May 19, 2011

Ms. Flora Chan
Bay Area Air Quality Management District
Permit Services Division
939 Ellis Street
San Francisco, California 94109

Re: **SVE System Startup Results**
Soil Vapor Extraction (SVE) System
1230 14th Street, Oakland, California
BAAQMD Plant No. 20186
BAAQMD Application No. 21821

Dear Ms. Chan:

Pangea Environmental Services (Pangea) is submitting startup test results for the soil vapor extraction (SVE) system in operation at the subject site. Startup of the remediation system was initiated on April 27, 2011. Described below are the system description, system startup and sampling, permit compliance, and future activities.

SYSTEM DESCRIPTION

The SVE system consists of a 250 cubic foot per minute (cfm) positive displacement blower (S-1), electric catalytic oxidizer (A-1), and emission stack (P-1). The SVE system is the vapor portion of the combined soil vapor/groundwater [dual phase extraction (DPE)] system. Soil vapor and groundwater are simultaneously extracted from the subsurface using PVC piping and drop-tube stingers in up to five remediation wells. After extraction from the wells, the soil vapor process stream passes through a vapor/liquid separator, where any entrained groundwater is separated out and treated. From the vapor/liquid separator, soil vapor passes through the positive-displacement blower and is routed to the oxidizer for abatement before being discharged to the atmosphere.

SYSTEM STARTUP AND SAMPLING

Pangea provided initial startup notification to Flora Chan on February 4, 2011. Influent and effluent vapor samples were collected on May 5, after approximately 7 days (165 hours) of total system operation. SVE system performance data, flow rates, laboratory analytical data, organic vapor analyzer measurements, hydrocarbon removal rates, emission rates, and destruction efficiency are summarized on attached Table 1. Laboratory analytical results are included in Attachment A.

PERMIT COMPLIANCE

Compliance with permit conditions is summarized below on Table A. Given the influent vapor concentration of 28 ppmv TPHg (below 200 ppmv), the Authority to Construct (ATC) permit requires a minimum abatement/destruction efficiency of >90% for TPHg. Based on the startup data the equipment achieved abatement of > 21.4% for TPHg, which *does not* meet the permit requirement. As shown on attached Table 1, the TPHg and benzene removal rates from the subsurface were approximately 1.0 and 0.05 lbs/day, respectively. The estimated benzene emission rate was 0.031 lbs/day, which is slightly exceeded the permit limit of 0.021 lbs/day. The ATC also requires a maximum flow rate of 410 scfm and minimum oxidizer temperature of 600 degrees Fahrenheit.

Table A – Compliance Evaluation for SVE Startup Data for 5/5/11

Sample Location	TPHg Concentration (ppmv)	Benzene Mass Removal/Emissions (lbs/day)	Flow Rate (scfm)	Temp (°F)*
Influent	28	0.05	107	671
Effluent	22	0.031	107	412
Permit Limit	90% Abatement	0.021 lbs/day	410	>600
Pass/Fail	**Fail** (21.4%)	**Fail**	**Pass**	**Pass**

* Thermocouples in oxidizer chamber transmit temperature data to temperature controllers on oxidizer control panel.

NOTIFICATION AND CORRECTIVE ACTION

Pangea noticed the permit exceedence on May 19, 2011 and promptly notified you the same day. Based on our discussion, Pangea shutdown the system the same day (May 19, 2011).

Our corrective action plan to remedy this exceedance is to inspect the equipment, repair the equipment (if needed), restart the system, collect influent and effluent samples, and shutdown the system pending analytical results. Pangea will prepare a brief report describing the sampling results and emission rates for submission to BAAQMD. If analytical results indicate compliance with ATC conditions, we will restart the system. If results indicate the system is still not in compliance with the ATC, Pangea will perform additional equipment evaluation and repair with the equipment provider.

CLOSING

If you have any questions or comments, please feel free to contact me at (510) 435-8664 or briddell@pangeaenv.com.

Sincerely,
Pangea Environmental Services

Bob Clark-Riddell, P.E.

ATTACHMENTS

Table 1 – SVE Performance Data

Attachment A – Laboratory Analytical Results

cc: SWRCB Geotracker Database (electronic copy)

Pangea

Table 1. SVE (DPE) Performance Data - 1230 14th Street, Oakland, CA											Removal				Emission Reporting					
Date	Wells	Oxidizer Hr Meter Reading (hours)	Total Time (days)	Interval Time (days)	System Vapor Flow Rate (cfm)	Applied Vacuum ("Hg)	Lab Sample ID	Influent TPHg Lab (ppmv)	Influent Benzene Lab Data (ppmv)	Influent OVA Reading (ppmv)	SVE TPHg Removal Rate (lbs/day)	SVE Benzene Removal Rate (lbs/day)	Cumulative SVE TPHg Removal (lbs)	Cumulative SVE Benzene Removal (lbs)	Effluent TPHg Lab (ppmv)	Effluent Benzene Lab Data (ppmv)	TPHg Abatement Efficiency (%)	Benzene Abatement Efficiency (%)	Benzene Emission Rate (lbs/day)	Cumulative Vapor Flow (cf)
04/27/11	DP-1,2,4,5	10730.2	0.0	0.0	107	9	INF-V	32	2.0	34	1.1	0.06	0.0	0	---	---	---	---	---	0
05/05/11	DP-1,2,4,5	10895.3	6.9	6.9	107	7	---	**28**	**1.5**	23	1.0	0.05	6.6	0.32	**22**	**1.0**	**21.4**	**33.3**	**0.031**	1,059,942
05/16/11	DP-1,2,4,5	11164.0	18.1	11.2	107	17	---	20	1.0	---	0.7	0.03	14.3	0.67	---	---	---	---	---	2,784,996

Notes:

ALL = Wells DP-1, DP-2, DP-3, DP-4 and DP-5.

NA = not analyzed; NM = not measured; --- = not available

System data estimated when specific data not available.

cfm = actual cubic feet (cf) per minute based on anemometer readings (from vacuum side of vacuum pump during SVE).

ppmv = parts per million on volume to volume basis. Actual lab data shown in **bold.** Lab data estimated for dates without lab data to allow mass removal calculation.

lbs = Pounds

"Hg = Inches of mercury vacuum

SVE = Soil Vapor Extraction

OVA = Organic Vapor Analyzer (Horiba Model MEXA 324JU)

TPHg and Benzene Removal Rates = For dates where no laboratory analytical data was collected, the lab data is estimated based on prior lab data and OVA readings to calculate period and cumulative mass removal.

Hydrocarbon Removal/Emission Rate = Rate based on Bay Area Air Quality Management District's Manual of Procedures for Soil Vapor Extraction dated July 17, 1991.

Rate = lab concentration (ppmv) x system flowrate (scfm) x (1lb-mole/386 ft^3) x molecular weight (86 lb/lb-mole for TPH-Gas hexane) x 1440 min/day x 1/1,000,000.

ATTACHMENT A

Laboratory Analytical Results

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Web: www.mccampbell.com E-mail: main@mccampbell.com
Telephone: 877-252-9262 Fax: 925-252-9269

Pangea Environmental Svcs., Inc.	Client Project ID: #1150.001; 1230 14st St	Date Sampled: 05/05/11
		Date Received: 05/05/11
1710 Franklin Street, Ste. 200	Client Contact: Morgan Gillies	Date Reported: 05/10/11
Oakland, CA 94612	Client P.O.:	Date Completed: 05/09/11

WorkOrder: 1105139

May 10, 2011

Dear Morgan:

Enclosed within are:

1) The results of the **2** analyzed samples from your project: **#1150.001; 1230 14st St,**
2) A QC report for the above samples,
3) A copy of the chain of custody, and
4) An invoice for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits.

If you have any questions or concerns, please feel free to give me a call. Thank you for choosing

McCampbell Analytical Laboratories for your analytical needs.

Best regards,

Angela Rydelius
Laboratory Manager
McCampbell Analytical, Inc.

1105139

McCAMPBELL ANALYTICAL, INC.

1534 Willow Pass Road
Pittsburg, CA 94565
Website: www.mccampbell.com Email: main@mccampbell.com
Telephone: (925) 252-9262 Fax: (925) 252-9269

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ 5 DAY

EDF Required? Coelt (Normal) No Write On (DW) No

Report To: Morgan Gillies	Bill To: Pangea
Company: Pangea Environmental Services, Inc.	
1710 Franklin Street, Suite 200, Oakland, CA 94612	E-Mail: mgillies@pangeaenv.com
Tele: (510) 836-3702	Fax: (510) 836-3709
Project #: 1150.001	Project Name: 1230 14th St
Project Location: 1230 14th St., Oakland	
Sampler Signature:	

SAMPLE ID	LOCATION (Field Point Name)	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED ICE	METHOD PRESERVED HCL	METHOD PRESERVED HNO_3	METHOD PRESERVED Other
EFF-V	EFF	5-5-11	0800	1	tedlar			X			X			
INF-V	INF	5-5-11	0815	1	Tedlar			X			X			

Analysis Request

BTEX & TPH as Gas (602/8020 + 8015)/MTBE	TPH as Diesel (8015) w/ Silica Gel Cleanup	Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 601 / 8010 / 8021	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8081	EPA 608 / 8082 PCB's ONLY	EPA 8140 / 8141	EPA 8150 / 8151	EPA 524.2 / 624 / 8260	EPA 525 / 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals (6010 / 6020)	LUFT 5 Metals (6010 / 6020)	Lead (200.8 / 200.9 / 6010)
X															
X															

Other: Five fuel oxygenates by EPA Method 8260

Comments: Filter Samples for Metals analysis: Yes / No

Relinquished By:	Date:	Time:	Received By:
	5-5-11	1540	
Relinquished By:	Date:	Time:	Received By:
	5/5/11	1700	
Relinquished By:	Date:	Time:	Received By:

ICE/t°_____ COMMENTS:
GOOD CONDITION_____
HEAD SPACE ABSENT_____
DECHLORINATED IN LAB_____
APPROPRIATE CONTAINERS_____
PRESERVED IN LAB_____

VOAS O&G METALS OTHER
PRESERVATION pH<2

McCampbell Analytical, Inc.
1534 Willow Pass Rd
Pittsburg, CA 94565-1701
(925) 252-9262

CHAIN-OF-CUSTODY RECORD

WorkOrder: 1105139 **ClientCode: PEO**

☐ WaterTrax ☐ WriteOn ☑ EDF ☐ Excel ☐ Fax ☑ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag

Report to:
Morgan Gillies
Pangea Environmental Svcs., Inc.
1710 Franklin Street, Ste. 200
Oakland, CA 94612
(510) 836-3700 FAX (510) 836-3709

Email: mgillies@pangeaenv.com
cc:
PO:
ProjectNo: #1150.001; 1230 14st St

Bill to:
Bob Clark-Riddell
Pangea Environmental Svcs., Inc.
1710 Franklin Street, Ste. 200
Oakland, CA 94612

Requested TAT: 5 days

Date Received: **05/05/2011**
Date Printed: **05/05/2011**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)											
					1	2	3	4	5	6	7	8	9	10	11	12
1105139-001	EFF-V	Air	5/5/2011 8:00	☐	A	A										
1105139-002	INF-V	Air	5/5/2011 8:15	☐	A											

Test Legend:

1	G-MBTEX_AIR	2	PREDF REPORT	3		4		5	
6		7		8		9		10	
11		12							

The following SampIDs: 001A, 002A contain testgroup.

Prepared by: Ana Venegas

Comments:

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).
Hazardous samples will be returned to client or disposed of at client expense.

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Sample Receipt Checklist

Client Name: **Pangea Environmental Svcs., Inc.**

Date and Time Received: **5/5/2011 6:34:59 PM**

Project Name: **#1150.001; 1230 14st St**

Checklist completed and reviewed by: Ana Venegas

WorkOrder N°: **1105139** Matrix Air

Carrier: Rob Pringle (MAI Courier)

Chain of Custody (COC) Information

Chain of custody present?	Yes ☑	No ☐
Chain of custody signed when relinquished and received?	Yes ☑	No ☐
Chain of custody agrees with sample labels?	Yes ☑	No ☐
Sample IDs noted by Client on COC?	Yes ☑	No ☐
Date and Time of collection noted by Client on COC?	Yes ☑	No ☐
Sampler's name noted on COC?	Yes ☑	No ☐

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	NA ☑
Shipping container/cooler in good condition?	Yes ☑	No ☐	
Samples in proper containers/bottles?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature	Cooler Temp:		NA ☑
Water - VOA vials have zero headspace / no bubbles?	Yes ☐	No ☐	No VOA vials submitted ☑
Sample labels checked for correct preservation?	Yes ☑	No ☐	
Metal - pH acceptable upon receipt (pH<2)?	Yes ☐	No ☐	NA ☑
Samples Received on Ice?	Yes ☐	No ☑	

** NOTE: If the "No" box is checked, see comments below.*

Client contacted: Date contacted: Contacted by:

Comments:

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Pangea Environmental Svcs., Inc.	Client Project ID: #1150.001; 1230 14st St	Date Sampled: 05/05/11
		Date Received: 05/05/11
1710 Franklin Street, Ste. 200	Client Contact: Morgan Gillies	Date Extracted: 05/06/11
Oakland, CA 94612	Client P.O.:	Date Analyzed: 05/06/11

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE*

Extraction method: SW5030B Analytical methods: SW8021B/8015Bm Work Order: 1105139

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS	Comments
001A	EFF-V	A	80	ND	3.4	1.7	0.56	2.7	1	104	d1
002A	INF-V	A	100	ND	4.8	2.5	0.93	3.9	1	109	d1

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	A	25	2.5	0.25	0.25	0.25	0.25	µg/L
	S	1.0	0.05	0.005	0.005	0.005	0.005	mg/Kg

* water and vapor samples are reported in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

cluttered chromatogram; sample peak coelutes with surrogate peak; %SS = Percent Recovery of Surrogate Standard; DF = Dilution Factor

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation:

d1) weakly modified or unmodified gasoline is significant

DHS ELAP Certification 1644

Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.
"When Quality Counts"

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Web: www.mccampbell.com E-mail: main@mccampbell.com
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Pangea Environmental Svcs., Inc.	Client Project ID: #1150.001; 1230 14st St	Date Sampled: 05/05/11
		Date Received: 05/05/11
1710 Franklin Street, Ste. 200	Client Contact: Morgan Gillies	Date Extracted: 05/06/11
Oakland, CA 94612	Client P.O.:	Date Analyzed: 05/06/11

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with MTBE and BTEX in ppmv*

Extraction method: SW5030B Analytical methods: SW8021B/8015Bm Work Order: 1105139

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS	Comments
001A	EFF-V	A	22	ND	1.0	0.44	0.13	0.62	1	104	d1
002A	INF-V	A	28	ND	1.5	0.66	0.21	0.88	1	109	d1

ppm (mg/L) to ppmv (ul/L) conversion for TPH(g) assumes the molecular weight of gasoline to be equal to that of hexane.

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	A	7.0	0.68	0.077	0.065	0.057	0.057	1	uL/L
	S	NA	NA	NA	NA	NA	NA	1	mg/Kg

* vapor samples are reported in µL/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L, water samples and all TCLP & SPLP extracts are reported in µg/L.

cluttered chromatogram; sample peak coelutes with surrogate peak; %SS = Percent Recovery of Surrogate Standard; DF = Dilution Factor

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation:

d1) weakly modified or unmodified gasoline is significant

DHS ELAP Certification 1644

Angela Rydelius, Lab Manager

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QC SUMMARY REPORT FOR SW8021B/8015Bm

W.O. Sample Matrix: Air QC Matrix: Water BatchID: 58153 WorkOrder 1105139

EPA Method SW8021B/8015Bm **Extraction SW5030B** **Spiked Sample ID: 1105173-003A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
TPH(btex)£	ND	60	88.8	85.4	3.96	112	111	0.993	70 - 130	20	70 - 130	20
MTBE	ND	10	117	117	0	95.9	103	7.15	70 - 130	20	70 - 130	20
Benzene	ND	10	108	105	3.03	98.2	100	2.03	70 - 130	20	70 - 130	20
Toluene	ND	10	101	103	1.11	99.8	102	2.06	70 - 130	20	70 - 130	20
Ethylbenzene	ND	10	100	99.6	0.733	104	105	1.87	70 - 130	20	70 - 130	20
Xylenes	ND	30	106	102	3.29	108	109	0.522	70 - 130	20	70 - 130	20
%SS:	96	10	99	101	2.49	98	94	4.80	70 - 130	20	70 - 130	20

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:
NONE

BATCH 58153 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1105139-001A	05/05/11 8:00 AM	05/06/11	05/06/11 3:23 PM	1105139-002A	05/05/11 8:15 AM	05/06/11	05/06/11 9:59 PM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

£ TPH(btex) = sum of BTEX areas from the FID.

cluttered chromatogram; sample peak coelutes with surrogate peak.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS ELAP Certification 1644 QA/QC Officer