dilution Factor
				Date	Time		
01728	TPH-GRO - Waters	SW-846 8015B modified	1	09/18/2007	13:37	Steven A Skiles	1
06053	BTEX by 8260B	SW-846 8260B	1	09/25/2007	06:25	Michael A Ziegler	1
01146	GC VOA Water Prep	SW-846 5030B	1	09/18/2007	13:37	Steven A Skiles	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	09/25/2007	06:25	Michael A Ziegler	1

Lancaster Laboratories Sample No. WW 5154833

Trip-09-12-07 NA Water

NA URSO

Sunol Pipeline SL0600100443 Trip Blank

Collected: 09/12/2007

Account Number: 11875

Submitted: 09/13/2007 09:30

Reported: 09/28/2007 at 12:52

Discard: 10/29/2007

Chevron Pipeline Co.

4800 Fournace Place - E320 D

Bellaire TX 77401

TB912

I 5E w

CAT No.	Analysis Name	CAS Number	As Received Result	As Received		Units	Dilution Factor
				Method	Detection Limit		
06053	BTEX by 8260B						
05401	Benzene	71-43-2	N.D.	0.5		ug/l	1
05407	Toluene	108-88-3	N.D.	0.5		ug/l	1
05415	Ethylbenzene	100-41-4	N.D.	0.5		ug/l	1
06310	Xylene (Total)	1330-20-7	N.D.	0.5		ug/l	1

State of California Lab Certification No. 2116

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Chronicle

CAT No.	Analysis Name	Method	Analysis		Analyst	Dilution Factor
			Trial#	Date and Time		
06053	BTEX by 8260B	SW-846 8260B	1	09/26/2007 05:05	Michael A Ziegler	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	09/26/2007 05:05	Michael A Ziegler	1

## Quality Control Summary

 Client Name: Chevron Pipeline Co.  
 Reported: 09/28/07 at 12:52 PM

Group Number: 1056034

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

### Laboratory Compliance Quality Control

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank MDL</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Batch number: 07261A08A TPH-GRO - Waters	Sample number(s): 5154827-5154832 N.D.	50.	ug/l	92	91	75-135	0	30
Batch number: D072644AA Benzene	Sample number(s): 5154827-5154829 N.D.	0.5	ug/l	85		78-119		
Toluene	N.D.	0.5	ug/l	89		85-115		
Ethylbenzene	N.D.	0.5	ug/l	89		82-119		
Xylene (Total)	N.D.	0.5	ug/l	90		83-113		
Batch number: Z072673AA Benzene	Sample number(s): 5154830-5154832 N.D.	0.5	ug/l	93		78-119		
Toluene	N.D.	0.5	ug/l	98		85-115		
Ethylbenzene	N.D.	0.5	ug/l	98		82-119		
Xylene (Total)	N.D.	0.5	ug/l	98		83-113		
Batch number: Z072684AA Benzene	Sample number(s): 5154833 N.D.	0.5	ug/l	94		78-119		
Toluene	N.D.	0.5	ug/l	105		85-115		
Ethylbenzene	N.D.	0.5	ug/l	98		82-119		
Xylene (Total)	N.D.	0.5	ug/l	101		83-113		

### Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike  
 Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS %REC</u>	<u>MSD %REC</u>	<u>MS/MSD Limits</u>	<u>RPD</u>	<u>RPD MAX</u>	<u>BKG Conc</u>	<u>DUP Conc</u>	<u>DUP RPD</u>	<u>Dup RPD Max</u>
Batch number: 07261A08A TPH-GRO - Waters	Sample number(s): 5154827-5154832 108		63-154			UNSPK: 5154827			
Batch number: D072644AA Benzene	Sample number(s): 5154827-5154829 92	97	83-128	3	30	UNSPK: P154825			
Toluene	93	96	83-127	3	30				
Ethylbenzene	97	100	82-129	2	30				
Xylene (Total)	95	97	82-130	2	30				
Batch number: Z072673AA Benzene	Sample number(s): 5154830-5154832 100	98	83-128	2	30	UNSPK: P154342			
Toluene	104	103	83-127	1	30				
Ethylbenzene	105	105	82-129	0	30				
Xylene (Total)	104	104	82-130	1	30				
Batch number: Z072684AA Benzene	Sample number(s): 5154833 86	97	83-128	12	30	UNSPK: P155516			

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

 Client Name: Chevron Pipeline Co.  
 Reported: 09/28/07 at 12:52 PM

Group Number: 1056034

### Sample Matrix Quality Control

 Unspiked (UNSPK) = the sample used in conjunction with the matrix spike  
 Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS</u> <u>%REC</u>	<u>MSD</u> <u>%REC</u>	<u>MS/MSD</u> <u>Limits</u>	<u>RPD</u> <u>RPD</u>	<u>RPD</u> <u>MAX</u>	<u>BKG</u> <u>Conc</u>	<u>DUP</u> <u>Conc</u>	<u>DUP</u> <u>RPD</u>	<u>Dup RPD</u> <u>Max</u>
Toluene	90	103	83-127	13	30				
Ethylbenzene	86	101	82-129	16	30				
Xylene (Total)	86	100	82-130	15	30				

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

 Analysis Name: TPH-GRO - Waters  
 Batch number: 07261A08A  
 Trifluorotoluene-F

---

5154827	94
5154828	92
5154829	91
5154830	94
5154831	92
5154832	93
Blank	90
LCS	93
LCSD	94
MS	97

---

Limits: 63-135

 Analysis Name: BTEX by 8260B  
 Batch number: D072644AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
5154827	97	90	96	97
5154828	95	89	96	96
5154829	98	93	97	96
Blank	97	90	96	94
LCS	92	87	94	101
MS	93	88	95	103
MSD	95	88	96	103

---

Limits: 80-116      77-113      80-113      78-113

 Analysis Name: BTEX by 8260B  
 Batch number: Z072673AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
5154830	90	93	103	95
5154831	93	95	102	92
5154832	91	94	101	92
Blank	89	94	104	94
LCS	90	98	104	96
MS	92	97	104	95

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Pipeline Co.  
Reported: 09/28/07 at 12:52 PM

Group Number: 1056034

### Surrogate Quality Control

MSD	92	98	103	96
Limits:	80-116	77-113	80-113	78-113
Analysis Name: BTEX by 8260B				
Batch number: Z072684AA				
	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
5154833	87	92	101	96
Blank	86	91	101	96
LCS	86	94	101	98
MS	88	93	101	97
MSD	87	92	103	99
Limits:	80-116	77-113	80-113	78-113

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.



## Lancaster Laboratories Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>N.D.</b>	none detected	<b>BMQL</b>	Below Minimum Quantitation Level
<b>TNTC</b>	Too Numerous To Count	<b>MPN</b>	Most Probable Number
<b>IU</b>	International Units	<b>CP Units</b>	cobalt-chloroplatinate units
<b>umhos/cm</b>	micromhos/cm	<b>NTU</b>	nephelometric turbidity units
<b>C</b>	degrees Celsius	<b>F</b>	degrees Fahrenheit
<b>Cal</b>	(diet) calories	<b>lb.</b>	pound(s)
<b>meq</b>	milliequivalents	<b>kg</b>	kilogram(s)
<b>g</b>	gram(s)	<b>mg</b>	milligram(s)
<b>ug</b>	microgram(s)	<b>l</b>	liter(s)
<b>ml</b>	milliliter(s)	<b>ul</b>	microliter(s)
<b>m3</b>	cubic meter(s)	<b>fib &gt;5 um/ml</b>	fibers greater than 5 microns in length per ml
<b>&lt;</b>	less than – The number following the sign is the <u>limit of quantitation</u> , the smallest amount of analyte which can be reliably determined using this specific test.		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million – One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture.		

U.S. EPA data qualifiers:

### Organic Qualifiers

<b>A</b>	TIC is a possible aldol-condensation product
<b>B</b>	Analyte was also detected in the blank
<b>C</b>	Pesticide result confirmed by GC/MS
<b>D</b>	Compound quantitated on a diluted sample
<b>E</b>	Concentration exceeds the calibration range of the instrument
<b>J</b>	Estimated value
<b>N</b>	Presumptive evidence of a compound (TICs only)
<b>P</b>	Concentration difference between primary and confirmation columns >25%
<b>U</b>	Compound was not detected
<b>X,Y,Z</b>	Defined in case narrative

### Inorganic Qualifiers

<b>B</b>	Value is <CRDL, but ≥IDL
<b>E</b>	Estimated due to interference
<b>M</b>	Duplicate injection precision not met
<b>N</b>	Spike amount not within control limits
<b>S</b>	Method of standard additions (MSA) used for calculation
<b>U</b>	Compound was not detected
<b>W</b>	Post digestion spike out of control limits
<b>*</b>	Duplicate analysis not within control limits
<b>+</b>	Correlation coefficient for MSA <0.995

Analytical test results for methods listed on the laboratories' accreditation scope meet all requirements of NELAC unless otherwise noted under the individual analysis.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

**WARRANTY AND LIMITS OF LIABILITY** – In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL LANCASTER LABORATORIES BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF LANCASTER LABORATORIES AND (B) WHETHER LANCASTER LABORATORIES HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Lancaster Laboratories which includes any conditions that vary from the Standard Terms and Conditions of Lancaster Laboratories and we hereby object to any conflicting terms contained in any acceptance or order submitted by client.



**Appendix C**  
**Notification Letter to the BAAQMD**

# COPY



3330 Cameron Park Drive, Ste 550  
Cameron Park, California 95682  
(530) 676-6004 ~ Fax: (530) 676-6005

November 2, 2006  
Project No. U2042-2627-01

Mr. Robert Cave  
Bay Area Air Quality Management District  
939 Ellis Street  
San Francisco, California 94109

Re: Notification of Proposed SVE Event  
(BAAQMD Application No. 12773 & Plant No. 17101)  
Chevron Pipeline Company  
Sunol Pipeline Spill Area  
Sunol, California

Dear Mr. Cave:

Stratus Environmental, Inc. (Stratus), on behalf of CBA Equipment, LLC (CBA), has prepared this letter to notify the Bay Area Air Quality Management District (BAAQMD) regarding a 6-month soil vapor extraction (SVE) event at Calaveras Road, Sunol, California (Figure 1). The SVE event is scheduled to be conducted between November 13, 2006, and May 13, 2006. The proposed SVE system will be operated 24 hours a day during the testing period, using a 30-horsepower (hp) rated propane generator, under a various location permit (Plant No. 17101).

An SVE event was conducted at this site for approximately three months between November 2005 and February 2006. CBA has been retained to conduct an additional 6-month SVE event to reduce the subsurface petroleum hydrocarbon mass.

During the proposed 6-month SVE event, petroleum hydrocarbon laden soil vapors will be extracted from existing vapor extraction wells (see Figure 1) using the 15-hp rated liquid ring blower of a CBA 200 cubic feet per minute (cfm) thermal oxidizer. The extracted soil vapors will be abated in a thermal oxidizer before discharging into the atmosphere (see Figure 2). A 25 kilowatt (30-hp) propane generator or similar will be used to energize the control panel of the SVE system.

## **SYSTEM START-UP AND OPERATION**

Stratus will conduct routine site visits during the 6-month period to verify system operation, optimize system performance, and conduct maintenance if warranted. In addition, influent and effluent air samples will be collected on a monthly basis to verify compliance with BAAQMD permit requirements.

November 2, 2006

During the system start-up and subsequent site visits, the following parameters will be monitored and recorded on field data sheets:

- Influent, operating, and effluent temperatures,
- Vapor extraction rate,
- Applied vacuum at each vapor extraction well,
- Influent flow into the system, and
- Photo-ionization detector (PID) measurements for organic vapors from the extraction wells.


Air samples will be collected on a monthly basis and forwarded to a state certified laboratory to be analyzed for gasoline range organics (GRO) by United States Environmental Protection Agency (USEPA) Method 8015, and for benzene, toluene, ethylbenzene, and total xylenes (BTEX), and methyl tertiary butyl ether (MTBE) by USEPA Method 8020. Analytical results and field data collected will be used to calculate and verify the destruction efficiency of the system. The first set of influent and effluent air samples will be analyzed on a 24-hour turnaround time; the results will be forwarded to BAAQMD via facsimile. The remainder of the air samples will be analyzed on a standard turnaround time (2 to 3 weeks).

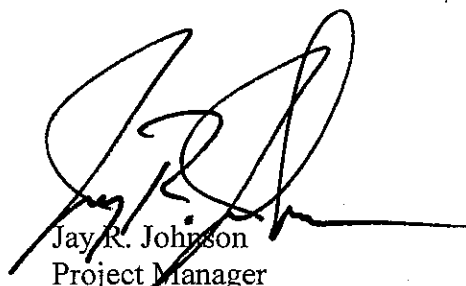
Stratus will prepare and submit quarterly reports to BAAQMD that will include a tabulated analytical summary, estimated mass emission rates, and destruction efficiency of the system.

If you have any questions regarding this notification, please call Kiran Nagaraju at (530) 676-6007.

Sincerely,

*STRATUS ENVIRONMENTAL, INC.*

  
Kiran Nagaraju  
Project Engineer

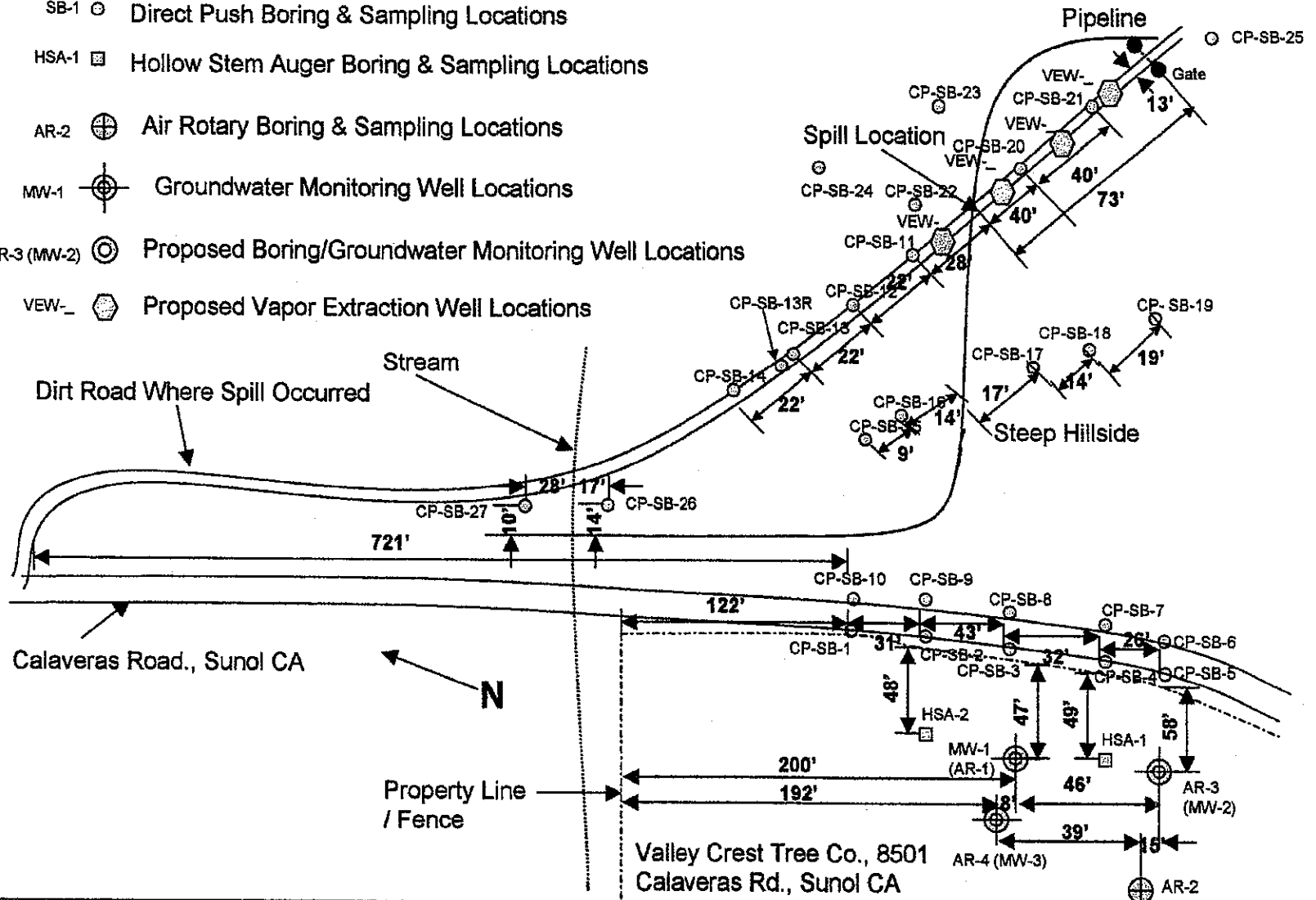
  
Jay R. Johnson  
Project Manager

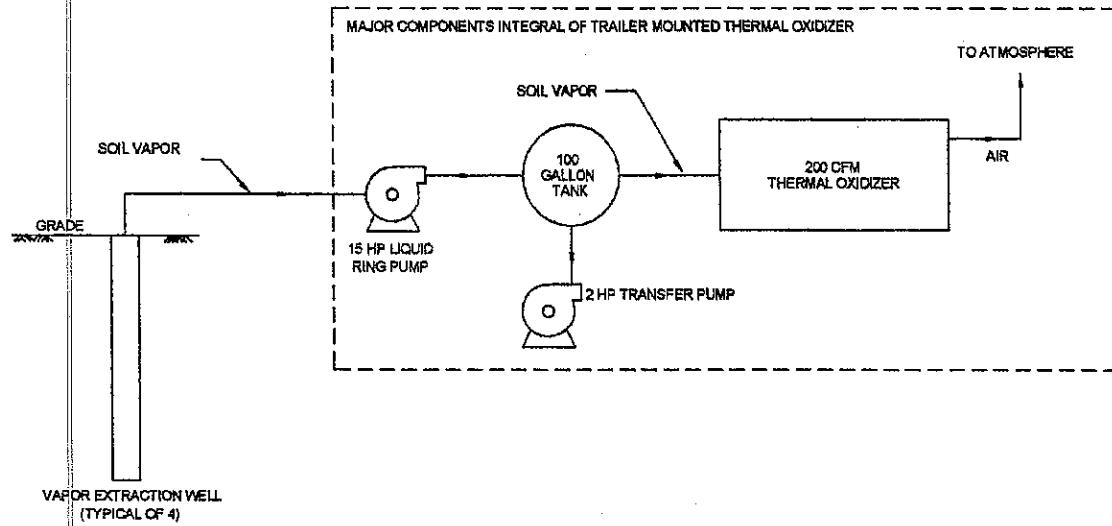
Attachments    Figure 1    Site Plan – Boring and Proposed Well Locations  
                         Figure 2    Process Flow Diagram

cc: Ms. Angela Liang, URS Corporation Americas

**Explanation**

- SB-1 ○ Direct Push Boring & Sampling Locations
- HSA-1 □ Hollow Stem Auger Boring & Sampling Locations
- AR-2 ⊕ Air Rotary Boring & Sampling Locations
- MW-1 ⊕ Groundwater Monitoring Well Locations
- AR-3 (MW-2) ⊕ Proposed Boring/Groundwater Monitoring Well Locations
- VEW- ⊕ Proposed Vapor Extraction Well Locations





SOIL VAPOR EXTRACTION & ABATEMENT  
NOT TO SCALE

THIS IS A PROCESS FLOW DIAGRAM, THEREFORE INSTRUMENTATION AND CONTROL EQUIPMENT DETAILS ARE NOT SHOWN. INSTRUMENT FUNCTIONS AND INTERACTIONS ARE ALSO NOT SHOWN. EQUIPMENT SIZES ARE NOT PROPORTIONAL AND ARE NOT INDICATIVE OF FINAL SIZES.

**STRATUS**  
ENVIRONMENTAL, INC.

CHEVRON PIPELINE COMPANY  
SUNOL PIPELINE SPILL AREA  
SUNOL, CALIFORNIA  
PROCESS FLOW DIAGRAM

FIGURE  
**2**  
PROJECT NO.  
USUNOL

**Appendix D**  
**BAAQMD Permit for the SVE System**



**BAY AREA AIR QUALITY  
MANAGEMENT DISTRICT**

939 ELLIS STREET  
SAN FRANCISCO, CALIFORNIA 94109  
(415) 771-6000

**PERMIT  
TO OPERATE**

Plant# 17101

Page: 1

Expires: SEP 1, 2007

This document does not permit the holder to violate any District regulation or other law.

CBA Equipment, LLC  
24988 Blue Ravine, Ste 108 181  
Folsom, Ca 95630

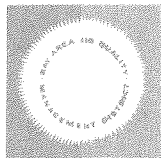
Location: 24988 Blue Ravine, Ste 108 181  
Folsom, Ca 95630

S#	DESCRIPTION	[Schedule]	PAID
1	CHEM> Contaminated soil remediation, Contaminated soil vapor Portable SVE System Abated by: A1 Afterburner	[G1, 382 days]	751

1 Permit Source, 0 Exempt Sources

\*\*\* See attached Permit Conditions \*\*\*

The operating parameters described above are based on information supplied by permit holder and may differ from the limits set forth in the attached conditions of the Permit to Operate. The limits of operation in the permit conditions are not to be exceeded. Exceeding these limits is considered a violation of District regulations subject to enforcement action.



**BAY AREA AIR QUALITY  
MANAGEMENT DISTRICT**

939 ELLIS STREET  
SAN FRANCISCO, CALIFORNIA 94109  
(415) 771-6000

**PERMIT  
TO OPERATE**

Plant# 17101

Page: 2

Expires: SEP 1, 2007

This document does not permit the holder to violate any District regulation or other law.

\*\*\* PERMIT CONDITIONS \*\*\*

=====

CONDITION ID #22399

1. The operator of this source shall provide written notification to the Engineering Division at least 3 days prior to start-up of operation at any new location. The notification shall include:
  - a. Application Number (12773) and Plant Number (17101).
  - b. Street address, including zip code, for the location where the equipment will be operated.
  - c. The name and telephone number of a contact person where the equipment will be operated.
  - d. The date of initial start-up and estimated duration of operations at that location.
  - e. The distance from the source to the outer boundary of the nearest K-12 school, or indication that the distance is greater than 1500 feet.

In the event that the start-up is delayed less than 5 days, the operator may provide telephone notice of said change to the assigned Plant Engineer in the Engineering Division. If the start-up is delayed more than 5 days, written notification must be resubmitted.

2. This equipment shall not remain at any single location for a period in excess of 12 consecutive months, following the date of initial operation except as allowed under Section 2-1-220.10. If this portable equipment remains at any fixed location for more than 12 months, the portable permit will automatically revert to a conventional permanent location permit and will lose its portability. [basis: Reg. 2-1-220.2]
3. This portable equipment, S-1, shall operate at all times in conformance with the eligibility requirements set forth in Regulation 2-1-220 for portable equipment.





**BAY AREA AIR QUALITY  
MANAGEMENT DISTRICT**

939 ELLIS STREET  
SAN FRANCISCO, CALIFORNIA 94109  
(415) 771-6000

**PERMIT  
TO OPERATE**

Plant# 17101

Page: 3

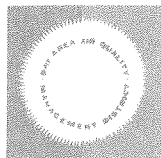
Expires: SEP 1, 2007

This document does not permit the holder to violate any District regulation or other law.

**\*\*\* PERMIT CONDITIONS \*\*\***

=====

- 4. This equipment is not to be operated within 1000 feet of the outer boundary of any K-12 school, unless the applicable requirements of the California Health and Safety Code Section 42301.6 have been met. This will require the submittal of an application for a revised permit to operate. [basis: Reg. 2-1-220.4]
- 5. This equipment shall be used exclusively for the removal of non-chlorinated volatile organic compounds associated with petroleum products from extracted soil vapor. This shall be demonstrated by onsite sampling required in condition 10 below. [basis: Health Risk Management Policy]
- 6. Precursor Organic Compound (POC) emissions from Source S-1 shall be abated by abatement device A-1, dual-mode thermal/catalytic oxidizer during all periods of operation. Soil vapor flow rate shall not exceed 200 scfm. [basis: Reg. 8-47-301.1,2]
- 7. The POC abatement efficiency of abatement device A-1 shall be maintained at a minimum of 98.5% by weight for inlet POC concentrations greater than or equal to 2000 ppmv (measured as C6). For inlet concentrations below 2000 ppmv and greater than or equal to 200 ppmv, a minimum abatement efficiency of 97% shall be maintained. For inlet concentrations below 200 ppmv, a minimum abatement efficiency of 90% shall be maintained. The minimum abatement efficiency shall be waived if outlet POC concentrations are shown to be less than 10 ppmv (measured as C6). In no event shall benzene emissions to the atmosphere exceed 0.250 pounds per day. Annual emissions of benzene shall not exceed 6.70 pounds per year. [basis: BACT; Health Risk Management Policy]
- 8. While operating as a Thermal Oxidizer, the minimum operating temperature of A-1 shall not be less than 1400 degrees Fahrenheit. While operating as a Catalytic Oxidizer, the minimum



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operating temperature of A-1 shall not be less than 600 degrees Fahrenheit.

- 9. To determine compliance with Condition Number 8, the dual-mode thermal/catalytic oxidizer shall be equipped with continuous measuring and temperature recording instrumentation. The temperature data collected from the temperature recorder shall be maintained in a file which shall be available for District inspection for a period of at least 2 years following the date on which such data are recorded.
- 10. To determine compliance with Condition 7, within 24 hours after start-up of the catalytic oxidizer and within 24 hours after start-up of the thermal oxidizer at any new location, the operator of this source shall:
  - a. Analyze the inlet gas stream to determine the vapor flow rate and concentration of POC present.
  - b. Analyze exhaust gas to determine the flow rate, and the concentration of benzene and POC present.
  - c. Calculate the benzene emission rate in pounds per day based on the exhaust gas analysis and the operating exhaust flow rate. The soil vapor flow rate shall be decreased, if necessary, to demonstrate compliance with Condition 7.
  - d. Calculate the POC abatement efficiency based on the inlet and exhaust gas sampling analysis. For the purpose of determining compliance with condition 7, the POC concentration shall be reported as hexane.
  - e. Submit to the District's Engineering Division the test results and emission calculations within one month from the testing date. Samples shall be analyzed according to modified EPA test methods 8015 and 8021 or their equivalent to determine the concentrations of POC and benzene.
- 11. Within 30 days from the completion of each



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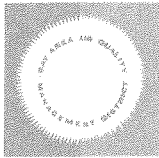
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treatment operation at a given location, the operator of this source shall provide the assigned Plant Engineer in the Engineering Division with a summary showing the following information:

- a. The dates and total number of days that the equipment was at that location and the dates, and total number of days that the equipment was operated at that location.
  - b. A summary of the abatement efficiency and benzene emission rate as determined and reported in the start-up sampling report required by condition 10e above.
  - c. The results of any additionally performed emission test, analysis, or monitoring result logged in for the day of operation they were taken.
  - d. The total throughput of contaminated soil vapor processed by S-1 at that location (indicated in cubic feet).
  - e. The total emissions of benzene at that location based on the sampling results required by condition 10 above. [basis: Reg. 1-523]
12. Within 30 days after the end of every calendar year, the operator of this source shall provide the assigned Plant Engineer in the Engineering Division a year end summary showing the following information:
- a. The location(s) at which the equipment was operated including the dates operated at each location.
  - b. The total throughput of contaminated soil vapor for the previous four quarters (indicated in cubic feet).
  - c. The total benzene emissions for the previous four quarters (indicated in pounds). [basis Reg. 1-523]
13. The operator shall maintain a file containing all measurements, records and other data that are required to be collected pursuant to the



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various provisions of this conditional Permit to Operate. All measurements, records and data required to be maintained by the operator shall be retained for at least two years following the date the data is recorded. [basis Reg. 1-523]

- 14. Any non-compliance with these conditions shall be reported to the Compliance and Enforcement Division at the time that it is first discovered. The submittal shall detail the corrective action taken and shall include the data showing the exceedance as well as the time of occurrence.

~~~~~ END OF CONDITIONS ~~~~~

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| S#          | Source Description  | Annual Average lbs/day |      |     |     |    |
|-------------|---------------------|------------------------|------|-----|-----|----|
|             |                     | PART                   | ORG  | NOx | SO2 | CO |
| 1           | Portable SVE System | -                      | 1.23 | -   | -   | -  |
| T O T A L S |                     |                        | 1.23 |     |     |    |

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