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RECEIVED
By Alameda County Environmental Health at 4:00 pm, Jan 21, 2014

January 21, 2014

Mr. Martin Musonge
Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, California 94612

Subject: **File No. 01-0098 (MYM)**
Site Located at 2844 Mountain Boulevard, Oakland, California

Dear Mr. Musonge:

Enclosed for your review is SOMA's "Multi-Phase Extraction Pilot Testing Report" for the subject property. It has been uploaded to the State's GeoTracker database and the Alameda County's FTP site.

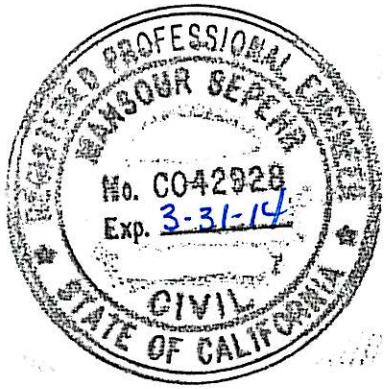
Thank you for your time in reviewing our report. Please do not hesitate to call me at (925) 734-6400, if you have any questions or comments.

Sincerely,

Mansour Sepehr, Ph.D., PE
Principal Hydrogeologist

Enclosure

cc: Mr. Tejindar Singh w/enclosure



Multi-Phase Extraction
Pilot Testing Report

2844 Mountain Boulevard
Oakland, California

Project 5084
RB File No. 01-0098

January 21, 2014

Prepared for

Mr. Tejindar P. Singh
6400 Dublin Blvd.
Dublin, California

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PERJURY STATEMENT

Site Location: 2844 Mountain Boulevard, Oakland, California

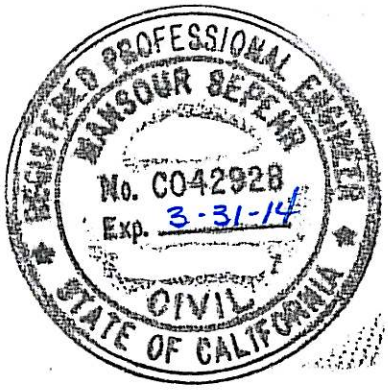
"I declare under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge".

Tejindar Singh
6400 Dublin Boulevard
Dublin, California 94568
Responsible Party

CERTIFICATION

SOMA Environmental Engineering, Inc. has prepared this report on behalf of Mr. Tejindar P. Singh for the site located at 2844 Mountain Blvd., Oakland, California. The report was prepared in accordance with San Francisco Bay Regional Water Quality Control Board correspondence dated April 3, 2013.

Mansour Sepehr, PhD, PE
Principal Hydrogeologist



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1. INTRODUCTION

SOMA Environmental Engineering, Inc. (SOMA) has prepared this report on behalf of Mr. Tejindar P. Singh for the site located at 2844 Mountain Blvd., Oakland, California. The site is located on the eastern corner of the intersection of Mountain Boulevard and Werner Court in a commercial/residential area (Figure 2). The Warren Freeway (freeway) is adjacent to Mountain Boulevard, and lies approximately 50 feet southwest of the site. This report presents results of multi-phase extraction (MPE) pilot testing, and documents SOMA's conclusions and recommendations.

This report was prepared in accordance with SOMA's workplan (dated December 26, 2012), as approved by San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) correspondence dated April 3, 2013.

1.1 Site Location and Description

The subject property is located in Alameda County, California. Figure 1 shows the location of the site and vicinity. The site is located on the eastern corner of the intersection of Mountain Boulevard and Werner Court in a commercial/residential area (Figure 2). The Warren Freeway is adjacent to Mountain Boulevard, and lies approximately 50 feet southwest of the site. The property was a historical retail gasoline station. A bookstore has been operating in the site building since May 2013. The historical underground storage tanks (USTs), installed in 1994, contained various grades of unleaded gasoline and diesel and had individual storage capacities of 3,000, 4,000, and 10,000 gallons. In August 2011, under SOMA's oversight, the two remaining USTs were removed and disposed of off-site. UST removal activities are documented in SOMA's report dated September 14, 2011. Site history is summarized in Appendix A.

1.2 Geology and Hydrogeology

The site is located in the eastern portion of the greater Oakland area approximately 6 miles inland from the San Francisco Bay. The site and the surrounding area is approximately one quarter mile southwest of Palo Seco Creek and is located on a slight gradient that slopes towards the southwest (Figure 1). Upper San Leandro reservoir is located approximately 3.5 mile east of the site. According to the USGS 7.S minute series quadrangle for the Oakland East area, the subject property is at an elevation of approximately 700 feet above mean sea level (msl).

The site lies east of the Alameda Bay Plain hydrologic subarea of the East San Francisco Bay Hydrologic study area. Small lenses of perched groundwater may

lie beneath portions of this hydrologic area. Regional groundwater flow direction is expected to be southwesterly toward the Bay.

According to the Geologic Map of the San Francisco-San Jose Quadrangle (1990, Map 5A, California Division of Mines & Geology), the site is situated within the active Hayward Fault Zone (Figure 1A). The fault is part of a northwest trending zone locally consisting of "slivers" or small blocks of bedrock. The rocks include Jurassic and Cretaceous-age ultramafic crystalline rocks and rhyolite of the Coast Range Ophiolite, marine sandstone and shale, and Franciscan complex rocks. The weathering of these rocks typically yields clayey soil.

According to the RSI Corrective Action Plan report, dated February 3, 1995, the saturated sediments beneath the site are primarily comprised of fine-grained materials which are not capable of transmitting significant amount of water to the wells. According to the above referenced report, the maximum extraction rate for groundwater extraction was less than 0.32 gallons per minute (gpm). During the current MPE pilot testing flow rates of up to 0.16 gpm were observed.

According to historical site reports (1995), the nearest well utilized for beneficial use, is located approximately 2200 feet southwest from the site (4315 Lincoln Ave, Oakland, CA) and is installed to the total depth of 260 feet bgs (depth to water at 240 feet bgs); this well is utilized for irrigation. No updated sensitive receptor survey was conducted at this time since it was not within the scope of this report.

During the previous CPT/MIP investigation (March 2012) at least two water bearing zones (WBZs) were present beneath the site. All site wells (RS-1 through RS-4) were screened from 5 to 25 feet bgs in what was previously designated as Perched WBZ. During the CPT/MIP investigation, groundwater samples were also collected from approximately 48 feet bgs from a WBZ which was designated as First WBZ.

During the May 2013 investigation, while logging the soil from boring DPT-5, there was a section where “very moist to wet” sediments were encountered at approximately 13 feet bgs. SOMA’s field geologist left the boring open at 15 feet in order to see if enough water would accumulate inside the boring for sampling. Water did accumulate inside the boring and the groundwater sample was called DPT-5W-1. Soil borings that were drilled during previous investigations had also been left open to see if water would accumulate at similar depths and no water accumulated inside those borings. During the previous investigation it was concluded that the shallow groundwater appears to be perched and somewhat discontinuous, so this shallow zone that was encountered is the perched and discontinuous zone.

2. MULTI-PHASE EXTRACTION PILOT TESTING

In December 2012, SOMA submitted a workplan for additional investigation, well replacement and (multi-phase extraction) MPE pilot testing. This workplan was approved by the San Francisco Bay regional water quality Control board (SF RWQCB) on April 3, 2013. In May 2013, two replacement wells (MW-1 and MW-2) were installed on-site to be utilized during the pilot test.

2.1 MPE Pilot Test Summary

Under SOMA's oversight, Golden Gate Remediation Technology (GGRT) performed MPE pilot testing between December 2, 2013 and December 16, 2013, utilizing existing site wells MW-1, MW-2, RS-3, and RS-4, as extraction and observation wells. Well locations are shown in Figure 2.

The pilot test was performed using a self-contained mobile treatment system (MTS), equipped with electrical generator, propane tank, liquid ring vacuum pump rated at 25-horsepower and 428-standard cubic feet per minute (scfm), air/water separator vessel, discharge hoses and traffic-rated hose ramps, downhole stingers, and a thermal oxidizer for vapor abatement (Figure 3). Both soil vapor and groundwater were extracted from the subsurface.

The liquid ring pump was selected for use during pilot testing as it can transfer both liquids and gases through the pump casing and they are the most commonly used vacuum pumps reported in the literature for MPE applications (AFCEE 1997; Hansen, et al. 1994; Suthersan 1997).

Physical and chemical parameters including applied vacuum, soil vapor extraction flow rates, oxidizer temperature, volume of groundwater extracted, volatile organic compound (VOC) concentrations, groundwater levels, and induced vacuum were monitored, measured and recorded. Induced vacuum in the observation wells was measured using magnehellic vacuum gauges fitted to airtight well caps and drawdown was measured utilizing standard water level meters. VOC concentrations in the extracted soil vapor stream were continuously monitored using a photo ionization detector (PID) calibrated to hexane. MPE pilot test operational data is presented in Tables 1a through 1f and 2a through 2f, along with field data sheets, in Appendix C. Extracted soil vapor samples were collected from influent and effluent gas streams during pilot testing (Figure 3 shows MTS sampling points).

2.2 Pilot Test Objectives

The overall objective of pilot testing was to evaluate whether MPE is sufficiently effective to justify full-scale implementation, and to evaluate its capability to remove contaminant mass in the most efficient and timely manner.

The first site-specific objective of MPE pilot testing was to lower the groundwater table to increase the volume of semi-saturated soil through which airflow and volatilization of constituents occur. The second objective was to remove soil vapor and groundwater from the impacted zone for treatment. The third objective was to evaluate effectiveness of the proposed technology and assess site conditions with regard to potential full-scale implementation.

Pilot test results were utilized to determine the following:

1. Mass Removal: Pilot testing results determine whether MPE can accomplish removal of contaminant mass at satisfactory rates. Mass removal rates will be evaluated using data obtained during pilot testing.
2. Zone of Influence Evaluation: pilot test results provide vadose and saturated zone response to the application of vacuum.
3. Subsurface Soil Properties/Parameters Evaluation: pilot test results provide information about the nature and variability of site-specific subsurface parameters and contaminant distribution.
4. Discharge Concentrations/Design Parameters: pilot test results establish initial levels of contaminants in extracted gas and liquid. This data will be used for future treatment system design and discharge permitting.
5. Cost Evaluation: pilot test results can aid in evaluating cost of full-scale system implementation and operation, as well as assessment of duration of soil and groundwater remediation.

2.3 Pre-Pilot Test Activities

SOMA prepared a site-specific Health and Safety Plan (HASP). The HASP is a requirement of the Occupational Safety and Health Administration (OSHA), “Hazardous Waste Operation and Emergency Response” guidelines (29 CFR 1910.120) and the California Occupational Safety and Health Administration (Cal/OSHA) “Hazardous Waste Operation and Emergency Response” guidelines (CCR Title 8, section 5192). The HASP is designed to address safety provisions during field activities and protect the field crew from physical and chemical hazards resulting from drilling, sampling, and remediation activities. It establishes personnel responsibilities, general safe work practices, field procedures, personal protective equipment standards, decontamination procedures, and emergency action plans. The HASP was reviewed and signed by field staff and contractors prior to beginning field operations.

In accordance with conditions of the various-locations Bay Area Air Quality Management District (BAAQMD) permit for the MTS, SOMA obtained a permit modification to include the subject site under the various locations air permit. The nearest school ‘Growing Light Montessori’ is less than 1,000 feet from the site, which triggered a public notification process. Upon receipt of the modified permit,

SOMA notified BAAQMD of the location, date, and duration of the pilot test, and the vapor treatment to be utilized.

Prior to MPE operation, a Wastewater Special Discharge Permit was obtained from the East Bay Municipal Utility District (EBMUD) to allow discharge to the site sewer during MPE activities (copy of discharge permit is attached in Appendix F). In preparation for discharge activities, on July 3, 2013, SOMA collected three effluent groundwater samples (after groundwater had passed through new carbon drums). Samples were analyzed according to the EBMUD discharge requirements. Based on acceptable laboratory analytical results, EBMUD issued the discharge permit (No. 05928020) on July 24, 2013. Certified laboratory analytical reports and chain of custody documentation are included in Appendix D.

2.4 Field Work and Procedures

The MTS system was operated continuously throughout the pilot test, if any interruptions occurred they were noted in pertinent field notes; MTS operational data collected during the pilot test included the following (no data was collected overnight):

- Oxidizer temperature
- Pump/air temperature
- Total flow
- Dilution flow
- Total liquids removed by vacuum
- PID readings

Oxidizer temperature and pump/air temperature are displayed on the MTS control panel and total flow was calculated using the pump vacuum observation. Dilution flow was read directly from the gas flow gauge at the air dilution flow control valve before the liquid ring pump; flow is reported in standard cubic feet per minute. Total liquids removed were read from a totalizing flow meter ahead of the GAC drums. Appendix C includes field data sheets (GGRT, MTS Operational Data Sheets and MTS Monitoring Point Data Sheets) for recording data.

All equipment was calibrated in the field in accordance with manufacturer recommendations. All extraction wells and observation wells were placed under pressure and observed any evidence of air leakage around the cement/bentonite grout seal of the well. Shaving foam was used to detect leaks and no air leakage was observed at any of the wells. Groundwater elevations were measured at observation wells using a standard electrical water level meter graduated in tenths of inches. Flush-threaded Schedule 40 PVC well casings were used as stingers. Stingers were connected by flexible hose to the MTS and extended into

the extraction well to within a few inches from the bottom of the well, removing groundwater from the well casing/screen by vacuum. Prior to insertion of the stinger, depth to groundwater was measured. Piping between the stinger and manifold was limited to 1 inch in diameter. Piping was placed under traffic rated hose ramps where necessary, which accept a maximum diameter of 1-inch pipe or hose.

Groundwater levels were measured at all wells and induced vacuum was measured at all wells when not in use for extraction. Induced vacuum was measured using a magnehellic vacuum gauge (Dwyer), attached to a barbed fitting that was attached to an air tight well cap. Groundwater elevation was measured by removing the well cap and inserting a standard groundwater level probe. MPE wells (4-inch diameter) were fitted with compression caps that enable both vacuum and groundwater levels to be measured simultaneously. These compression caps remain air tight allowing a magnahellic gauge to be attached via hose barb and with a 10-foot-long, 1-inch diameter pipe inserted through the center of the cap until it is below groundwater level for insertion of a groundwater level probe. Vacuum gauges read a minimum range of 0.01 inches of water to 20 inches of water. Groundwater level probes read at graduations of 0.1 inches.

Extracted soil vapor concentrations were measured with a PID calibrated to hexane. Vapor samples were collected in Tedlar bags within the first 24 hours of extraction at each extraction well and throughout the pilot test. Influent soil vapor samples were collected through a sampling port located on the vacuum pump discharge manifold and thermal oxidizer stack vapor samples were collected through a sampling port located at the top of the stack.

Measurements were recorded at a minimum of every 1-1.5 hours, during daytime operating hours.

2.5 Pilot Test Implementation

The zone of influence (ZOI) for MPE pilot testing was estimated by determining pressure changes in observation wells versus distance from the extraction well at the end of the pilot test (EPA 1995). The effective ZOI is defined as the distance at which a pressure drop of 0.10 in-H_20 is observed. The log of vacuum pressure measured in the observation well at the end of pilot testing is plotted against the distance from the MPE well. Figure 4 illustrates the lateral extents of the ZOIs utilizing data taken from observation wells, and Figures 5a through 5d show ZOI for each well or combination of wells. The data points describe straight lines and the lines intersect the pressure axis at 0.1 inches of water with the distance axis used to estimate the MPE ZOI. Summaries of pilot test implementation at each extraction well or well combination are listed below.

2.5.1 Extraction at MW-1

Pilot testing utilizing MW-1 began at 1:00 pm on December 2, 2013 and was terminated at 11:00 am on December 5, 2013; total test time was 4,200 minutes or 70 hours. Tables 1a and 2a show operational data during this period. Casing vacuum ranged from 22.5 to 23 inches of mercury and vapor extraction flow rate ranged from 68 to 74 scfm. VOC concentrations in the extracted soil vapor stream measured using a PID ranged from 2,150 ppmv as hexane to 8,780 ppmv (Table 2A). Thermal oxidizer temperatures ranged from 1,498 °F to 1,532 °F.

Induced vacuum was detected in observation wells MW-2 and RS-4 at 0.30 and 0.20 inches of water, respectively, at the end of extraction from this well (Table 3). ZOI ranged up to 60 feet for extraction at MW-1 (Figure 5a).

A total of 286 gallons of groundwater (Table 1a) was extracted at an average rate of 0.068 gpm. Once steady-state pumping was reached, a drawdown of 2.03 feet was observed in well MW-2 and 0.63 feet in RS-4. Figure 6a shows drawdown over time during extraction.

2.5.2 Extraction at MW-2

Pilot testing utilizing MW-2 began at 11:00 on December 5, 2013 and was terminated at 10:00 on December 9, 2013; total test time was 5,700 minutes or 95 hours. Tables 1b and 2b show operational data for this well. Casing vacuum ranged from 21.2 to 23.3 inches of mercury and vapor extraction flow rate ranged from 66 to 77 scfm. VOC concentrations in the extracted soil vapor stream measured using a PID ranged from 496 ppmv as hexane to 6,070 ppmv (Table 2B). Thermal oxidizer temperatures ranged from 1,487 °F to 1,540 °F.

Induced vacuum was detected in observation wells MW-1 and RS-4 at 0.25 and 0.60 inches of water, respectively, at the end of extraction from this well (Table 3). ZOI ranged up to 25 feet for extraction at MW-2 (Figure 5b).

A total of 530 gallons of groundwater (Table 1b) was extracted at an average rate of 0.093 gpm. Once steady-state pumping was reached, a drawdown of 1.43 feet was observed in well RS-4 and 0.65 feet in MW-1. Figure 6b shows drawdown over time during extraction.

2.5.3 Extraction at RS-4

Pilot testing for extraction at RS-4 began at 10:00am on December 9, 2013 and was terminated at 9:00am on December 12, 2013. Total test time was 4,260 minutes or 71 hours. Tables 1c and 2c show operational data for this period. Casing vacuum ranged from 21.3 to 22.5 inches of mercury and vapor extraction flow rate ranged from 62 scfm to 74 scfm. VOC concentrations in the extracted soil vapor stream measured using a PID ranged from 271 ppmv as hexane to

711 ppmv (Table 2c). Thermal oxidizer temperatures ranged from 1,498 °F to 1,512 °F.

Induced vacuum was detected in observation wells MW-1 and MW-2 at 0.2 inches of water in each well (Table 3). ZOI ranged up to 28 feet for extraction at RS-4 (Figure 5c).

A total of 377 gallons of groundwater (Table 1c) was extracted at an average rate of 0.089 gpm. A drawdown of 1.37 feet was observed in well MW-2. Figure 6c shows drawdown over time during extraction.

2.5.4 Extraction at RS-3

Pilot testing utilizing RS-3 began at 9:00am on December 12, 2013 and was terminated at 12:00pm on the same day; total test time was 180 minutes or 3 hours. Tables 1d and 2d show operational data for RS-3. Casing vacuum ranged from 24.7 to 25 inches of mercury and vapor extraction flow rate was 63 scfm. VOC concentrations in the extracted soil vapor stream measured using an PID ranged from 46 ppmv as hexane to 156 ppmv (Table 2d). Thermal oxidizer temperatures ranged from 1,499 °F to 1,509 °F.

Induced vacuum was detected only in MW-1 at 0.10 inches of water, at the end of extraction from this well (Table 3). No vacuum was observed in any other well.

A total of 11 gallons of groundwater (Table 1d) was extracted at an average rate of 0.061 gpm from RS-3. A drawdown of 0.12 feet was observed in well MW-2. Figure 6d shows drawdown over time during extraction.

2.5.5 Extraction at MW-1 and MW-2

Pilot testing for combined extraction at MW-1 and MW-2 began at 12:00pm on December 12, 2013 and was terminated at 9:00am on December 16, 2013; total test time was 5,550 minutes or 92.5 hours. Tables 1e and 2e show operational data for this period. Induced vacuum and groundwater levels were measured at observation wells RS-3 and RS-4. Casing vacuum was maintained between 16.9 and 19.6 inches of mercury and vapor extraction flow rate ranged from 100 to 136 scfm. VOC concentrations in the extracted soil vapor stream measured using a PID ranged from 578 ppmv to 2,700 ppmv as hexane (Table 2e). Thermal oxidizer temperatures ranged from 1,499 °F to 1,520 °F.

Induced vacuum was detected in observation wells RS-3 and RS-4 at 0.02 and 3.0 inches of water, respectively, at the end of extraction from these wells (Table 3). ZOI ranged up to 44 feet for combined extraction at MW-1 and MW-2 (Figure 5d).

A total of 876 gallons of groundwater (Table 1e) was extracted at an average rate of 0.158 gpm. A drawdown of 1.83 feet was observed in well RS-4. Figure 6e shows drawdown over time during extraction.

2.5.6 Extraction at MW-1, MW-2, and RS-4

Pilot testing for combined extraction at MW-1, MW-2, and RS-4 began at 9:00am on December 16, 2013 and was terminated at 12:00pm on December 16, 2013; total test time was 180 minutes or 3 hours. Tables 1f and 2f show operational data for this period. Casing vacuum was maintained between 16.9 and 17.1 inches of mercury and vapor extraction flow rate ranged from 135 to 139 scfm. VOC concentrations in the extracted soil vapor stream measured using a PID ranged from 482 ppmv to 617 ppmv as hexane (Table 2f). Thermal oxidizer temperatures ranged from 1,504 °F to 1,512 °F.

Induced vacuum was not detected in the only observation well RS-3 until the end of pilot testing (Table 3) and hence no ZOI could be calculated for this combined extraction. A total of 11 gallons of groundwater (Table 1f) was extracted at an average rate of 0.06 gpm.

2.6 Pilot Testing Results

Contaminant mass removed was estimated using flow rates and volume of air extracted during pilot testing, and VOC concentrations in ppmv as hexane measured by PID. VOC mass removal rate in lbs/day is estimated by dividing the estimated VOC mass removed during pilot testing by elapsed time.

The estimated total mass of VOCs removed from soil vapor extracted from extraction wells during this event was 497 lbs. The estimated average VOC mass removal rate was approximately 36 lbs/day. The highest VOC mass removal rate was observed in well MW-1 at approximately 87 lbs/day. Estimated VOC mass removal rates and VOC mass removed during each configuration are presented below and in Tables 2 and 2a through 2f.

2.6.1 Mass Removal at MW-1

The estimated mass of VOCs removed from soil vapor extracted from extraction well MW-1 was 253 lbs. The estimated total VOC mass removal rate was approximately 87 lbs/day with a median flow rate of 70 scfm. Testing at MW-1 occurred over a period of 4,200 minutes or 70 hours (Table 2a).

2.6.2 Mass Removal at MW-2

The estimated mass of VOCs removed from soil vapor extracted from extraction well MW-2 was 109 lbs. The estimated total VOC mass removal rate was

approximately 28 lbs/day with a median flow rate of 70 scfm. Testing at MW-2 occurred over a period of 5,700 minutes or 95 hours (Table 2b).

2.6.3 Mass Removal at RS-4

The estimated mass of VOCs removed from soil vapor extracted from extraction well RS-4 was 28 lbs. The estimated total VOC mass removal rate was approximately 10 lbs/day with a median flow rate of 70 scfm. Testing at RS-4 occurred over a period of 4,260 minutes or 71 hours (Table 2c).

2.6.4 Mass Removal at RS-3

The estimated mass of VOCs removed from soil vapor extracted from extraction at well RS-3 was 0.25 lbs. The estimated total VOC mass removal rate was approximately 2 lbs/day with a median flow rate of 63 scfm. Testing occurred over a period of 180 minutes, or 3 hours (Table 2d).

2.6.5 Mass Removal at MW-1 and MW-2

The estimated mass of VOCs removed from soil vapor extracted from combined extraction at wells MW-1 and MW-2 was 103 lbs. The estimated total VOC mass removal rate was approximately 27 lbs/day with a median flow rate of 117 scfm. Testing occurred over a period of 5,550 minutes or 92.5 hours (Table 2e).

2.6.6 Mass Removal at MW-1, MW-2, and RS-4

The estimated mass of VOCs removed from soil vapor extracted from combined extraction at wells MW-1, MW-2, and RS-4 was 2.74 lbs. The estimated total VOC mass removal rate was approximately 22 lbs/day with a median flow rate of 136 scfm. Testing occurred over a period of 180 minutes or 3 hours (Table 2f).

2.7 Soil Vapor Analytical Laboratory Results

Vapor samples were submitted under chain-of-custody documentation to Curtis and Tompkins of Berkeley, a California state-certified environmental laboratory, where they were analyzed for TPH-g using USEPA Analytical Method TO-3 and for BTEX, MtBE, and other VOCs using USEPA Analytical Method TO-15. Vapor samples were obtained from the oxidizer stack to demonstrate compliance with BAAQMD various-locations permit conditions to determine destruction efficiency of the extracted vapors. Soil vapor analytical results are presented in Table 4. Certified laboratory analytical reports and chain of custody documentation are included in Appendix D.

Estimated total mass of TPH-g and benzene removed using laboratory data is presented in Table 4.The mass of TPH-g and benzene removed by the pilot test

was estimated using soil vapor analytical results for the pilot test and the median flow rate. The estimated total mass removed from extracted soil vapor was 612.7 lbs of TPH-g and 5.7 lbs of benzene. The discrepancy between the estimated total mass of VOCs removed utilizing PID data and the total mass of TPH-g and benzene removed utilizing laboratory analysis data is a result of the difference between PID measurements as hexane and laboratory analyses of the extracted vapor stream. It appears that vapor sampling for laboratory analysis may have coincided with somewhat higher PID readings. These occurrences likely influenced the calculation of contaminant mass based on vapor analytical results, contributing to the difference between the mass derived from PID readings and mass derived from analytical results. Concentrations based on laboratory analysis are representative only of that moment in the pilot test at which the extracted vapor stream was sampled. Since laboratory analytical results are not representative of the entire length of the pilot test, unlike PID measurements that were collected continuously over the entire duration of the pilot test, the total mass of VOCs removed as measured by PID was used to estimate mass removals. Analytical results support compliance with the BAAQMD permit achieving an abatement efficiency of over 99%.

2.8 Pre- and Post- MPE Groundwater Sampling

Table 5 lists analytical results for groundwater samples collected before and after the MPE event; Third Quarter 2013 groundwater monitoring results were used as pre-MPE sampling data. Post-MPE groundwater sampling was conducted as part of the Fourth Quarter 2013 groundwater monitoring event and a certified laboratory analytical report and chain-of-custody documentation are included in Appendix D.

Upon comparison of pre and post MPE sampling results (Table 5) it was observed that, TPH-g decreased in RS-4 and remained below laboratory-reporting limit in RS-3 and MW-2, no comparison could be made for MW-1 due to raised dilution and reporting limit during pre-MPE sampling event; TPH-d decreased in RS-3, increased in RS-4 and MW-2, and remained unchanged in MW-1; benzene decreased in MW-1 and MW-2 and remained below laboratory reporting limits in RS-3 and RS-4; MtBE and TAME decreased in RS-4, MW-1, and MW-2 and increased in RS-3; and TBA decreased in RS-4 and MW-1, and increased in RS-3 and MW-2. Where post-MPE sampling exhibited higher COC concentrations than pre-MPE sampling, it indicates that due to vacuum influence on the subsurface lithology and on contaminant distribution, contamination has migrated toward the extraction wells resulting in increased concentrations around the extraction points. Concentration reduction indicates that a limited mass was present at that location and this pilot testing event was effective in removing the bulk of contamination in that area.

2.9 Pilot Test Water Treatment and Disposal

As mentioned in Section 2.3, extracted groundwater water was treated and discharge to the on-site sewer system. Approximately 2,091 gallons was produced during the MPE pilot test. Extracted groundwater was treated through two 55-gallon GAC drums prior to discharge. In order comply with discharge permit requirements SOMA has been submitting quarterly discharge reports to EBMUD for the duration of permit validity.

3. OBSERVATIONS, CONCLUSIONS AND RECOMMENDATIONS

MPE pilot test results indicate that this technique was effective in removing lightweight PHCs from the smear zone. During the pilot test, 497 pounds of PHCs were removed from the subsurface with an average mass removal rate of 36 lbs/day. ZOI ranged from 25 to 60 feet, demonstrating the effectiveness of MPE. A total of 2,091 gallons of groundwater was removed from the subsurface. During Post-MPE sampling, significant concentration reduction of all COCs was observed. Based on above presented evidence, MPE appears to be viable technology for remediating residual contamination at this site.

3.1 Observations and Conclusions

Based on field and laboratory data collected during pilot testing, the following was determined:

- Approximately 497 pounds of volatile PHCs were removed during the MPE pilot test.
- The effective ZOI from extraction wells ranged from 25 to 60 feet.
- The average VOC mass removal rate was approximately 36 lbs/day.
- Maximum VOC mass removal rate was observed in MW-1 at 87 lbs/day; VOC mass removal rate from individual wells MW-2, RS-4, and RS-3 was estimated at 28 lbs/day, 10 lbs/day, and 2 lbs/day, respectively. These rates indicate that RS-3 and RS-4 were less effective during MPE operation. Combined extraction from MW-1 and MW-2 yielded a removal rate of 27 lbs/day.
- During the recent groundwater sampling event most contaminant concentrations decreased since the pre-MPE sampling event indicating the effectiveness of the MPE pilot test. In some cases, post-MPE sampling indicated higher COC concentrations than pre-MPE sampling, indicating that subsurface contamination was concentrated around the extraction points due to applied vacuum.

3.2 Recommendations

Based on the effectiveness of MPE pilot test conducted at the site during the month of December 2013, SOMA recommends conducting further MPE events utilizing MW-1, MW-2, and a combination of the two wells as extraction wells.

For further MPE operation at the site, a brief economical analysis was conducted to evaluate the cost effectiveness of two alternatives: continuous MPE operation using a permanent/fixed system installation versus intermittent MPE operation using rental equipment. Continuous MPE operation will require upfront costs of purchasing and installing the permanent system, installing three-phase power at the site, and applying for a new permit to operate with the BAAQMD to name a few. These upfront costs could add up to approximately $250,000.

On the other hand, intermittent MPE option only has a rental cost of operation. Per our experience running MPE system on intermittent mode will increase the efficiency of its operation. Running through a prolong time span will deplete the soil vapor from the subsurface and reduce the mass removal rate. Therefore, pulsing the system gives the residual contaminant mass some time to re-volatilize into the soil pores which can be removed by subsequent operation of the MPE system. In light of the above evaluation, intermittent MPE operation appears to be the appropriate alternative for contaminant mass removal. SOMA proposes to conduct two to three 30-day MPE events at the site in order to mitigate remaining contaminant mass from the subsurface.

FIGURES

Source: Google (R) 2012

N

approximate scale in feet

0 100 200

Figure 1: Site Vicinity Map

SOMA ENVIRONMENTAL ENGINEERING, INC.

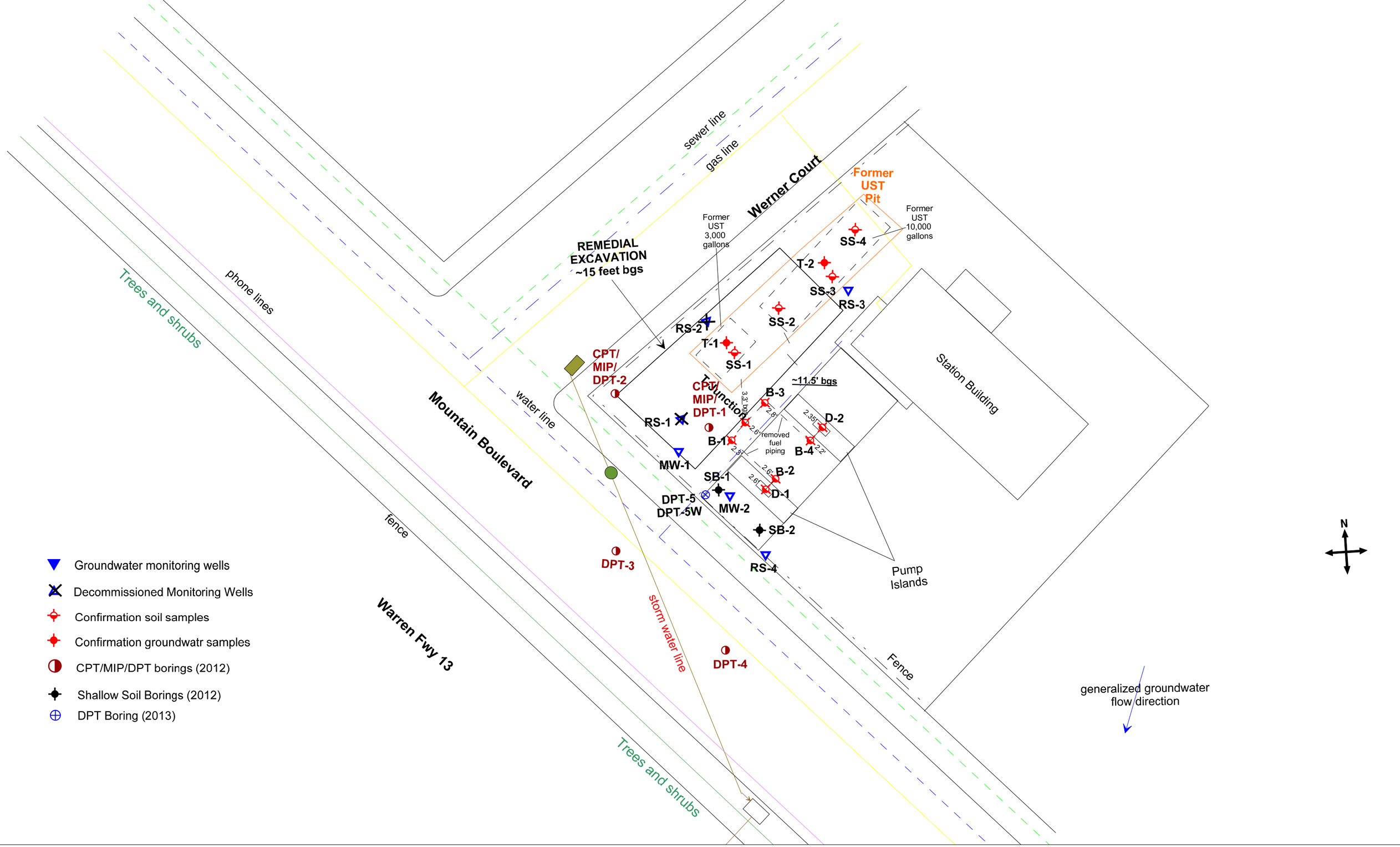
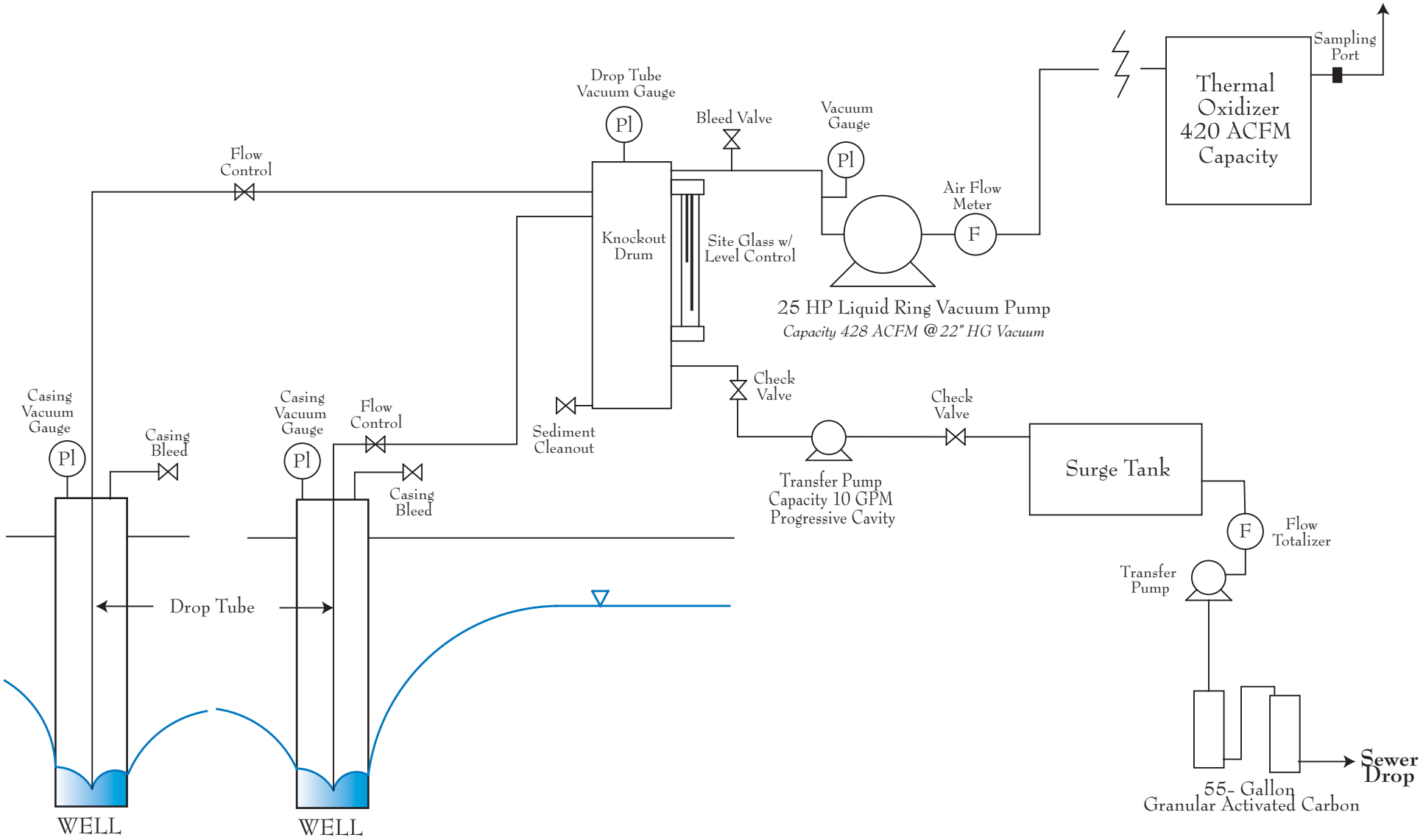


Figure 2: Site Map Showing Locations of Former USTs, Soil Borings, and Groundwater Monitoring Wells

ENVIRONMENTAL ENGINEERING, INC.



Not to Scale

Figure 3: MTS Process Schematic

SOMA ENVIRONMENTAL ENGINEERING, INC.

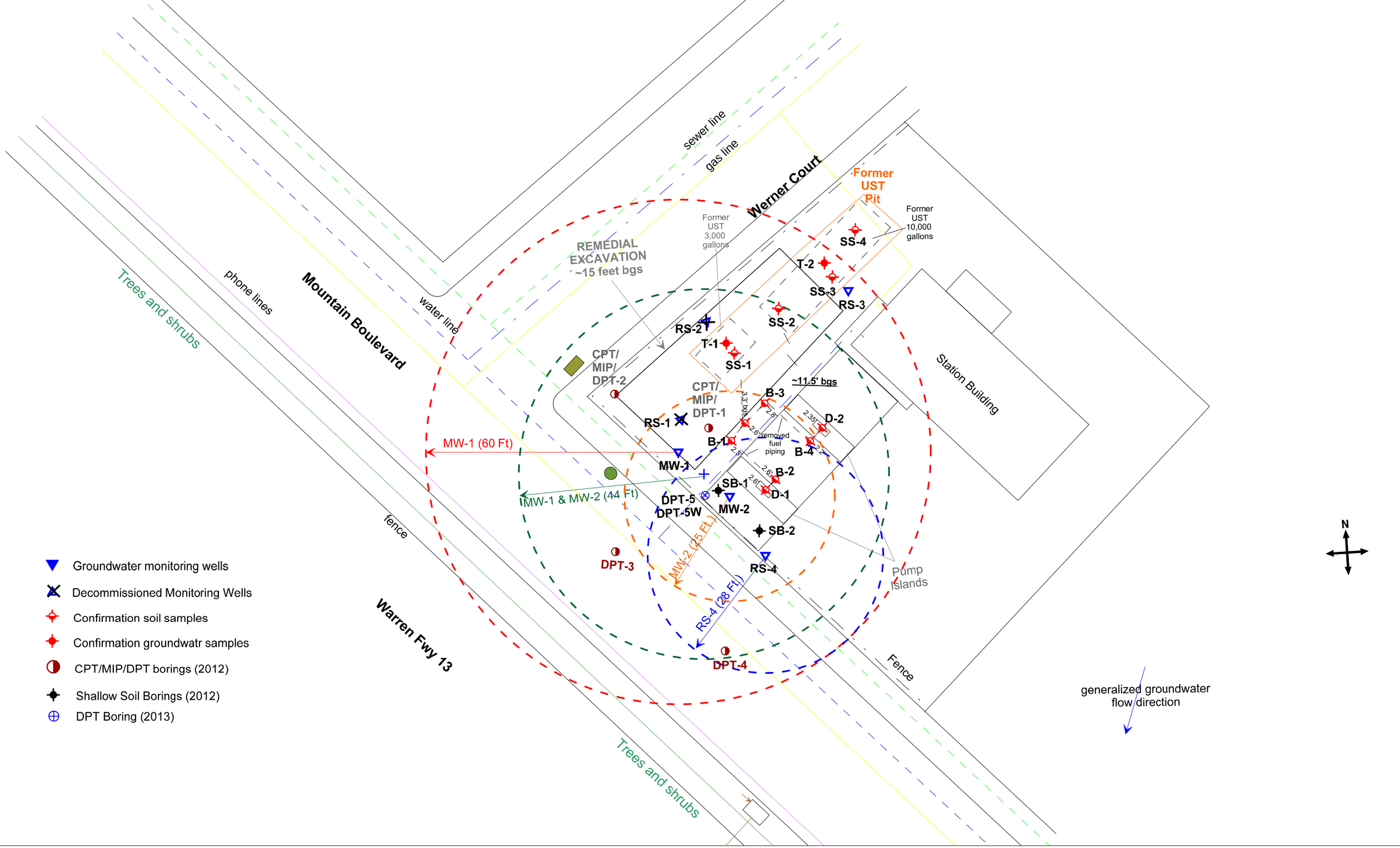


Figure 4: Extent of Zone of Influence

ENVIRONMENTAL ENGINEERING, INC.

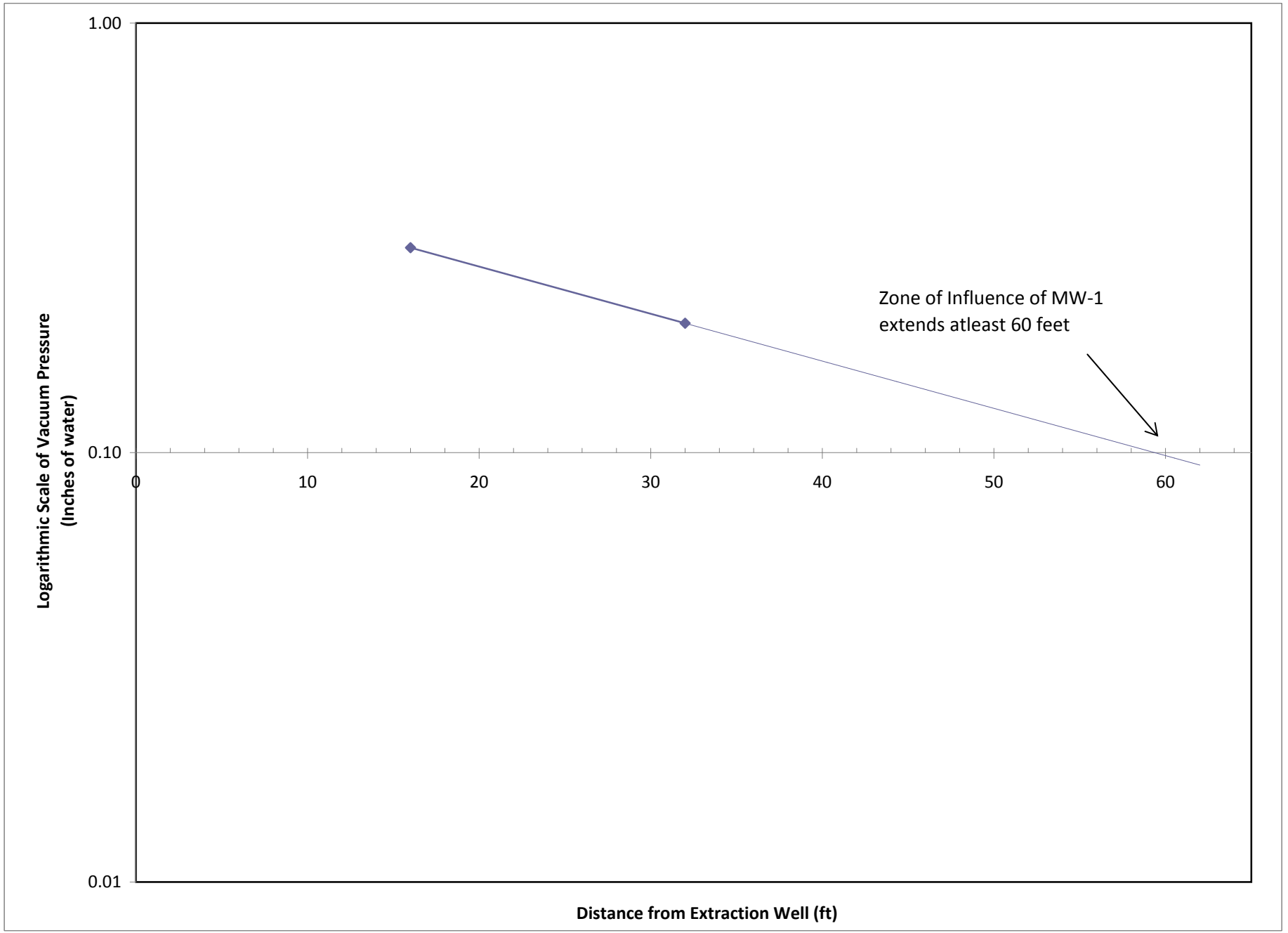


**Figure 5a: Zone of Influence,
Extraction at MW-1**

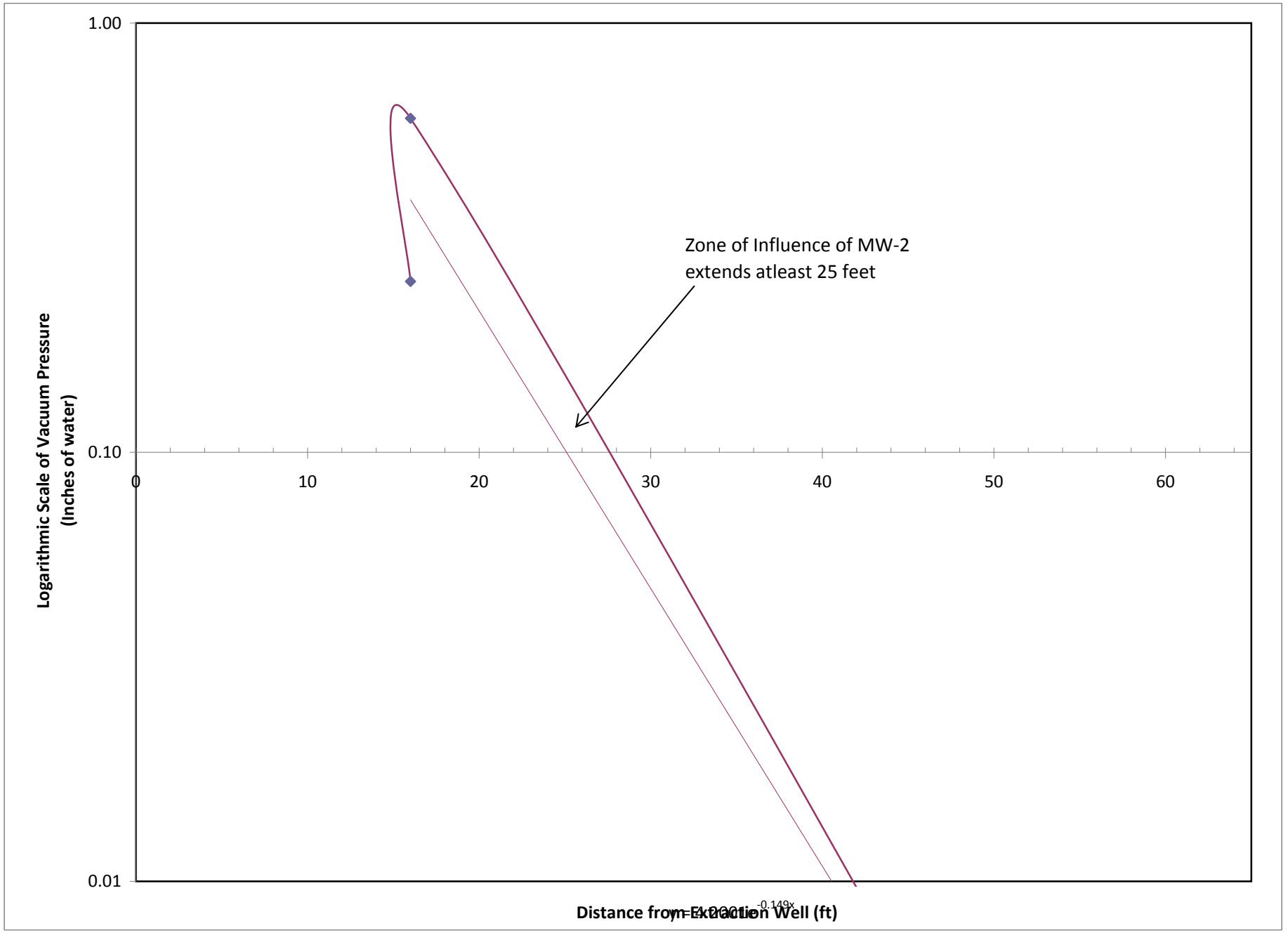


**Figure 5b: Zone of Influence,
Extraction at MW-2**

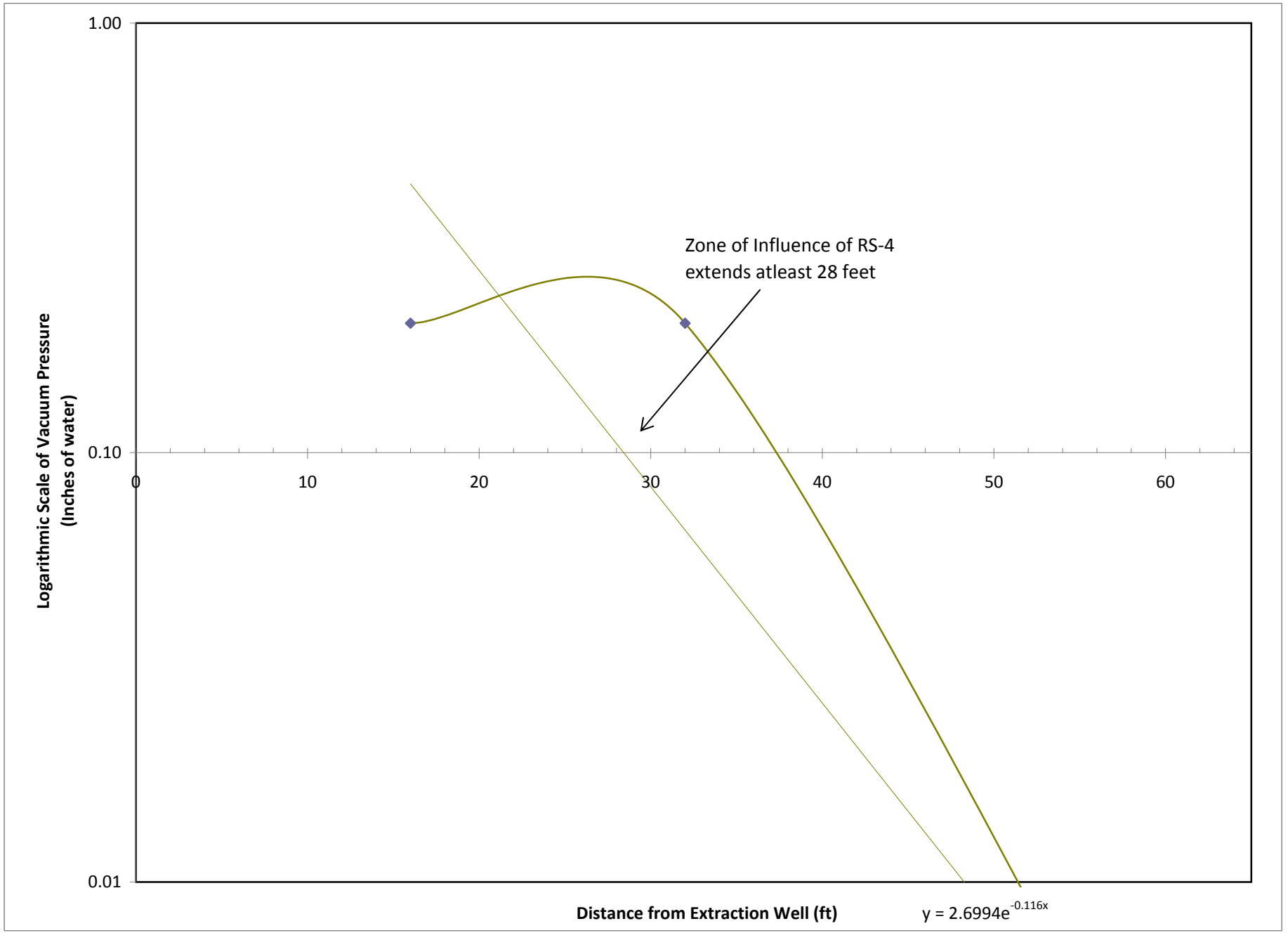


Figure 5c: Zone of Influence,
Extraction at RS-4

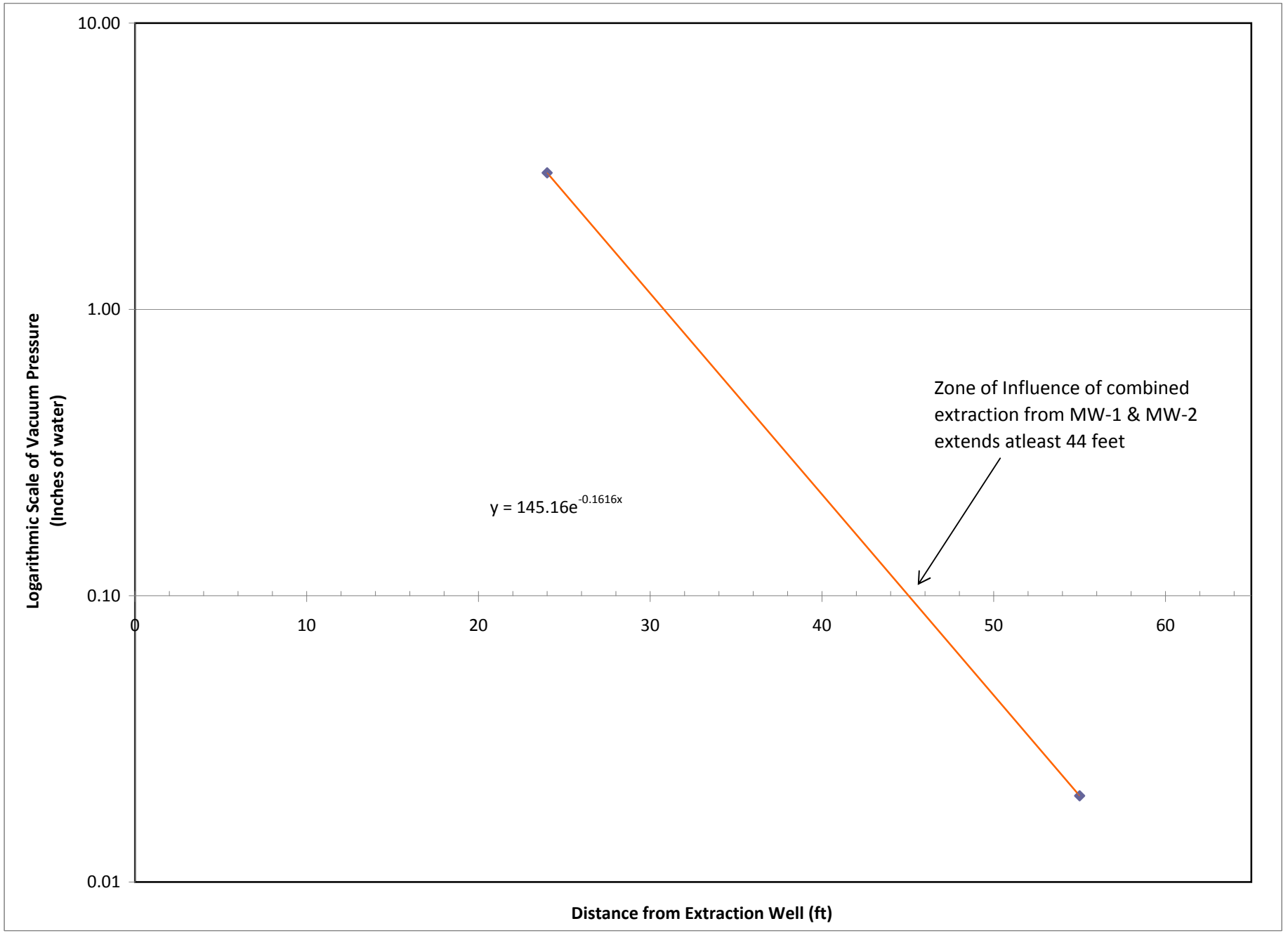


Figure 5d: Zone of Influence,
Combined Extraction at MW-1 MW-2

Figure 6a: Drawdown Vs. Time (Extraction at MW-1)

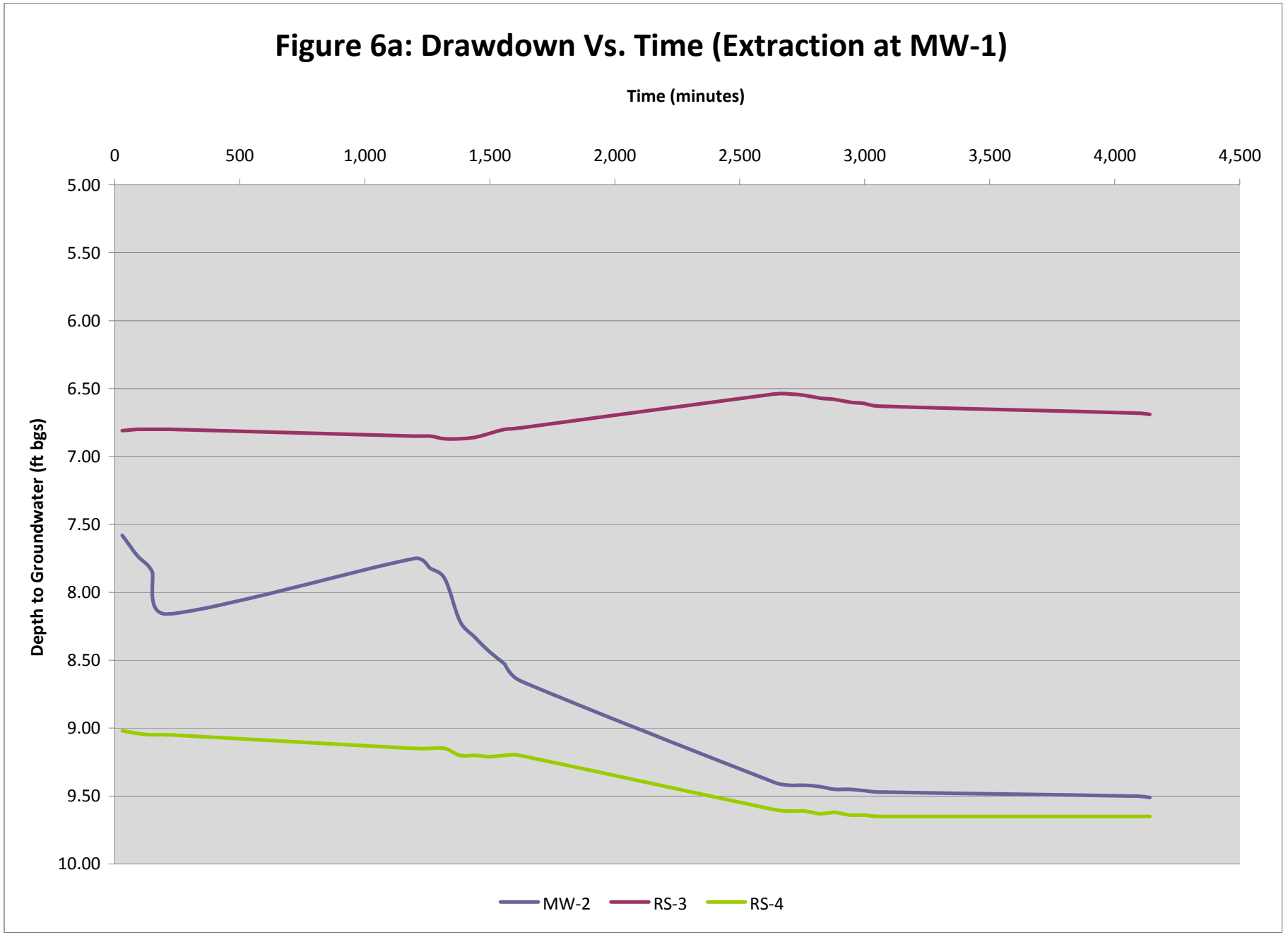


Figure 6b: Drawdown Vs. Time (Extraction at MW-2)

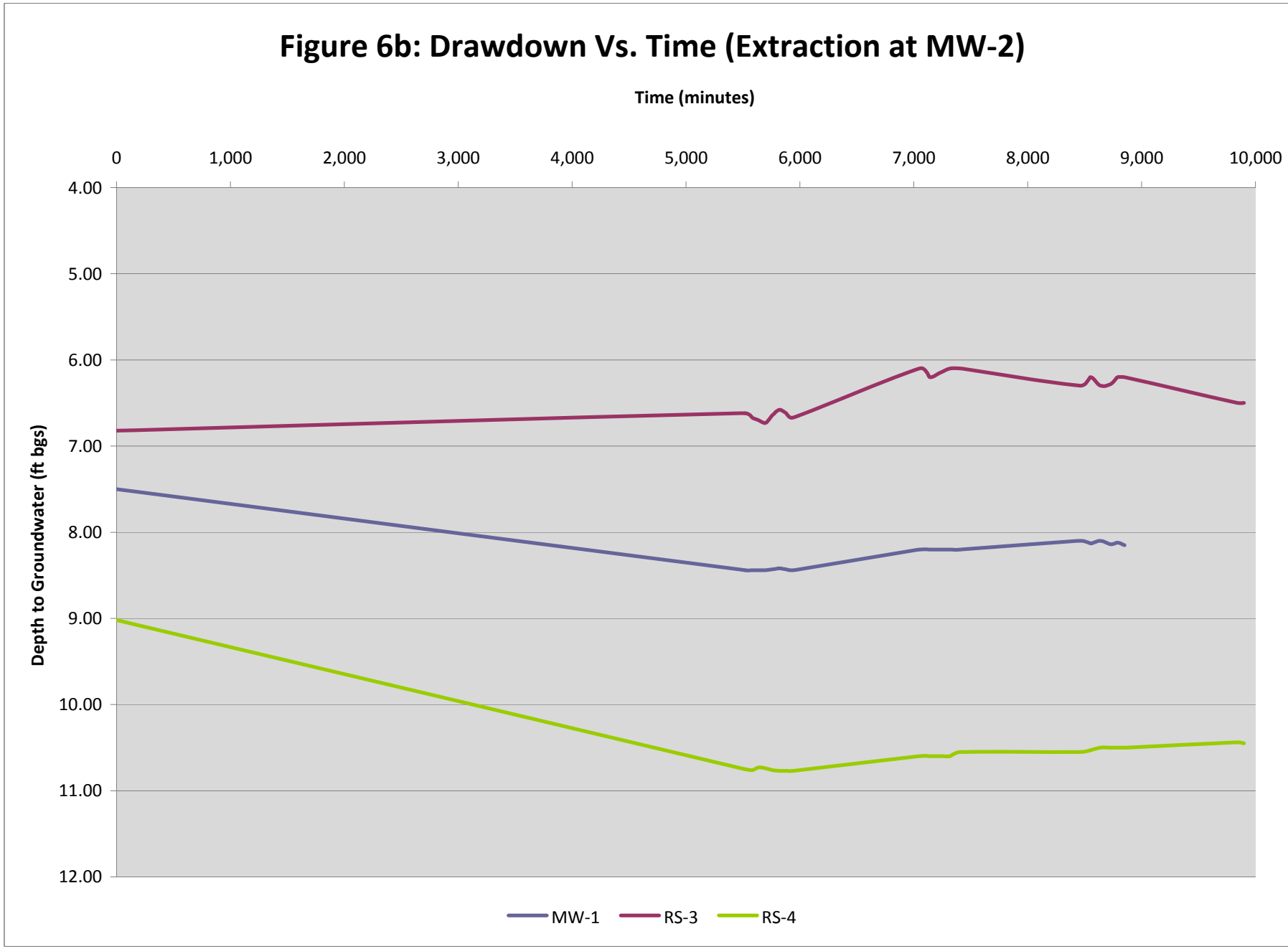


Figure 6c: Drawdown Vs. Time (Extraction at RS-4)

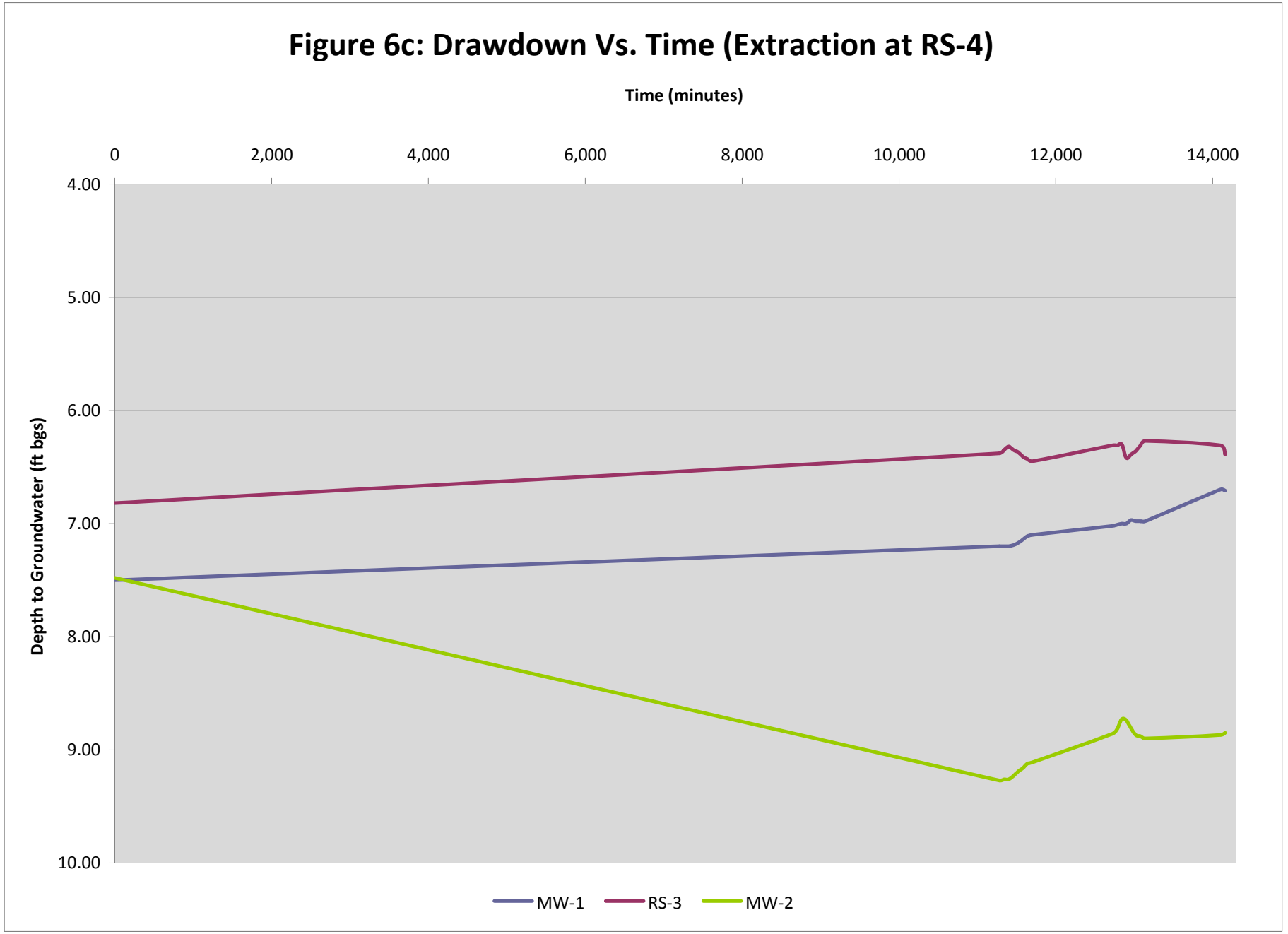


Figure 6d: Drawdown Vs. Time (Extraction at RS-3)

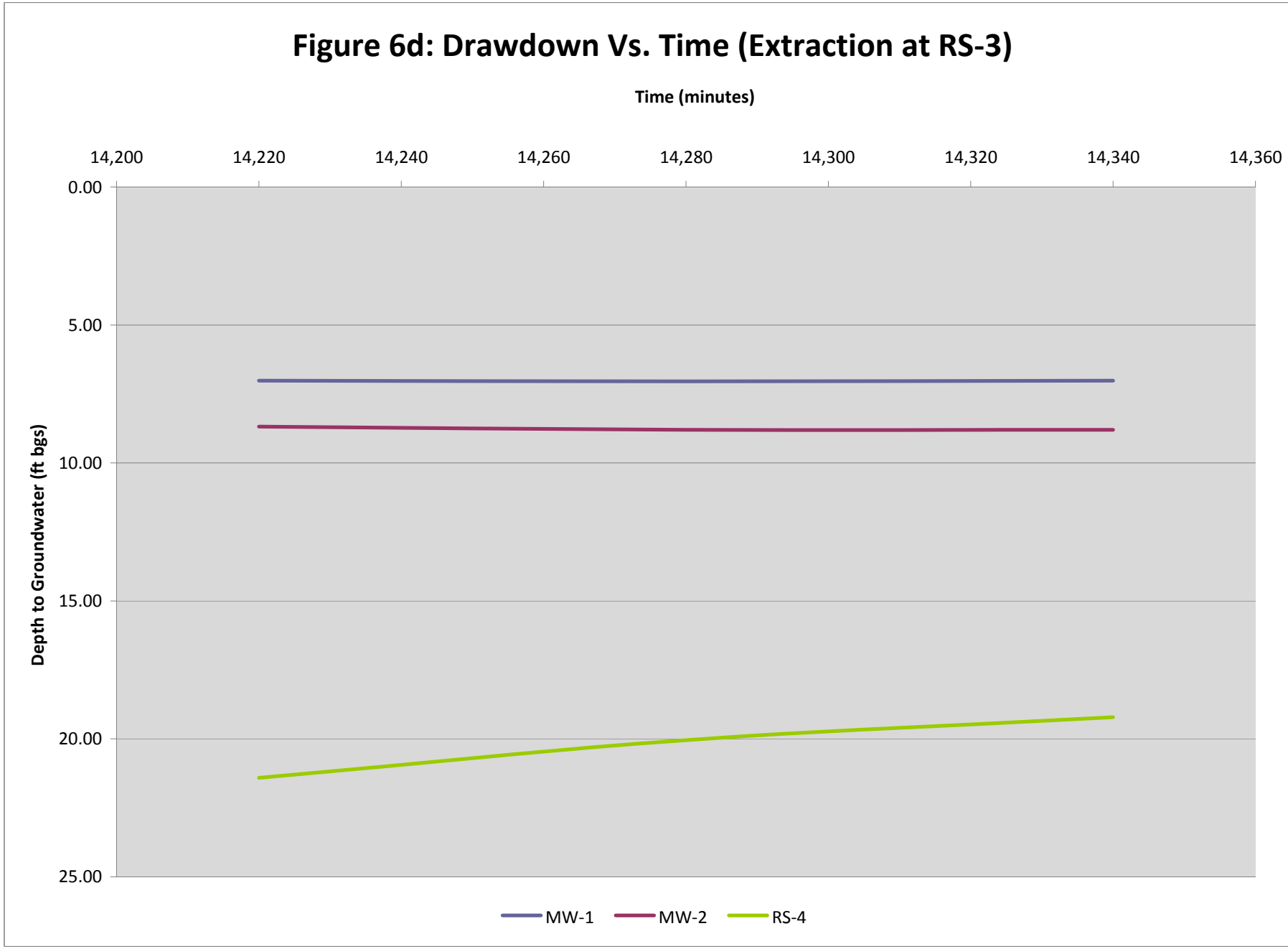
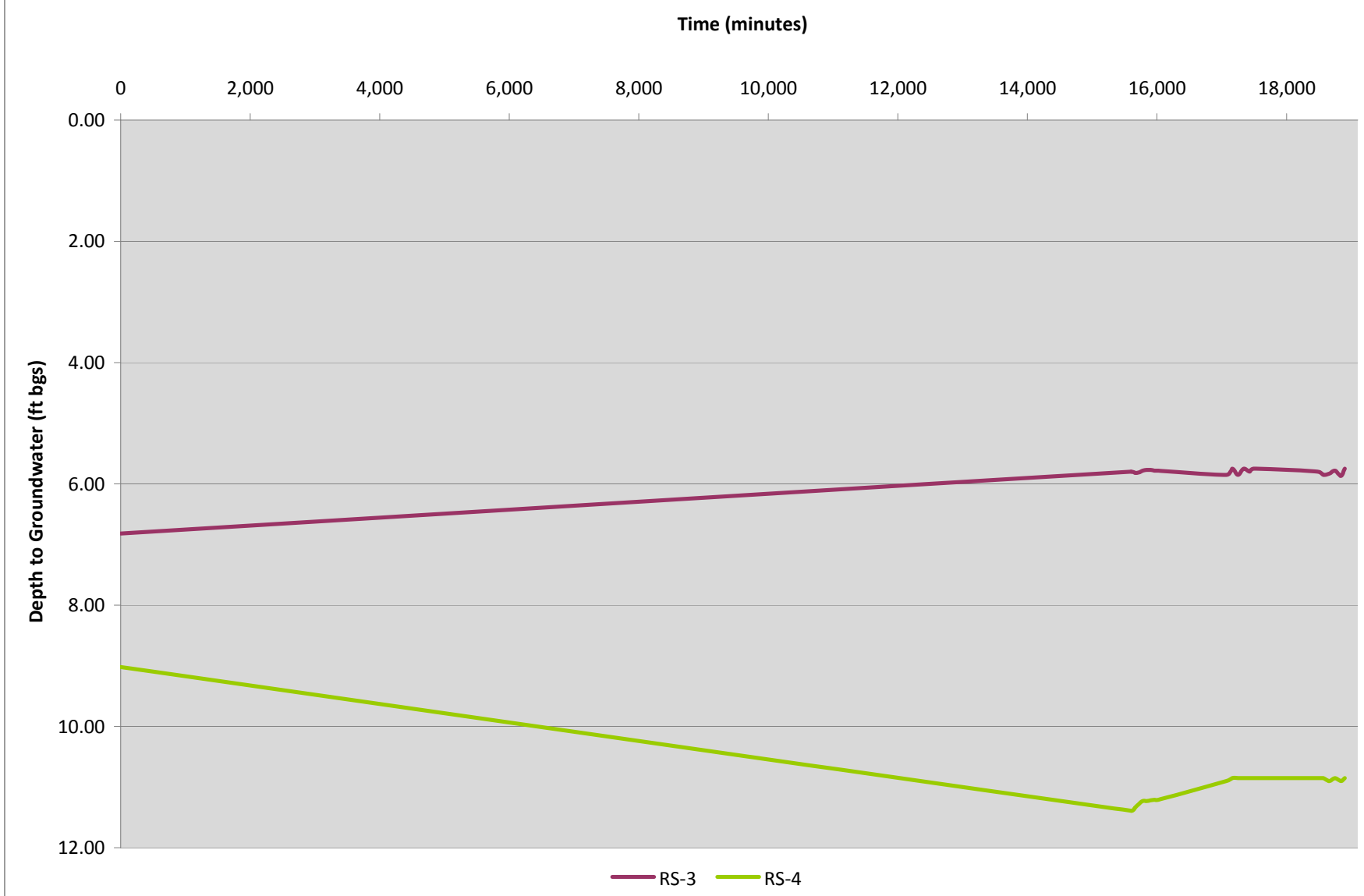


Figure 6e: Drawdown Vs. Time (Extraction at MW-1 & MW-2)



TABLES

Table 1

MPE Pilot Test December 2013
Operational Data

2844 Mountain Blvd.
Oakland, California

DATE	TIME	PID (ppmv)	WELL MANIFOLD VACUUM (In of Hg)	OXIDIZER TEMPERATURE (^{0}F)	WELL FIELD FLOW VAPOR RATE (scfm)	TOTAL SYSTEM VAPOR FLOW RATE (scfm)	DILUTION AIR FLOW RATE (scfm)	SYSTEM (BLOWER) VACUUM (In of Hg)	SYSTEM TOTALIZER READING (gallons)	COMMENTS
12/2/2013	1300									Begin extraction from MW-1
	1330	8,780	22.7	1520	70	70	0	25	0	
	1430	6,030	22.7	1511	70	70	0	25		
	1530	inf=4,510; eff=2	22.9	1514	70	70	0	25		
	1630	3,810	22.9	1507	70	70	0	25	23	
12/3/2013	900	7,470	22.7	1526	70	70	0	25		
	1000	6,720	22.7	1521	70	70	0	25		
	1100	5,290	22.7	1515	68	68	0	25.1		
	1200	2,510	22.8	1532	70	70	0	25		
	1300	2,310	22.9	1523	71	71	0	24.9		
	1400	2,910	22.6	1509	74	74	0	24.7		
	1500	2,720	22.6	1517	74	74	0	24.7		
	1600	2,430	22.5	1510	71	71	0	24.9		
12/4/2013	900	2,390	22.5	1505	71	71	0	24.9	177	
	1000	2,360	22.5	1509	71	71	0	24.9		
	1100	2,340	22.5	1515	70	70	0	25		
	1200	2,320	22.7	1499	70	70	0	25		
	1300	2,300	22.7	1506	70	70	0	25		
	1400	2,280	22.7	1502	70	70	0	25		
	1500	2,270	22.7	1501	73	73	0	24.8		
	1600	2,250	22.6	1498	73	73	0	24.8		
12/5/2013	900	2,210	23	1520	70	70	0	25	286	
	1000	2,170	22.8	1509	70	70	0	25		
	1100	2,150	22.8	1502	68	68	0	25.1		
	1200	6,070	23	1540	68	68	0	25.1		Extracting from MW-2
	1300	4,810	23	1495	68	68	0	25.1		
	1400	3,490	23	1499	68	68	0	25.1		
	1500	3,150	23	1508	70	70	0	25		
	1600	2,720	23	1502	70	70	0	25		
12/6/2013	900	1,790	23	1505	68	68	0	25.1	403	
	1000	1,720	22.9	1487	70	70	0	25		
	1100	1,560	23	1503	70	70	0	25		
	1200	1,621	23	1499	70	70	0	25		
	1300	1,350	23.1	1495	73	73	0	24.8		
	1400	1,324	22.8	1498	77	77	0	24.5		
	1500	1,305	22.9	1502	77	77	0	24.5		
	1600	1,392	22.1	1501	77	77	0	24.5		
12/7/2013	900	1,060	21.2	1520	70	70	0	25	521	
	1030	1,044	21.2	1505	68	68	0	25.1		
	1200	955	22.2	1508	68	68	0	25.1		
	1330	982	22.2	1502	68	68	0	25.1		
	1500	984	23	1499	70	70	0	25		
	1630	768	23	1501	70	70	0	25		
12/8/2013	900	830	23.1	1509	70	70	0	25	698	
	1030	770	23.2	1502	70	70	0	25		
	1200	540	23.3	1505	68	68	0	25.1		
	1330	496	23	1499	68	68	0	25.1		
	1500	712	23	1501	68	68	0	25.1		
	1630	695	22.8	1506	70	70	0	25		

Table 1

MPE Pilot Test December 2013
Operational Data

2844 Mountain Blvd.
Oakland, California

DATE	TIME	PID (ppmv)	WELL MANIFOLD VACUUM (In of Hg)	OXIDIZER TEMPERATURE (^{0}F)	WELL FIELD FLOW VAPOR RATE (scfm)	TOTAL SYSTEM VAPOR FLOW RATE (scfm)	DILUTION AIR FLOW RATE (scfm)	SYSTEM (BLOWER) VACUUM (In of Hg)	SYSTEM TOTALIZER READING (gallons)	COMMENTS
12/9/2013	900	684	21.8	1498	66	66	0	25.2	816	
	1000	651	21.8	1502	68	68	0	25.1		
	1100	588	22.3	1509	65	65	0	25.3		Extracting from RS-4
	1200	679	22.3	1501	62	62	0	25.5		
	1300	711	22.2	1498	62	62	0	25.5		
	1400	692	21.5	1502	65	65	0	25.3		
	1500	679	21.3	1499	63	63	0	25.4		
	1600	632	21.4	1505	63	63	0	25.4		
12/10/2013	900	515	22.3	1499	68	68	0	25.1	955	
	1000	499	22.3	1502	70	70	0	25		
	1100	502	22.3	1505	68	68	0	25.1		
	1200	485	22.3	1501	68	68	0	25.1		
	1300	446	22.2	1506	73	73	0	24.8		
	1400	435	22.5	1499	70	70	0	25		
	1500	432	22.4	1504	70	70	0	25		
	1600	419	22.4	1501	70	70	0	25		
12/11/2013	900	379	22.3	1499	74	74	0	24.7	1,071	
	1000	362	22.3	1504	74	74	0	24.7		
	1100	349	22.3	1501	73	73	0	24.8		
	1200	338	22.3	1503	73	73	0	24.8		
	1300	331	22.3	1498	73	73	0	24.8		
	1400	345	22.1	1505	73	73	0	24.8		
	1500	336	22	1509	73	73	0	24.8		
	1600	335	22	1512	74	74	0	24.7		
12/12/2013	800	291	22.1	1508	73	73	0	24.8	1,193	
	900	271	23	1501	70	70	0	25		
	1000	156	24.8	1509	63	63	0	25.4		Extracting from RS-3
	1100	88	25	1499	63	63	0	25.4		
	1200	46	24.7	1504	63	63	0	25.4		
	1300	2,700	19.4	1507	100	100	0	23.1	1,204	Extracting from MW-1 and MW-2
	1400	1,558	19.6	1502	100	100	0	23.1		
	1500	1,381	19.5	1506	103	103	0	22.9		
	1600	958	19.2	1503	108	108	0	22.6		
12/13/2013	900	646	19.1	1504	116	116	0	22.1	1,596	
	1000	621	19	1507	116	116	0	22.1		
	1100	651	19.2	1509	116	116	0	22.1		
	1200	632	19.1	1502	117	117	0	22		
	1300	621	18.9	1508	117	117	0	22		
	1400	702	18.6	1499	117	117	0	22		
	1500	679	18.2	1507	117	117	0	22		
	1600	645	18.2	1505	117	117	0	22		
12/14/2013	930	725	19	1520	117	117	0	22	1,720	
	1100	642	19.2	1520	114	114	0	22.2		
	1230	630	19	1520	114	114	0	22.2		
	1400	607	19	1520	117	117	0	22		
	1530	648	19.3	1520	114	114	0	22.2		
	1630	590	19	1520	114	114	0	22.2		

Table 1

MPE Pilot Test December 2013
Operational Data

2844 Mountain Blvd.
Oakland, California

DATE	TIME	PID (ppmv)	WELL MANIFOLD VACUUM (In of Hg)	OXIDIZER TEMPERATURE (^{0}F)	WELL FIELD FLOW VAPOR RATE (scfm)	TOTAL SYSTEM VAPOR FLOW RATE (scfm)	DILUTION AIR FLOW RATE (scfm)	SYSTEM (BLOWER) VACUUM (In of Hg)	SYSTEM TOTALIZER READING (gallons)	COMMENTS
12/15/2013	930	641	18	1520	116	116	0	22.1	1,889	
	1100	603	19	1520	117	117	0	22		
	1230	590	19	1520	117	117	0	22		
	1400	590	17.3	1520	128	128	0	21.3		
	1530	580	18	1520	128	128	0	21.3		
	1630	578	17.4	1520	131	131	0	21.1		
12/16/2013	900	617	16.9	1512	136	136	0	20.8	2,080	Extracting from MW-1, MW-2, RS-4
	1000	482	16.9	1505	135	135	0	20.9		
	1100	504	17.1	1509	136	136	0	20.8		
	1200	482	17	1504	139	139	0	20.6	2,091	End Extraction
Totalizer readings = 2,091 gallons = 0.104 gpm										
Total time of test = 20,070 minutes = 334.5 hours = 13.94 days										

Notes

ppmv	parts per million vapor
In of Hg	inches of mercury
In of H_20	inches of water
^{0}F	degrees Fahrenheit
scfm	standard cubic feet per minute

Table 1a

MPE Pilot Test December 2013
Operational Data : MW-1

2844 Mountain Blvd.
Oakland, California

DATE	TIME	PID (ppmv)	WELL MANIFOLD VACUUM (In of Hg)	OXIDIZER TEMPERATURE (^{0}F)	WELL FIELD FLOW VAPOR RATE (scfm)	TOTAL SYSTEM VAPOR FLOW RATE (scfm)	DILUTION AIR FLOW RATE (scfm)	SYSTEM (BLOWER) VACUUM (In of Hg)	SYSTEM TOTALIZER READING (gallons)	COMMENTS
12/2/2013	1300									Begin extraction from MW-1
	1330	8,780	22.7	1520	70	70	0	25	0	
	1430	6,030	22.7	1511	70	70	0	25		
	1530	inf=4,510; eff=2	22.9	1514	70	70	0	25		
	1630	3,810	22.9	1507	70	70	0	25	23	
12/3/2013	900	7,470	22.7	1526	70	70	0	25		
	1000	6,720	22.7	1521	70	70	0	25		
	1100	5,290	22.7	1515	68	68	0	25.1		
	1200	2,510	22.8	1532	70	70	0	25		
	1300	2,310	22.9	1523	71	71	0	24.9		
	1400	2,910	22.6	1509	74	74	0	24.7		
	1500	2,720	22.6	1517	74	74	0	24.7		
	1600	2,430	22.5	1510	71	71	0	24.9		
12/4/2013	900	2,390	22.5	1505	71	71	0	24.9	177	
	1000	2,360	22.5	1509	71	71	0	24.9		
	1100	2,340	22.5	1515	70	70	0	25		
	1200	2,320	22.7	1499	70	70	0	25		
	1300	2,300	22.7	1506	70	70	0	25		
	1400	2,280	22.7	1502	70	70	0	25		
	1500	2,270	22.7	1501	73	73	0	24.8		
	1600	2,250	22.6	1498	73	73	0	24.8		
12/5/2013	900	2,210	23	1520	70	70	0	25	286	
	1000	2,170	22.8	1509	70	70	0	25		
	1100	2,150	22.8	1502	68	68	0	25.1		Switch extraction to MW-2
Totalizer readings = 286 gallons = 0.068 gpm										
Total time of test = 4,200 minutes = 70 hours = 2.92 days										

Notes

ppmv	parts per million vapor
In of Hg	inches of mercury
In of H_20	inches of water
^{0}F	degrees Fahrenheit
scfm	standard cubic feet per minute

Table 1b

MPE Pilot Test December 2013
Operational Data: MW-2

2844 Mountain Blvd.
Oakland, California

DATE	TIME	PID (ppmv)	WELL MANIFOLD VACUUM (In of Hg)	OXIDIZER TEMPERATURE (^{0}F)	WELL FIELD FLOW VAPOR RATE (scfm)	TOTAL SYSTEM VAPOR FLOW RATE (scfm)	DILUTION AIR FLOW RATE (scfm)	SYSTEM (BLOWER) VACUUM (In of Hg)	SYSTEM TOTALIZER READING (gallons)	COMMENTS
12/5/2013	1200	6,070	23	1540	68	68	0	25.1		Extracting from MW-2
	1300	4,810	23	1495	68	68	0	25.1		
	1400	3,490	23	1499	68	68	0	25.1		
	1500	3,150	23	1508	70	70	0	25		
	1600	2,720	23	1502	70	70	0	25		
12/6/2013	900	1,790	23	1505	68	68	0	25.1	403	
	1000	1,720	22.9	1487	70	70	0	25		
	1100	1,560	23	1503	70	70	0	25		
	1200	1,621	23	1499	70	70	0	25		
	1300	1,350	23.1	1495	73	73	0	24.8		
	1400	1,324	22.8	1498	77	77	0	24.5		
	1500	1,305	22.9	1502	77	77	0	24.5		
	1600	1,392	22.1	1501	77	77	0	24.5		
12/7/2013	900	1,060	21.2	1520	70	70	0	25	521	
	1030	1,044	21.2	1505	68	68	0	25.1		
	1200	955	22.2	1508	68	68	0	25.1		
	1330	982	22.2	1502	68	68	0	25.1		
	1500	984	23	1499	70	70	0	25		
	1630	768	23	1501	70	70	0	25		
12/8/2013	900	830	23.1	1509	70	70	0	25	698	
	1030	770	23.2	1502	70	70	0	25		
	1200	540	23.3	1505	68	68	0	25.1		
	1330	496	23	1499	68	68	0	25.1		
	1500	712	23	1501	68	68	0	25.1		
	1630	695	22.8	1506	70	70	0	25		
12/9/2013	900	684	21.8	1498	66	66	0	25.2	816	530 gallons
	1000	651	21.8	1502	68	68	0	25.1		
										Switch extraction to RS-4
Volume of extracted groundwater = 530 gallons = 0.093 gpm										
Total time of test = 5,700 minutes = 95 hours = 3.96 days										

Notes

ppmv	parts per million vapor
In of Hg	inches of mercury
In of H_20	inches of water
^{0}F	degrees Fahrenheit
scfm	standard cubic feet per minute

Table 1c

MPE Pilot Test December 2013
Operational Data: RS-4

2844 Mountain Blvd.
Oakland, California

DATE	TIME	PID (ppmv)	WELL MANIFOLD VACUUM (In of Hg)	OXIDIZER TEMPERATURE (^{0}F)	WELL FIELD FLOW VAPOR RATE (scfm)	TOTAL SYSTEM VAPOR FLOW RATE (scfm)	DILUTION AIR FLOW RATE (scfm)	SYSTEM (BLOWER) VACUUM (In of Hg)	SYSTEM TOTALIZER READING (gallons)	COMMENTS
12/9/2013	1100	588	22.3	1509	65	65	0	25.3		Extracting from RS-4
	1200	679	22.3	1501	62	62	0	25.5		
	1300	711	22.2	1498	62	62	0	25.5		
	1400	692	21.5	1502	65	65	0	25.3		
	1500	679	21.3	1499	63	63	0	25.4		
	1600	632	21.4	1505	63	63	0	25.4		
12/10/2013	900	515	22.3	1499	68	68	0	25.1	955	
	1000	499	22.3	1502	70	70	0	25		
	1100	502	22.3	1505	68	68	0	25.1		
	1200	485	22.3	1501	68	68	0	25.1		
	1300	446	22.2	1506	73	73	0	24.8		
	1400	435	22.5	1499	70	70	0	25		
	1500	432	22.4	1504	70	70	0	25		
	1600	419	22.4	1501	70	70	0	25		
12/11/2013	900	379	22.3	1499	74	74	0	24.7	1,071	
	1000	362	22.3	1504	74	74	0	24.7		
	1100	349	22.3	1501	73	73	0	24.8		
	1200	338	22.3	1503	73	73	0	24.8		
	1300	331	22.3	1498	73	73	0	24.8		
	1400	345	22.1	1505	73	73	0	24.8		
	1500	336	22	1509	73	73	0	24.8		
	1600	335	22	1512	74	74	0	24.7		
12/12/2013	800	291	22.1	1508	73	73	0	24.8	1,193	377 gallons
	900	271	23	1501	70	70	0	25		Switch extraction to RS-3
Volume of extracted groundwater = 377 gallons = 0.089 gpm										
Total time of test = 4,260 minutes = 71 hours = 2.96 days										

Notes

ppmv	parts per million vapor
In of Hg	inches of mercury
In of H_20	inches of water
^{0}F	degrees Fahrenhei
scfm	standard cubic feet per minute

Table 1d

MPE Pilot Test December 2013
Operational Data: RS-3

2844 Mountain Blvd.
Oakland, California

DATE	TIME	PID (ppmv)	WELL MANIFOLD VACUUM (In of Hg)	OXIDIZER TEMPERATURE (^{0}F)	WELL FIELD FLOW VAPOR RATE (scfm)	TOTAL SYSTEM VAPOR FLOW RATE (scfm)	DILUTION AIR FLOW RATE (scfm)	SYSTEM (BLOWER) VACUUM (In of Hg)	SYSTEM TOTALIZER READING (gallons)	COMMENTS
12/12/2013	1000	156	24.8	1509	63	63	0	25.4		Extracting from RS-3
	1100	88	25	1499	63	63	0	25.4		
	1200	46	24.7	1504	63	63	0	25.4		
									1,204	11 gallons Switch extraction to MW-1 & MW-2
Totalizer readings = 11 gallons = 0.061 gpm										
Total time of test = 180 minutes = 3 hours = 0.13 days										

Notes

ppmv	parts per million vapor
In of Hg	inches of mercury
In of H_20	inches of water
^{0}F	degrees Fahrenheit
scfm	standard cubic feet per minute

Table 1e

MPE Pilot Test December 2013
Operational Data: MW-1 & MW-2

2844 Mountain Blvd.
Oakland, California

DATE	TIME	PID (ppmv)	WELL MANIFOLD VACUUM (In of Hg)	OXIDIZER TEMPERATURE (^{0}F)	WELL FIELD FLOW VAPOR RATE (scfm)	TOTAL SYSTEM VAPOR FLOW RATE (scfm)	DILUTION AIR FLOW RATE (scfm)	SYSTEM (BLOWER) VACUUM (In of Hg)	SYSTEM TOTALIZER READING (gallons)	COMMENTS
12/12/2013	1300	2,700	19.4	1507	100	100	0	23.1	1,204	Extracting from MW-1 and MW-2
	1400	1,558	19.6	1502	100	100	0	23.1		
	1500	1,381	19.5	1506	103	103	0	22.9		
	1600	958	19.2	1503	108	108	0	22.6		
12/13/2013	900	646	19.1	1504	116	116	0	22.1	1,596	
	1000	621	19	1507	116	116	0	22.1		
	1100	651	19.2	1509	116	116	0	22.1		
	1200	632	19.1	1502	117	117	0	22		
	1300	621	18.9	1508	117	117	0	22		
	1400	702	18.6	1499	117	117	0	22		
	1500	679	18.2	1507	117	117	0	22		
	1600	645	18.2	1505	117	117	0	22		
12/14/2013	930	725	19	1520	117	117	0	22	1,720	
	1100	642	19.2	1520	114	114	0	22.2		
	1230	630	19	1520	114	114	0	22.2		
	1400	607	19	1520	117	117	0	22		
	1530	648	19.3	1520	114	114	0	22.2		
	1630	590	19	1520	114	114	0	22.2		
12/15/2013	930	641	18	1520	116	116	0	22.1	1,889	
	1100	603	19	1520	117	117	0	22		
	1230	590	19	1520	117	117	0	22		
	1400	590	17.3	1520	128	128	0	21.3		
	1530	580	18	1520	128	128	0	21.3		
	1630	578	17.4	1520	131	131	0	21.1		
12/16/2013	900	617	16.9	1512	136	136	0	20.8	2,080	876 gallons Switch extraction to MW-1, MW-2, RS-4
Volume of extracted groundwater = 876 gallons = 0.158 gpm										
Total time of test = 5,550 minutes = 92.5 hours = 3.85 days										

Notes

ppmv	parts per million vapor
In of Hg	inches of mercury
In of H_20	inches of water
^{0}F	degrees Fahrenheit
scfm	standard cubic feet per minute

Table 1f

MPE Pilot Test December 2013
Operational Data: MW-1, MW-2, & RS-4

2844 Mountain Blvd.
Oakland, California

DATE	TIME	PID (ppmv)	WELL MANIFOLD VACUUM (In of Hg)	OXIDIZER TEMPERATURE (^{0}F)	WELL FIELD FLOW VAPOR RATE (scfm)	TOTAL SYSTEM VAPOR FLOW RATE (scfm)	DILUTION AIR FLOW RATE (scfm)	SYSTEM (BLOWER) VACUUM (In of Hg)	SYSTEM TOTALIZER READING (gallons)	COMMENTS
12/16/2013	900	617	16.9	1512	136	136	0	20.8	2,080	Extracting from MW-1, MW-2, RS-4
	1000	482	16.9	1505	135	135	0	20.9		
	1100	504	17.1	1509	136	136	0	20.8		
	1200	482	17	1504	139	139	0	20.6	2,091	11 gallons End Extraction
Totalizer readings = 11 gallons = 0.06 gpm										
Total time of test = 180 minutes = 3 hours = 0.13 days										

Notes

ppmv	parts per million vapor
In of Hg	inches of mercury
In of H_20	inches of water
^{0}F	degrees Fahrenheit
scfm	standard cubic feet per minute

Table 2

MPE Event
Extraction Data and VOC Mass Removal Rate
December 2013

2844 Mountain Blvd.
Oakland, California

MPE WELL	COMMENT	DATE	CLOCK TIME	INCREMENTAL TIME	ELAPSED TIME	Q			PID		MASS REMOVAL		
				minutes	minutes	SCFM	ft^3 of extracted air	Moles of extracted air	ppmv as hexane	VOC mole %	lb VOC mass removal as hexane	lbs/min	lbs/day
MW-1	**START**	**12/2/2013**	1300	0	0								
			1330	30	30	70	2,085	5.5013	8,780	0.0088	4.1636	0.1388	200
			1430	60	90	70	4,170	11.0026	6,030	0.0060	5.7190	0.0953	137
			1530	60	150	70	4,170	11.0026	4,510	0.0045	4.2774	0.0713	103
			1630	60	210	70	4,170	11.0026	3,810	0.0038	3.6135	0.0602	87
		12/3/2013	900	990	1,200	70	68,805	181.5435	7,470	0.0075	116.8984	0.1181	170
			1000	60	1,260	70	4,170	11.0026	6,720	0.0067	6.3734	0.1062	153
			1100	60	1,320	68	4,075	10.7514	5,290	0.0053	4.9026	0.0817	118
			1200	60	1,380	70	4,170	11.0026	2,510	0.0025	2.3806	0.0397	57
			1300	60	1,440	71	4,265	11.2538	2,310	0.0023	2.2409	0.0373	54
			1400	60	1,500	74	4,456	11.7563	2,910	0.0029	2.9490	0.0491	71
			1500	60	1,560	74	4,456	11.7563	2,720	0.0027	2.7564	0.0459	66
			1600	60	1,620	71	4,265	11.2538	2,430	0.0024	2.3573	0.0393	57
		12/4/2013	900	1020	2,640	71	72,509	191.3154	2,390	0.0024	39.4144	0.0386	56
			1000	60	2,700	71	4,265	11.2538	2,360	0.0024	2.2894	0.0382	55
			1100	60	2,760	70	4,170	11.0026	2,340	0.0023	2.2193	0.0370	53
			1200	60	2,820	70	4,170	11.0026	2,320	0.0023	2.2004	0.0367	53
			1300	60	2,880	70	4,170	11.0026	2,300	0.0023	2.1814	0.0364	52
			1400	60	2,940	70	4,170	11.0026	2,280	0.0023	2.1624	0.0360	52
			1500	60	3,000	73	4,360	11.5051	2,270	0.0023	2.2512	0.0375	54
			1600	60	3,060	73	4,360	11.5051	2,250	0.0023	2.2314	0.0372	54
		12/5/2013	900	1020	4,080	70	70,890	187.0449	2,210	0.0022	35.6324	0.0349	50
			1000	60	4,140	70	4,170	11.0026	2,170	0.0022	2.0581	0.0343	49
			1100	60	4,200	68	4,075	10.7514	2,150	0.0022	1.9926	0.0332	48
MW-2			1200	60	4,260	68	4,075	10.7514	6,070	0.0061	5.6255	0.0938	135
			1300	60	4,320	68	4,075	10.7514	4,810	0.0048	4.4578	0.0743	107
			1400	60	4,380	68	4,075	10.7514	3,490	0.0035	3.2344	0.0539	78
			1500	60	4,440	70	4,170	11.0026	3,150	0.0032	2.9875	0.0498	72
			1600	60	4,500	70	4,170	11.0026	2,720	0.0027	2.5797	0.0430	62

Table 2

MPE Event
Extraction Data and VOC Mass Removal Rate
December 2013

2844 Mountain Blvd.
Oakland, California

MPE WELL	COMMENT	DATE	CLOCK TIME	INCREMENTAL TIME	ELAPSED TIME	Q			PID		MASS REMOVAL		
				minutes	minutes	SCFM	ft^3 of extracted air	Moles of extracted air	ppmv as hexane	VOC mole %	lb VOC mass removal as hexane	lbs/min	lbs/day
RS-4		**12/6/2013**	900	1020	5,520	68	69,271	182.7743	1,790	0.0018	28.2017	0.0276	40
			1000	60	5,580	70	4,170	11.0026	1,720	0.0017	1.6313	0.0272	39
			1100	60	5,640	70	4,170	11.0026	1,560	0.0016	1.4795	0.0247	36
			1200	60	5,700	70	4,170	11.0026	1,621	0.0016	1.5374	0.0256	37
			1300	60	5,760	73	4,360	11.5051	1,350	0.0014	1.3388	0.0223	32
			1400	60	5,820	77	4,646	12.2587	1,324	0.0013	1.3991	0.0233	34
			1500	60	5,880	77	4,646	12.2587	1,305	0.0013	1.3790	0.0230	33
			1600	60	5,940	77	4,646	12.2587	1,392	0.0014	1.4709	0.0245	35
		12/7/2013	900	1020	6,960	70	70,890	187.0449	1,060	0.0011	17.0907	0.0168	24
			1030	90	7,050	68	6,112	16.1271	1,044	0.0010	1.4513	0.0161	23
			1200	90	7,140	68	6,112	16.1271	955	0.0010	1.3276	0.0148	21
			1330	90	7,230	68	6,112	16.1271	982	0.0010	1.3651	0.0152	22
			1500	90	7,320	70	6,255	16.5040	984	0.0010	1.3999	0.0156	22
			1630	90	7,410	70	6,255	16.5040	768	0.0008	1.0926	0.0121	17
		12/8/2013	900	990	8,400	70	68,805	181.5435	830	0.0008	12.9887	0.0131	19
			1030	90	8,490	70	6,255	16.5040	770	0.0008	1.0954	0.0122	18
			1200	90	8,580	68	6,112	16.1271	540	0.0005	0.7507	0.0083	12
			1330	90	8,670	68	6,112	16.1271	496	0.0005	0.6895	0.0077	11
			1500	90	8,760	68	6,112	16.1271	712	0.0007	0.9898	0.0110	16
			1630	90	8,850	70	6,255	16.5040	695	0.0007	0.9887	0.0110	16
		12/9/2013	900	990	9,840	66	65,663	173.2537	684	0.0007	10.2152	0.0103	15
			1000	60	9,900	68	4,075	10.7514	651	0.0007	0.6033	0.0101	14
			1100	60	9,960	65	3,884	10.2490	588	0.0006	0.5195	0.0087	12
			1200	60	10,020	62	3,694	9.7466	679	0.0007	0.5705	0.0095	14
			1300	60	10,080	62	3,694	9.7466	711	0.0007	0.5974	0.0100	14
			1400	60	10,140	65	3,884	10.2490	692	0.0007	0.6114	0.0102	15
			1500	60	10,200	63	3,789	9.9978	679	0.0007	0.5852	0.0098	14
			1600	60	10,260	63	3,789	9.9978	632	0.0006	0.5447	0.0091	13
		12/10/2013	900	1020	11,280	68	69,271	182.7743	515	0.0005	8.1139	0.0080	11
			1000	60	11,340	70	4,170	11.0026	499	0.0005	0.4733	0.0079	11
			1100	60	11,400	68	4,075	10.7514	502	0.0005	0.4652	0.0078	11
			1200	60	11,460	68	4,075	10.7514	485	0.0005	0.4495	0.0075	11
			1300	60	11,520	73	4,360	11.5051	446	0.0004	0.4423	0.0074	11
			1400	60	11,580	70	4,170	11.0026	435	0.0004	0.4126	0.0069	10

Table 2

MPE Event
Extraction Data and VOC Mass Removal Rate
December 2013

2844 Mountain Blvd.
Oakland, California

MPE WELL	COMMENT	DATE	CLOCK TIME	INCREMENTAL TIME	ELAPSED TIME	Q			PID		MASS REMOVAL		
				minutes	minutes	SCFM	ft^3 of extracted air	Moles of extracted air	ppmv as hexane	VOC mole %	lb VOC mass removal as hexane	lbs/min	lbs/day
			1500	60	11,640	70	4,170	11.0026	432	0.0004	0.4097	0.0068	10
			1600	60	11,700	70	4,170	11.0026	419	0.0004	0.3974	0.0066	10
		12/11/2013	900	1020	12,720	74	75,746	199.8565	379	0.0004	6.5293	0.0064	9
			1000	60	12,780	74	4,456	11.7563	362	0.0004	0.3668	0.0061	9
			1100	60	12,840	73	4,360	11.5051	349	0.0003	0.3461	0.0058	8
			1200	60	12,900	73	4,360	11.5051	338	0.0003	0.3352	0.0056	8
			1300	60	12,960	73	4,360	11.5051	331	0.0003	0.3283	0.0055	8
			1400	60	13,020	73	4,360	11.5051	345	0.0003	0.3421	0.0057	8
			1500	60	13,080	73	4,360	11.5051	336	0.0003	0.3332	0.0056	8
			1600	60	13,140	74	4,456	11.7563	335	0.0003	0.3395	0.0057	8
		12/12/2013	800	960	14,100	73	69,767	184.0809	291	0.0003	4.6175	0.0048	7
			900	60	14,160	70	4,170	11.0026	271	0.0003	0.2570	0.0043	6
RS-3			1000	60	14,220	63	3,789	9.9978	156	0.0002	0.1344	0.0022	3
			1100	60	14,280	63	3,789	9.9978	88	0.0001	0.0758	0.0013	2
			1200	60	14,340	63	3,789	9.9978	46	0.0000	0.0396	0.0007	1
MW-1 & MW-2			1300	60	14,400	100	5,979	15.7756	2,700	0.0027	3.6716	0.0612	88
			1400	60	14,460	100	5,979	15.7756	1,558	0.0016	2.1187	0.0353	51
			1500	60	14,520	103	6,169	16.2780	1,381	0.0014	1.9378	0.0323	47
			1600	60	14,580	108	6,455	17.0316	958	0.0010	1.4065	0.0234	34
		12/13/2013	900	1020	15,600	116	117,828	310.8906	646	0.0006	17.3120	0.0170	24
			1000	60	15,660	116	6,931	18.2877	621	0.0006	0.9789	0.0163	23
			1100	60	15,720	116	6,931	18.2877	651	0.0007	1.0262	0.0171	25
			1200	60	15,780	117	7,026	18.5389	632	0.0006	1.0100	0.0168	24
			1300	60	15,840	117	7,026	18.5389	621	0.0006	0.9924	0.0165	24
			1400	60	15,900	117	7,026	18.5389	702	0.0007	1.1218	0.0187	27
			1500	60	15,960	117	7,026	18.5389	679	0.0007	1.0851	0.0181	26
			1600	60	16,020	117	7,026	18.5389	645	0.0006	1.0307	0.0172	25
		12/14/2013	930	1050	17,070	117	122,959	324.4306	725	0.0007	20.2753	0.0193	28
			1100	90	17,160	114	10,254	27.0547	642	0.0006	1.4972	0.0166	24
			1230	90	17,250	114	10,254	27.0547	630	0.0006	1.4692	0.0163	24
			1400	90	17,340	117	10,539	27.8083	607	0.0006	1.4550	0.0162	23
			1530	90	17,430	114	10,254	27.0547	648	0.0006	1.5112	0.0168	24
			1630	60	17,490	114	6,836	18.0365	590	0.0006	0.9173	0.0153	22

Table 2

MPE Event
Extraction Data and VOC Mass Removal Rate
December 2013

2844 Mountain Blvd.
Oakland, California

MPE WELL	COMMENT	DATE	CLOCK TIME	INCREMENTAL TIME	ELAPSED TIME	Q			PID		MASS REMOVAL		
				minutes	minutes	SCFM	ft^3 of extracted air	Moles of extracted air	ppmv as hexane	VOC mole %	lb VOC mass removal as hexane	lbs/min	lbs/day
		12/15/2013	930	990	18,480	116	114,362	301.7468	641	0.0006	16.6728	0.0168	24
			1100	90	18,570	117	10,539	27.8083	603	0.0006	1.4454	0.0161	23
			1230	90	18,660	117	10,539	27.8083	590	0.0006	1.4143	0.0157	23
			1400	90	18,750	128	11,539	30.4460	590	0.0006	1.5484	0.0172	25
			1530	90	18,840	128	11,539	30.4460	580	0.0006	1.5222	0.0169	24
			1630	60	18,900	131	7,860	20.7388	578	0.0006	1.0333	0.0172	25
MW-1, MW-2, RS-4		**12/16/2013**	900	990	19,890	136	134,784	355.6310	617	0.0006	18.9144	0.0191	28
			1000	60	19,950	135	8,074	21.3022	482	0.0005	0.8851	0.0148	21
			1100	60	20,010	136	8,169	21.5534	504	0.0005	0.9364	0.0156	22
	STOP		1200	60	20,070	139	8,359	22.0558	482	0.0005	0.9164	0.0153	22
	TOTAL				**20,070**		**1,687,559**	**4,453**			**497**	**0.0248**	**36**
	MEDIAN					**70**			**695**	**0.0007**			

Notes

Q	volumetric flow rate
SCFM	standard cubic feet per minute
ft^3	cubic feet per minute
VOC	volatile organic compounds
PID	photo-ionization detector
ppmv	parts per million vapor

DERIVATION OF MASS REMOVAL RATE

ppmv as hexane/1,000,000 = VOC mole %
ft3 of extracted air/(379 ft3 air/lb-mole air) = moles of extracted air
(moles of extracted air)(VOC mole %)(86.2 lb/lb-mole hexane) = lbs of VOC removed as hexane
(lbs of VOC mass removed as hexane)(elapsed time) = lbs/min of VOC removed as hexane
(lbs/min of VOC removed as hexane)(60 min/1 hour)(24 hours/1 day) = lbs/day of VOC removed as hexane

Table 2a

MPE Event
Extraction Data and VOC Mass Removal Rate (MW-1)
December 2013

2844 Mountain Blvd.
Oakland, California

MPE WELL	COMMENT	DATE	CLOCK TIME	INCREMENTAL TIME	ELAPSED TIME	Q			PID		MASS REMOVAL		
				minutes	minutes	SCFM	ft^3 of extracted air	Moles of extracted air	ppmv as hexane	VOC mole %	lb VOC mass removal as hexane	lbs/min	lbs/day
MW-1	**START**	**12/2/2013**	1300	0	0								
			1330	30	30	70	2,085	5.5013	8,780	0.0088	4.1636	0.1388	200
			1430	60	90	70	4,170	11.0026	6,030	0.0060	5.7190	0.0953	137
			1530	60	150	70	4,170	11.0026	4,510	0.0045	4.2774	0.0713	103
			1630	60	210	70	4,170	11.0026	3,810	0.0038	3.6135	0.0602	87
		12/3/2013	900	990	1,200	70	68,805	181.5435	7,470	0.0075	116.8984	0.1181	170
			1000	60	1,260	70	4,170	11.0026	6,720	0.0067	6.3734	0.1062	153
			1100	60	1,320	68	4,075	10.7514	5,290	0.0053	4.9026	0.0817	118
			1200	60	1,380	70	4,170	11.0026	2,510	0.0025	2.3806	0.0397	57
			1300	60	1,440	71	4,265	11.2538	2,310	0.0023	2.2409	0.0373	54
			1400	60	1,500	74	4,456	11.7563	2,910	0.0029	2.9490	0.0491	71
			1500	60	1,560	74	4,456	11.7563	2,720	0.0027	2.7564	0.0459	66
			1600	60	1,620	71	4,265	11.2538	2,430	0.0024	2.3573	0.0393	57
		12/4/2013	900	1020	2,640	71	72,509	191.3154	2,390	0.0024	39.4144	0.0386	56
			1000	60	2,700	71	4,265	11.2538	2,360	0.0024	2.2894	0.0382	55
			1100	60	2,760	70	4,170	11.0026	2,340	0.0023	2.2193	0.0370	53
			1200	60	2,820	70	4,170	11.0026	2,320	0.0023	2.2004	0.0367	53
			1300	60	2,880	70	4,170	11.0026	2,300	0.0023	2.1814	0.0364	52
			1400	60	2,940	70	4,170	11.0026	2,280	0.0023	2.1624	0.0360	52
			1500	60	3,000	73	4,360	11.5051	2,270	0.0023	2.2512	0.0375	54
			1600	60	3,060	73	4,360	11.5051	2,250	0.0023	2.2314	0.0372	54
		12/5/2013	900	1020	4,080	70	70,890	187.0449	2,210	0.0022	35.6324	0.0349	50
			1000	60	4,140	70	4,170	11.0026	2,170	0.0022	2.0581	0.0343	49
			1100	60	4,200	68	4,075	10.7514	2,150	0.0022	1.9926	0.0332	48
	TOTAL				**4,200**		**294,566**	**777**			**253**	**0.0603**	**87**
	MEDIAN					**70**			**2,390**	**0.0024**			

Notes

Q	volumetric flow rate
SCFM	standard cubic feet per minute
ft^3	cubic feet per minute
VOC	volatile organic compounds
PID	photo-ionization detector
ppmv	parts per million vapor

DERIVATION OF MASS REMOVAL RATE

ppmv as hexane/1,000,000 = VOC mole %
ft3 of extracted air/(379 ft3 air/lb-mole air) = moles of extracted air
(moles of extracted air)(VOC mole %)(86.2 lb/lb-mole hexane) = lbs of VOC removed as hexane
(lbs of VOC mass removed as hexane)(elapsed time) = lbs/min of VOC removed as hexane
(lbs/min of VOC removed as hexane)(60 min/1 hour)(24 hours/1 day) = lbs/day of VOC removed as hexane

Table 2b

MPE Event
Extraction Data and VOC Mass Removal Rate (MW-2)
December 2013

2844 Mountain Blvd.
Oakland, California

MPE WELL	COMMENT	DATE	CLOCK TIME	INCREMENTAL TIME	ELAPSED TIME	Q			PID		MASS REMOVAL		
				minutes	minutes	SCFM	ft^3 of extracted air	Moles of extracted air	ppmv as hexane	VOC mole %	lb VOC mass removal as hexane	lbs/min	lbs/day
MW-2		**12/5/2013**	1200	60	60	68	4,075	10.7514	6,070	0.0061	5.6255	0.0938	135
			1300	60	120	68	4,075	10.7514	4,810	0.0048	4.4578	0.0743	107
			1400	60	180	68	4,075	10.7514	3,490	0.0035	3.2344	0.0539	78
			1500	60	240	70	4,170	11.0026	3,150	0.0032	2.9875	0.0498	72
			1600	60	300	70	4,170	11.0026	2,720	0.0027	2.5797	0.0430	62
		12/6/2013	900	1020	1,320	68	69,271	182.7743	1,790	0.0018	28.2017	0.0276	40
			1000	60	1,380	70	4,170	11.0026	1,720	0.0017	1.6313	0.0272	39
			1100	60	1,440	70	4,170	11.0026	1,560	0.0016	1.4795	0.0247	36
			1200	60	1,500	70	4,170	11.0026	1,621	0.0016	1.5374	0.0256	37
			1300	60	1,560	73	4,360	11.5051	1,350	0.0014	1.3388	0.0223	32
			1400	60	1,620	77	4,646	12.2587	1,324	0.0013	1.3991	0.0233	34
			1500	60	1,680	77	4,646	12.2587	1,305	0.0013	1.3790	0.0230	33
			1600	60	1,740	77	4,646	12.2587	1,392	0.0014	1.4709	0.0245	35
		12/7/2013	900	1020	2,760	70	70,890	187.0449	1,060	0.0011	17.0907	0.0168	24
			1030	90	2,850	68	6,112	16.1271	1,044	0.0010	1.4513	0.0161	23
			1200	90	2,940	68	6,112	16.1271	955	0.0010	1.3276	0.0148	21
			1330	90	3,030	68	6,112	16.1271	982	0.0010	1.3651	0.0152	22
			1500	90	3,120	70	6,255	16.5040	984	0.0010	1.3999	0.0156	22
			1630	90	3,210	70	6,255	16.5040	768	0.0008	1.0926	0.0121	17
		12/8/2013	900	990	4,200	70	68,805	181.5435	830	0.0008	12.9887	0.0131	19
			1030	90	4,290	70	6,255	16.5040	770	0.0008	1.0954	0.0122	18
			1200	90	4,380	68	6,112	16.1271	540	0.0005	0.7507	0.0083	12
			1330	90	4,470	68	6,112	16.1271	496	0.0005	0.6895	0.0077	11
			1500	90	4,560	68	6,112	16.1271	712	0.0007	0.9898	0.0110	16
			1630	90	4,650	70	6,255	16.5040	695	0.0007	0.9887	0.0110	16
		12/9/2013	900	990	5,640	66	65,663	173.2537	684	0.0007	10.2152	0.0103	15
			1000	60	5,700	68	4,075	10.7514	651	0.0007	0.6033	0.0101	14
	TOTAL				**5,700**		**391,770**	**1,034**			**109**	**0.0192**	**28**
	MEDIAN					**70**			**1,060**	**0.0011**			

Notes

Q	volumetric flow rate
SCFM	standard cubic feet per minute
ft^3	cubic feet per minute
VOC	volatile organic compounds
PID	photo-ionization detector
ppmv	parts per million vapor

DERIVATION OF MASS REMOVAL RATE

ppmv as hexane/1,000,000 = VOC mole %
ft3 of extracted air/(379 ft3 air/lb-mole air) = moles of extracted air
(moles of extracted air)(VOC mole %)(86.2 lb/lb-mole hexane) = lbs of VOC removed as hexane
(lbs of VOC mass removed as hexane)(elapsed time) = lbs/min of VOC removed as hexane
(lbs/min of VOC removed as hexane)(60 min/1 hour)(24 hours/1 day) = lbs/day of VOC removed as hexane

Table 2c

MPE Event
Extraction Data and VOC Mass Removal Rate_RS-4
December 2013

2844 Mountain Blvd.
Oakland, California

MPE WELL	COMMENT	DATE	CLOCK TIME	INCREMENTAL TIME	ELAPSED TIME	Q			PID		MASS REMOVAL		
				minutes	minutes	SCFM	ft^3 of extracted air	Moles of extracted air	ppmv as hexane	VOC mole %	lb VOC mass removal as hexane	lbs/min	lbs/day
RS-4		**12/9/2013**	1100	60	60	65	3,884	10.2490	588	0.0006	0.5195	0.0087	12
			1200	60	120	62	3,694	9.7466	679	0.0007	0.5705	0.0095	14
			1300	60	180	62	3,694	9.7466	711	0.0007	0.5974	0.0100	14
			1400	60	240	65	3,884	10.2490	692	0.0007	0.6114	0.0102	15
			1500	60	300	63	3,789	9.9978	679	0.0007	0.5852	0.0098	14
			1600	60	360	63	3,789	9.9978	632	0.0006	0.5447	0.0091	13
		12/10/2013	900	1020	1,380	68	69,271	182.7743	515	0.0005	8.1139	0.0080	11
			1000	60	1,440	70	4,170	11.0026	499	0.0005	0.4733	0.0079	11
			1100	60	1,500	68	4,075	10.7514	502	0.0005	0.4652	0.0078	11
			1200	60	1,560	68	4,075	10.7514	485	0.0005	0.4495	0.0075	11
			1300	60	1,620	73	4,360	11.5051	446	0.0004	0.4423	0.0074	11
			1400	60	1,680	70	4,170	11.0026	435	0.0004	0.4126	0.0069	10
			1500	60	1,740	70	4,170	11.0026	432	0.0004	0.4097	0.0068	10
			1600	60	1,800	70	4,170	11.0026	419	0.0004	0.3974	0.0066	10
		12/11/2013	900	1020	2,820	74	75,746	199.8565	379	0.0004	6.5293	0.0064	9
			1000	60	2,880	74	4,456	11.7563	362	0.0004	0.3668	0.0061	9
			1100	60	2,940	73	4,360	11.5051	349	0.0003	0.3461	0.0058	8
			1200	60	3,000	73	4,360	11.5051	338	0.0003	0.3352	0.0056	8
			1300	60	3,060	73	4,360	11.5051	331	0.0003	0.3283	0.0055	8
			1400	60	3,120	73	4,360	11.5051	345	0.0003	0.3421	0.0057	8
			1500	60	3,180	73	4,360	11.5051	336	0.0003	0.3332	0.0056	8
			1600	60	3,240	74	4,456	11.7563	335	0.0003	0.3395	0.0057	8
		12/12/2013	800	960	4,200	73	69,767	184.0809	291	0.0003	4.6175	0.0048	7
			900	60	4,260	70	4,170	11.0026	271	0.0003	0.2570	0.0043	6
	TOTAL				**4,260**		**301,592**	**796**			**28**	**0.0067**	**10**
	MEDIAN					**70**			**434**	**0.0004**			

Notes

Q	volumetric flow rate
SCFM	standard cubic feet per minute
ft^3	cubic feet per minute
VOC	volatile organic compounds
PID	photo-ionization detector
ppmv	parts per million vapor

DERIVATION OF MASS REMOVAL RATE

ppmv as hexane/1,000,000 = VOC mole %
ft3 of extracted air/(379 ft3 air/lb-mole air) = moles of extracted air
(moles of extracted air)(VOC mole %)(86.2 lb/lb-mole hexane) = lbs of VOC removed as hexane
(lbs of VOC mass removed as hexane)(elapsed time) = lbs/min of VOC removed as hexane
(lbs/min of VOC removed as hexane)(60 min/1 hour)(24 hours/1 day) = lbs/day of VOC removed as hexane

Table 2d

MPE Event
Extraction Data and VOC Mass Removal Rate_RS-3
December 2013

2844 Mountain Blvd.
Oakland, California

MPE WELL	COMMENT	DATE	CLOCK TIME	INCREMENTAL TIME	ELAPSED TIME	Q			PID		MASS REMOVAL		
				minutes	minutes	SCFM	ft^3 of extracted air	Moles of extracted air	ppmv as hexane	VOC mole %	lb VOC mass removal as hexane	lbs/min	lbs/day
RS-3		**12/12/2013**	1000	60	60	63	3,789	9.9978	156	0.0002	0.1344	0.0022	3.23
			1100	60	120	63	3,789	9.9978	88	0.0001	0.0758	0.0013	1.82
			1200	60	180	63	3,789	9.9978	46	0.0000	0.0396	0.0007	0.95
	TOTAL				**180**		**11,368**	**30**			**0.250**	**0.0014**	**2.00**
	MEDIAN					**63**			**88**	**0.0001**			

Notes

Q	volumetric flow rate
SCFM	standard cubic feet per minute
ft^3	cubic feet per minute
VOC	volatile organic compounds
PID	photo-ionization detector
ppmv	parts per million vapor

DERIVATION OF MASS REMOVAL RATE

ppmv as hexane/1,000,000 = VOC mole %
ft3 of extracted air/(379 ft3 air/lb-mole air) = moles of extracted air
(moles of extracted air)(VOC mole %)(86.2 lb/lb-mole hexane) = lbs of VOC removed as hexane
(lbs of VOC mass removed as hexane)(elapsed time) = lbs/min of VOC removed as hexane
(lbs/min of VOC removed as hexane)(60 min/1 hour)(24 hours/1 day) = lbs/day of VOC removed as hexane

Table 2e

MPE Event
Extraction Data and VOC Mass Removal Rate_MW-1 & MW-2
December 2013

2844 Mountain Blvd.
Oakland, California

MPE WELL	COMMENT	DATE	CLOCK TIME	INCREMENTAL TIME	ELAPSED TIME	Q			PID		MASS REMOVAL		
				minutes	minutes	SCFM	ft^3 of extracted air	Moles of extracted air	ppmv as hexane	VOC mole %	lb VOC mass removal as hexane	lbs/min	lbs/day
MW-1 & MW-2		**12/12/2013**	1300	60	60	100	5,979	15.7756	2,700	0.0027	3.6716	0.0612	88
			1400	60	120	100	5,979	15.7756	1,558	0.0016	2.1187	0.0353	51
			1500	60	180	103	6,169	16.2780	1,381	0.0014	1.9378	0.0323	47
			1600	60	240	108	6,455	17.0316	958	0.0010	1.4065	0.0234	34
		12/13/2013	900	1020	1,260	116	117,828	310.8906	646	0.0006	17.3120	0.0170	24
			1000	60	1,320	116	6,931	18.2877	621	0.0006	0.9789	0.0163	23
			1100	60	1,380	116	6,931	18.2877	651	0.0007	1.0262	0.0171	25
			1200	60	1,440	117	7,026	18.5389	632	0.0006	1.0100	0.0168	24
			1300	60	1,500	117	7,026	18.5389	621	0.0006	0.9924	0.0165	24
			1400	60	1,560	117	7,026	18.5389	702	0.0007	1.1218	0.0187	27
			1500	60	1,620	117	7,026	18.5389	679	0.0007	1.0851	0.0181	26
			1600	60	1,680	117	7,026	18.5389	645	0.0006	1.0307	0.0172	25
		12/14/2013	930	1050	2,730	117	122,959	324.4306	725	0.0007	20.2753	0.0193	28
			1100	90	2,820	114	10,254	27.0547	642	0.0006	1.4972	0.0166	24
			1230	90	2,910	114	10,254	27.0547	630	0.0006	1.4692	0.0163	24
			1400	90	3,000	117	10,539	27.8083	607	0.0006	1.4550	0.0162	23
			1530	90	3,090	114	10,254	27.0547	648	0.0006	1.5112	0.0168	24
			1630	60	3,150	114	6,836	18.0365	590	0.0006	0.9173	0.0153	22
		12/15/2013	930	990	4,140	116	114,362	301.7468	641	0.0006	16.6728	0.0168	24
			1100	90	4,230	117	10,539	27.8083	603	0.0006	1.4454	0.0161	23
			1230	90	4,320	117	10,539	27.8083	590	0.0006	1.4143	0.0157	23
			1400	90	4,410	128	11,539	30.4460	590	0.0006	1.5484	0.0172	25
			1530	90	4,500	128	11,539	30.4460	580	0.0006	1.5222	0.0169	24
			1630	60	4,560	131	7,860	20.7388	578	0.0006	1.0333	0.0172	25
MW-1, MW-2, RS-4		**12/16/2013**	900	990	5,550	136	134,784	355.6310	617	0.0006	18.9144	0.0191	28
	TOTAL				**5,550**		**663,662**	**1,751**			**103**	**0.0186**	**27**
	MEDIAN					**117**			**641**	**0.0006**			

Notes

Q	volumetric flow rate
SCFM	standard cubic feet per minute
ft^3	cubic feet per minute
VOC	volatile organic compounds
PID	photo-ionization detector
ppmv	parts per million vapor

DERIVATION OF MASS REMOVAL RATE

ppmv as hexane/1,000,000 = VOC mole %
ft3 of extracted air/(379 ft3 air/lb-mole air) = moles of extracted air
(moles of extracted air)(VOC mole %)(86.2 lb/lb-mole hexane) = lbs of VOC removed as hexane
(lbs of VOC mass removed as hexane)(elapsed time) = lbs/min of VOC removed as hexane
(lbs/min of VOC removed as hexane)(60 min/1 hour)(24 hours/1 day) = lbs/day of VOC removed as hexane

Table 2f

MPE Event
Extraction Data and VOC Mass Removal Rate_MW-1, MW-2, & RS-4
December 2013

2844 Mountain Blvd.
Oakland, California

MPE WELL	COMMENT	DATE	CLOCK TIME	INCREMENTAL TIME	ELAPSED TIME	Q			PID		MASS REMOVAL		
				minutes	minutes	SCFM	ft^3 of extracted air	Moles of extracted air	ppmv as hexane	VOC mole %	lb VOC mass removal as hexane	lbs/min	lbs/day
MW-1, MW-2, RS-4		**12/16/2013**	900	0	0	136	0	0.0000	617	0.0006	0.0000		
			1000	60	60	135	8,074	21.3022	482	0.0005	0.8851	0.0148	21
			1100	60	120	136	8,169	21.5534	504	0.0005	0.9364	0.0156	22
	STOP		1200	60	180	139	8,359	22.0558	482	0.0005	0.9164	0.0153	22
	TOTAL				**180**		**24,601**	**65**			**2.74**	**0.0152**	**22**
	MEDIAN					**136**			**493**	**0.0005**			

Notes

Q	volumetric flow rate
SCFM	standard cubic feet per minute
ft^3	cubic feet per minute
VOC	volatile organic compounds
PID	photo-ionization detector
ppmv	parts per million vapor

DERIVATION OF MASS REMOVAL RATE

ppmv as hexane/1,000,000 = VOC mole %
ft3 of extracted air/(379 ft3 air/lb-mole air) = moles of extracted air
(moles of extracted air)(VOC mole %)(86.2 lb/lb-mole hexane) = lbs of VOC removed as hexane
(lbs of VOC mass removed as hexane)(elapsed time) = lbs/min of VOC removed as hexane
(lbs/min of VOC removed as hexane)(60 min/1 hour)(24 hours/1 day) = lbs/day of VOC removed as hexane

Table 3

MPE Pilot Test December 2013

Observation Wells Data

2844 Mountain Blvd.,
Oakland, California

DATE	TIME	INCREMENTAL TIME	ELAPSED TIME	WELL ID MW-1		WELL ID MW-2		WELL ID RS-3		WELL ID RS-4	
				GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)
12/2/2013	1300	0	0	7.50		7.48		6.82		9.02	
				EXTRACTION WELL		**Distance From MW-1=16 feet**		**Distance From MW-1=56 feet**		**Distance From MW-1=32 feet**	
	1330	30	30	7.55	-	7.58		6.81		9.02	
	1430	60	90	7.57	-	7.73		6.80		9.04	
	1530	60	150	7.58	-	7.85		6.80		9.05	
	1630	60	210	7.58	-	8.16		6.80		9.05	
12/3/2013	900	990	1,200	7.20	-	7.75	0.20	6.85	0.00	9.15	0.20
	1000	60	1,260	14.55	-	7.82	0.20	6.85	0.00	9.15	0.20
	1100	60	1,320	17.78	-	7.90	0.50	6.87	0.00	9.15	0.20
	1200	60	1,380	17.76	-	8.21	0.30	6.87	0.00	9.20	0.20
	1300	60	1,440	17.75	-	8.33	0.30	6.86	0.00	9.20	0.20
	1400	60	1,500	17.77	-	8.44	0.30	6.83	0.00	9.21	0.20
	1500	60	1,560	17.77	-	8.53	0.30	6.80	0.00	9.20	0.20
	1600	60	1,620	17.76	-	8.65	0.30	6.79	0.00	9.20	0.20
12/4/2013	900	1020	2,640	16.90	-	9.40	0.30	6.54	0.00	9.60	0.20
	1000	60	2,700	16.90	-	9.42	0.30	6.54	0.00	9.61	0.20
	1100	60	2,760	16.89	-	9.42	0.30	6.55	0.00	9.61	0.20
	1200	60	2,820	16.89	-	9.43	0.30	6.57	0.00	9.63	0.20
	1300	60	2,880	16.90	-	9.45	0.30	6.58	0.00	9.62	0.20
	1400	60	2,940	16.92	-	9.45	0.30	6.60	0.00	9.64	0.20
	1500	60	3,000	16.92	-	9.46	0.30	6.61	0.00	9.64	0.20
	1600	60	3,060	16.94	-	9.47	0.30	6.63	0.00	9.65	0.20
12/5/2013	900	1020	4,080	17.01	-	9.50	0.30	6.68	0.00	9.65	0.20
	1000	60	4,140	17.00	-	9.51	0.30	6.69	0.00	9.65	0.20
	1100	60	4,200	Added vacuum oil							
			4,200	**Distance From MW-2=16 feet**		**EXTRACTION WELL**		**Distance From MW-2=56 feet**		**Distance From MW-2=16 feet**	
	1200	60	4,260	17.00	0.30	9.50	-	6.69	0.00	9.65	0.30
	1300	60	4,320	14.70	0.30	18.16	-	6.95	0.00	9.32	0.30

Table 3

MPE Pilot Test December 2013

Observation Wells Data

2844 Mountain Blvd.,
Oakland, California

DATE	TIME	INCREMENTAL TIME	ELAPSED TIME	WELL ID MW-1		WELL ID MW-2		WELL ID RS-3		WELL ID RS-4	
				GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)
12/5/2013	1400	60	4,380	14.73	0.30	18.16	-	6.98	0.00	9.38	0.30
	1500	60	4,440	13.79	0.30	18.17	-	6.91	0.00	9.44	0.30
	1600	60	4,500	12.27	0.20	18.17	-	6.82	0.00	9.58	0.30
12/6/2013	900	1020	5,520	8.44	0.20	18.18	-	6.62	0.00	10.75	0.30
	1000	60	5,580	8.44	0.20	18.19	-	6.67	0.00	10.76	0.20
	1100	60	5,640	8.44	0.20	18.20	-	6.70	0.00	10.73	0.20
	1200	60	5,700	8.44	0.20	18.21	-	6.73	0.00	10.74	0.20
	1300	60	5,760	8.43	0.20	18.21	-	6.64	0.00	10.76	0.20
	1400	60	5,820	8.42	0.20	18.21	-	6.58	0.00	10.77	0.20
	1500	60	5,880	8.43	0.20	18.22	-	6.62	0.00	10.77	0.20
	1600	60	5,940	8.44	0.20	18.22	-	6.67	0.00	10.77	0.20
12/7/2013	1030	1110	7,050	8.20	0.20	18.10	-	6.10	0.00	10.60	0.40
	1200	90	7,140	8.20	0.20	18.10	-	6.20	0.00	10.60	0.40
	1330	90	7,230	8.20	0.20	18.10	-	6.15	0.00	10.60	0.30
	1500	90	7,320	8.20	0.20	18.10	-	6.10	0.00	10.60	0.30
	1630	90	7,410	8.20	0.20	18.10	-	6.10	0.20	10.55	0.40
12/8/2013	1000	1050	8,460	8.10	0.20	18.10	-	6.30	0.20	10.55	0.40
	1130	90	8,550	8.13	0.20	18.10	-	6.20	0.20	10.53	0.40
	1300	90	8,640	8.10	0.20	18.10	-	6.30	0.20	10.50	0.40
	1430	90	8,730	8.14	0.20	18.14	-	6.28	0.20	10.50	0.40
	1530	60	8,790	8.12	0.20	18.14	-	6.20	0.20	10.50	0.40
	1630	60	8,850	8.15	0.20	18.15	-	6.20	0.00	10.50	0.40
12/9/2013	900	990	9,840		0.25	18.23	-	6.50	0.00	10.44	0.60
	1000	60	9,900		0.25	18.23	-	6.50	0.00	10.45	0.60
			9,900	**Distance From RS-4=32 feet**		**Distance From RS-4=16 feet**		**Distance From RS-4=65 feet**		**EXTRACTION WELL**	
	1100	60	9,960		0.20	16.92	0.50	6.35	0.00	20.44	-
	1200	60	10,020		0.20	16.28	0.40	6.33	0.00	20.79	-
	1300	60	10,080		0.20	15.62	0.40	6.31	0.00	21.17	-

Table 3

MPE Pilot Test December 2013

Observation Wells Data

2844 Mountain Blvd.,
Oakland, California

DATE	TIME	INCREMENTAL TIME	ELAPSED TIME	WELL ID MW-1		WELL ID MW-2		WELL ID RS-3		WELL ID RS-4	
				GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)
12/9/2013	1400	60	10,140		0.20	13.74	0.40	6.26	0.00	21.20	-
	1500	60	10,200		0.20	13.51	0.30	6.02	0.00	21.19	-
	1600	60	10,260		0.20	13.34	0.30	5.91	0.00	21.18	-
12/10/2013	900	1020	11,280	7.20	0.20	9.27	0.30	6.38	0.00	21.26	-
	1000	60	11,340	7.20	0.20	9.26	0.30	6.35	0.00	21.41	-
	1100	60	11,400	7.20	0.20	9.26	0.30	6.32	0.00	21.62	-
	1200	60	11,460	7.19	0.20	9.23	0.30	6.35	0.00	21.51	-
	1300	60	11,520	7.17	0.20	9.19	0.30	6.37	0.00	21.19	-
	1400	60	11,580	7.14	0.20	9.16	0.30	6.41	0.00	21.17	-
	1500	60	11,640	7.11	0.20	9.12	0.30	6.43	0.00	21.14	-
	1600	60	11,700	7.10	0.20	9.11	0.30	6.45	0.00	21.15	-
12/11/2013	900	1020	12,720	7.02	0.20	8.86	0.30	6.31	0.00	21.22	-
	1000	60	12,780	7.01	0.20	8.82	0.30	6.31	0.00	21.44	-
	1100	60	12,840	7.00	0.20	8.73	0.30	6.30	0.00	21.79	-
	1200	60	12,900	7.00	0.20	8.74	0.30	6.42	0.00	21.32	-
	1300	60	12,960	6.97	0.20	8.81	0.30	6.39	0.00	21.34	-
	1400	60	13,020	6.98	0.20	8.87	0.30	6.36	0.00	21.17	-
	1500	60	13,080	6.98	0.20	8.88	0.30	6.31	0.00	21.19	-
	1600	60	13,140	6.98	0.20	8.90	0.30	6.27	0.00	21.20	-
12/12/2013	800	960	14,100	6.70	0.20	8.87	0.20	6.31	0.00	21.18	-
	900	60	14,160	6.71	0.20	8.85	0.20	6.39	0.00	21.21	-
			14,160	**Distance From RS-3=56 feet**		**Distance From RS-3=56 feet**		**EXTRACTION WELL**		**Distance From RS-3=65 feet**	
	1000	60	14,220	7.02	0.10	8.68	0.00	21.40	-	21.41	0.00
	1100	60	14,280	7.04	0.10	8.80	0.00	21.41	-	20.05	0.00
	1200	60	14,340	7.02	0.10	8.80	0.00	21.37	-	19.21	0.00
			14,340	**EXTRACTION WELLS**				**Distance from center of MW-1 & MW-2 = 55 feet**		**Distance from center of MW-1 & MW-2 = 24 feet**	
	1300	60	14,400	15.50	-	15.27	-	15.58	0.00	20.00	3.05
	1400	60	14,460	15.59	-	15.25	-	15.60	0.00	20.00	3.05

Table 3

MPE Pilot Test December 2013

Observation Wells Data

2844 Mountain Blvd.,
Oakland, California

DATE	TIME	INCREMENTAL TIME	ELAPSED TIME	WELL ID MW-1		WELL ID MW-2		WELL ID RS-3		WELL ID RS-4	
				GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)
12/12/2013	1500	60	14,520	15.67	-	15.24	-	10.52	0.00	18.65	3.05
	1600	60	14,580	15.68	-	15.25	-	10.51	0.00	18.92	3.05
12/13/2013	900	1020	15,600	15.70	-	15.32	-	5.80	0.00	11.39	3.00
	1000	60	15,660	15.62	-	15.26	-	5.82	0.00	11.34	3.00
	1100	60	15,720	15.61	-	15.27	-	5.81	0.00	11.28	3.00
	1200	60	15,780	15.61	-	15.25	-	5.78	0.00	11.23	3.00
	1300	60	15,840	15.60	-	15.25	-	5.77	0.00	11.23	3.00
	1400	60	15,900	15.63	-	15.25	-	5.77	0.00	11.22	3.00
	1500	60	15,960	15.61	-	15.24	-	5.78	0.00	11.21	3.00
	1600	60	16,020	15.62	-	15.25	-	5.78	0.00	11.21	3.00
12/14/2013	930	1050	17,070	15.50	-	15.15	-	5.85	0.01	10.90	3.00
	1100	90	17,160	15.55	-	15.20	-	5.75	0.01	10.85	3.00
	1230	90	17,250	15.50	-	15.20	-	5.85	0.01	10.85	3.00
	1400	90	17,340	15.55	-	15.20	-	5.75	0.01	10.85	3.00
	1530	90	17,430	15.45	-	15.20	-	5.80	0.01	10.85	3.00
	1630	60	17,490	15.50	-	15.20	-	5.75	0.02	10.85	3.00
12/15/2013	930	990	18,480	15.50	-	15.20	-	5.80	0.02	10.85	3.00
	1100	90	18,570	15.50	-	15.10	-	5.85	0.02	10.85	3.00
	1230	90	18,660	15.50	-	15.20	-	5.83	0.02	10.90	3.00
	1400	90	18,750	15.50	-	15.20	-	5.78	0.02	10.85	3.00
	1530	90	18,840	15.55	-	15.25	-	5.87	0.02	10.90	3.00
	1630	60	18,900	15.55	-	15.20	-	5.75	0.02	10.85	3.00
			18,900	**EXTRACTION WELLS**				**Average distance from extraction wells = 59 feet**		**EXTRACTION WELLS**	
12/16/2013	900	990	19,890	15.56	-	15.26	-	5.74	0.00	20.92	-
	1000	60	19,950	15.53	-	15.23	-	5.70	0.00	20.93	-
	1100	60	20,010	15.51	-	15.21	-	5.61	0.00	20.95	-
	1200	60	20,070	15.51	-	15.22	-	5.63	0.00	20.96	-

Table 4
Soil Vapor Analytical Results
December 2013 MPE Pilot Test

2844 Mountain Blvd,
Oakland, California

Extraction Well	Vapor Sample ID	Collection Date/Time	USEPA TO-3 MODIFIED	USEPA TO-15 MODIFIED					Q (CFM)	Mass Removal Rate (lbs/day) (TPHg/benzene)	Total Test time (minutes/days)	Total Mass Removed (lbs) (TPHg/benzene)
			TPHg (ug/m^3)	Benzene (ug/m^3)	MtBE (ug/m^3)	Toluene (ug/m^3)	Ethyl benzene (ug/m^3)	Total Xylenes (ug/m^3)				
MW-1	Effluent	12/2/13 @ 1600	1200	1.6	9.1	14.0	4.0	23.8	70	NA	NA	**612.71/5.69**
	Influent	12/2/13 @ 1600	7,000,000 (b)	65,000 (a)	1,800,000 (a)	<19,000	140,000 (a)	280,000 (a)	70	43.96 (d)/ 0.41(d)	20,070/13.94	
		REMOVAL EFFICIENCIES	99.98%	99.998%	99.999%	NA	99.997%	99.99%				

Notes

CFM	cubic feet per minute
lbs/day	pounds per day
ug/m^3	micrograms per cubic meter
MtBE	Methyl ter-butyl ether
<	not detected at or above laboratory detection limit
(a)	dilution factor 10,000
(b)	dilution factor 100
(c)	dilution factor 500
(d)	average value

DERIVATION OF MASS REMOVAL RATE

(ug/m^3) [(1mg/1000ug) ($1m^3$/1000 L)] = **mg/L**
(**mg/L**) (28.32 L/1 ft^3) ([Q} ft^3/min) = **mg/min**
(**mg/min**)(1g/1000mg)(1kg/1000g)(60min/1hr)(24hr/1day) = **kg/day**
(**kg/day**)(2.2lbs/1kg) = **lbs/day**

DERIVATION OF TOTAL MASS REMOVED

Total time of test = **days** (Tables 2 - 5)
(mass removal rate [**lbs/day**])(total time of test [**days**]) = Total Removed (**lbs**)

DERIVATION OF REMOVAL EFFICIENCIES
Influent sample concentration / STACK sample concentration

Table 5
Dissolved-Phase Hydrocarbon Concentations in Groundwater
Pre-and Post MPE Pilot Test
2844 Mountain Blvd., Oakland, CA

Monitoring Well	Date	TPH-g (µg/L)	TPH-d (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-Benzene (µg/L)	Total Xylenes (µg/L)	MtBE 8260B (µg/L)	TBA (µg/L)	TAME (µg/L)
RS-3	9/4/2013	<50	170 Y	<0.5	<0.5	<0.5	<0.5	<0.5	<10	<0.5
	12/30/2013	**<50**	**61 Y**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**21**	**680**	**0.64**
RS-4	9/4/2013	20,000	5,100	<100	<100	660	2,830	18,000	75,000	1,200
	12/30/2013	**<13,000**	**9,900**	**<130**	**<130**	**<130**	**150**	**16,000**	**37,000**	**1,100**
MW-1	9/4/2013	<50,000	13,000	2,000	<500	1,400	4,200	70,000	48,000	7,700
	12/30/2013	**34,000**	**13,000**	**920**	**1,000**	**1,300**	**4,900**	**43,000**	**43,000**	**4,500**
MW-2	9/4/2013	<25,000	3,900	860	<250	710	1,580	32,000	31,000	4,600
	12/30/2013	**<13,000**	**6,300**	**180**	**<130**	**<130**	**330**	**18,000**	**53,000**	**1,800**

Notes:
TPH-g: Total hydrocarbons as gasoline
TPH-d: Total hydrocarbons as diesel
TBA: ter-Butyl Alcohol
TAME: ter-Amyl Methyl Ether
Y: Sample exhibits chromatographic pattern which does not resemble standard.
<: Not detected above the laboratroy reporting limit.
NA: Not Analyzed

APPENDIX A
Site History

Soil contamination was initially identified at the site in March 1989, during the replacement of the product lines by Diablo Tank and Equipment. Up to 8,400 mg/kg of total PHCs as gasoline (TPH-g) were identified in soil samples collected from the southern edge of the USTs.

In July 1989, On-Site Technologies excavated and disposed of between 90 and 150 cubic yards of contaminated soil from the southern end of the UST that then contained premium unleaded fuel. Up to 3,300 mg/kg of total PHCs as gasoline (TPH-g) were detected in samples collected from excavation sidewalls.

In May 1990, Remediation Service International (RSI) conducted a soil and groundwater assessment at the site including installation of four groundwater monitoring wells (RS-1 through RS-4). Hydrocarbons were detected in both soil and groundwater during this assessment.

In June 1991, soil remediation began at the site using soil vapor extraction (SVE). In October 1991, groundwater remediation began at the site using RSI's remedial system. Remediation was suspended in 1992, apparently due to Desert Petroleum's financial problems.

In 1994 a 280-gallon waste oil UST was removed along with approximately 40 cubic yards of contaminated soil and in 1998 the 4,000-gallon gasoline UST was removed along with approximately 40 cubic yards of contaminated soil.

Reportedly the site has been monitored on a quarterly basis since May 1990, monitoring was discontinued in 1999. A Corrective Action Plan for the site was prepared in February 1995.

Beginning in 1995, hydrocarbon concentrations started to rise and free hydrocarbons appeared in monitoring well RS-1. During interim free-product removal, between October and December 1996, 30.4 gallons of gasoline and 1,077 gallons of contaminated groundwater were removed from monitoring well RS-1.

In March 1999, Western Geo-Engineers of Woodland, California prepared a quarterly groundwater monitoring report and subsurface conduit study for the site. This subsurface conduit study identified a sewer line that was partially submerged below the typical depth to groundwater at the site. This sewer line could potentially act as a conduit for migration of groundwater contamination.

A Report for Soil and Groundwater Assessment was prepared by Agua Science Engineers, Inc in May 24, 2000 which documented further delineation of the soil and groundwater contamination extent in the off-site area.

“Out-of-compliance” correspondence dated June 18, 2009, was issued by Alameda County Environmental Health Services (ACEHS) for the site; this letter

was related to a workplan dated December 7, 2000 for installation of five monitoring wells in both on- and off-site areas where elevated concentrations of fuel hydrocarbons had been detected.

Between July 29 and August 18, 2011 two underground storage tanks (USTs), one 10,000-gallon and one 3,000-gallon capacity, were excavated and disposed of off-site. During this event, associated fuel piping was also excavated and disposed of off-site. Depth to the bottom of excavation pit was recorded at 11.5 feet bgs. The UST pit and trenches were not backfilled to grade with clean (imported) fill material or resurfaced because the owner indicated he intends to install new USTs and piping in the near future. The UST pit was lined and backfilled with existing material and concrete rubble. The site is currently fenced in, which limits public access to the property. Confirmation soil samples were collected from beneath removed USTs and associated piping. Two groundwater samples were collected from the UST pit. It appeared that soil and groundwater contamination still exists in the area of removed USTs, as illustrated by levels of chemicals of concern (COCs) in excess of Environmental Screening Levels (ESLs). Lesser soil contamination exists in the area beneath the removed fuel piping.

On March 15 and 16, 2012, under SOMA's oversight, Fisch Drilling (Fisch) advanced on-site borings CPT/MIP-1 and CPT/MIP-2, and borings DPT-1 through DPT-4. Borings DPT-1 and DPT-2 were advanced adjacent to CPT/MIP-1 and CPT/MIP-2. Boring DPT-1 was renamed CPT/DPT-1 and was continuously logged to verify the CPT obtained data. Based on results of this sampling it appeared that soil and groundwater contamination still exists in the area of removed USTs and in the explored downgradient (off-site) areas. In order to address residual soil contamination, SOMA proposed conducting a shallow soil excavation in the vicinity of former USTs.

In October 2012, based on chemical concentrations in soil, an interim remedial excavation to address the residual contamination in the area of the former USTs was implemented. As part of this remedial excavation an area of approximately 1,200 square feet was excavated to approximately 12 feet bgs and then deepened to approximately 15 feet bgs based on soil discoloration and field PID readings. Approximately 788.65 tons of excavated soils were disposed of at an approved disposal facility and excavation pit was backfilled with clean fill material. Prior to backfill placement confirmation soil samples were collected from the bottom and sidewalls of excavation (where feasible); once backfilled the area was resurfaced with asphalt and concrete, as appropriate. Two groundwater monitoring wells RS-1 and RS-2 were located near or inside the footprint of the excavation, and as required were decommissioned prior to the initiation of excavation activities at the site

In December 2012, SOMA submitted a workplan for additional investigation, well replacement and (multi-phase extraction) MPE pilot testing. This workplan was

approved by the San Francisco Bay regional water quality Control board (SF RWQCB) on April 3, 2013. In May 2013, two replacement wells (MW-1 and MW-2) and two soil borings next to each other (DPT-5 and DPT-5W) for collection of soil and groundwater samples were installed. Results were documented in SOMA's report 'Additional Investigation and Monitoring Wells Replacement Report' dated September 13, 2013.

APPENDIX B

BAAQMD and Groundwater Discharge Permits

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

October 16, 2013

SOMA Environmental Engineering, Inc
6620 Owens Dr, Suite A
Pleasanton, CA 94588

Attention: Erica Fisker

Application Number: 25513
Plant Number: 19396
Equipment Location:
335 So Norfolk Street
San Mateo, CA 94403

Dear Applicant:

SUBJECT: CHANGE OF PERMIT CONDITIONS

This letter is to advise you that your application for changes in permit conditions for the following equipment has been approved:

S-1 Portable Soil Vapor Extraction System

Operation of this equipment will be subject to permit condition no. 23387 which is attached. If you have any questions regarding this matter, please call **Flora W Chan, Air Quality Engineer II at (415) 749-4630**.

Very truly yours

Jim Karas, P.E.
Director of Engineering

by _____
Air Quality Engineering Manager

BGY:FWC
Attachment: Permit Condition no. 23387

1. The operator of this source shall notify the District at least 3 days prior to start-up of operation at any new location. The notification shall include:
   a. Application Number (25513, 23258, 19214, 15435) and Plant Number (19396, 18119)
   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 Permit Services 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: Regulation 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.

4. This equipment is not to be operated within 1000 feet of the outer boundary of any K-12 school. Such operation will require the submittal of an application for a revised permit to operate so that the applicable requirements of the California Health and Safety Code Section 42301.6 may be met. These notification requirements have been satisfied for operation at the 2001 Sir Francis Drake Boulevard in Fairfax and 2844 Mountain Boulevard,Oakland,CA 94602 [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.

6. Precursor Organic Compound (POC) emissions from Source S-1 shall be abated by Abatement device A-1, Thermal Oxidizer, Catalytic Oxidizer or Carbon adsorption,

during all periods of operation. Soil vapor flow rate shall not exceed 250 scfm. [Basis: Regulation 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 hexane). 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 hexane). In no event shall benzene emissions to the atmosphere exceed 0.250 pounds per day. Annual emissions of benzene shall not exceed 3.8 pounds per year.

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

9. To determine compliance with Condition Number 8, the dual-mode 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 thermal/catalytic oxidizer at any new location, and within 24 hours of conversion from thermal to catalytic mode at an existing location, the operator of this source shall:
    a. Analyze the inlet gas 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 outlet 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 Permit Services 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 treatment operation at a given location, the operator of this source shall provide the assigned Plant Engineer in the Permit Services 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 conditions 10 above (indicated in pounds).

12. During operation of the Activated Carbon Vessels, the operator of this source shall monitor with a photo-ionization detector (PID), flame-ionization detector (FID), or other method approved in writing by the District's Source Test Manager at the following locations:
    a. At the inlet to the second to last Carbon vessel in series.
    b. At the inlet to the last Carbon vessel in series.
    c. At the outlet of the Carbon vessel that is last in series prior to venting to the atmosphere.

    When using an FID to monitor breakthrough, readings may be taken with and without a Carbon filter tip fitted on the FID probe. Concentrations measured with the Carbon filter tip in place shall be considered methane for the purposes of these permit conditions.

13. These monitor readings shall be recorded in a monitoring log at the time they are taken. The monitoring results shall be used to estimate the frequency of Carbon change

out necessary to maintain compliance with conditions number 14 and 15, and shall be conducted on a daily basis. The operator of this source may propose for District review, based on actual measurements taken at the site during operation of the source, that the monitoring schedule be changed based on the decline in organic emissions and/or the demonstrated breakthrough rates of the carbon vessels. Written approval by the District's Engineering Division must be received by the operator prior to a change to the monitoring schedule.

14. The second to last Carbon vessel shall be immediately changed out with unspent carbon upon breakthrough, defined as the detection at its outlet in excess of the higher of the following limits:
    a. 10 % of the inlet stream concentration to the carbon bed.
    b. 10 ppmv (measured as hexane).
15. The last Carbon vessel shall be immediately changed out with unspent Carbon upon detection at its outlet of 10 ppmv or greater (measured as hexane).
16. The operator of this source shall maintain the following information for each month of operation of the Activated Carbon Vessels:

    a. Hours and time of operation.
    b. Each emission test, analysis or monitoring results logged in for the day of operation they were taken.
    c. The number of Carbon vessels removed from service.

    Such records shall be retained and made available for inspection by the District for two years following the date the data is recorded. [basis: Reg.523]

17. Within 30 days after the end of every calendar year, the operator of this source shall provide the assigned Plant Engineer in the Permit Services 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: Regulation 1-523]

18. The operator shall maintain a file containing all measurements, records and other data that are required to be collected pursuant to the 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: Regulation 1-523]

19. 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

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

August 14, 2013

SOMA Environmental Engineering, Inc
6620 Owens Dr, Suite A
Pleasanton, CA 94588

Attention: **Ruchi Mathur**

Application Number :**25513**
Plant No. :**19396**
Equipment Location :
SOMA Environmental Engineering, Inc
335 So Norfolk Street
San Mateo, CA 94403

Dear Applicant:

Subject: Portable Dual Phase Extraction System

We are pleased to inform you that the District has made a preliminary decision to approve your application. However, because this project is subject to the public notice requirements of Regulation 2-1-412, a final decision on your application cannot be made until the end of the Public Notice period and the District has had time to review and consider all comments.

Please include your application number with any correspondence with the District. If you have any questions on this matter, please call **Flora W Chan at (415) 749-4630.**

CC: FWC

EAST BAY
MUNICIPAL UTILITY DISTRICT

CERTIFIED MAIL
(Return Receipt Requested)
Certified Mail No.7005 2570 0000 6630 3888

July 24, 2012

Mansour Sepehr
President
SOMA Environmental Engineering, Inc.
6620 Owens Drive, Suite A
Pleasanton, CA 94588

Dear Mr. Sepehr:

Re: **Wastewater Special Discharge Permit No. 05928020**
Discharge Location: 2844 Mountain Blvd., Oakland, CA

Enclosed is the Special Discharge Permit for SOMA Environmental Engineering, Inc. for your information and records. Please read the Permit terms and conditions and the enclosed *Special Discharge Permit Standard Terms and Conditions,* July 2010 Edition. As a Permit holder, you are legally responsible for complying with all Permit conditions and requirements. Your permit expires on July 31, 2014.

SOMA Environmental Engineering, Inc. shall report to the Wastewater Environmental Services Division any changes, permanent or temporary, to the premises or operations that significantly affect the quality or volume of the permitted discharge or deviate from the terms and conditions under which the Permit was granted.

If you have any questions regarding this Permit, please contact Laurice Brown of the Wastewater Environmental Services Division at (510) 287-1613.

Sincerely,

SOPHIA D. SKODA
Acting Manager of Wastewater Environmental Services

SDS:LLB:llb

Enclosures

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EBMUD

SPECIAL DISCHARGE PERMIT

PERMIT NUMBER 05928020

APPLICANT FORM

APPLICANT BUSINESS NAME	SIC CODE
SOMA ENVIRONMENTAL ENGINEERING, INC.	

ADDRESS OF SITE DISCHARGING WASTEWATER	APPLICANT MAILING ADDRESS
2844 MOUNTAIN BLVD. (STREET ADDRESS)	6620 OWENS DR, SUITE A (STREET ADDRESS)
OAKLAND (CITY) 94602 (ZIP CODE)	PLEASANTON (CITY) 94588 (ZIP CODE)

CONTACT PERSONS

APPLICANT

NAME	TITLE	PHONE NUMBER
RUCHI MATHUR	STAFF ENGINEER	925-734-6400

CONSULTANT

NAME	TITLE	PHONE NUMBER
MANSOUR SEPEHR	PRESIDENT	925-734-6400

CONTRACTOR

NAME	TITLE	PHONE NUMBER

CERTIFICATION

I understand that issuance of a Special Discharge Permit does not exempt or preclude the facility from being issued a Discharge Minimization or Pollution Prevention Permit.

I understand that I am legally responsible for discharge of wastewater from the facility and for complying with the Terms and Conditions of this Special Discharge Permit.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that the qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

MANSOUR SEPEHR (NAME) — PRESIDENT (TITLE)

(SIGNATURE (SEE CERTIFICATION REQUIREMENTS ON INSTRUCTIONS)) — 5/22/13 (DATE)

REV. 3/12

SPECIAL DISCHARGE PERMIT

EBMUD PERMIT NUMBER 05928020 **APPLICANT FORM**

Purpose: This information demonstrates the wastewater meets established criteria for a Special Discharge Permit. Check each statement that applies and supply required information.

☑ *Reasonable and cost effective means of recycling and reuse of the wastewater are unavailable.* Provide information describing what means were considered, and why they were not implemented.

This site is funded by LUST cleanup fund and hence is under tight budget for groundwater cleanup.

☑ *The wastewater is unsuitable for discharge to the storm sewer.* Provide explanation.

This is a UST site where contaminated groundwater (GW) has been impacted by petroleum hydrocarbons. This is a remedial effort to extract, treat and discharge impacted GW.

☑ *The wastewater is generated only within the SD-1 wastewater service area.* Provide location.

2844 Mountain Blvd., Oakland - 94602

☑ *The wastewater meets source criteria.* Describe the source and operations generating the wastewater. Include the Wastewater Source Category from Special Discharge Permit Standard Terms and Conditions, Section A, II.

Groundwater extracted during a 2-week multi-phase extraction(MPE) event at the site will be treated through two 55-gallon granular activated carbon (GAC) drums connected in series prior to discharge. Source category (f):Other Sources for temporary discharge.

☑ *The wastewater is discharged during a limited period of time.*

Maximum Discharge Duration: 1 Year days Start Date: July2013 Hours of Discharge: upto 12 hrs/day

Wastewater volume and flow will not exceed 100 gals/minute.

Total Discharge Volume: approx. 40,000 gallons

☑ *Discharge to the sanitary sewer during a rain even may be prohibited.* Describe containment capacity during a 10-year rain event (3.16 inches of rainfall in a 24-hour period).

No MPE event will be conducted during rain and hence no discharge will occur.

☐ *The side sewer through which the wastewater is discharged has been identified.* Applicant is responsible for obtaining local permits to use manholes or cleanouts for discharge.

Attach a site diagram. Show facility location, property lines, wastewater source, drainage plumbing, the side sewer, and sampling location.

☑ *Known and potential pollutants present in the wastewater are characterized.*

Attach a summarized list of all pollutant concentrations present in the wastewater. Also include the complete certified laboratory analytical report. See attached list, table and lab report.

☑ *Treatment technology or best management practices have been identified that will result in the wastewater meeting discharge limits, and sediment or silt does not enter collection system.*

1) Describe pretreatment or best management practices that will be used to ensure the wastewater discharge complies with Ordinance No. 311A-03 wastewater discharge limits or permit-specific limits as necessary.

Extracted groundwater from site monitoring/remediation wells will be pretreated through two 55-gallon GAC drums connected in series. The final effluent from these drums will be sampled and sent to the laboratory for analysis to demonstrate compliance.

2) Attach a schematic flow diagram of the pretreatment system. The diagram must accurately depict the pretreatment system as constructed. Field deviation from the diagram is not allowed, unless pretreatment system modifications are approved and the permit revised prior to the discharge.

See attached Figure 2.

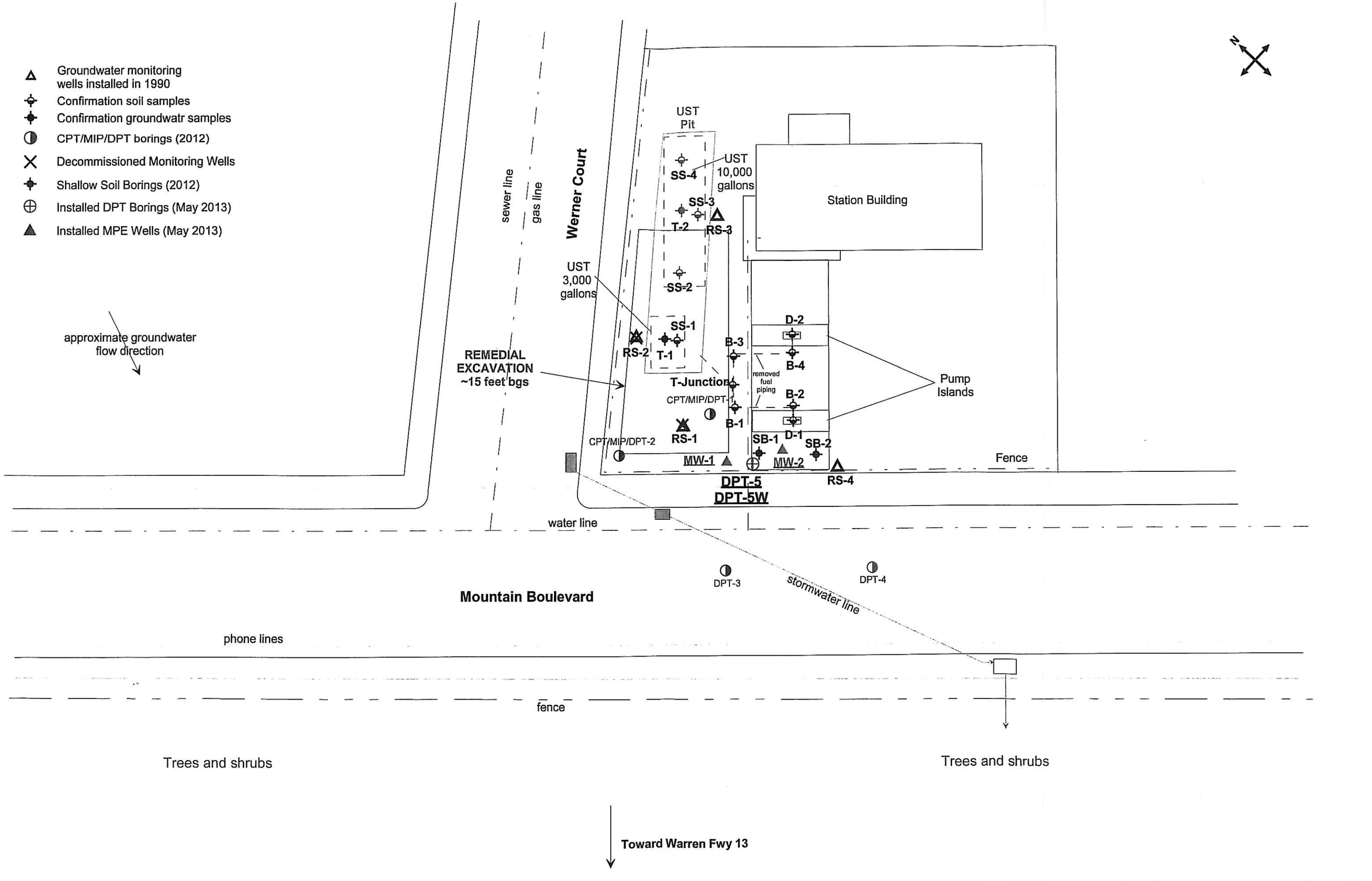
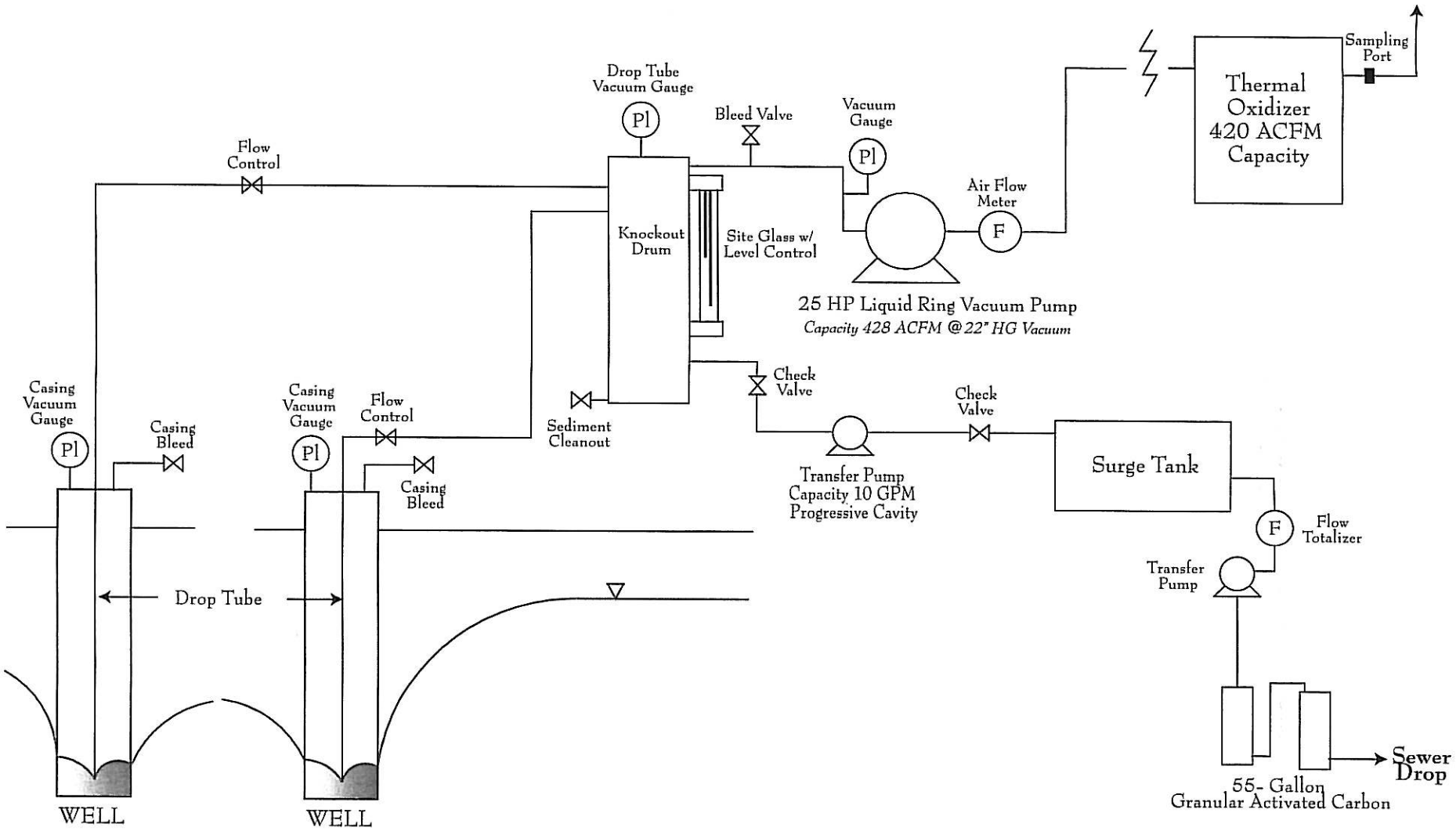


Figure 1: Site map showing locations of site wells at 2844 Mountain Blvd, Oakland



Not to Scale

Figure 2: MTS Process Schematic

ENVIRONMENTAL ENGINEERING, INC.

EBMUD

SPECIAL DISCHARGE PERMIT
Terms and Conditions

Permit Number 05928020 SOMA Environmental Engineering, Inc.

GENERAL CONDITIONS

I. SOMA Environmental Engineering, Inc. shall comply with all items of the attached Special Discharge Permit Standard Terms and Conditions.

II. SOMA Environmental Engineering, Inc. shall discharge Special Discharge wastewater only from the specific source described in the *Special Discharge Permit Standard Terms & Conditions* as **other sources**. This permit is for the discharge of wastewater generated from excavation and remediation activities located at 2844 Mountain Blvd., Oakland, CA.

III. SOMA Environmental Engineering, Inc. shall immediately cease discharge of treated Special Discharge wastewater if not in compliance with any of the terms and conditions of this Special Discharge Permit.

IV. This Special Discharge Permit is considered a **waiver** of EBMUD Ordinance No. 311, prohibiting:

- Discharge of wastewater directly into a manhole or other opening into the community sewer system.
- Discharge of stormwater, drainage water, and groundwater to the community sewer.

V. SOMA Environmental Engineering, Inc. shall not discharge Special Discharge wastewater after this Permit expiration date.

COMPLIANCE REQUIREMENTS

I. SOMA Environmental Engineering, Inc. shall pretreat or manage all Special Discharge wastewater sufficient to achieve compliance with the limits established in this Special Discharge Permit. Pretreatment shall be according to Figure 2: MTS Process Schematic diagram submitted by SOMA Environmental Engineering, Inc.

II. SOMA Environmental Engineering, Inc. shall post a sign in the discharge area stating, "All Wastewater Discharge must comply with the Special Discharge Permit."

III. SOMA Environmental Engineering, Inc. shall not discharge to the sanitary sewer during a rain event or within 24-hours after a rain event, which is defined as any precipitation greater than a drizzle.

IV. SOMA Environmental Engineering, Inc. shall not discharge wastewater at a flow rate greater than 100 gallons per minute.

V. All discharge shall be through a totalizing flow meter and logged with date, time, and volume of each discharge and signed by Site Manager.

VI. SOMA Environmental Engineering, Inc. is responsible for obtaining local permits or approval from the City of Oakland for the use of manholes, cleanouts, and/or side sewers for the discharge of Special Discharge wastewater.

WASTEWATER DISCHARGE LIMITS

SOMA Environmental Engineering, Inc. shall not discharge Special Discharge wastewater into the community sewer if the strength of the wastewater exceeds EBMUD Wastewater Control Ordinance Discharge Limits.

EBMUD

SPECIAL DISCHARGE PERMIT
Terms and Conditions

Permit Number 05928020

MONITORING AND REPORTING REQUIREMENTS

I. Permit Holder shall monitor wastewater discharge operations to ensure compliance with the terms and conditions of this Special Discharge Permit. Sampling of discharge has been submitted and meets EBMUD limits. Data submitted includes analyses for Purgeable Organics (BTEX), Volatile Organics (VOCs), and Oil and Grease Hydrocarbon (HC). EBMUD reserves the right to require additional testing if the site work warrants.

II. SOMA Environmental Engineering, Inc. shall submit discharge logs including dates, times, volumes and signature of Site Manager including the authorized signature and certification statement to EBMUD. **The logs are due quarterly based on a calendar year.**

INSPECTIONS

The District may conduct random, unannounced inspections to verify compliance with the terms and conditions of this Special Discharge Permit. SOMA Environmental Engineering, Inc. shall grant District personnel access to the facility and discharge logs to conduct inspections and collect Special Discharge Wastewater samples.

ENFORCEMENT AND PENALTIES

Failure to comply with the terms and conditions of this Special Discharge Permit and *Special Discharge Permit Standard Terms and Conditions* may result in enforcement actions, including violation follow-up fees, civil enforcement penalties, and administrative fines of up to $5,000 per day.

RATES AND CHARGES

This Special Discharge Permit may be amended to include changes to rates and charges that may be established by the District during the term of this Special Discharge Permit. The discharge shall be charged $0.02 per gallon for the entire volume of discharge and the permit fee is $995.

AUTHORIZATION

Special Discharger SOMA Environmental Engineering, Inc. is hereby authorized to discharge Special Discharge Wastewater to the community sewer subject to compliance with EBMUD Wastewater Control Ordinance, Special Discharge Permit Terms and Conditions, and billing conditions.

Effective: August 4, 2013

Expires: July 31, 2014

Director, Wastewater Department — Date: 8/4/13

APPENDIX C

MPE Pilot Test Field Data Sheets

Golden Gate Remediation Technology

ADDRESS: 2844 Mountain Blvd., Oakland
PROJECT #: 5084

MTS OPERATIONAL DATA

DATE	TIME	OXIDIZER TEMPERATURE (F)	PUMP/AIR TEMPERATURE (F)	STINGER VACUUM (IN-Hg)	PUMP VACUUM (IN-Hg)	TOTAL FLOW (SCFM)	DILUTION FLOW (SCFM)	WELL FLOW (SCFM)	INFLUENT CONCENTRATION (PPMV)	WATER TOTALIZER
12/2/2013	1300	Begin extraction from MW-1								
	1330	1520	170	22.7	25	70	0	70	8,780	0
	1430	1511	170	22.7	25	70	0	70	6,030	
	1530	1514	170	22.9	25	70	0	70	inf=4,510; eff=2	
	1630	1507	170	22.9	25	70	0	70	3,810	23
12/3/2013	900	1526	170	22.7	25	70	0	70	7,470	
	1000	1521	170	22.7	25	70	0	70	6,720	
	1100	1515	170	22.7	25.1	68	0	68	5,290	
	1200	1532	170	22.8	25	70	0	70	2,510	
	1300	1523	170	22.9	24.9	71	0	71	2,310	
	1400	1509	170	22.6	24.7	74	0	74	2,910	
	1500	1517	170	22.6	24.7	74	0	74	2,720	
	1600	1510	171	22.5	24.9	71	0	71	2,430	
12/4/2013	900	1505	171	22.5	24.9	71	0	71	2,390	177
	1000	1509	171	22.5	24.9	71	0	71	2,360	
	1100	1515	171	22.5	25	70	0	70	2,340	
	1200	1499	171	22.7	25	70	0	70	2,320	
	1300	1506	171	22.7	25	70	0	70	2,300	
	1400	1502	171	22.7	25	70	0	70	2,280	
	1500	1501	170	22.7	24.8	73	0	73	2,270	
	1600	1498	170	22.6	24.8	73	0	73	2,250	
12/5/2013	900	1520	170	23	25	70	0	70	2,210	286
	1000	1509	170	22.8	25	70	0	70	2,170	
	1100	1502	170	22.8	25.1	68	0	68	2,150	
		Extraction from MW-2								
	1200	1540	170	23	25.1	68	0	68	6,070	
	1300	1495	170	23	25.1	68	0	68	4,810	
	1400	1499	170	23	25.1	68	0	68	3,490	
	1500	1508	170	23	25	70	0	70	3,150	
	1600	1502	170	23	25	70	0	70	2,720	

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Golden Gate Remediation Technology

ADDRESS: 2844 Mountain Blvd., Oakland
PROJECT #: 5084

MTS OPERATIONAL DATA

DATE	TIME	OXIDIZER TEMPERATURE (F)	PUMP/AIR TEMPERATURE (F)	STINGER VACUUM (IN-Hg)	PUMP VACUUM (IN-Hg)	TOTAL FLOW (SCFM)	DILUTION FLOW (SCFM)	WELL FLOW (SCFM)	INFLUENT CONCENTRATION (PPMV)	WATER TOTALIZER
12/6/2013	900	1505	170	23	25.1	68	0	68	1,790	403
	1000	1487	170	22.9	25	70	0	70	1,720	
	1100	1503	170	23	25	70	0	70	1,560	
	1200	1499	170	23	25	70	0	70	1,621	
	1300	1495	170	23.1	24.8	73	0	73	1,350	
	1400	1498	170	22.8	24.5	77	0	77	1,324	
	1500	1502	170	22.9	24.5	77	0	77	1,305	
	1600	1501	170	22.1	24.5	77	0	77	1,392	
12/7/2013	900	1520	170	21.2	25	70	0	70	1,060	521
	1030	1505	169	21.2	25.1	68	0	68	1,044	
	1200	1508	169	22.2	25.1	68	0	68	955	
	1330	1502	170	22.2	25.1	68	0	68	982	
	1500	1499	170	23	25	70	0	70	984	
	1630	1501	169	23	25	70	0	70	768	
12/8/2013	900	1509	169	23.1	25	70	0	70	830	698
	1030	1502	170	23.2	25	70	0	70	770	
	1200	1505	170	23.3	25.1	68	0	68	540	
	1330	1499	171	23	25.1	68	0	68	496	
	1500	1501	170	23	25.1	68	0	68	712	
	1630	1506	170	22.8	25	70	0	70	695	
12/9/2013	900	1498	170	21.8	25.2	66	0	66	684	816
	1000	1502	170	21.8	25.1	68	0	68	651	
		Extraction from RS-4								
	1100	1509	169	22.3	25.3	65	0	65	588	
	1200	1501	169	22.3	25.5	62	0	62	679	
	1300	1498	170	22.2	25.5	62	0	62	711	
	1400	1502	171	21.5	25.3	65	0	65	692	
	1500	1499	170	21.3	25.4	63	0	63	679	
	1600	1505	170	21.4	25.4	63	0	63	632	
12/10/2013	900	1499	169	22.3	25.1	68	0	68	515	955
	1000	1502	169	22.3	25	70	0	70	499	
	1100	1505	170	22.3	25.1	68	0	68	502	

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Golden Gate Remediation Technology

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MTS OPERATIONAL DATA

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	1200	1501	170	22.3	25.1	68	0	68	485	
	1300	1506	170	22.2	24.8	73	0	73	446	
	1400	1499	170	22.5	25	70	0	70	435	
	1500	1504	171	22.4	25	70	0	70	432	
	1600	1501	171	22.4	25	70	0	70	419	
12/11/2013	900	1499	169	22.3	24.7	74	0	74	379	1,071
	1000	1504	169	22.3	24.7	74	0	74	362	
	1100	1501	170	22.3	24.8	73	0	73	349	
	1200	1503	171	22.3	24.8	73	0	73	338	
	1300	1498	171	22.3	24.8	73	0	73	331	
	1400	1505	171	22.1	24.8	73	0	73	345	
	1500	1509	171	22	24.8	73	0	73	336	
	1600	1512	171	22	24.7	74	0	74	335	
12/12/2013	800	1508	170	22.1	24.8	73	0	73	291	1,193
	900	1501	171	23	25	70	0	70	271	
		Extraction from RS-3								
	1000	1509	169	24.8	25.4	63	0	63	156	
	1100	1499	170	25	25.4	63	0	63	88	
	1200	1504	170	24.7	25.4	63	0	63	46	
		Extraction from MW-1 and MW-2								
	1300	1507	172	19.4	23.1	100	0	100	2,700	
	1400	1502	172	19.6	23.1	100	0	100	1,558	
	1500	1506	171	19.5	22.9	103	0	103	1,381	
	1600	1503	171	19.2	22.6	108	0	108	958	
12/13/2013	900	1504	170	19.1	22.1	116	0	116	646	1,596
	1000	1507	170	19	22.1	116	0	116	621	
	1100	1509	171	19.2	22.1	116	0	116	651	
	1200	1502	172	19.1	22	117	0	117	632	
	1300	1508	172	18.9	22	117	0	117	621	
	1400	1499	173	18.6	22	117	0	117	702	
	1500	1507	172	18.2	22	117	0	117	679	
	1600	1505	172	18.2	22	117	0	117	645	

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Golden Gate Remediation Technology

ADDRESS: 2844 Mountain Blvd., Oakland
PROJECT #: 5084

MTS OPERATIONAL DATA

DATE	TIME	OXIDIZER TEMPERATURE (F)	PUMP/AIR TEMPERATURE (F)	STINGER VACUUM (IN-Hg)	PUMP VACUUM (IN-Hg)	TOTAL FLOW (SCFM)	DILUTION FLOW (SCFM)	WELL FLOW (SCFM)	INFLUENT CONCENTRATION (PPMV)	WATER TOTALIZER
12/14/2013	930	1520	171	19	22	117	0	117	725	1,720
	1100	1520	171	19.2	22.2	114	0	114	642	
	1230	1520	172	19	22.2	114	0	114	630	
	1400	1520	173	19	22	117	0	117	607	
	1530	1520	173	19.3	22.2	114	0	114	648	
	1630	1520	171	19	22.2	114	0	114	590	
12/15/2013	930	1520	171	18	22.1	116	0	116	641	1,889
	1100	1520	172	19	22	117	0	117	603	
	1230	1520	174	19	22	117	0	117	590	
	1400	1520	173	17.3	21.3	128	0	128	590	
	1530	1520	174	18	21.3	128	0	128	580	
	1630	1520	174	17.4	21.1	131	0	131	578	
		Extraction from MW-1, MW-2, and RS-4								
12/16/2013	900	1512	172	16.9	20.8	136	0	136	617	
	1000	1505	172	16.9	20.9	135	0	135	482	
	1100	1509	173	17.1	20.8	136	0	136	504	
	1200	1504	173	17	20.6	139	0	139	482	2,091
		End Extraction								

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Golden Gate Remediation Technology

SITE ADDRESS: 2844 Mountain Blvd., Oakland
PROJECT #: 5084

MTS MONITORING POINT DATA

DATE	TIME	INCREMENTAL TIME	ELAPSED TIME	WELL ID MW-1		WELL ID MW-2		WELL ID RS-3		WELL ID RS-4	
				GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)
12/2/2013	1300	0	0	7.50		7.48		6.82		9.02	
				EXTRACTION WELL							
	1330	30	30	7.55	-	7.58		6.81		9.02	
	1430	60	90	7.57	-	7.73		6.80		9.04	
	1530	60	150	7.58	-	7.85		6.80		9.05	
	1630	60	210	7.58	-	8.16		6.80		9.05	
12/3/2013	900	990	1,200	7.20	-	7.75	0.20	6.85	0.00	9.15	0.20
	1000	60	1,260	14.55	-	7.82	0.20	6.85	0.00	9.15	0.20
	1100	60	1,320	17.78	-	7.90	0.50	6.87	0.00	9.15	0.20
	1200	60	1,380	17.76	-	8.21	0.30	6.87	0.00	9.20	0.20
	1300	60	1,440	17.75	-	8.33	0.30	6.86	0.00	9.20	0.20
	1400	60	1,500	17.77	-	8.44	0.30	6.83	0.00	9.21	0.20
	1500	60	1,560	17.77	-	8.53	0.30	6.80	0.00	9.20	0.20
	1600	60	1,620	17.76	-	8.65	0.30	6.79	0.00	9.20	0.20
12/4/2013	900	1020	2,640	16.90	-	9.40	0.30	6.54	0.00	9.60	0.20
	1000	60	2,700	16.90	-	9.42	0.30	6.54	0.00	9.61	0.20
	1100	60	2,760	16.89	-	9.42	0.30	6.55	0.00	9.61	0.20
	1200	60	2,820	16.89	-	9.43	0.30	6.57	0.00	9.63	0.20
	1300	60	2,880	16.90	-	9.45	0.30	6.58	0.00	9.62	0.20
	1400	60	2,940	16.92	-	9.45	0.30	6.60	0.00	9.64	0.20
	1500	60	3,000	16.92	-	9.46	0.30	6.61	0.00	9.64	0.20
	1600	60	3,060	16.94	-	9.47	0.30	6.63	0.00	9.65	0.20
12/5/2013	900	1020	4,080	17.01	-	9.50	0.30	6.68	0.00	9.65	0.20
	1000	60	4,140	17.00	-	9.51	0.30	6.69	0.00	9.65	0.20
	1100	60	4,200	Added vacuum oil							

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Golden Gate Remediation Technology

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MTS MONITORING POINT DATA

DATE	TIME	INCREMENTAL TIME	ELAPSED TIME	WELL ID MW-1		WELL ID MW-2		WELL ID RS-3		WELL ID RS-4	
				GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)
			4,200			EXTRACTION WELL					
	1200	60	4,260	17.00	0.30	9.50	-	6.69	0.00	9.65	0.30
	1300	60	4,320	14.70	0.30	18.16	-	6.95	0.00	9.32	0.30
	1400	60	4,380	14.73	0.30	18.16	-	6.98	0.00	9.38	0.30
	1500	60	4,440	13.79	0.30	18.17	-	6.91	0.00	9.44	0.30
	1600	60	4,500	12.27	0.20	18.17	-	6.82	0.00	9.58	0.30
12/6/2013	900	1020	5,520	8.44	0.20	18.18	-	6.62	0.00	10.75	0.30
	1000	60	5,580	8.44	0.20	18.19	-	6.67	0.00	10.76	0.20
	1100	60	5,640	8.44	0.20	18.20	-	6.70	0.00	10.73	0.20
	1200	60	5,700	8.44	0.20	18.21	-	6.73	0.00	10.74	0.20
	1300	60	5,760	8.43	0.20	18.21	-	6.64	0.00	10.76	0.20
	1400	60	5,820	8.42	0.20	18.21	-	6.58	0.00	10.77	0.20
	1500	60	5,880	8.43	0.20	18.22	-	6.62	0.00	10.77	0.20
	1600	60	5,940	8.44	0.20	18.22	-	6.67	0.00	10.77	0.20
12/7/2013	1030	1110	7,050	8.20	0.20	18.10	-	6.10	0.00	10.60	0.40
	1200	90	7,140	8.20	0.20	18.10	-	6.20	0.00	10.60	0.40
	1330	90	7,230	8.20	0.20	18.10	-	6.15	0.00	10.60	0.30
	1500	90	7,320	8.20	0.20	18.10	-	6.10	0.00	10.60	0.30
	1630	90	7,410	8.20	0.20	18.10	-	6.10	0.20	10.55	0.40
12/8/2013	1000	1050	8,460	8.10	0.20	18.10	-	6.30	0.20	10.55	0.40
	1130	90	8,550	8.13	0.20	18.10	-	6.20	0.20	10.53	0.40
	1300	90	8,640	8.10	0.20	18.10	-	6.30	0.20	10.50	0.40
	1430	90	8,730	8.14	0.20	18.14	-	6.28	0.20	10.50	0.40
	1530	60	8,790	8.12	0.20	18.14	-	6.20	0.20	10.50	0.40
	1630	60	8,850	8.15	0.20	18.15	-	6.20	0.00	10.50	0.40
12/9/2013	900	990	9,840		0.25	18.23	-	6.50	0.00	10.44	0.60
	1000	60	9,900		0.25	18.23	-	6.50	0.00	10.45	0.60

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Golden Gate Remediation Technology

SITE ADDRESS: 2844 Mountain Blvd., Oakland
PROJECT #: 5084

MTS MONITORING POINT DATA

DATE	TIME	INCREMENTAL TIME	ELAPSED TIME	WELL ID MW-1		WELL ID MW-2		WELL ID RS-3		WELL ID RS-4	
				GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)
			9,900							EXTRACTION WELL	
	1100	60	9,960		0.20	16.92	0.50	6.35	0.00	20.44	-
	1200	60	10,020		0.20	16.28	0.40	6.33	0.00	20.79	-
	1300	60	10,080		0.20	15.62	0.40	6.31	0.00	21.17	-
	1400	60	10,140		0.20	13.74	0.40	6.26	0.00	21.20	-
	1500	60	10,200		0.20	13.51	0.30	6.02	0.00	21.19	-
	1600	60	10,260		0.20	13.34	0.30	5.91	0.00	21.18	-
12/10/2013	900	1020	11,280	7.20	0.20	9.27	0.30	6.38	0.00	21.26	-
	1000	60	11,340	7.20	0.20	9.26	0.30	6.35	0.00	21.41	-
	1100	60	11,400	7.20	0.20	9.26	0.30	6.32	0.00	21.62	-
	1200	60	11,460	7.19	0.20	9.23	0.30	6.35	0.00	21.51	-
	1300	60	11,520	7.17	0.20	9.19	0.30	6.37	0.00	21.19	-
	1400	60	11,580	7.14	0.20	9.16	0.30	6.41	0.00	21.17	-
	1500	60	11,640	7.11	0.20	9.12	0.30	6.43	0.00	21.14	-
	1600	60	11,700	7.10	0.20	9.11	0.30	6.45	0.00	21.15	-
12/11/2013	900	1020	12,720	7.02	0.20	8.86	0.30	6.31	0.00	21.22	-
	1000	60	12,780	7.01	0.20	8.82	0.30	6.31	0.00	21.44	-
	1100	60	12,840	7.00	0.20	8.73	0.30	6.30	0.00	21.79	-
	1200	60	12,900	7.00	0.20	8.74	0.30	6.42	0.00	21.32	-
	1300	60	12,960	6.97	0.20	8.81	0.30	6.39	0.00	21.34	-
	1400	60	13,020	6.98	0.20	8.87	0.30	6.36	0.00	21.17	-
	1500	60	13,080	6.98	0.20	8.88	0.30	6.31	0.00	21.19	-
	1600	60	13,140	6.98	0.20	8.90	0.30	6.27	0.00	21.20	-
12/12/2013	800	960	14,100	6.70	0.20	8.87	0.20	6.31	0.00	21.18	-
	900	60	14,160	6.71	0.20	8.85	0.20	6.39	0.00	21.21	-

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Golden Gate Remediation Technology

SITE ADDRESS: 2844 Mountain Blvd., Oakland
PROJECT #: 5084

MTS MONITORING POINT DATA

DATE	TIME	INCREMENTAL TIME	ELAPSED TIME	WELL ID MW-1		WELL ID MW-2		WELL ID RS-3		WELL ID RS-4	
				GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)
			14,160					**EXTRACTION WELL**			
	1000	60	14,220	7.02	0.10	8.68	0.00	21.40	-	21.41	0.00
	1100	60	14,280	7.04	0.10	8.80	0.00	21.41	-	20.05	0.00
	1200	60	14,340	7.02	0.10	8.80	0.00	21.37	-	19.21	0.00
			14,340	**EXTRACTION WELLS**							
	1300	60	14,400	15.50	-	15.27	-	15.58	0.00	20.00	3.05
	1400	60	14,460	15.59	-	15.25	-	15.60	0.00	20.00	3.05
	1500	60	14,520	15.67	-	15.24	-	10.52	0.00	18.65	3.05
	1600	60	14,580	15.68	-	15.25	-	10.51	0.00	18.92	3.05
12/13/2013	900	1020	15,600	15.70	-	15.32	-	5.80	0.00	11.39	3.00
	1000	60	15,660	15.62	-	15.26	-	5.82	0.00	11.34	3.00
	1100	60	15,720	15.61	-	15.27	-	5.81	0.00	11.28	3.00
	1200	60	15,780	15.61	-	15.25	-	5.78	0.00	11.23	3.00
	1300	60	15,840	15.60	-	15.25	-	5.77	0.00	11.23	3.00
	1400	60	15,900	15.63	-	15.25	-	5.77	0.00	11.22	3.00
	1500	60	15,960	15.61	-	15.24	-	5.78	0.00	11.21	3.00
	1600	60	16,020	15.62	-	15.25	-	5.78	0.00	11.21	3.00
12/14/2013	930	1050	17,070	15.50	-	15.15	-	5.85	0.01	10.90	3.00
	1100	90	17,160	15.55	-	15.20	-	5.75	0.01	10.85	3.00
	1230	90	17,250	15.50	-	15.20	-	5.85	0.01	10.85	3.00
	1400	90	17,340	15.55	-	15.20	-	5.75	0.01	10.85	3.00
	1530	90	17,430	15.45	-	15.20	-	5.80	0.01	10.85	3.00
	1630	60	17,490	15.50	-	15.20	-	5.75	0.02	10.85	3.00
12/15/2013	930	990	18,480	15.50	-	15.20	-	5.80	0.02	10.85	3.00
	1100	90	18,570	15.50	-	15.10	-	5.85	0.02	10.85	3.00
	1230	90	18,660	15.50	-	15.20	-	5.83	0.02	10.90	3.00
	1400	90	18,750	15.50	-	15.20	-	5.78	0.02	10.85	3.00
	1530	90	18,840	15.55	-	15.25	-	5.87	0.02	10.90	3.00

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Golden Gate Remediation Technology

SITE ADDRESS: 2844 Mountain Blvd., Oakland
PROJECT #: 5084

MTS MONITORING POINT DATA

DATE	TIME	INCREMENTAL TIME	ELAPSED TIME	WELL ID MW-1		WELL ID MW-2		WELL ID RS-3		WELL ID RS-4	
				GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)	GW ELEVATION (FEET BELOW TOC)	VACCUM (IN WATER)
	1630	60	18,900	15.55	-	15.20	-	5.75	0.02	10.85	3.00
			18,900	**EXTRACTION WELLS**						**EXTRACTION WELLS**	
12/16/2013	900	990	19,890	15.56	-	15.26	-	5.74	0.00	20.92	-
	1000	60	19,950	15.53	-	15.23	-	5.70	0.00	20.93	-
	1100	60	20,010	15.51	-	15.21	-	5.61	0.00	20.95	-
	1200	60	20,070	15.51	-	15.22	-	5.63	0.00	20.96	-

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APPENDIX D

Certified Laboratory Analytical Reports and Chain-Of-Custody Documentation

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 246706
ANALYTICAL REPORT

SOMA Environmental Engineering Inc.
6620 Owens Dr.
Pleasanton, CA 94588

Project : 5084
Location : 2844 Mountain Blvd., Oakland
Level : II

Sample ID	Lab ID
EFFLUENT	246706-001
EFFLUENT	246706-002
EFFLUENT	246706-003

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: Tracy Babjar Date: 07/11/2013

Tracy Babjar
Project Manager
(510) 204-2226

NELAP # 01107CA

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**246706**
Client:	**SOMA Environmental Engineering Inc.**
Project:	**5084**
Location:	**2844 Mountain Blvd., Oakland**
Request Date:	**07/03/13**
Samples Received:	**07/03/13**

This data package contains sample and QC results for three water samples, requested for the above referenced project on 07/03/13. The samples were received cold and intact.

TPH-Extractables by GC (EPA 8015B):
No analytical problems were encountered.

Volatile Organics by GC/MS (EPA 8260B):
EFFLUENT (lab # 246706-001) had pH greater than 2.The samples were not compromised because the pH was taken after the analysis. No other analytical problems were encountered.

Total Oil & Grease (HEM) (EPA 1664A):
Matrix spikes were not performed for this analysis due to insufficient sample volume. No analytical problems were encountered.

CHAIN OF CUSTODY

Curtis & Tompkins, Ltd
Analytical Laboratory Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510)486-0900 Phone
(510)486-0532 Fax

LOGIN # 246706

Sampler: Parsa Motavalli

Project No: 5084

Report To: Joyce Bobek

Project Name: 2844 Mountain Blvd., Oakland

Company : SOMA Environmental

Turnaround Time: Standard

Telephone: 925-734-6400

Fax: 925-734-6401

Lab No.	Sample ID.	Sampling Date Time	Matrix: Soil	Matrix: Water	Matrix: Waste	# of Containers	Preservative: HCL	Preservative: H_2SO_4	Preservative: HNO_3	Preservative: ICE	Analyses: TPH-g, BTEX, MtBE 8260B	Analyses: Gasoline Oxygenates 8260B	Analyses: TPH-d 8015	Analyses: TPH-oil & grease
1	Effluent	7/3/13 10:03		*		3 VOAs	*			*	*	*		
2	Effluent	7/3/13 9:58		*		1- 1 L Amber				*			*	
3	Effluent	7/3/13 9:57		*		1- 1 L Amber	*			*				*

Notes: EDF OUTPUT REQUIRED
GasOx: DIPE, ETBE, TAME, TBA

RELINQUISHED BY:	DATE/TIME	RECEIVED BY:	DATE/TIME
[signature]	7/3/13 10:33 AM	[signature]	7/3/13 10:33 AM
	DATE/TIME		DATE/TIME
	DATE/TIME		DATE/TIME

COOLER RECEIPT CHECKLIST Curtis & Tompkins, Ltd.

Login # 246706 Date Received 7/3/13 Number of coolers 0
Client SOMA Project 2844 Mountain Blvd.

Date Opened 7/3/13 By (print) AM (sign)
Date Logged in ↓ By (print) ↓ (sign) ↓

1. Did cooler come with a shipping slip (airbill, etc)_____ YES (NO)
Shipping info_____

2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples ☐ NO
How many _____ Name_____ Date_____
2B. Were custody seals intact upon arrival? _____ YES NO N/A
3. Were custody papers dry and intact when received?_____ YES NO
4. Were custody papers filled out properly (ink, signed, etc)? _____ YES NO
5. Is the project identifiable from custody papers? (If so fill out top of form)___ YES NO
6. Indicate the packing in cooler: (if other, describe)_____

☐ Bubble Wrap ☐ Foam blocks ☐ Bags ☒ None
☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: ☐ Wet ☐ Blue/Gel ☒ None Temp(°C)_____

☐ Samples Received on ice & cold without a temperature blank; temp. taken with IR gun

☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present?_____ YES (NO)
If YES, what time were they transferred to freezer?_____
9. Did all bottles arrive unbroken/unopened?_____ (YES) NO
10. Are there any missing / extra samples? _____ YES (NO)
11. Are samples in the appropriate containers for indicated tests? _____ (YES) NO
12. Are sample labels present, in good condition and complete? _____ (YES) NO
13. Do the sample labels agree with custody papers? _____ (YES) NO
14. Was sufficient amount of sample sent for tests requested? _____ (YES) NO
15. Are the samples appropriately preserved? _____ (YES) NO N/A
16. Did you check preservatives for all bottles for each sample? _____ YES NO (N/A)
17. Did you document your preservative check? _____ YES NO (N/A)
18. Did you change the hold time in LIMS for unpreserved VOAs? _____ YES NO (N/A)
19. Did you change the hold time in LIMS for preserved terracores? _____ YES NO (N/A)
20. Are bubbles > 6mm absent in VOA samples? _____ (YES) NO N/A
21. Was the client contacted concerning this sample delivery? _____ YES (NO)
If YES, Who was called?_____ By_____ Date:_____

COMMENTS

_____
_____
_____
_____
_____
_____

Rev 10, 11/11

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	246706	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 3520C
Project#:	5084	Analysis:	EPA 8015B
Field ID:	EFFLUENT	Batch#:	200404
Matrix:	Water	Sampled:	07/03/13
Units:	ug/L	Received:	07/03/13
Diln Fac:	1.000	Prepared:	07/05/13

Type: SAMPLE Analyzed: 07/08/13
Lab ID: 246706-002

Analyte	Result	RL
Diesel C10-C24	100 Y	50

Surrogate	%REC	Limits
o-Terphenyl	94	62-133

Type: BLANK Analyzed: 07/07/13
Lab ID: QC696613

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
o-Terphenyl	100	62-133

Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Total Extractable Hydrocarbons

Lab #:	246706	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 3520C
Project#:	5084	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	200404
Units:	ug/L	Prepared:	07/05/13
Diln Fac:	1.000	Analyzed:	07/08/13

Type: BS Cleanup Method: EPA 3630C
Lab ID: QC696614

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,132	85	59-120

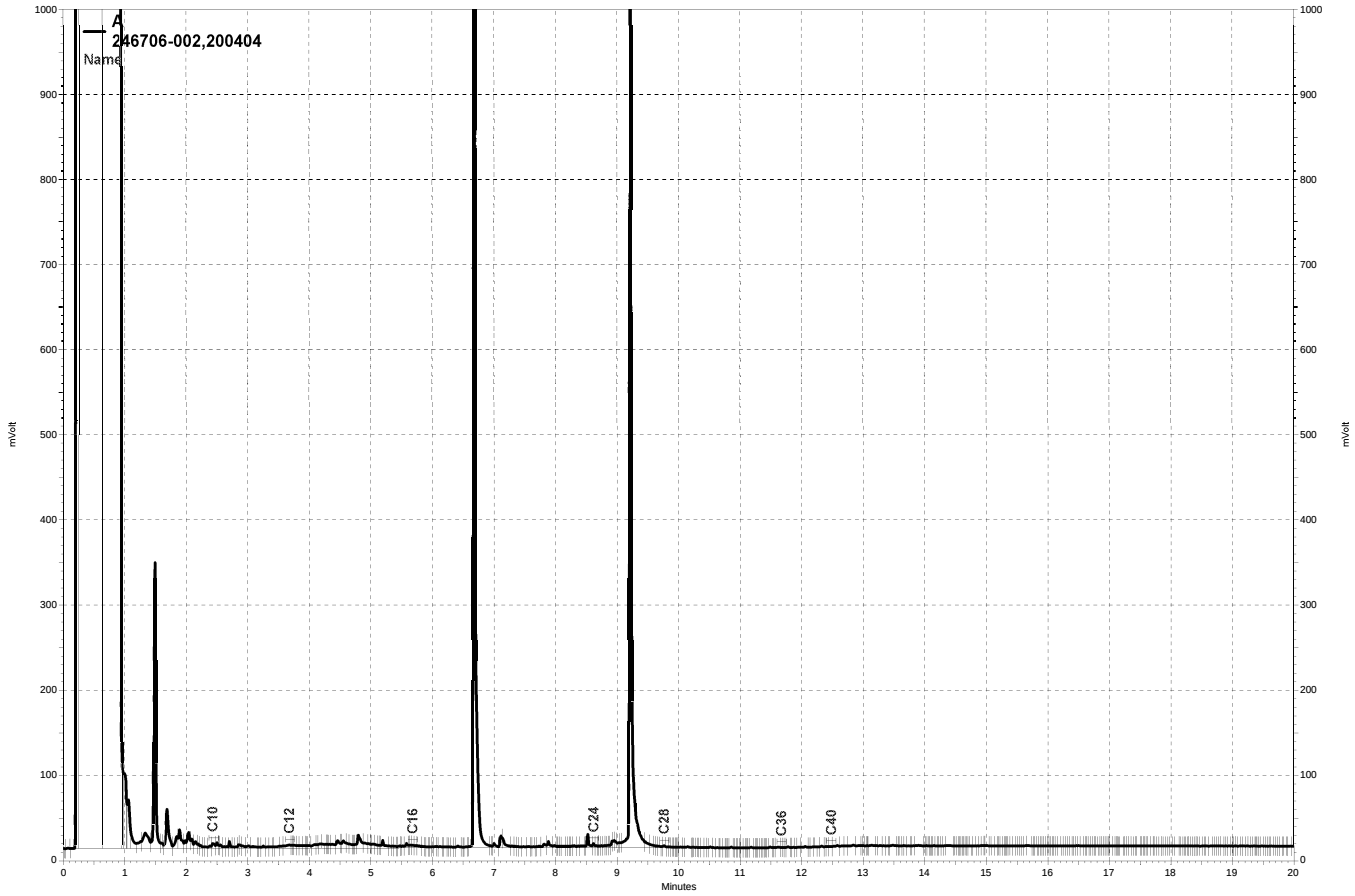
Surrogate	%REC	Limits
o-Terphenyl	104	62-133

Type: BSD Cleanup Method: EPA 3630C
Lab ID: QC696615

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	2,303	92	59-120	8	46

Surrogate	%REC	Limits
o-Terphenyl	113	62-133

RPD= Relative Percent Difference



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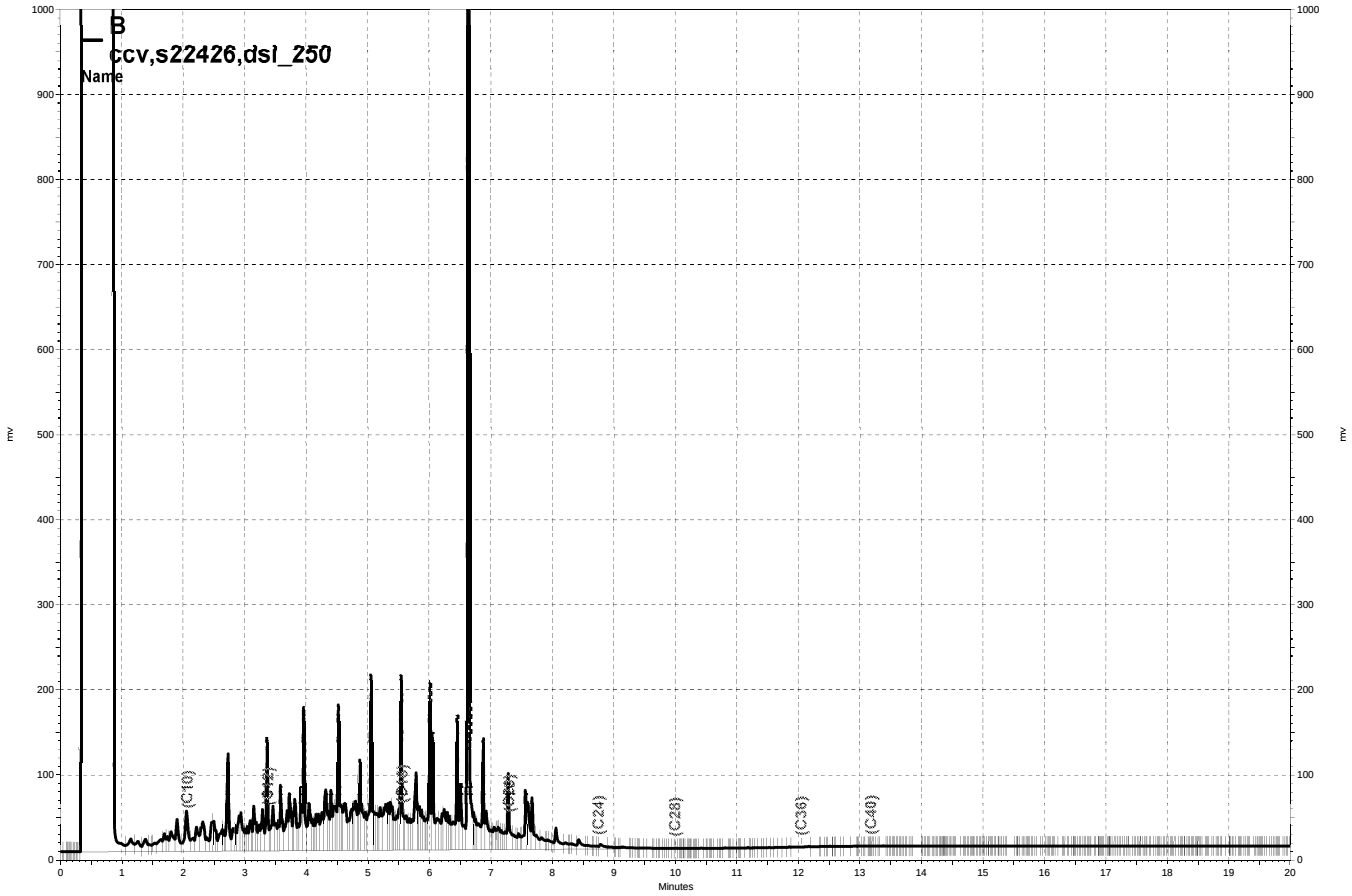

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Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	246706	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5084	Analysis:	EPA 8260B
Field ID:	EFFLUENT	Batch#:	200418
Lab ID:	246706-001	Sampled:	07/03/13
Matrix:	Water	Received:	07/03/13
Units:	ug/L	Analyzed:	07/08/13
Diln Fac:	1.000		

Analyte	Result	RL
Gasoline C7-C12	ND	50
tert-Butyl Alcohol (TBA)	ND	10
Isopropyl Ether (DIPE)	ND	0.50
Ethyl tert-Butyl Ether (ETBE)	ND	0.50
Methyl tert-Amyl Ether (TAME)	ND	0.50
MTBE	ND	0.50
1,2-Dichloroethane	ND	0.50
Benzene	ND	0.50
Toluene	ND	0.50
1,2-Dibromoethane	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	0.50
o-Xylene	ND	0.50

Surrogate	%REC	Limits
Dibromofluoromethane	98	77-134
1,2-Dichloroethane-d4	129	72-140
Toluene-d8	102	80-120
Bromofluorobenzene	113	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	246706	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5084	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	200418
Units:	ug/L	Analyzed:	07/08/13
Diln Fac:	1.000		

Type: BS Lab ID: QC696675

Analyte	Spiked	Result	%REC	Limits
tert-Butyl Alcohol (TBA)	125.0	116.4	93	37-144
Isopropyl Ether (DIPE)	25.00	21.95	88	52-123
Ethyl tert-Butyl Ether (ETBE)	25.00	24.11	96	57-120
Methyl tert-Amyl Ether (TAME)	25.00	24.27	97	59-120
MTBE	25.00	24.70	99	58-120
1,2-Dichloroethane	25.00	29.91	120	73-136
Benzene	25.00	23.37	93	78-125
Toluene	25.00	25.24	101	79-123
1,2-Dibromoethane	25.00	24.04	96	78-120
Ethylbenzene	25.00	26.60	106	80-126
m,p-Xylenes	50.00	49.54	99	80-123
o-Xylene	25.00	23.35	93	75-120

Surrogate	%REC	Limits
Dibromofluoromethane	100	77-134
1,2-Dichloroethane-d4	124	72-140
Toluene-d8	103	80-120
Bromofluorobenzene	115	80-120

Type: BSD Lab ID: QC696676

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
tert-Butyl Alcohol (TBA)	125.0	119.5	96	37-144	3	31
Isopropyl Ether (DIPE)	25.00	21.58	86	52-123	2	20
Ethyl tert-Butyl Ether (ETBE)	25.00	24.00	96	57-120	0	23
Methyl tert-Amyl Ether (TAME)	25.00	24.27	97	59-120	0	22
MTBE	25.00	24.92	100	58-120	1	23
1,2-Dichloroethane	25.00	29.42	118	73-136	2	20
Benzene	25.00	23.49	94	78-125	1	20
Toluene	25.00	25.11	100	79-123	1	20
1,2-Dibromoethane	25.00	24.35	97	78-120	1	20
Ethylbenzene	25.00	26.43	106	80-126	1	20
m,p-Xylenes	50.00	49.09	98	80-123	1	20
o-Xylene	25.00	23.13	93	75-120	1	20

Surrogate	%REC	Limits
Dibromofluoromethane	99	77-134
1,2-Dichloroethane-d4	123	72-140
Toluene-d8	104	80-120
Bromofluorobenzene	114	80-120

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	246706	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5084	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	200418
Units:	ug/L	Analyzed:	07/08/13
Diln Fac:	1.000		

Type: BS Lab ID: QC696677

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	919.6	92	80-120

Surrogate	%REC	Limits
Dibromofluoromethane	100	77-134
1,2-Dichloroethane-d4	128	72-140
Toluene-d8	106	80-120
Bromofluorobenzene	114	80-120

Type: BSD Lab ID: QC696678

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	1,000	889.1	89	80-120	3	20

Surrogate	%REC	Limits
Dibromofluoromethane	95	77-134
1,2-Dichloroethane-d4	116	72-140
Toluene-d8	107	80-120
Bromofluorobenzene	115	80-120

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	246706	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5084	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC696679	Batch#:	200418
Matrix:	Water	Analyzed:	07/08/13
Units:	ug/L		

Analyte	Result	RL
Gasoline C7-C12	ND	50
tert-Butyl Alcohol (TBA)	ND	10
Isopropyl Ether (DIPE)	ND	0.50
Ethyl tert-Butyl Ether (ETBE)	ND	0.50
Methyl tert-Amyl Ether (TAME)	ND	0.50
MTBE	ND	0.50
1,2-Dichloroethane	ND	0.50
Benzene	ND	0.50
Toluene	ND	0.50
1,2-Dibromoethane	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	0.50
o-Xylene	ND	0.50

Surrogate	%REC	Limits
Dibromofluoromethane	96	77-134
1,2-Dichloroethane-d4	113	72-140
Toluene-d8	108	80-120
Bromofluorobenzene	117	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Total Oil & Grease (HEM)

Lab #:	246706	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	5084	Analysis:	EPA 1664A
Analyte:	Oil & Grease (HEM)	Batch#:	200357
Field ID:	EFFLUENT	Sampled:	07/03/13
Matrix:	Water	Received:	07/03/13
Units:	mg/L	Analyzed:	07/03/13

Type	Lab ID	Result	RL	Diln Fac
SAMPLE	246706-003	ND	4.85	0.9700
BLANK	QC696413	ND	5.00	1.000

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Total Oil & Grease (HEM)

Lab #:	246706	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	5084	Analysis:	EPA 1664A
Analyte:	Oil & Grease (HEM)	Diln Fac:	1.000
Matrix:	Water	Batch#:	200357
Units:	mg/L	Analyzed:	07/03/13

Type	Lab ID	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC696414	40.00	36.40	91	78-114		
BSD	QC696415	40.00	39.80	100	78-114	9	18

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 251253
ANALYTICAL REPORT

SOMA Environmental Engineering Inc.	Project : 5084
6620 Owens Dr.	Location : 2844 Mountain Blvd., Oakland
Pleasanton, CA 94588	Level : II

Sample ID	Lab ID
EFF MPE	251253-001
INF MPE	251253-002

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: Tracy Babjar Date: 12/06/2013

Tracy Babjar
Project Manager
tracy.babjar@ctberk.com
(510) 204-2226

NELAP # 01107CA

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**251253**
Client:	**SOMA Environmental Engineering Inc.**
Project:	**5084**
Location:	**2844 Mountain Blvd., Oakland**
Request Date:	**12/02/13**
Samples Received:	**12/02/13**

This data package contains sample and QC results for two air samples, requested for the above referenced project on 12/02/13. The samples were received cold and intact.

Volatile Organics in Air by MS (EPA TO-15):

High response was observed for 2-hexanone in the ICV analyzed 12/04/13 08:12; affected data was qualified with "b". Low responses were observed for naphthalene and 1,2,4-trichlorobenzene in the CCV analyzed 12/04/13 20:32; affected data was qualified with "b". Low recoveries were observed for naphthalene and 1,2,4-trichlorobenzene in the BS for batch 205760; these low recoveries were not associated with any reported results. High RPD was also observed for naphthalene and 1,2,4-trichlorobenzene in the BS/BSD for batch 205760; the high RPD was not associated with any reported results. No other analytical problems were encountered.

Volatile Organics in Air GC (EPA TO-3):

No analytical problems were encountered.

CHAIN OF CUSTODY

Curtis & Tompkins, Ltd.
Analytical Laboratory Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510)486-0900 Phone
(510)486-0532 Fax

C&T LOGIN # 251253

Sampler: Masoud Sepehr

Project No: 5084

Report To: Joyce Bobek

Project Name: 2844 Mountain Blvd., Oakland, CA

Company : SOMA Environmental

Turnaround Time: Standard

Telephone: 925-734-6400

Fax: 925-734-6401

Lab No.	Sample ID.	Sampling Date Time	Matrix: Soil	Matrix: Water	Matrix: Waste	Matrix: Air	# of Containers	Preservative: HCL	Preservative: H_2SO_4	Preservative: HNO_3	Preservative: ICE	Preservative: NONE	Analyses: TO-3	Analyses: TO-15
1	EFF MPE	12,2,13 – 4				*	Tedlar bag					*	*	*
2	INF MPE	↕				*	Tedlar bag					*	*	*

Notes: **EDF OUTPUT REQUIRED**

RELINQUISHED BY:	RECEIVED BY:
12,2,13 – 4 DATE/TIME	12-2-13 5:5 DATE/TIME
DATE/TIME	DATE/TIME
DATE/TIME	DATE/TIME

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 251253 Date Received 12/2/13 Number of coolers 1
Client SOMA ENVIRONMENTAL Project 2844 MOUNTAIN BLVD, OAKLAND, CA (5084)

Date Opened 12/2/13 By (print) JR (sign) Tina Rarka
Date Logged in ↓ By (print) ↓ (sign) ↓

1. Did cooler come with a shipping slip (airbill, etc) ____ YES (NO)
   Shipping info ____
2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples ☒ NO
   How many ____ Name ____ Date ____
2B. Were custody seals intact upon arrival? ____ YES NO (N/A)
3. Were custody papers dry and intact when received? ____ (YES) NO
4. Were custody papers filled out properly (ink, signed, etc)? ____ (YES) NO
5. Is the project identifiable from custody papers? (If so fill out top of form) ____ (YES) NO
6. Indicate the packing in cooler: (if other, describe) ____

☐ Bubble Wrap ☐ Foam blocks ☐ Bags ☒ None
☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: ☐ Wet ☐ Blue/Gel ☒ None Temp(°C) ____

☐ Samples Received on ice & cold without a temperature blank; temp. taken with IR gun

☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? ____ YES (NO)
   If YES, what time were they transferred to freezer? ____
9. Did all bottles arrive unbroken/unopened? ____ (YES) NO
10. Are there any missing / extra samples? ____ YES (NO)
11. Are samples in the appropriate containers for indicated tests? ____ (YES) NO
12. Are sample labels present, in good condition and complete? ____ (YES) NO
13. Do the sample labels agree with custody papers? ____ (YES) NO
14. Was sufficient amount of sample sent for tests requested? ____ (YES) NO
15. Are the samples appropriately preserved? ____ YES NO (N/A)
16. Did you check preservatives for all bottles for each sample? ____ YES NO (N/A)
17. Did you document your preservative check? ____ YES NO (N/A)
18. Did you change the hold time in LIMS for unpreserved VOAs? ____ YES NO (N/A)
19. Did you change the hold time in LIMS for preserved terracores? ____ YES NO (N/A)
20. Are bubbles > 6mm absent in VOA samples? ____ YES NO (N/A)
21. Was the client contacted concerning this sample delivery? ____ YES (NO)
   If YES, Who was called? ____ By ____ Date: ____

COMMENTS

Rev 10, 11/11

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	251253	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	5084	Analysis:	EPA TO-15
Field ID:	EFF MPE	Diln Fac:	1.000
Lab ID:	251253-001	Batch#:	205704
Matrix:	Air	Sampled:	12/02/13
Units (V):	ppbv	Received:	12/02/13
Units (M):	ug/m3	Analyzed:	12/04/13

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.50	ND	2.5
Freon 114	ND	0.50	ND	3.5
Chloromethane	ND	0.50	ND	1.0
Vinyl Chloride	ND	0.50	ND	1.3
1,3-Butadiene	ND	0.50	ND	1.1
Bromomethane	ND	0.50	ND	1.9
Chloroethane	ND	0.50	ND	1.3
Trichlorofluoromethane	ND	0.50	ND	2.8
Acrolein	ND	2.0	ND	4.6
1,1-Dichloroethene	ND	0.50	ND	2.0
Freon 113	ND	0.50	ND	3.8
Acetone	31	2.0	74	4.8
Carbon Disulfide	ND	0.50	ND	1.6
Methylene Chloride	ND	0.50	ND	1.7
trans-1,2-Dichloroethene	ND	0.50	ND	2.0
MTBE	2.5	0.50	9.1	1.8
n-Hexane	ND	0.50	ND	1.8
1,1-Dichloroethane	ND	0.50	ND	2.0
Vinyl Acetate	ND	0.50	ND	1.8
cis-1,2-Dichloroethene	ND	0.50	ND	2.0
2-Butanone	23	0.50	68	1.5
Ethyl Acetate	0.75	0.50	2.7	1.8
Tetrahydrofuran	14	0.50	41	1.5
Chloroform	ND	0.50	ND	2.4
1,1,1-Trichloroethane	ND	0.50	ND	2.7
Cyclohexane	ND	0.50	ND	1.7
Carbon Tetrachloride	ND	0.50	ND	3.1
Benzene	0.50	0.50	1.6	1.6
1,2-Dichloroethane	ND	0.50	ND	2.0
n-Heptane	ND	0.50	ND	2.0
Trichloroethene	0.79	0.50	4.3	2.7
1,2-Dichloropropane	ND	0.50	ND	2.3
Bromodichloromethane	ND	0.50	ND	3.4
cis-1,3-Dichloropropene	ND	0.50	ND	2.3
4-Methyl-2-Pentanone	ND	0.50	ND	2.0

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	251253	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	5084	Analysis:	EPA TO-15
Field ID:	EFF MPE	Diln Fac:	1.000
Lab ID:	251253-001	Batch#:	205704
Matrix:	Air	Sampled:	12/02/13
Units (V):	ppbv	Received:	12/02/13
Units (M):	ug/m3	Analyzed:	12/04/13

Analyte	Result (V)	RL	Result (M)	RL
Toluene	3.7	0.50	14	1.9
trans-1,3-Dichloropropene	ND	0.50	ND	2.3
1,1,2-Trichloroethane	ND	0.50	ND	2.7
Tetrachloroethene	1.1	0.50	7.7	3.4
2-Hexanone	ND	0.50	ND	2.0
Dibromochloromethane	ND	0.50	ND	4.3
1,2-Dibromoethane	ND	0.50	ND	3.8
Chlorobenzene	ND	0.50	ND	2.3
Ethylbenzene	0.93	0.50	4.0	2.2
m,p-Xylenes	4.2	0.50	18	2.2
o-Xylene	1.3	0.50	5.8	2.2
Styrene	ND	0.50	ND	2.1
Bromoform	ND	0.50	ND	5.2
1,1,2,2-Tetrachloroethane	ND	0.50	ND	3.4
4-Ethyltoluene	0.85	0.50	4.2	2.5
1,3,5-Trimethylbenzene	1.2	0.50	6.0	2.5
1,2,4-Trimethylbenzene	3.5	0.50	17	2.5
1,3-Dichlorobenzene	ND	0.50	ND	3.0
1,4-Dichlorobenzene	ND	0.50	ND	3.0
Benzyl chloride	ND	0.50	ND	2.6
1,2-Dichlorobenzene	ND	0.50	ND	3.0
1,2,4-Trichlorobenzene	ND	0.50	ND	3.7
Hexachlorobutadiene	ND	0.50	ND	5.3
Naphthalene	ND	2.0	ND	10

Surrogate	%REC	Limits
Bromofluorobenzene	94	70-130

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	251253	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	5084	Analysis:	EPA TO-15
Field ID:	INF MPE	Units (M):	ug/m3
Lab ID:	251253-002	Diln Fac:	10,000
Matrix:	Air	Sampled:	12/02/13
Units (V):	ppbv	Received:	12/02/13

Analyte	Result (V)	RL	Result (M)	RL	Batch#	Analyzed
Freon 12	ND	5,000	ND	25,000	205760	12/05/13
Freon 114	ND	5,000	ND	35,000	205760	12/05/13
Chloromethane	ND	5,000	ND	10,000	205760	12/05/13
Vinyl Chloride	ND	5,000	ND	13,000	205760	12/05/13
1,3-Butadiene	ND	5,000	ND	11,000	205760	12/05/13
Bromomethane	ND	5,000	ND	19,000	205760	12/05/13
Chloroethane	ND	5,000	ND	13,000	205760	12/05/13
Trichlorofluoromethane	ND	5,000	ND	28,000	205760	12/05/13
Acrolein	ND	20,000	ND	46,000	205760	12/05/13
1,1-Dichloroethene	ND	5,000	ND	20,000	205760	12/05/13
Freon 113	ND	5,000	ND	38,000	205760	12/05/13
Acetone	ND	20,000	ND	48,000	205760	12/05/13
Carbon Disulfide	ND	5,000	ND	16,000	205760	12/05/13
Methylene Chloride	ND	5,000	ND	17,000	205760	12/05/13
trans-1,2-Dichloroethene	ND	5,000	ND	20,000	205760	12/05/13
MTBE	490,000	5,000	1,800,000	18,000	205760	12/05/13
n-Hexane	35,000	5,000	120,000	18,000	205760	12/05/13
1,1-Dichloroethane	ND	5,000	ND	20,000	205760	12/05/13
Vinyl Acetate	ND	5,000	ND	18,000	205760	12/05/13
cis-1,2-Dichloroethene	ND	5,000	ND	20,000	205760	12/05/13
2-Butanone	ND	5,000	ND	15,000	205760	12/05/13
Ethyl Acetate	ND	5,000	ND	18,000	205760	12/05/13
Tetrahydrofuran	ND	5,000	ND	15,000	205760	12/05/13
Chloroform	ND	5,000	ND	24,000	205760	12/05/13
1,1,1-Trichloroethane	ND	5,000	ND	27,000	205760	12/05/13
Cyclohexane	71,000	5,000	240,000	17,000	205760	12/05/13
Carbon Tetrachloride	ND	5,000	ND	31,000	205760	12/05/13
Benzene	20,000	5,000	65,000	16,000	205760	12/05/13
1,2-Dichloroethane	ND	5,000	ND	20,000	205760	12/05/13
n-Heptane	45,000	5,000	180,000	20,000	205760	12/05/13
Trichloroethene	ND	5,000	ND	27,000	205760	12/05/13
1,2-Dichloropropane	ND	5,000	ND	23,000	205760	12/05/13
Bromodichloromethane	ND	5,000	ND	34,000	205760	12/05/13
cis-1,3-Dichloropropene	ND	5,000	ND	23,000	205760	12/05/13
4-Methyl-2-Pentanone	ND	5,000	ND	20,000	205760	12/05/13
Toluene	ND	5,000	ND	19,000	205760	12/05/13

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Volatile Organics in Air

Lab #:	251253	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	5084	Analysis:	EPA TO-15
Field ID:	INF MPE	Units (M):	ug/m3
Lab ID:	251253-002	Diln Fac:	10,000
Matrix:	Air	Sampled:	12/02/13
Units (V):	ppbv	Received:	12/02/13

Analyte	Result (V)	RL	Result (M)	RL	Batch#	Analyzed
trans-1,3-Dichloropropene	ND	5,000	ND	23,000	205760	12/05/13
1,1,2-Trichloroethane	ND	5,000	ND	27,000	205760	12/05/13
Tetrachloroethene	ND	5,000	ND	34,000	205760	12/05/13
2-Hexanone	ND	5,000	ND	20,000	205760	12/05/13
Dibromochloromethane	ND	5,000	ND	43,000	205760	12/05/13
1,2-Dibromoethane	ND	5,000	ND	38,000	205760	12/05/13
Chlorobenzene	ND	5,000	ND	23,000	205760	12/05/13
Ethylbenzene	32,000	5,000	140,000	22,000	205760	12/05/13
m,p-Xylenes	64,000	5,000	280,000	22,000	205760	12/05/13
o-Xylene	ND	5,000	ND	22,000	205760	12/05/13
Styrene	ND	5,000	ND	21,000	205760	12/05/13
Bromoform	ND	5,000	ND	52,000	205760	12/05/13
1,1,2,2-Tetrachloroethane	ND	5,000	ND	34,000	205760	12/05/13
4-Ethyltoluene	ND	5,000	ND	25,000	205760	12/05/13
1,3,5-Trimethylbenzene	ND	5,000	ND	25,000	205760	12/05/13
1,2,4-Trimethylbenzene	ND	5,000	ND	25,000	205760	12/05/13
1,3-Dichlorobenzene	ND	5,000	ND	30,000	205760	12/05/13
1,4-Dichlorobenzene	ND	5,000	ND	30,000	205760	12/05/13
Benzyl chloride	ND	5,000	ND	26,000	205760	12/05/13
1,2-Dichlorobenzene	ND	5,000	ND	30,000	205760	12/05/13
1,2,4-Trichlorobenzene	ND	5,000	ND	37,000	205704	12/04/13
Hexachlorobutadiene	ND	5,000	ND	53,000	205760	12/05/13
Naphthalene	ND	20,000	ND	100,000	205704	12/04/13

Surrogate	%REC	Limits	Batch#	Analyzed
Bromofluorobenzene	101	70-130	205760	12/05/13

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	251253	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	5084	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	205704
Units (V):	ppbv	Analyzed:	12/03/13
Diln Fac:	1.000		

Type: BS Lab ID: QC718647

Analyte	Spiked	Result (V)	%REC	Limits
Freon 12	10.00	9.796	98	70-130
Freon 114	10.00	9.982	100	70-130
Chloromethane	10.00	8.616	86	70-130
Vinyl Chloride	10.00	10.11	101	70-130
1,3-Butadiene	10.00	9.452	95	70-130
Bromomethane	10.00	9.712	97	70-130
Chloroethane	10.00	10.40	104	70-130
Trichlorofluoromethane	10.00	10.11	101	70-130
Acrolein	10.00	9.440	94	62-130
1,1-Dichloroethene	10.00	9.304	93	70-130
Freon 113	10.00	9.608	96	70-130
Acetone	10.00	10.31	103	67-130
Carbon Disulfide	10.00	8.775	88	70-130
Methylene Chloride	10.00	8.912	89	68-130
trans-1,2-Dichloroethene	10.00	10.41	104	70-130
MTBE	10.00	10.21	102	70-130
n-Hexane	10.00	9.420	94	70-130
1,1-Dichloroethane	10.00	9.975	100	70-130
Vinyl Acetate	10.00	12.31	123	70-130
cis-1,2-Dichloroethene	10.00	10.16	102	70-130
2-Butanone	10.00	10.49	105	70-130
Ethyl Acetate	10.00	10.41	104	70-130
Tetrahydrofuran	10.00	10.65	106	70-130
Chloroform	10.00	9.843	98	70-130
1,1,1-Trichloroethane	10.00	10.71	107	70-130
Cyclohexane	10.00	10.92	109	70-130
Carbon Tetrachloride	10.00	10.72	107	70-130
Benzene	10.00	10.24	102	70-130
1,2-Dichloroethane	10.00	11.38	114	70-130
n-Heptane	10.00	10.55	105	70-130
Trichloroethene	10.00	10.59	106	70-130
1,2-Dichloropropane	10.00	10.96	110	70-130
Bromodichloromethane	10.00	10.67	107	70-130
cis-1,3-Dichloropropene	10.00	11.29	113	70-130

RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	251253	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	5084	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	205704
Units (V):	ppbv	Analyzed:	12/03/13
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits
4-Methyl-2-Pentanone	10.00	12.00	120	70-130
Toluene	10.00	10.90	109	70-130
trans-1,3-Dichloropropene	10.00	11.72	117	70-130
1,1,2-Trichloroethane	10.00	10.89	109	70-130
Tetrachloroethene	10.00	10.47	105	70-130
2-Hexanone	10.00	11.72	117	70-130
Dibromochloromethane	10.00	11.00	110	70-130
1,2-Dibromoethane	10.00	10.93	109	70-130
Chlorobenzene	10.00	10.04	100	70-130
Ethylbenzene	10.00	10.06	101	70-130
m,p-Xylenes	20.00	19.43	97	70-130
o-Xylene	10.00	9.991	100	70-130
Styrene	10.00	10.87	109	70-130
Bromoform	10.00	10.82	108	70-130
1,1,2,2-Tetrachloroethane	10.00	10.67	107	70-130
4-Ethyltoluene	10.00	11.69	117	70-130
1,3,5-Trimethylbenzene	10.00	11.72	117	70-130
1,2,4-Trimethylbenzene	10.00	11.49	115	70-130
1,3-Dichlorobenzene	10.00	10.52	105	70-130
1,4-Dichlorobenzene	10.00	10.57	106	70-130
Benzyl chloride	10.00	11.38	114	70-130
1,2-Dichlorobenzene	10.00	10.39	104	70-130
1,2,4-Trichlorobenzene	10.00	11.53	115	62-130
Hexachlorobutadiene	10.00	10.78	108	68-130
Naphthalene	10.00	11.86	119	54-136

Surrogate	%REC	Limits
Bromofluorobenzene	113	70-130

RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	251253	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	5084	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	205704
Units (V):	ppbv	Analyzed:	12/03/13
Diln Fac:	1.000		

Type: BSD Lab ID: QC718648

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
Freon 12	10.00	9.772	98	70-130	0	20
Freon 114	10.00	10.01	100	70-130	0	20
Chloromethane	10.00	9.554	96	70-130	10	27
Vinyl Chloride	10.00	10.15	101	70-130	0	23
1,3-Butadiene	10.00	9.522	95	70-130	1	21
Bromomethane	10.00	9.738	97	70-130	0	20
Chloroethane	10.00	10.66	107	70-130	2	20
Trichlorofluoromethane	10.00	9.936	99	70-130	2	20
Acrolein	10.00	9.535	95	62-130	1	31
1,1-Dichloroethene	10.00	9.416	94	70-130	1	20
Freon 113	10.00	9.572	96	70-130	0	23
Acetone	10.00	10.48	105	67-130	2	20
Carbon Disulfide	10.00	8.807	88	70-130	0	20
Methylene Chloride	10.00	8.836	88	68-130	1	23
trans-1,2-Dichloroethene	10.00	10.76	108	70-130	3	20
MTBE	10.00	10.27	103	70-130	1	20
n-Hexane	10.00	9.715	97	70-130	3	20
1,1-Dichloroethane	10.00	10.23	102	70-130	3	20
Vinyl Acetate	10.00	12.56	126	70-130	2	21
cis-1,2-Dichloroethene	10.00	10.24	102	70-130	1	20
2-Butanone	10.00	10.55	106	70-130	1	20
Ethyl Acetate	10.00	10.66	107	70-130	2	20
Tetrahydrofuran	10.00	11.00	110	70-130	3	20
Chloroform	10.00	9.729	97	70-130	1	20
1,1,1-Trichloroethane	10.00	10.88	109	70-130	2	20
Cyclohexane	10.00	11.25	112	70-130	3	20
Carbon Tetrachloride	10.00	10.96	110	70-130	2	20
Benzene	10.00	10.89	109	70-130	6	20
1,2-Dichloroethane	10.00	11.87	119	70-130	4	20
n-Heptane	10.00	10.47	105	70-130	1	20
Trichloroethene	10.00	11.21	112	70-130	6	20
1,2-Dichloropropane	10.00	11.38	114	70-130	4	20
Bromodichloromethane	10.00	11.06	111	70-130	4	20
cis-1,3-Dichloropropene	10.00	12.31	123	70-130	9	20

RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	251253	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	5084	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	205704
Units (V):	ppbv	Analyzed:	12/03/13
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
4-Methyl-2-Pentanone	10.00	12.74	127	70-130	6	20
Toluene	10.00	10.76	108	70-130	1	23
trans-1,3-Dichloropropene	10.00	12.43	124	70-130	6	20
1,1,2-Trichloroethane	10.00	11.64	116	70-130	7	20
Tetrachloroethene	10.00	11.17	112	70-130	6	20
2-Hexanone	10.00	11.54	115	70-130	2	21
Dibromochloromethane	10.00	11.74	117	70-130	7	20
1,2-Dibromoethane	10.00	11.60	116	70-130	6	20
Chlorobenzene	10.00	9.992	100	70-130	1	21
Ethylbenzene	10.00	9.551	96	70-130	5	20
m,p-Xylenes	20.00	18.64	93	70-130	4	20
o-Xylene	10.00	9.733	97	70-130	3	20
Styrene	10.00	10.32	103	70-130	5	21
Bromoform	10.00	11.42	114	70-130	5	20
1,1,2,2-Tetrachloroethane	10.00	11.28	113	70-130	6	24
4-Ethyltoluene	10.00	11.49	115	70-130	2	22
1,3,5-Trimethylbenzene	10.00	11.87	119	70-130	1	23
1,2,4-Trimethylbenzene	10.00	11.43	114	70-130	1	24
1,3-Dichlorobenzene	10.00	10.08	101	70-130	4	22
1,4-Dichlorobenzene	10.00	10.15	101	70-130	4	22
Benzyl chloride	10.00	11.03	110	70-130	3	21
1,2-Dichlorobenzene	10.00	9.931	99	70-130	5	22
1,2,4-Trichlorobenzene	10.00	11.74	117	62-130	2	28
Hexachlorobutadiene	10.00	10.56	106	68-130	2	27
Naphthalene	10.00	11.80	118	54-136	0	29

Surrogate	%REC	Limits
Bromofluorobenzene	113	70-130

RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	251253	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	5084	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC718649	Diln Fac:	1.000
Matrix:	Air	Batch#:	205704
Units (V):	ppbv	Analyzed:	12/03/13

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.50	ND	2.5
Freon 114	ND	0.50	ND	3.5
Chloromethane	ND	0.50	ND	1.0
Vinyl Chloride	ND	0.50	ND	1.3
1,3-Butadiene	ND	0.50	ND	1.1
Bromomethane	ND	0.50	ND	1.9
Chloroethane	ND	0.50	ND	1.3
Trichlorofluoromethane	ND	0.50	ND	2.8
Acrolein	ND	2.0	ND	4.6
1,1-Dichloroethene	ND	0.50	ND	2.0
Freon 113	ND	0.50	ND	3.8
Acetone	ND	2.0	ND	4.8
Carbon Disulfide	ND	0.50	ND	1.6
Methylene Chloride	ND	0.50	ND	1.7
trans-1,2-Dichloroethene	ND	0.50	ND	2.0
MTBE	ND	0.50	ND	1.8
n-Hexane	ND	0.50	ND	1.8
1,1-Dichloroethane	ND	0.50	ND	2.0
Vinyl Acetate	ND	0.50	ND	1.8
cis-1,2-Dichloroethene	ND	0.50	ND	2.0
2-Butanone	ND	0.50	ND	1.5
Ethyl Acetate	ND	0.50	ND	1.8
Tetrahydrofuran	ND	0.50	ND	1.5
Chloroform	ND	0.50	ND	2.4
1,1,1-Trichloroethane	ND	0.50	ND	2.7
Cyclohexane	ND	0.50	ND	1.7
Carbon Tetrachloride	ND	0.50	ND	3.1
Benzene	ND	0.50	ND	1.6
1,2-Dichloroethane	ND	0.50	ND	2.0
n-Heptane	ND	0.50	ND	2.0
Trichloroethene	ND	0.50	ND	2.7
1,2-Dichloropropane	ND	0.50	ND	2.3
Bromodichloromethane	ND	0.50	ND	3.4
cis-1,3-Dichloropropene	ND	0.50	ND	2.3
4-Methyl-2-Pentanone	ND	0.50	ND	2.0

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	251253	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	5084	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC718649	Diln Fac:	1.000
Matrix:	Air	Batch#:	205704
Units (V):	ppbv	Analyzed:	12/03/13

Analyte	Result (V)	RL	Result (M)	RL
Toluene	ND	0.50	ND	1.9
trans-1,3-Dichloropropene	ND	0.50	ND	2.3
1,1,2-Trichloroethane	ND	0.50	ND	2.7
Tetrachloroethene	ND	0.50	ND	3.4
2-Hexanone	ND	0.50	ND	2.0
Dibromochloromethane	ND	0.50	ND	4.3
1,2-Dibromoethane	ND	0.50	ND	3.8
Chlorobenzene	ND	0.50	ND	2.3
Ethylbenzene	ND	0.50	ND	2.2
m,p-Xylenes	ND	0.50	ND	2.2
o-Xylene	ND	0.50	ND	2.2
Styrene	ND	0.50	ND	2.1
Bromoform	ND	0.50	ND	5.2
1,1,2,2-Tetrachloroethane	ND	0.50	ND	3.4
4-Ethyltoluene	ND	0.50	ND	2.5
1,3,5-Trimethylbenzene	ND	0.50	ND	2.5
1,2,4-Trimethylbenzene	ND	0.50	ND	2.5
1,3-Dichlorobenzene	ND	0.50	ND	3.0
1,4-Dichlorobenzene	ND	0.50	ND	3.0
Benzyl chloride	ND	0.50	ND	2.6
1,2-Dichlorobenzene	ND	0.50	ND	3.0
1,2,4-Trichlorobenzene	ND	0.50	ND	3.7
Hexachlorobutadiene	ND	0.50	ND	5.3
Naphthalene	ND	2.0	ND	10

Surrogate	%REC	Limits
Bromofluorobenzene	116	70-130

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	251253	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	5084	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	205760
Units (V):	ppbv	Analyzed:	12/04/13
Diln Fac:	1.000		

Type: BS Lab ID: QC718883

Analyte	Spiked	Result (V)	%REC	Limits
Freon 12	10.00	10.26	103	70-130
Freon 114	10.00	10.17	102	70-130
Chloromethane	10.00	9.996	100	70-130
Vinyl Chloride	10.00	9.913	99	70-130
1,3-Butadiene	10.00	9.762	98	70-130
Bromomethane	10.00	10.26	103	70-130
Chloroethane	10.00	8.698	87	70-130
Trichlorofluoromethane	10.00	10.07	101	70-130
Acrolein	10.00	7.902	79	62-130
1,1-Dichloroethene	10.00	9.181	92	70-130
Freon 113	10.00	9.505	95	70-130
Acetone	10.00	8.249	82	67-130
Carbon Disulfide	10.00	7.828	78	70-130
Methylene Chloride	10.00	8.209	82	68-130
trans-1,2-Dichloroethene	10.00	10.36	104	70-130
MTBE	10.00	10.41	104	70-130
n-Hexane	10.00	10.07	101	70-130
1,1-Dichloroethane	10.00	10.20	102	70-130
Vinyl Acetate	10.00	11.96	120	70-130
cis-1,2-Dichloroethene	10.00	9.731	97	70-130
2-Butanone	10.00	10.76	108	70-130
Ethyl Acetate	10.00	9.849	98	70-130
Tetrahydrofuran	10.00	9.920	99	70-130
Chloroform	10.00	10.01	100	70-130
1,1,1-Trichloroethane	10.00	10.19	102	70-130
Cyclohexane	10.00	10.65	107	70-130
Carbon Tetrachloride	10.00	10.10	101	70-130
Benzene	10.00	10.43	104	70-130
1,2-Dichloroethane	10.00	10.54	105	70-130
n-Heptane	10.00	11.04	110	70-130
Trichloroethene	10.00	10.54	105	70-130
1,2-Dichloropropane	10.00	11.01	110	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	251253	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	5084	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	205760
Units (V):	ppbv	Analyzed:	12/04/13
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits
Bromodichloromethane	10.00	10.30	103	70-130
cis-1,3-Dichloropropene	10.00	11.11	111	70-130
4-Methyl-2-Pentanone	10.00	12.02	120	70-130
Toluene	10.00	10.03	100	70-130
trans-1,3-Dichloropropene	10.00	11.23	112	70-130
1,1,2-Trichloroethane	10.00	10.35	104	70-130
Tetrachloroethene	10.00	9.919	99	70-130
2-Hexanone	10.00	12.31 b	123	70-130
Dibromochloromethane	10.00	9.843	98	70-130
1,2-Dibromoethane	10.00	10.34	103	70-130
Chlorobenzene	10.00	9.972	100	70-130
Ethylbenzene	10.00	9.650	97	70-130
m,p-Xylenes	20.00	19.04	95	70-130
o-Xylene	10.00	9.228	92	70-130
Styrene	10.00	11.04	110	70-130
Bromoform	10.00	9.595	96	70-130
1,1,2,2-Tetrachloroethane	10.00	9.782	98	70-130
4-Ethyltoluene	10.00	10.57	106	70-130
1,3,5-Trimethylbenzene	10.00	9.333	93	70-130
1,2,4-Trimethylbenzene	10.00	9.655	97	70-130
1,3-Dichlorobenzene	10.00	9.681	97	70-130
1,4-Dichlorobenzene	10.00	9.412	94	70-130
Benzyl chloride	10.00	10.67	107	70-130
1,2-Dichlorobenzene	10.00	9.329	93	70-130
1,2,4-Trichlorobenzene	10.00	5.380 b	54 *	62-130
Hexachlorobutadiene	10.00	8.215	82	68-130
Naphthalene	10.00	5.074 b	51 *	54-136

Surrogate	%REC	Limits
Bromofluorobenzene	106	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	251253	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	5084	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	205760
Units (V):	ppbv	Analyzed:	12/04/13
Diln Fac:	1.000		

Type: BSD Lab ID: QC718884

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
Freon 12	10.00	10.02	100	70-130	2	20
Freon 114	10.00	10.14	101	70-130	0	20
Chloromethane	10.00	9.849	98	70-130	1	27
Vinyl Chloride	10.00	9.653	97	70-130	3	23
1,3-Butadiene	10.00	9.600	96	70-130	2	21
Bromomethane	10.00	10.06	101	70-130	2	20
Chloroethane	10.00	8.476	85	70-130	3	20
Trichlorofluoromethane	10.00	9.809	98	70-130	3	20
Acrolein	10.00	7.864	79	62-130	0	31
1,1-Dichloroethene	10.00	9.025	90	70-130	2	20
Freon 113	10.00	9.587	96	70-130	1	23
Acetone	10.00	8.202	82	67-130	1	20
Carbon Disulfide	10.00	7.677	77	70-130	2	20
Methylene Chloride	10.00	8.077	81	68-130	2	23
trans-1,2-Dichloroethene	10.00	10.09	101	70-130	3	20
MTBE	10.00	10.21	102	70-130	2	20
n-Hexane	10.00	9.972	100	70-130	1	20
1,1-Dichloroethane	10.00	10.16	102	70-130	0	20
Vinyl Acetate	10.00	11.92	119	70-130	0	21
cis-1,2-Dichloroethene	10.00	9.704	97	70-130	0	20
2-Butanone	10.00	10.67	107	70-130	1	20
Ethyl Acetate	10.00	9.850	99	70-130	0	20
Tetrahydrofuran	10.00	9.799	98	70-130	1	20
Chloroform	10.00	9.925	99	70-130	1	20
1,1,1-Trichloroethane	10.00	10.34	103	70-130	1	20
Cyclohexane	10.00	10.58	106	70-130	1	20
Carbon Tetrachloride	10.00	10.11	101	70-130	0	20
Benzene	10.00	10.59	106	70-130	2	20
1,2-Dichloroethane	10.00	10.40	104	70-130	1	20
n-Heptane	10.00	11.02	110	70-130	0	20
Trichloroethene	10.00	10.53	105	70-130	0	20
1,2-Dichloropropane	10.00	11.26	113	70-130	2	20

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	251253	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	5084	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	205760
Units (V):	ppbv	Analyzed:	12/04/13
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
Bromodichloromethane	10.00	10.30	103	70-130	0	20
cis-1,3-Dichloropropene	10.00	11.03	110	70-130	1	20
4-Methyl-2-Pentanone	10.00	12.26	123	70-130	2	20
Toluene	10.00	10.32	103	70-130	3	23
trans-1,3-Dichloropropene	10.00	11.27	113	70-130	0	20
1,1,2-Trichloroethane	10.00	10.64	106	70-130	3	20
Tetrachloroethene	10.00	9.846	98	70-130	1	20
2-Hexanone	10.00	13.04 b	130	70-130	6	21
Dibromochloromethane	10.00	10.39	104	70-130	5	20
1,2-Dibromoethane	10.00	10.73	107	70-130	4	20
Chlorobenzene	10.00	10.38	104	70-130	4	21
Ethylbenzene	10.00	9.891	99	70-130	2	20
m,p-Xylenes	20.00	19.99	100	70-130	5	20
o-Xylene	10.00	9.776	98	70-130	6	20
Styrene	10.00	11.31	113	70-130	2	21
Bromoform	10.00	9.974	100	70-130	4	20
1,1,2,2-Tetrachloroethane	10.00	10.15	102	70-130	4	24
4-Ethyltoluene	10.00	10.79	108	70-130	2	22
1,3,5-Trimethylbenzene	10.00	9.734	97	70-130	4	23
1,2,4-Trimethylbenzene	10.00	9.883	99	70-130	2	24
1,3-Dichlorobenzene	10.00	10.18	102	70-130	5	22
1,4-Dichlorobenzene	10.00	10.17	102	70-130	8	22
Benzyl chloride	10.00	11.10	111	70-130	4	21
1,2-Dichlorobenzene	10.00	9.844	98	70-130	5	22
1,2,4-Trichlorobenzene	10.00	10.86 b	109	62-130	67 *	28
Hexachlorobutadiene	10.00	10.42	104	68-130	24	27
Naphthalene	10.00	12.52 b	125	54-136	85 *	29

Surrogate	%REC	Limits
Bromofluorobenzene	99	70-130

*= Value outside of QC limits; see narrative
b= See narrative
RPD= Relative Percent Difference
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	251253	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	5084	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC718885	Diln Fac:	1.000
Matrix:	Air	Batch#:	205760
Units (V):	ppbv	Analyzed:	12/04/13

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.50	ND	2.5
Freon 114	ND	0.50	ND	3.5
Chloromethane	ND	0.50	ND	1.0
Vinyl Chloride	ND	0.50	ND	1.3
1,3-Butadiene	ND	0.50	ND	1.1
Bromomethane	ND	0.50	ND	1.9
Chloroethane	ND	0.50	ND	1.3
Trichlorofluoromethane	ND	0.50	ND	2.8
Acrolein	ND	2.0	ND	4.6
1,1-Dichloroethene	ND	0.50	ND	2.0
Freon 113	ND	0.50	ND	3.8
Acetone	ND	2.0	ND	4.8
Carbon Disulfide	ND	0.50	ND	1.6
Methylene Chloride	ND	0.50	ND	1.7
trans-1,2-Dichloroethene	ND	0.50	ND	2.0
MTBE	ND	0.50	ND	1.8
n-Hexane	ND	0.50	ND	1.8
1,1-Dichloroethane	ND	0.50	ND	2.0
Vinyl Acetate	ND	0.50	ND	1.8
cis-1,2-Dichloroethene	ND	0.50	ND	2.0
2-Butanone	ND	0.50	ND	1.5
Ethyl Acetate	ND	0.50	ND	1.8
Tetrahydrofuran	ND	0.50	ND	1.5
Chloroform	ND	0.50	ND	2.4
1,1,1-Trichloroethane	ND	0.50	ND	2.7
Cyclohexane	ND	0.50	ND	1.7
Carbon Tetrachloride	ND	0.50	ND	3.1
Benzene	ND	0.50	ND	1.6
1,2-Dichloroethane	ND	0.50	ND	2.0
n-Heptane	ND	0.50	ND	2.0
Trichloroethene	ND	0.50	ND	2.7
1,2-Dichloropropane	ND	0.50	ND	2.3
Bromodichloromethane	ND	0.50	ND	3.4
cis-1,3-Dichloropropene	ND	0.50	ND	2.3
4-Methyl-2-Pentanone	ND	0.50	ND	2.0

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Volatile Organics in Air

Lab #:	251253	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	5084	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC718885	Diln Fac:	1.000
Matrix:	Air	Batch#:	205760
Units (V):	ppbv	Analyzed:	12/04/13

Analyte	Result (V)	RL	Result (M)	RL
Toluene	ND	0.50	ND	1.9
trans-1,3-Dichloropropene	ND	0.50	ND	2.3
1,1,2-Trichloroethane	ND	0.50	ND	2.7
Tetrachloroethene	ND	0.50	ND	3.4
2-Hexanone	ND	0.50	ND	2.0
Dibromochloromethane	ND	0.50	ND	4.3
1,2-Dibromoethane	ND	0.50	ND	3.8
Chlorobenzene	ND	0.50	ND	2.3
Ethylbenzene	ND	0.50	ND	2.2
m,p-Xylenes	ND	0.50	ND	2.2
o-Xylene	ND	0.50	ND	2.2
Styrene	ND	0.50	ND	2.1
Bromoform	ND	0.50	ND	5.2
1,1,2,2-Tetrachloroethane	ND	0.50	ND	3.4
4-Ethyltoluene	ND	0.50	ND	2.5
1,3,5-Trimethylbenzene	ND	0.50	ND	2.5
1,2,4-Trimethylbenzene	ND	0.50	ND	2.5
1,3-Dichlorobenzene	ND	0.50	ND	3.0
1,4-Dichlorobenzene	ND	0.50	ND	3.0
Benzyl chloride	ND	0.50	ND	2.6
1,2-Dichlorobenzene	ND	0.50	ND	3.0
1,2,4-Trichlorobenzene	ND	0.50	ND	3.7
Hexachlorobutadiene	ND	0.50	ND	5.3
Naphthalene	ND	2.0	ND	10

Surrogate	%REC	Limits
Bromofluorobenzene	110	70-130

ND= Not Detected
RL= Reporting Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Aromatic / Petroleum Hydrocarbons in Air

Lab #:	251253	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	5084	Analysis:	EPA TO-3
Analyte:	Gasoline Range Organics C6-C12	Batch#:	205673
Matrix:	Air	Sampled:	12/02/13
Units (V):	ppbv	Received:	12/02/13
Units (M):	ug/m3	Analyzed:	12/03/13

Field ID	Type	Lab ID	Result (V)	RL	MDL	Result (M)	RL	MDL	Diln Fac
EFF MPE	SAMPLE	251253-001	300	25	5.6	1,200	100	23	1.000
INF MPE	SAMPLE	251253-002	1,700,000	2,500	560	7,000,000	10,000	2,300	100.0
	BLANK	QC718532	ND	25	5.6	ND	100	23	1.000

ND= Not Detected
RL= Reporting Limit
MDL= Method Detection Limit
Result M= Result in mass units
Result V= Result in volume units

Curtis & Tompkins, Ltd.

Batch QC Report

Aromatic / Petroleum Hydrocarbons in Air

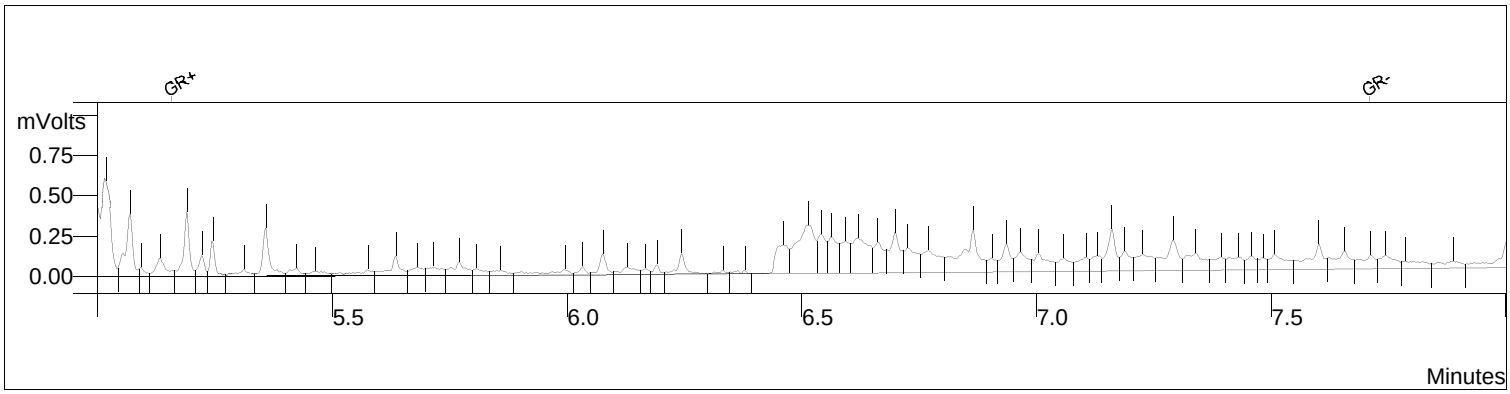
Lab #:	251253	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	METHOD
Project#:	5084	Analysis:	EPA TO-3
Analyte:	Gasoline Range Organics C6-C12	Diln Fac:	1.000
Matrix:	Air	Batch#:	205673
Units (V):	ppbv	Analyzed:	12/03/13

Type	Lab ID	Spiked	Result (V)	%REC	Limits	RPD	Lim
BS	QC718530	2,100	2,378	113	70-130		
BSD	QC718531	2,100	2,444	116	70-130	3	25

RPD= Relative Percent Difference
Result V= Result in volume units

GRO by TO-3

Sample ID:	251253-001,205673		
Data File:	c:\varianws\data\120313\337_003.run		
Sample List:	c:\varianws\120313.smp		
Method:	c:\varianws\to3_081811.mth		
Acquisition Date:	12/03/2013 12:43:54		
Calculation Date:	12/03/2013 12:55:56		
Instrument ID:	MSAIR03	Operator:	TO-3
Injection Notes:	1x		
Multiplier:	1.000	Divisor:	1.000



Channel: **Front = FID** **RESULTS**

#	RT (min)	Peak Name	Area	Result (ppbv)
1	6.432	GRO:6-12	11020	296.216
		Totals	**11020**	**296.216**

Integration Parameters

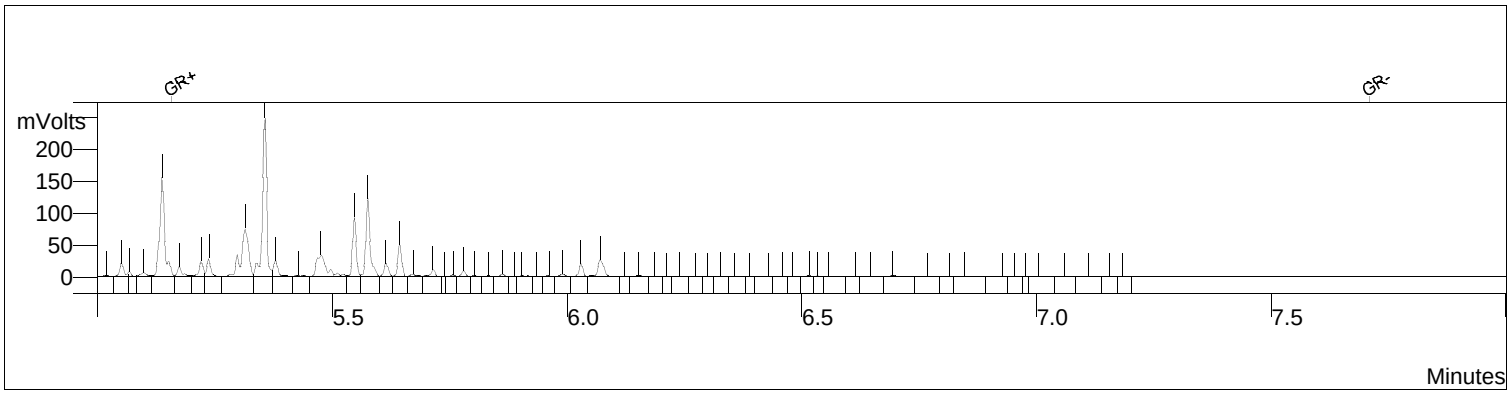
Initial Tangent %:	0
Initial Peak Width (sec):	4
Initial Peak Reject Value:	50.000
Initial S/N Ratio:	3

Data Handling Time Events

Time (min)	Event
0.009	II on
4.801	II off
5.157	GR on
7.708	GR off

GRO by TO-3

Sample ID:	251253-002,205673		
Data File:	c:\varianws\data\120313\337_006.run		
Sample List:	c:\varianws\120313.smp		
Method:	c:\varianws\to3_081811.mth		
Acquisition Date:	12/03/2013 14:47:00		
Calculation Date:	12/03/2013 14:59:03		
Instrument ID:	MSAIR03	Operator:	TO-3
Injection Notes:	100x,c00005		
Multiplier:	1.000	Divisor:	1.000



Channel: Front = FID RESULTS

#	RT (min)	Peak Name	Area	Result (ppbv)
1	6.432	GRO:6-12	634416	17052.563
		Totals	**634416**	**17052.563**

Integration Parameters

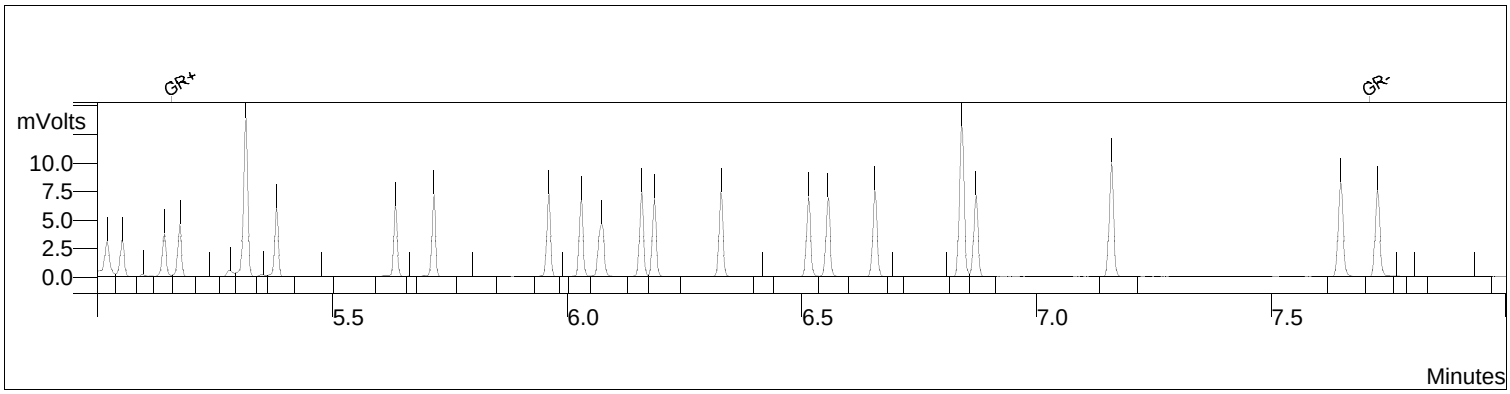
Initial Tangent %:	0
Initial Peak Width (sec):	4
Initial Peak Reject Value:	50.000
Initial S/N Ratio:	3

Data Handling Time Events

Time (min)	Event
0.009	II on
4.801	II off
5.157	GR on
7.708	GR off

GRO by TO-3

Sample ID:	ccv/bs,qc718530		
Data File:	c:\varianws\data\120313\337_.run		
Sample List:	c:\varianws\120313.smp		
Method:	c:\varianws\to3_081811.mth		
Acquisition Date:	12/03/2013 11:03:42		
Calculation Date:	12/03/2013 11:15:45		
Instrument ID:	MSAIR03	Operator:	TO-3
Injection Notes:	205673,s23643,1x		
Multiplier:	1.000	Divisor:	1.000



Channel: Front = FID RESULTS

#	RT (min)	Peak Name	Area	Result (ppbv)
1	6.432	GRO:6-12	88452	2377.515
		Totals	**88452**	**2377.515**

Integration Parameters

Initial Tangent %:	0
Initial Peak Width (sec):	4
Initial Peak Reject Value:	50.000
Initial S/N Ratio:	3

Data Handling Time Events

Time (min)	Event
0.009	II on
4.801	II off
5.157	GR on
7.708	GR off

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 251991
ANALYTICAL REPORT

SOMA Environmental Engineering Inc.
6620 Owens Dr.
Pleasanton, CA 94588

Project : 5081
Location : 2844 Mountain Blvd., Oakland
Level : II

Sample ID	Lab ID
RS-3	251991-001
RS-4	251991-002
MW-1	251991-003
MW-2	251991-004

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: Tracy Babjar Date: 01/06/2014

Tracy Babjar
Project Manager
tracy.babjar@ctberk.com
(510) 204-2226

NELAP # 01107CA

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**251991**
Client:	**SOMA Environmental Engineering Inc.**
Project:	**5081**
Location:	**2844 Mountain Blvd., Oakland**
Request Date:	**12/30/13**
Samples Received:	**12/30/13**

This data package contains sample and QC results for four water samples, requested for the above referenced project on 12/30/13. The samples were received cold and intact.

TPH-Extractables by GC (EPA 8015B):
No analytical problems were encountered.

Volatile Organics by GC/MS (EPA 8260B):
High recovery was observed for o-xylene in the BS for batch 206693; the associated RPD was within limits, and this analyte was not detected at or above the RL in the associated samples. No other analytical problems were encountered.

CHAIN OF CUSTODY

Curtis & Tompkins, Ltd
Analytical Laboratory Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510)486-0900 Phone
(510)486-0532 Fax

LOGIN # 251991

Sampler: Lizzie Hightower

Project No: 5081

Report To: Joyce Bobek

Project Name: 2844 Mountain Blvd., Oakland

Company : SOMA Environmental

Turnaround Time: Standard

Telephone: 925-734-6400

Fax: 925-734-6401

Lab No.	Sample ID.	Sampling Date Time	Matrix: Soil	Matrix: Water	Matrix: Waste	# of Containers	Preservative: HCL	Preservative: H_2SO_4	Preservative: HNO_3	Preservative: ICE	Analyses: TPH-g, BTEX, MtBE 8260B	Analyses: Gasoline Oxygenates 8260B	Analyses: TPH-d 8015
	RS-3	12/30/13 12:01		*		3 VOAs, 2-500 mL Ambers	*			*	*	*	*
	RS-4	13:30		*		3 VOAs, 2-500 mL Ambers	*			*	*	*	*
	MW-1	12:35		*		3 VOAs, 2-500 mL Ambers	*			*	*	*	*
	MW-2	13:02		*		3 VOAs, 2-500 mL Ambers	*			*	*	*	*

Notes: **EDF OUTPUT REQUIRED**
GasOx: DIPE, ETBE, TAME, TBA

ON BLUE ICE

RELINQUISHED BY:	RECEIVED BY:
12/30/13 14:48 DATE/TIME	12/30/13 1448 DATE/TIME
DATE/TIME	DATE/TIME
DATE/TIME	DATE/TIME

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 25199 Date Received 12/30/13 Number of coolers 1
Client SOMA Project 5081

Date Opened 12/30 By (print) M (sign) M
Date Logged in L By (print) L (sign) L

1. Did cooler come with a shipping slip (airbill, etc) ____ YES (NO)
   Shipping info ____
2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples ☑ NO
   How many ____ Name ____ Date ____
2B. Were custody seals intact upon arrival? ____ YES NO ~~N/A~~
3. Were custody papers dry and intact when received? ____ YES NO
4. Were custody papers filled out properly (ink, signed, etc)? ____ YES NO
5. Is the project identifiable from custody papers? (If so fill out top of form) YES NO
6. Indicate the packing in cooler: (if other, describe) ____

☐ Bubble Wrap ☐ Foam blocks ☐ Bags ☐ None
☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: ☐ Wet ☒ Blue/Gel ☐ None Temp(°C) ____

☒ Samples Received on ice & cold without a temperature blank; ~~temp. taken with IR gun~~

☒ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? ____ YES (NO)
   If YES, what time were they transferred to freezer? ____
9. Did all bottles arrive unbroken/unopened? ____ YES NO
10. Are there any missing / extra samples? ____ YES ~~NO~~
11. Are samples in the appropriate containers for indicated tests? ____ YES NO
12. Are sample labels present, in good condition and complete? ____ YES NO
13. Do the sample labels agree with custody papers? ____ YES NO
14. Was sufficient amount of sample sent for tests requested? ____ YES NO
15. Are the samples appropriately preserved? ____ YES NO N/A
16. Did you check preservatives for all bottles for each sample? ____ YES NO (N/A)
17. Did you document your preservative check? ____ YES NO ~~N/A~~
18. Did you change the hold time in LIMS for unpreserved VOAs? ____ YES NO ~~N/A~~
19. Did you change the hold time in LIMS for preserved terracores? ____ YES NO (N/A)
20. Are bubbles > 6mm absent in VOA samples? ____ (YES) NO N/A
21. Was the client contacted concerning this sample delivery? ____ YES (NO)
   If YES, Who was called? ____ By ____ Date: ____

COMMENTS

____

____

____

____

____

____

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	251991	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 3520C
Project#:	5081	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	12/30/13
Units:	ug/L	Received:	12/30/13
Diln Fac:	1.000	Prepared:	01/02/14
Batch#:	206736	Analyzed:	01/03/14

Field ID: RS-3 Lab ID: 251991-001
Type: SAMPLE Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	61 Y	51

Surrogate	%REC	Limits
o-Terphenyl	102	66-129

Field ID: RS-4 Lab ID: 251991-002
Type: SAMPLE Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	9,900	51

Surrogate	%REC	Limits
o-Terphenyl	101	66-129

Field ID: MW-1 Lab ID: 251991-003
Type: SAMPLE Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	13,000	51

Surrogate	%REC	Limits
o-Terphenyl	99	66-129

Field ID: MW-2 Lab ID: 251991-004
Type: SAMPLE Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	6,300	51

Surrogate	%REC	Limits
o-Terphenyl	101	66-129

Type: BLANK Cleanup Method: EPA 3630C
Lab ID: QC722815

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
o-Terphenyl	88	66-129

Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Total Extractable Hydrocarbons

Lab #:	251991	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 3520C
Project#:	5081	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	206736
Units:	ug/L	Prepared:	01/02/14
Diln Fac:	1.000	Analyzed:	01/03/14

Type: BS
Lab ID: QC722816
Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	1,910	76	61-120

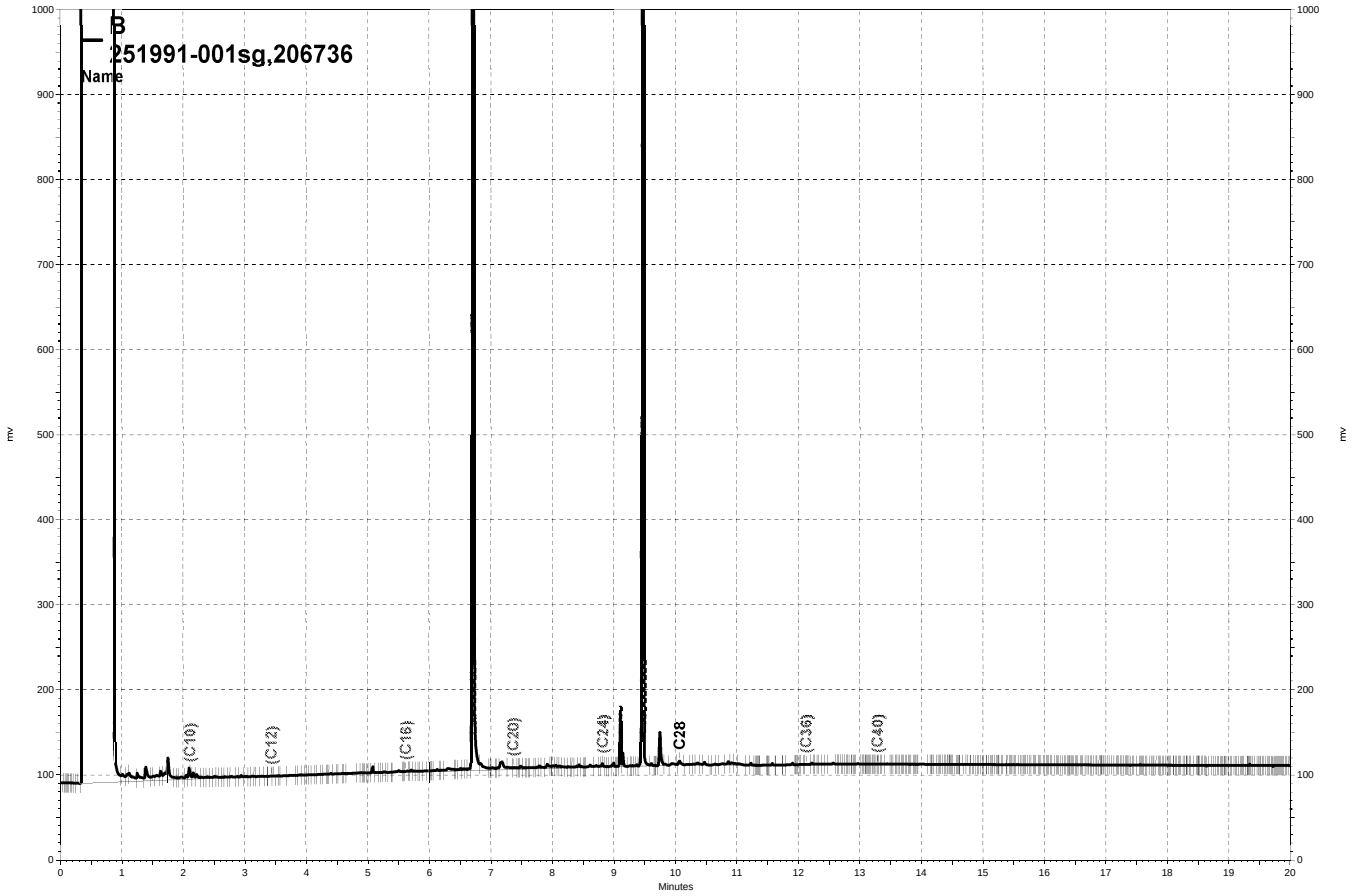
Surrogate	%REC	Limits
o-Terphenyl	97	66-129

Type: BSD
Lab ID: QC722817
Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	1,986	79	61-120	4	45

Surrogate	%REC	Limits
o-Terphenyl	99	66-129

RPD= Relative Percent Difference



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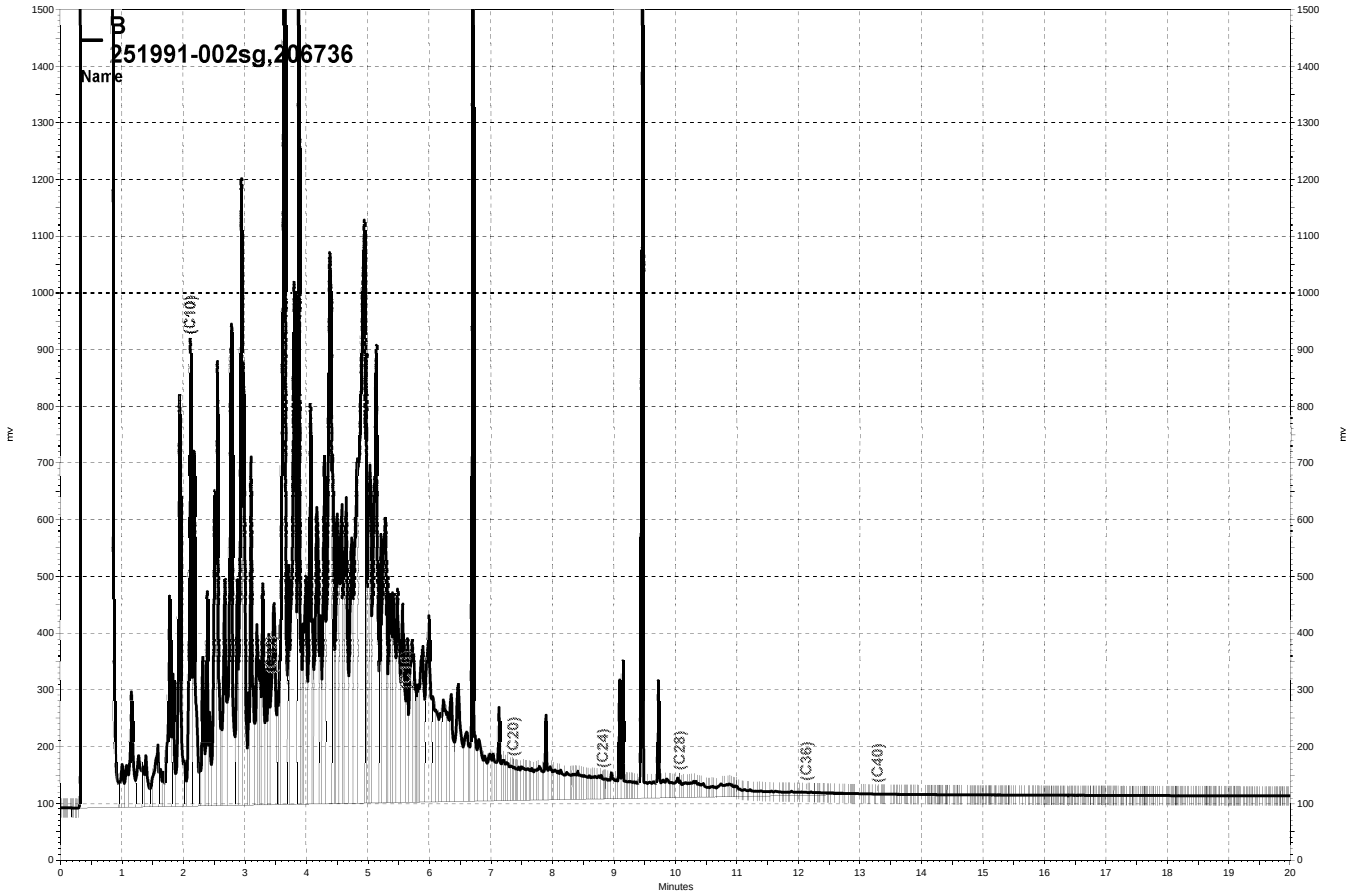

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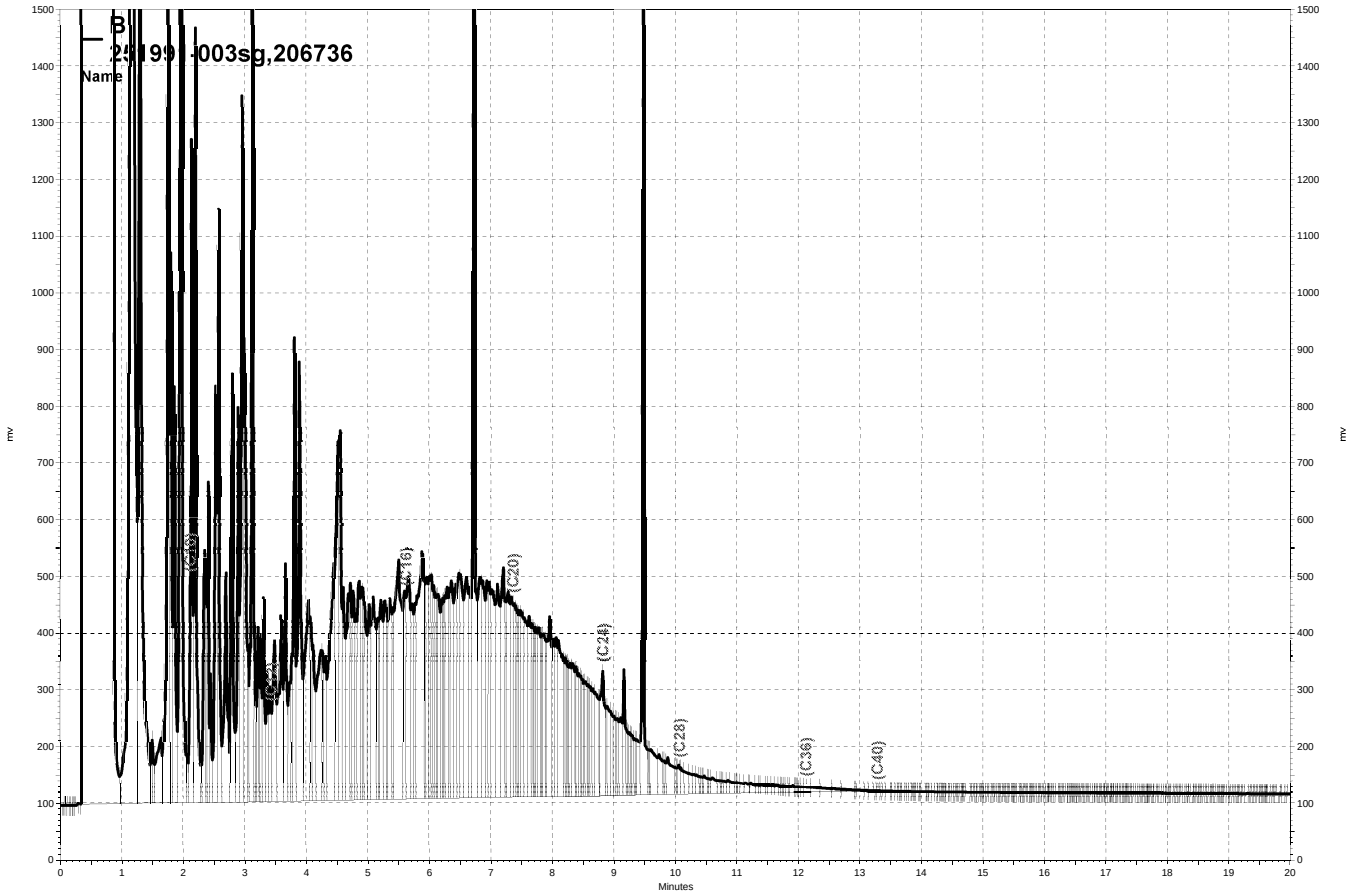

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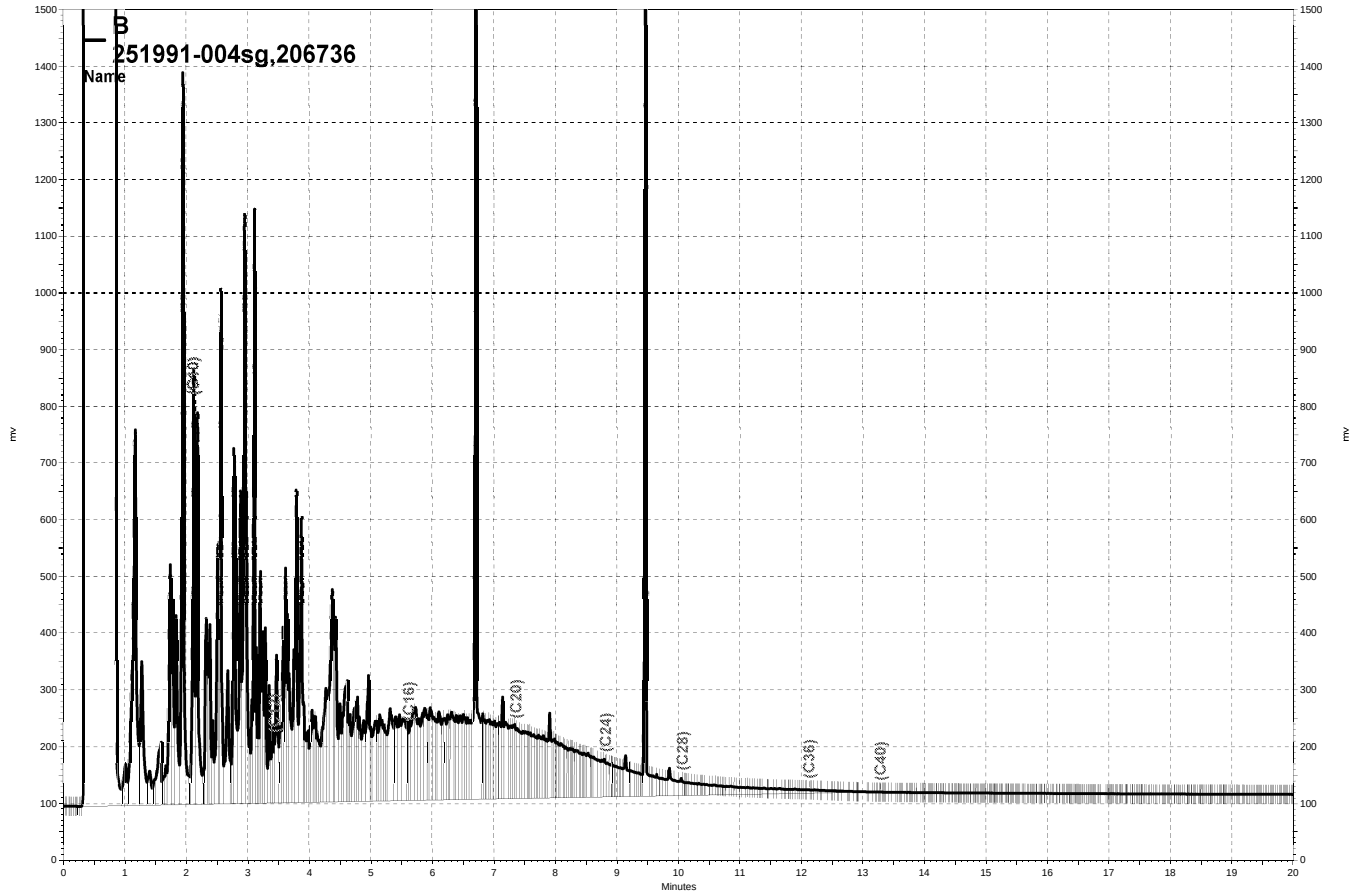

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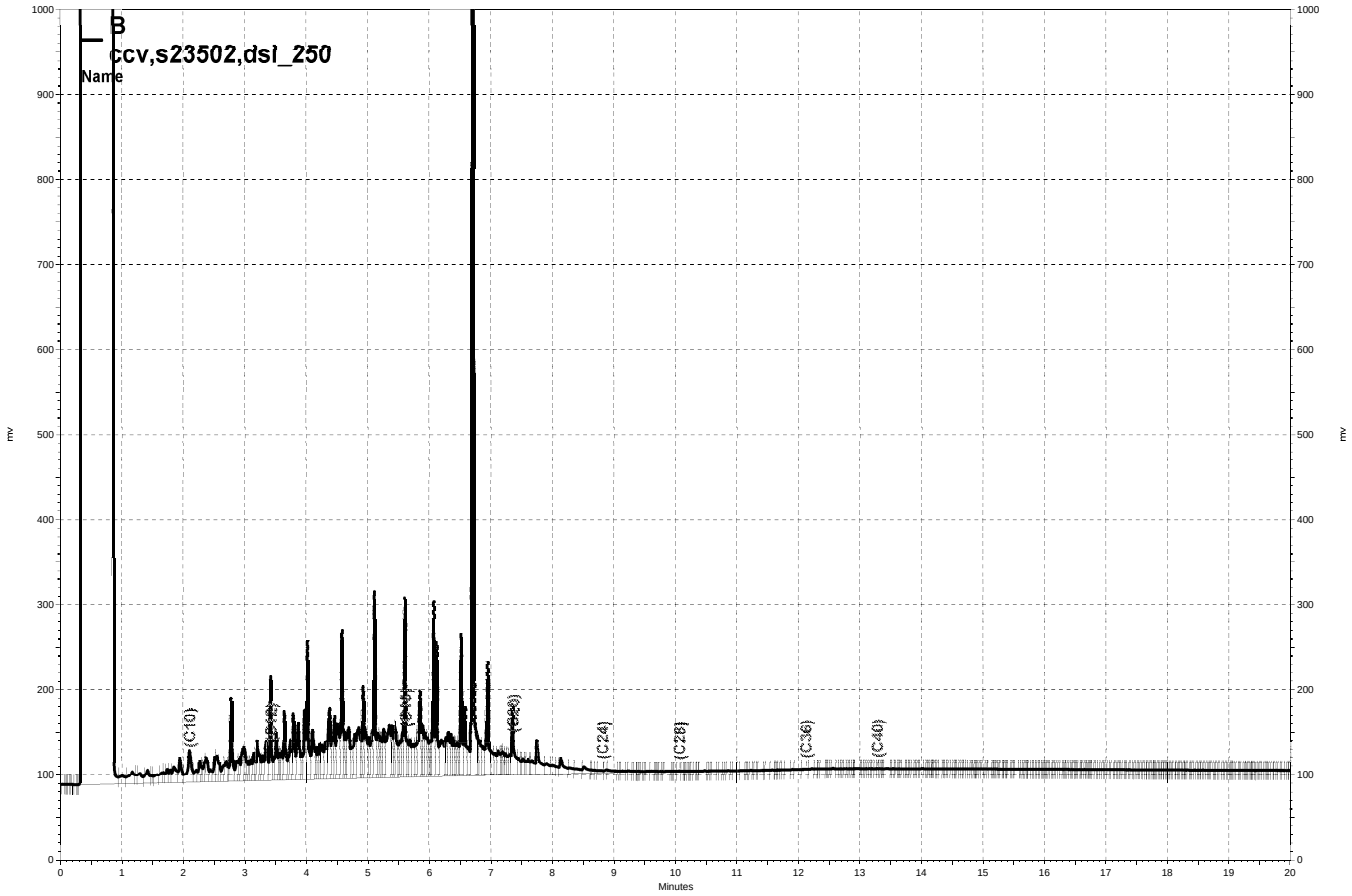

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Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	251991	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5081	Analysis:	EPA 8260B
Field ID:	RS-3	Batch#:	206693
Lab ID:	251991-001	Sampled:	12/30/13
Matrix:	Water	Received:	12/30/13
Units:	ug/L	Analyzed:	12/31/13
Diln Fac:	1.000		

Analyte	Result	RL
Gasoline C7-C12	ND	50
tert-Butyl Alcohol (TBA)	680	10
Isopropyl Ether (DIPE)	ND	0.50
Ethyl tert-Butyl Ether (ETBE)	ND	0.50
Methyl tert-Amyl Ether (TAME)	0.64	0.50
MTBE	21	0.50
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	0.50
o-Xylene	ND	0.50

Surrogate	%REC	Limits
Dibromofluoromethane	96	77-136
1,2-Dichloroethane-d4	88	75-139
Toluene-d8	91	80-120
Bromofluorobenzene	96	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	251991	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5081	Analysis:	EPA 8260B
Field ID:	RS-4	Batch#:	206693
Lab ID:	251991-002	Sampled:	12/30/13
Matrix:	Water	Received:	12/30/13
Units:	ug/L	Analyzed:	12/31/13
Diln Fac:	250.0		

Analyte	Result	RL
Gasoline C7-C12	ND	13,000
tert-Butyl Alcohol (TBA)	37,000	2,500
Isopropyl Ether (DIPE)	ND	130
Ethyl tert-Butyl Ether (ETBE)	ND	130
Methyl tert-Amyl Ether (TAME)	1,100	130
MTBE	16,000	130
Benzene	ND	130
Toluene	ND	130
Ethylbenzene	ND	130
m,p-Xylenes	150	130
o-Xylene	ND	130

Surrogate	%REC	Limits
Dibromofluoromethane	96	77-136
1,2-Dichloroethane-d4	87	75-139
Toluene-d8	85	80-120
Bromofluorobenzene	100	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	251991	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5081	Analysis:	EPA 8260B
Field ID:	MW-1	Batch#:	206717
Lab ID:	251991-003	Sampled:	12/30/13
Matrix:	Water	Received:	12/30/13
Units:	ug/L	Analyzed:	01/02/14
Diln Fac:	500.0		

Analyte	Result	RL
Gasoline C7-C12	34,000	25,000
tert-Butyl Alcohol (TBA)	43,000	5,000
Isopropyl Ether (DIPE)	ND	250
Ethyl tert-Butyl Ether (ETBE)	ND	250
Methyl tert-Amyl Ether (TAME)	4,500	250
MTBE	43,000	250
Benzene	920	250
Toluene	1,000	250
Ethylbenzene	1,300	250
m,p-Xylenes	3,800	250
o-Xylene	1,100	250

Surrogate	%REC	Limits
Dibromofluoromethane	100	77-136
1,2-Dichloroethane-d4	94	75-139
Toluene-d8	87	80-120
Bromofluorobenzene	98	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Organics by GC/MS

Lab #:	251991	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5081	Analysis:	EPA 8260B
Field ID:	MW-2	Batch#:	206717
Lab ID:	251991-004	Sampled:	12/30/13
Matrix:	Water	Received:	12/30/13
Units:	ug/L	Analyzed:	01/02/14
Diln Fac:	250.0		

Analyte	Result	RL
Gasoline C7-C12	ND	13,000
tert-Butyl Alcohol (TBA)	53,000	2,500
Isopropyl Ether (DIPE)	ND	130
Ethyl tert-Butyl Ether (ETBE)	ND	130
Methyl tert-Amyl Ether (TAME)	1,800	130
MTBE	18,000	130
Benzene	180	130
Toluene	ND	130
Ethylbenzene	ND	130
m,p-Xylenes	330	130
o-Xylene	ND	130

Surrogate	%REC	Limits
Dibromofluoromethane	99	77-136
1,2-Dichloroethane-d4	94	75-139
Toluene-d8	90	80-120
Bromofluorobenzene	99	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	251991	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5081	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC722651	Batch#:	206693
Matrix:	Water	Analyzed:	12/31/13
Units:	ug/L		

Analyte	Result	RL
Gasoline C7-C12	ND	50
tert-Butyl Alcohol (TBA)	ND	10
Isopropyl Ether (DIPE)	ND	0.50
Ethyl tert-Butyl Ether (ETBE)	ND	0.50
Methyl tert-Amyl Ether (TAME)	ND	0.50
MTBE	ND	0.50
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	0.50
o-Xylene	ND	0.50

Surrogate	%REC	Limits
Dibromofluoromethane	96	77-136
1,2-Dichloroethane-d4	85	75-139
Toluene-d8	84	80-120
Bromofluorobenzene	99	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	251991	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5081	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	206693
Units:	ug/L	Analyzed:	12/31/13
Diln Fac:	1.000		

Type: BS Lab ID: QC722652

Analyte	Spiked	Result	%REC	Limits
tert-Butyl Alcohol (TBA)	100.0	95.91	96	37-151
Isopropyl Ether (DIPE)	20.00	18.60	93	56-124
Ethyl tert-Butyl Ether (ETBE)	20.00	19.89	99	61-122
Methyl tert-Amyl Ether (TAME)	20.00	18.54	93	65-120
MTBE	20.00	20.27	101	64-121
Benzene	20.00	20.20	101	80-124
Toluene	20.00	21.47	107	80-122
Ethylbenzene	20.00	22.81	114	80-124
m,p-Xylenes	40.00	47.37	118	80-122
o-Xylene	20.00	24.45	122 *	77-120

Surrogate	%REC	Limits
Dibromofluoromethane	97	77-136
1,2-Dichloroethane-d4	88	75-139
Toluene-d8	92	80-120
Bromofluorobenzene	98	80-120

Type: BSD Lab ID: QC722653

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
tert-Butyl Alcohol (TBA)	100.0	102.2	102	37-151	6	30
Isopropyl Ether (DIPE)	20.00	17.38	87	56-124	7	20
Ethyl tert-Butyl Ether (ETBE)	20.00	18.99	95	61-122	5	22
Methyl tert-Amyl Ether (TAME)	20.00	18.19	91	65-120	2	22
MTBE	20.00	20.26	101	64-121	0	20
Benzene	20.00	18.74	94	80-124	8	20
Toluene	20.00	18.92	95	80-122	13	20
Ethylbenzene	20.00	20.88	104	80-124	9	20
m,p-Xylenes	40.00	43.75	109	80-122	8	20
o-Xylene	20.00	22.37	112	77-120	9	20

Surrogate	%REC	Limits
Dibromofluoromethane	97	77-136
1,2-Dichloroethane-d4	90	75-139
Toluene-d8	87	80-120
Bromofluorobenzene	97	80-120

*= Value outside of QC limits; see narrative
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	251991	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5081	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	206693
Units:	ug/L	Analyzed:	12/31/13
Diln Fac:	1.000		

Type: BS Lab ID: QC722654

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	800.0	843.6	105	80-120

Surrogate	%REC	Limits
Dibromofluoromethane	95	77-136
1,2-Dichloroethane-d4	84	75-139
Toluene-d8	87	80-120
Bromofluorobenzene	97	80-120

Type: BSD Lab ID: QC722655

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	800.0	846.8	106	80-120	0	20

Surrogate	%REC	Limits
Dibromofluoromethane	95	77-136
1,2-Dichloroethane-d4	82	75-139
Toluene-d8	84	80-120
Bromofluorobenzene	95	80-120

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	251991	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5081	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	206717
Units:	ug/L	Analyzed:	01/02/14
Diln Fac:	1.000		

Type: BS Lab ID: QC722733

Analyte	Spiked	Result	%REC	Limits
tert-Butyl Alcohol (TBA)	125.0	141.8	113	37-151
Isopropyl Ether (DIPE)	25.00	25.38	102	56-124
Ethyl tert-Butyl Ether (ETBE)	25.00	25.96	104	61-122
Methyl tert-Amyl Ether (TAME)	25.00	23.45	94	65-120
MTBE	25.00	27.14	109	64-121
Benzene	25.00	25.28	101	80-124
Toluene	25.00	25.38	102	80-122
Ethylbenzene	25.00	26.68	107	80-124
m,p-Xylenes	50.00	54.26	109	80-122
o-Xylene	25.00	29.01	116	77-120

Surrogate	%REC	Limits
Dibromofluoromethane	100	77-136
1,2-Dichloroethane-d4	88	75-139
Toluene-d8	85	80-120
Bromofluorobenzene	96	80-120

Type: BSD Lab ID: QC722734

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
tert-Butyl Alcohol (TBA)	125.0	128.2	103	37-151	10	30
Isopropyl Ether (DIPE)	25.00	23.93	96	56-124	6	20
Ethyl tert-Butyl Ether (ETBE)	25.00	25.19	101	61-122	3	22
Methyl tert-Amyl Ether (TAME)	25.00	23.39	94	65-120	0	22
MTBE	25.00	26.01	104	64-121	4	20
Benzene	25.00	25.16	101	80-124	0	20
Toluene	25.00	26.50	106	80-122	4	20
Ethylbenzene	25.00	27.30	109	80-124	2	20
m,p-Xylenes	50.00	57.18	114	80-122	5	20
o-Xylene	25.00	30.06	120	77-120	4	20

Surrogate	%REC	Limits
Dibromofluoromethane	96	77-136
1,2-Dichloroethane-d4	85	75-139
Toluene-d8	86	80-120
Bromofluorobenzene	94	80-120

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	251991	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5081	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC722735	Batch#:	206717
Matrix:	Water	Analyzed:	01/02/14
Units:	ug/L		

Analyte	Result	RL
Gasoline C7-C12	ND	50
tert-Butyl Alcohol (TBA)	ND	10
Isopropyl Ether (DIPE)	ND	0.50
Ethyl tert-Butyl Ether (ETBE)	ND	0.50
Methyl tert-Amyl Ether (TAME)	ND	0.50
MTBE	ND	0.50
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	0.50
o-Xylene	ND	0.50

Surrogate	%REC	Limits
Dibromofluoromethane	94	77-136
1,2-Dichloroethane-d4	84	75-139
Toluene-d8	87	80-120
Bromofluorobenzene	95	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Organics by GC/MS

Lab #:	251991	Location:	2844 Mountain Blvd., Oakland
Client:	SOMA Environmental Engineering Inc.	Prep:	EPA 5030B
Project#:	5081	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	206717
Units:	ug/L	Analyzed:	01/02/14
Diln Fac:	1.000		

Type: BS Lab ID: QC722736

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	1,018	102	80-120

Surrogate	%REC	Limits
Dibromofluoromethane	96	77-136
1,2-Dichloroethane-d4	90	75-139
Toluene-d8	85	80-120
Bromofluorobenzene	97	80-120

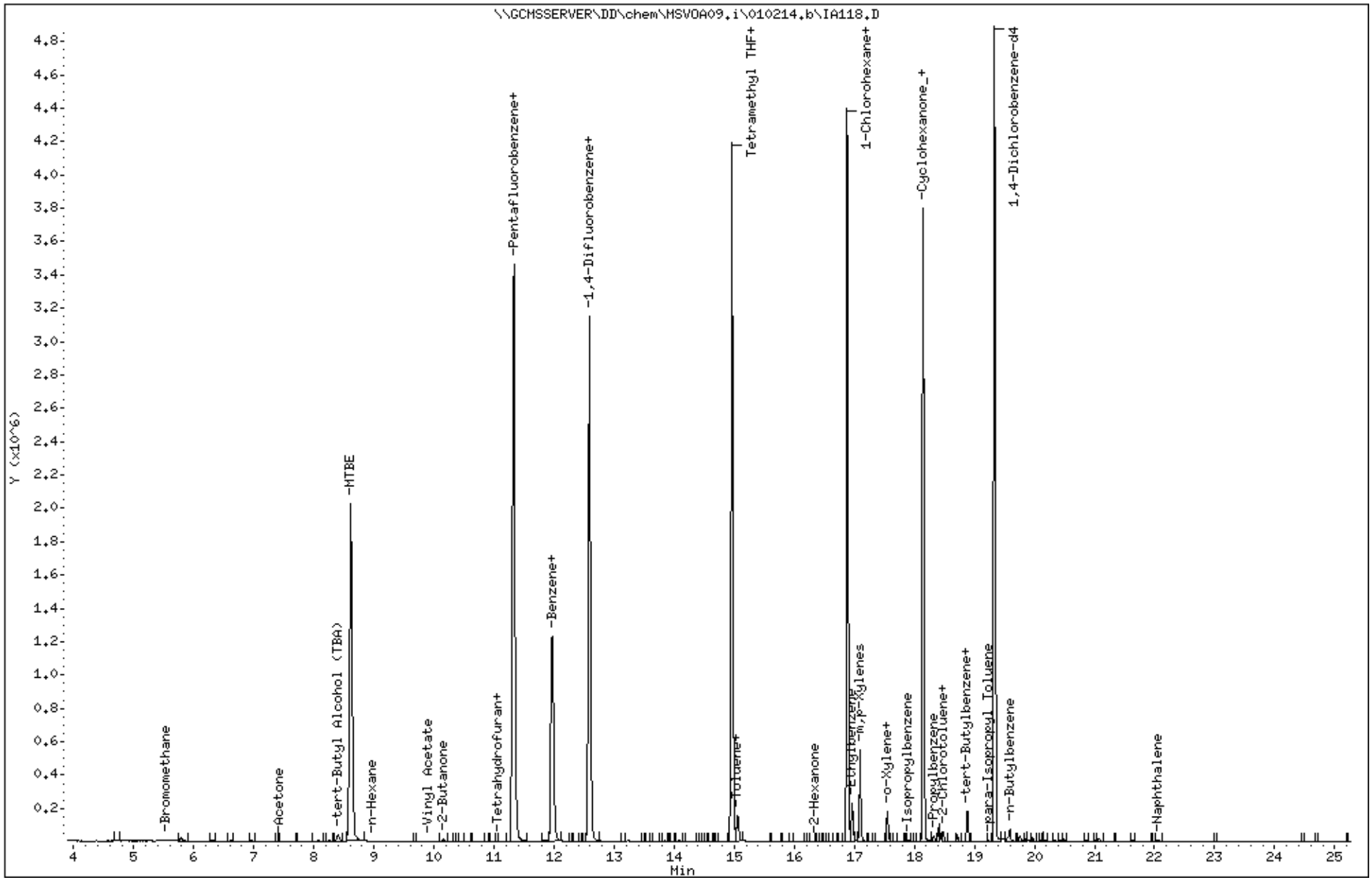
Type: BSD Lab ID: QC722737

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	1,000	1,034	103	80-120	2	20

Surrogate	%REC	Limits
Dibromofluoromethane	94	77-136
1,2-Dichloroethane-d4	85	75-139
Toluene-d8	84	80-120
Bromofluorobenzene	96	80-120

RPD= Relative Percent Difference

Data File: \\GCMSSERVER\DD\chem\MSVOA09.i\010214.b\IA118.D
Date : 02-JAN-2014 20:40
Client ID: DYNA P&T
Instrument: MSVOA09.i
Sample Info: S251991-003
Purge Volume: 5.0
Operator: VOC
Column phase: RTx Volatiles
Column diameter: 0.25



Data File: \\GCMSSERVER\DD\chem\MSVOA09.i\123113.b\ILV08TVH.D

Date : 31-DEC-2013 14:06

Client ID: DYNA P&T

Instrument: MSVOA09.i

Sample Info: BSD,QC722655,206693,S23229,.008/100

Operator: VOC

Column phase:

Column diameter: 2.00