

September 24, 2009

Mr. Chris Villarreal  
Project Manager  
U.S. EPA  
Region 6  
1445 Ross Ave. (6SF-TS)  
Dallas Texas, 75202

Subject: Completed Actions and Proposed Vents  
Leon Valley Veterinary Clinic  
6701 Bandera Road  
Leon Valley, Texas

Mr. Villarreal:

This letter presents a report concerning completed and proposed actions at the Leon Valley Veterinary Clinic. After receiving your comments and approval of the proposed vent system, we will then contact the building owner and seek his permission for installation of the system. A description of site conditions and a more detailed discussion of the work are presented below.

## **1.0 SITE CONDITIONS AND EPA STUDIES**

The Leon Valley Veterinary Clinic is located on 6701 Bandera Road in San Antonio, Texas. The location of the site is shown on Figure 1.

The Veterinary Clinic is a slab-on-grade single story building constructed in approximately<sup>1</sup> 1977. The footprint of the building encompasses approximately 2000 square feet. A plan of the property showing building details is presented on Figure 2. Photographs of the site are presented in Appendix A.

The United States Environmental Protection Agency (EPA) has conducted testing of the indoor air space at the Veterinary Clinic. The EPA has also tested soil vapor beneath the slab of the building. This testing revealed that concentrations of perchloroethene (PCE) in two indoor air samples at the Veterinary Clinic were 6.4 and 19 ug/m<sup>3</sup>. The concentrations of PCE in two soil vapor samples from beneath the slab were 20,000 and 36,000 ug/m<sup>3</sup>. This testing was conducted by EPA in January 2009. A figure showing the testing locations is presented on Figure 3. A summary of the testing is presented on Table I.

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<sup>1</sup> Construction date recognized by the Bexar County Appraisal District

The EPA also conducted a passive soil vapor survey on the Vet Clinic Property and adjoining property in November 2009. A summary of this testing is shown on Figure 4.

## **2.0 PID SURVEY BY STC**

A photo-ionization detector (PID) with a 11.7 eV lamp was utilized by STC to evaluate total organic vapor concentrations in utility penetrations and other targeted locations in the Veterinary Clinic. The purpose of this work was to assess the potential for preferential pathways where vapors beneath the slab may enter the building.

The PID was used to search for the presence of vapors in sewer lines, water penetrations, and the interstitial wall space. The PID was deployed at the site by STC on June 4, 2009 and July 22, 2009.

The initial PID survey conducted June 4, 2009 measured for vapors at more than 20 locations. Areas targeted for inspection included the following:

- The wall penetrations for each hot and cold water line.
- The wall penetration for each sanitary sewer line at all the sinks and toilets in the clinic.
- Selected locations where the PID could be inserted below the baseboard and possibly measure vapors in the interstitial wall space.
- Behind wall sockets and plates for light switches.
- Exterior weep holes.
- Other available locations where vapors might have a tendency to accumulate

The PID survey in June 2009 identified detectable organic vapor concentrations in exterior weep holes and one sewer line location. The sampling points for this survey are shown on Figure 5. Test results and more detailed sample descriptions are presented on Table II.

A second survey was conducted on July 22, 2009 and was performed to verify and confirm the June data. This survey indicated that organic vapor concentrations were no longer detectable in the exterior weep holes. The sampling points for this survey are shown on Figure 6. Test results and more detailed sample descriptions are presented on Table III.

## **3.0 DISCUSSION OF RESULTS AND AREAS TARGETED FOR MITIGATION**

The PID Survey indicated detectable organic vapor concentrations were present at the following locations:

- At multiple exterior weep holes in June 2009 but not at weep hole locations in July 2009.
- In the sink drain located in the Treatment Room in June 2009.
- In the sub slab vapor sampling port in July 2009, but not in June 2009.

The reason for the absence of organic vapors at weep hole locations in July 2009 is unknown. However, we suspect the drop could be due to differences in air temperature and barometric pressure between the June and July measurement events. Changes in the ventilation and operation of the building's HVAC system could also affect the readings.

The vapor reading in the Treatment Room sink drain was taken directly from the drain opening and not the wall penetration for the drain. Therefore, this sample could represent fugitive vapors from sewer gases and not be indicative of elevated PCE vapors.

The reason for the absence of detectable organic vapor concentrations in the sub slab vapor port in June 2009 is unknown. It is also unclear why the vapors found by the PID detector appear to be significantly lower than the vapor tests by EPA. We suspect these differences are primarily due to the difference in sampling techniques. The vapor sampling conducted by EPA at the sub slab port utilized Summa canisters that slowly withdrew air over an 8 hour period through a sealed connection. The PID survey was a brief withdrawal of vapors without a sealed connection at the sampling port.

Organic vapor concentrations at weep hole locations in June 2009 were highest on the north side of the building where a crack in the brick veneer wall was evident (See Photographs 5 and 14 in Appendix A).

Based on the data collected to date, two areas of the building are currently targeted for vapor mitigation. These locations are:

1. Near the crack in the brick veneer on the north wall of the lease space.
2. On the northwest corner of the building where it is suspected the main sewer line exits the building and flows to the public system.

The area near the crack in the north brick veneer wall is targeted because this area may be a focal point for sub-slab vapors to escape and enter the indoor air. The sewer line exit point is targeted because permeable backfill around the sewer line could also serve as a collection point for vapor. If organic vapors do indeed accumulate in sewer back fill, withdrawal of vapors in this area could potentially reduce organic vapor concentrations throughout the sub-slab where backfill is located. Withdrawal of vapors in sewer backfill also appeared to be successful at reducing indoor air concentrations at the adjoining property where vapor mitigation<sup>3</sup> has already taken place.

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<sup>3</sup> Sub Slab depressurization vents were installed on the adjoining property at located 6709 Bandera. These vents are located approximately 50 feet from the west wall of the Vet Clinic and showed reductions in indoor air PCE concentrations after the vents became operational.

#### **4.0 DETAILS OF THE PROPOSED MITIGATION SYSTEM**

It is proposed that vapors will be withdrawn from the subsurface at two vent locations. One vent will be located near the crack in the north brick wall and the other vent will be located where the sewer line exits the slab. These locations, designated SSD Vent 3 and SSD Vent 4, are shown on Figure 2.

The vents will consist of 4 inch diameter PVC pipes that are placed approximately 3 feet below surface. The target depth of the vents is one foot below the foundation wall. A profile view of the proposed vents is shown on Figure 8.

Prior to installing the vents, a camera inspection will be performed to potentially locate existing sewer lines that may be present on the west side of the Veterinary Clinic. These estimated line locations are shown on Figure 7.

To potentially enhance vapor withdrawal from under the slab, a plastic liner will be placed in a 5 foot radius around SSD Vent 4. The liner is designed to minimize the infiltration of ambient air and focus withdrawal of vapors from beneath the slab and sewer backfill areas. Depth of the liner will be at least 1 foot below surface to allow vegetative growth. Thickness of the liner will be 40 mil.

Provided the sewer line locations shown on Figure 7 are confirmed by the camera inspection, a smaller liner will also be placed around SSD Vent 3. This liner will be placed in areas within a 5 foot radius of the vent where grass is present. This smaller liner area is shown on Figure 7.

The vents will be powered by an EcoVantage Solar Fan Kit (Catalog Number CDT-F0). Additional details concerning the vents and solar panels are shown on Figure 8.

#### **5.0 TESTING OF THE INDOOR AIR**

Approximately 2 weeks after installation, the indoor air at the Veterinary Clinic will be retested. This will be conducted using Summa canisters withdrawing over an 8 hour period. The day selected for testing will be limited to a daylight time when the solar fans are running with a supply voltage of at least 50% of the estimated maximum.

The same testing methods referenced above will be repeated at intervals of 3 months and 6 months after vent installation. The overall effectiveness of the system will then be evaluated. A report on the evaluation will then be submitted to EPA for review.

#### **6.0 SUMMARY**

The EPA has tested the indoor air and sub-slab vapors at the Leon Valley Veterinary Clinic. STC has augmented this data with a PID survey to identify potential vapor migration pathways. Based on the data collected, two areas were selected for vapor mitigation. STC is prepared to install solar powered vents at these locations. Pending EPA's approval of this plan, we will seek

landowner approval. The vents will then be installed and then monitoring will be conducted. The monitoring will extend over a period of six months and STC will prepare a report on the vent system effectiveness at that time.

We will await your approval of the plan and possible comments on the work. If you have any questions, please do not hesitate to contact me at (210) 696-6288.

**Respectfully,**



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**Craig Tribbley P.G.  
Vice President  
CAPM 00022**

**cc: Stuart Schneider, Saving Square Partners  
Erich Birch, Birch, Becker, Moorman  
Eric Pastor, Pastor, Behling & Wheeler LLC**

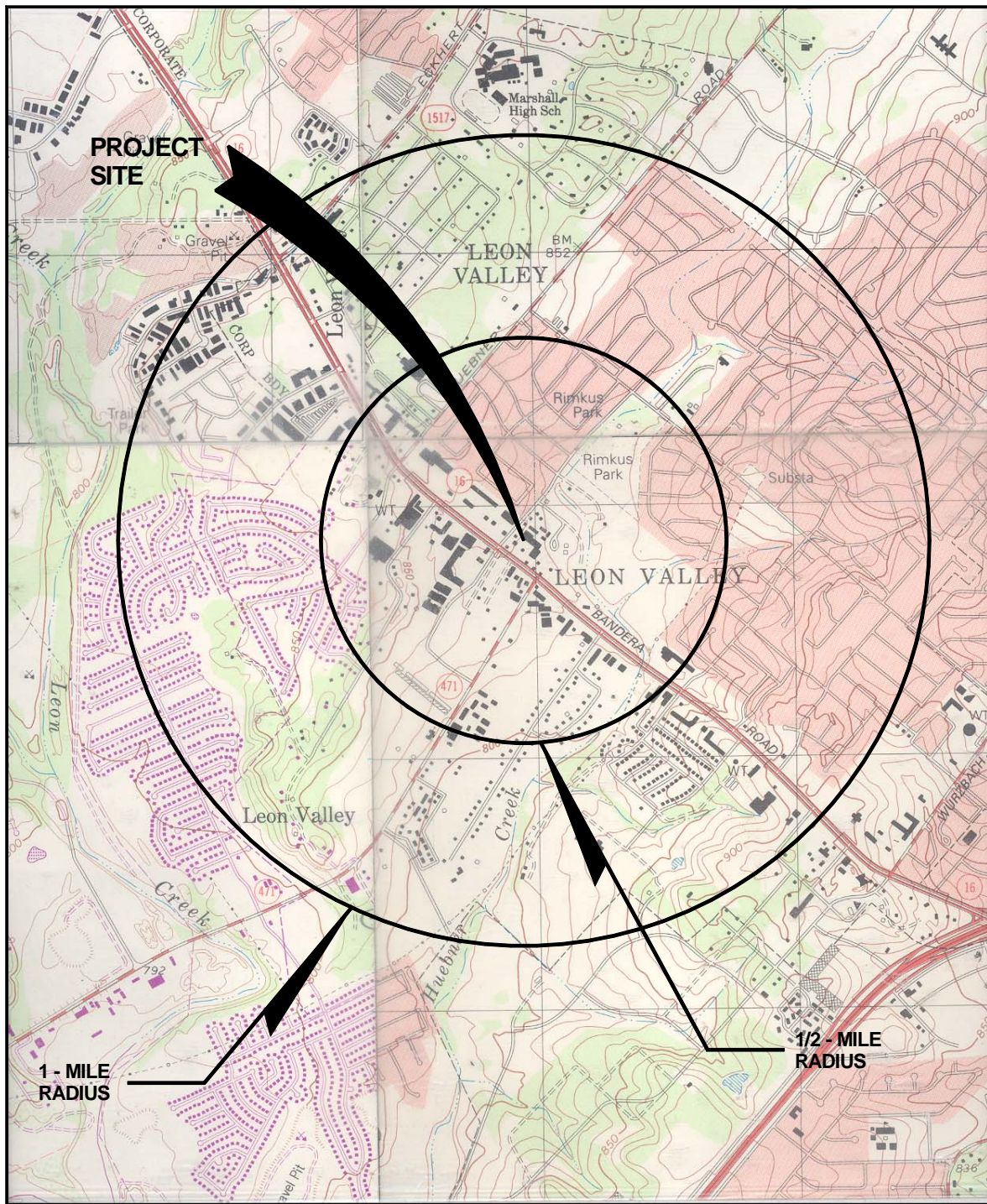
**Attachments:**

**Figure 1 – Site Location  
Figure 2 – Site Plan and Proposed Vent Locations  
Figure 3 – Vapor Testing Location by EPA – January 2009  
Figure 4 – Passive Soil Gas Survey Results  
Figure 5 – PID Readings – June 2009  
Figure 6 – PID Readings – July 2009  
Figure 7 – Vent Details – Plan View  
Figure 8 – Vent Details – Profile View**

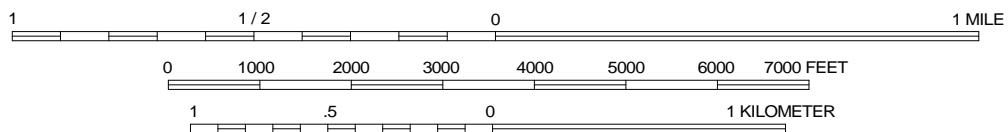
**Table I – Summary of Vapor Testing by EPA – January 2009  
Table II – Summary of PID Reading by STC - June 2009  
Table III – Summary of PID Reading by STC - July 2009**

**Appendix A – Site Photographs**





SCALE = 1 : 24,000



CONTOUR INTERVAL 10 FEET  
DASHED LINES - 5 FOOT CONTOURS

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**SITE VICINITY MAP**

FIG. 1

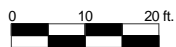
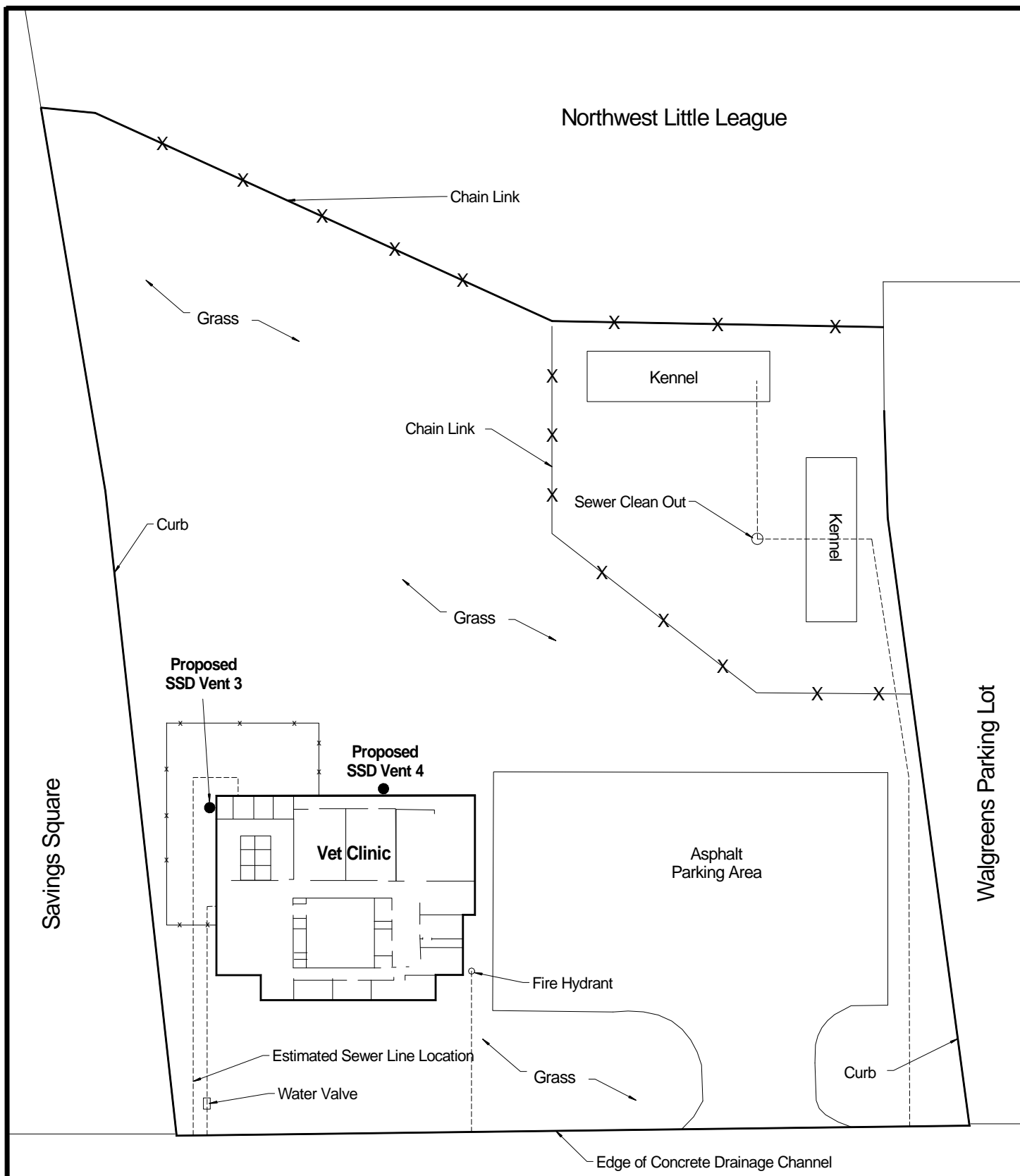
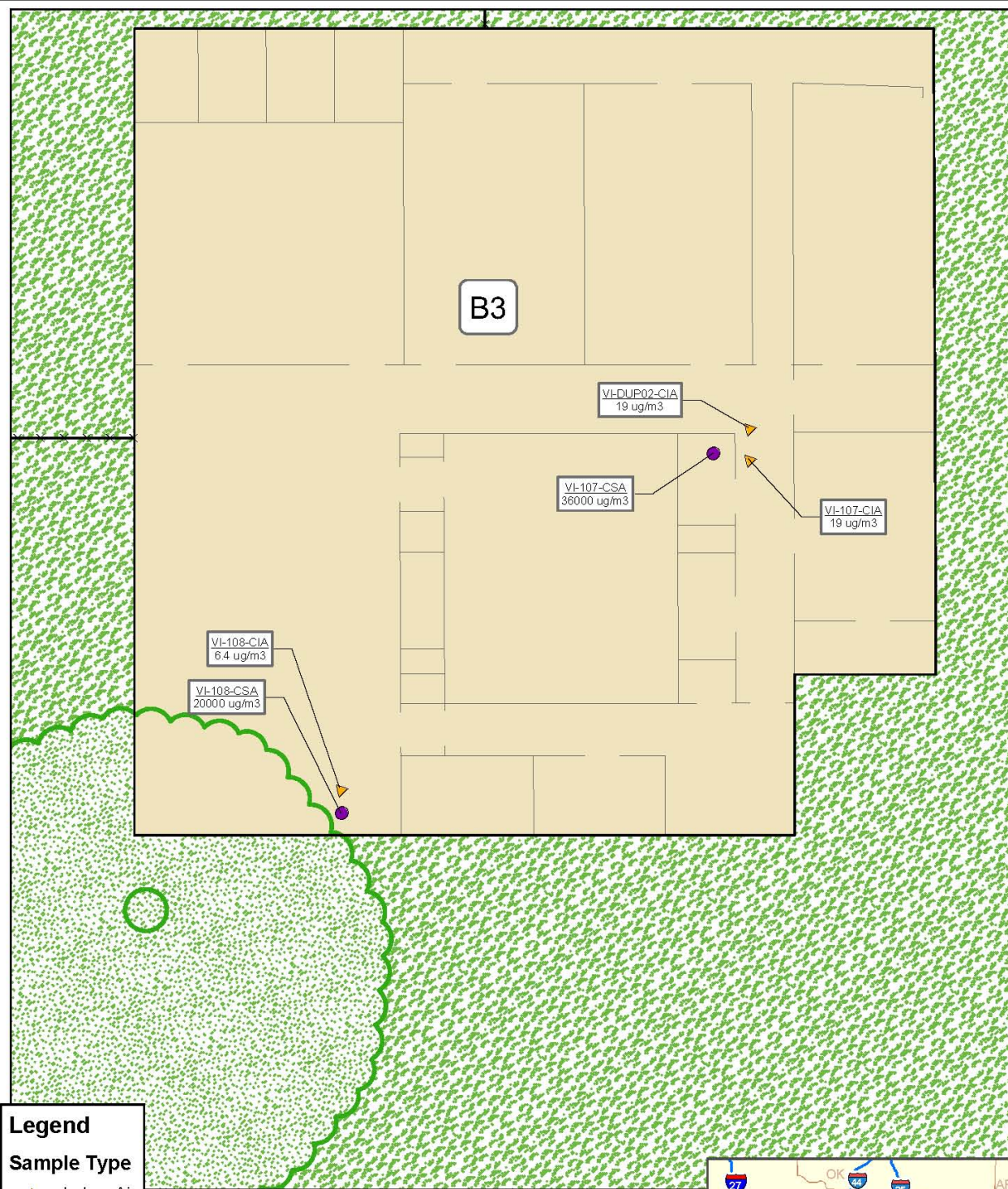


Figure 2 Site Plan - 09.22.09.SKF





**Legend**

**Sample Type**

- ▲ Indoor Air
- Sub

0 5 10  
Feet



Remedial Investigation  
Bandera Road Ground Water Plume Superfund Site  
Leon Valley/San Antonio, Bexar County, Texas



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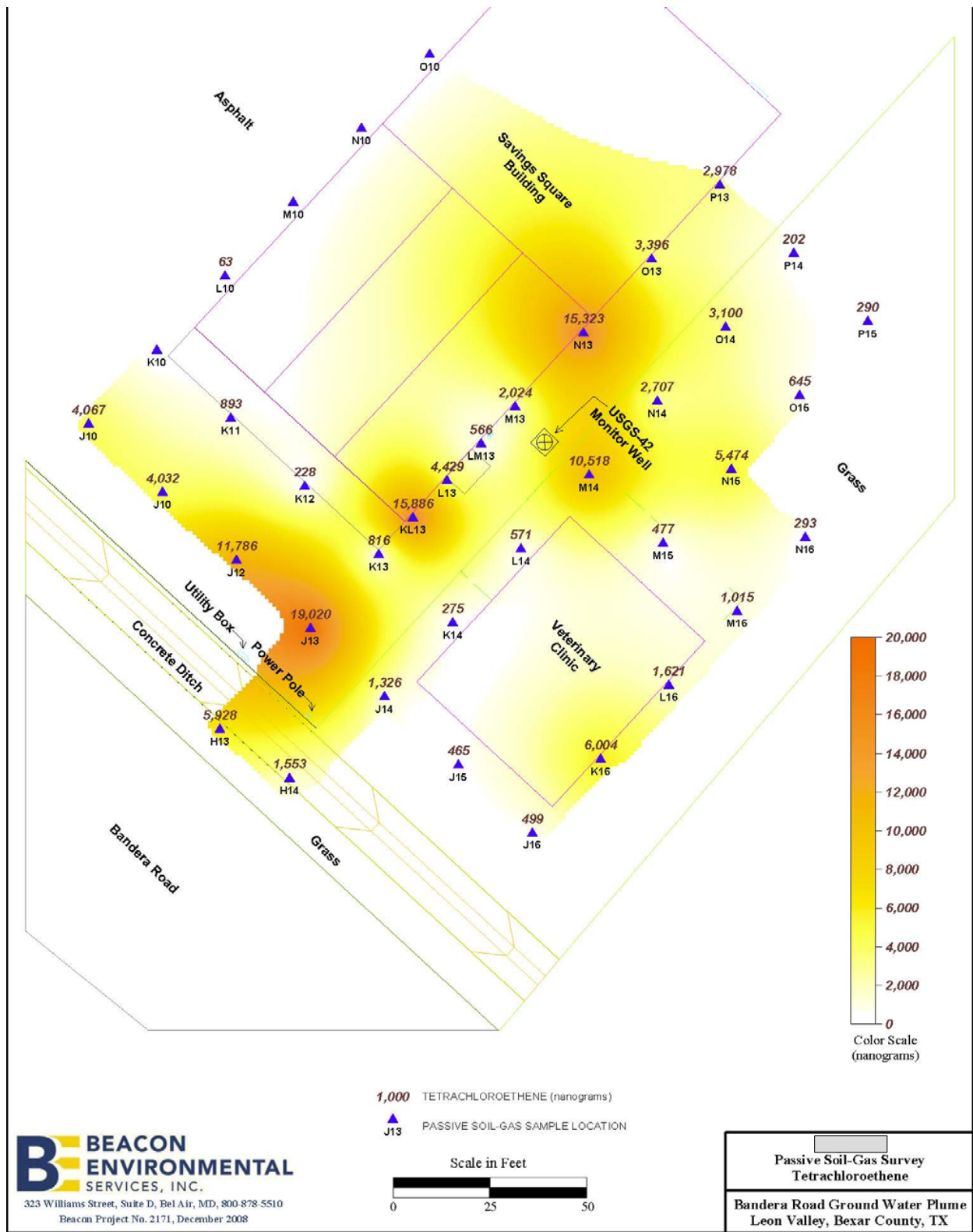
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**EPA AIR SAMPLING LOCATIONS**

FIG. 3





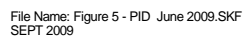
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**PASSIVE SOIL GAS SURVEY**

FIG. 4



Fenced Dog Run

# LEGEND

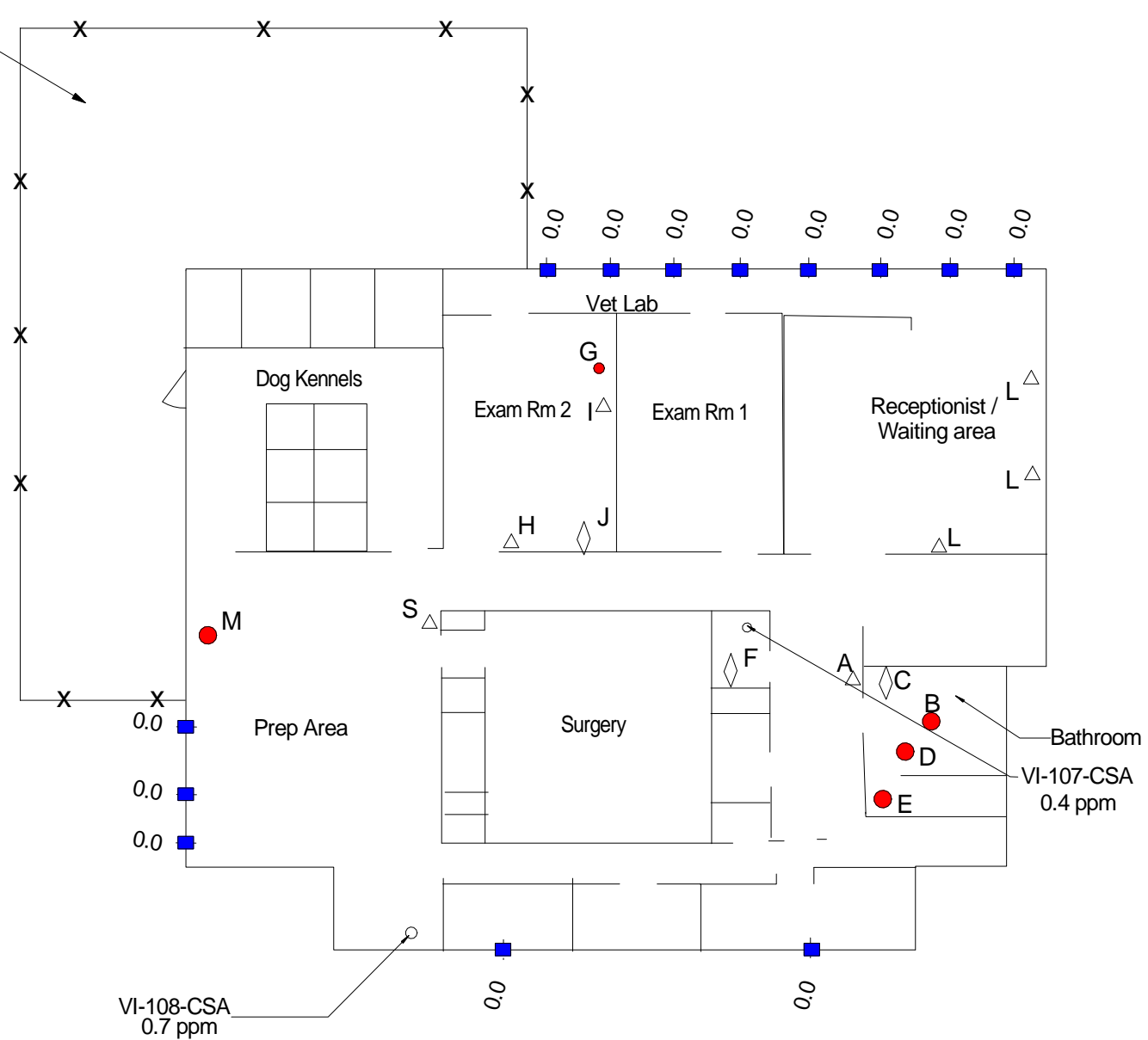
- Sink/drain sewer penetration
- △ Electrical outlet
- Weep hole in brick veneer
- ◇ Baseboard



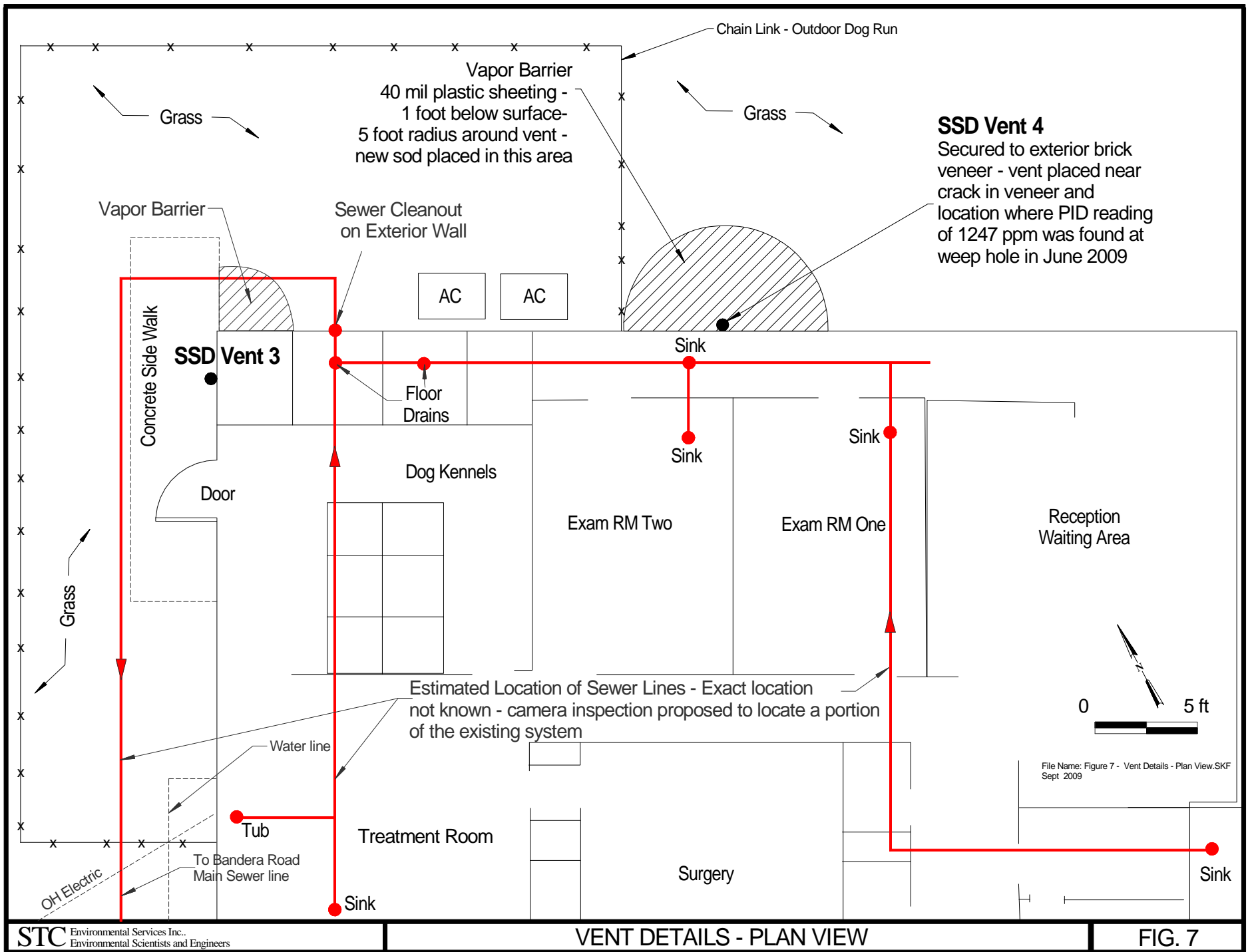
File Name: Figure 6 - PID July 2009.SKF  
SEPT 2009

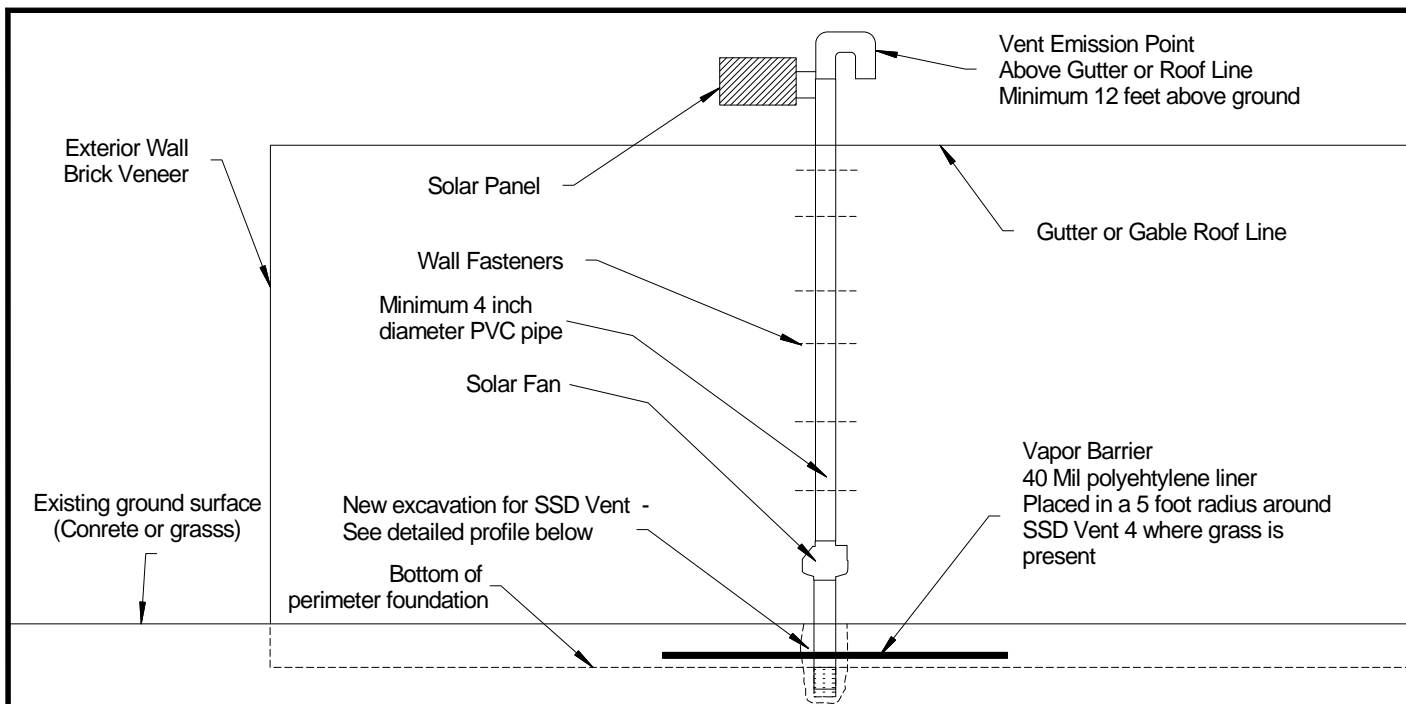
VI-108-CSA  
0.7 ppm

Bathroom  
VI-107-CSA  
0.4 ppm









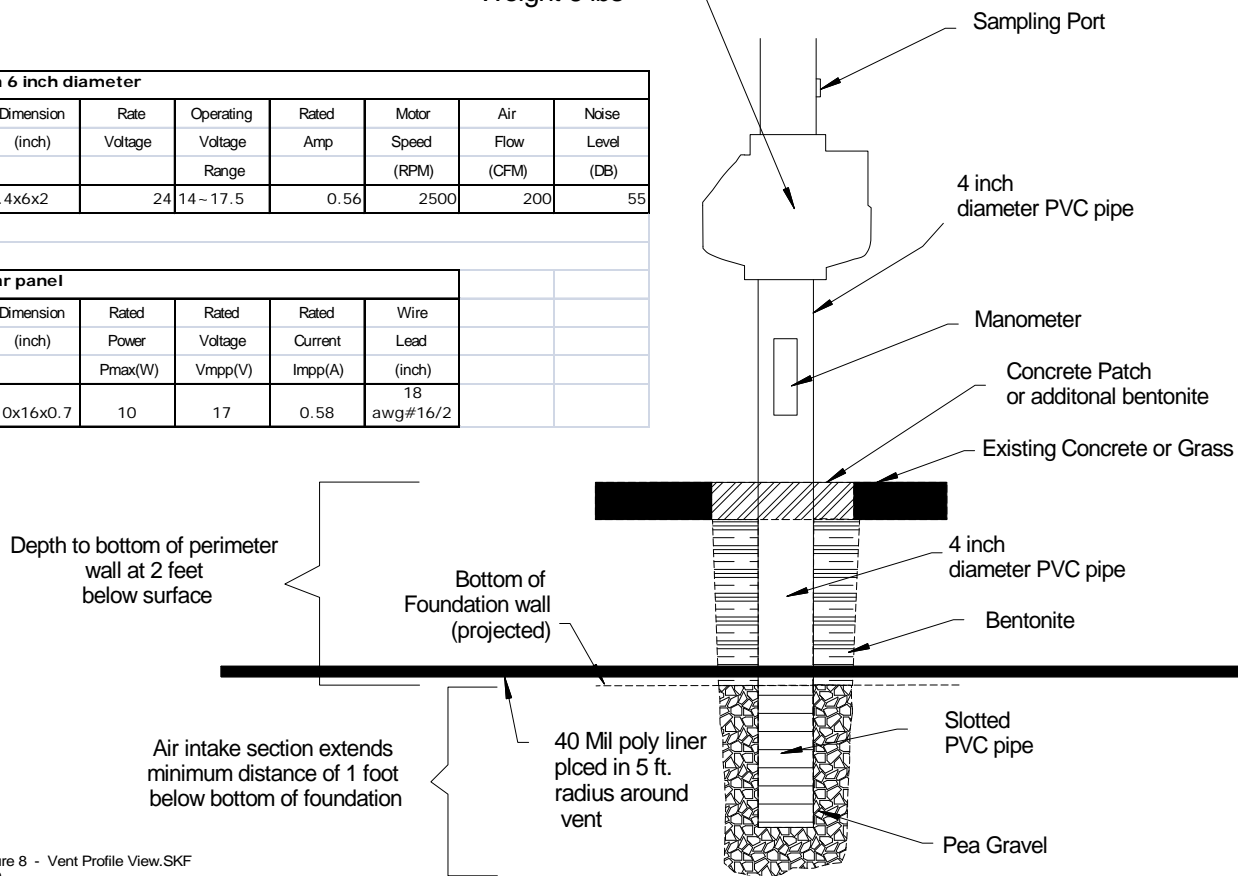
CDT Solar Fan kit  
Cat. No. CDT-F10  
Weight 6 lbs

DC Axial Fan 6 inch diameter

Part#	Dimension (inch)	Rate Voltage	Operating Voltage Range	Rated Amp	Motor Speed (RPM)	Air Flow (CFM)	Noise Level (DB)
34001	6.4x6x2	24	14 - 17.5	0.56	2500	200	55

10 Watt Solar panel

Part#	Dimension (inch)	Rated Power Pmax(W)	Rated Voltage Vmpp(V)	Rated Current Impp(A)	Wire Lead (inch) 18 awg #16/2
31010	10x16x0.7	10	17	0.58	



FILE NAME: Figure 8 - Vent Profile View.SKF  
DATE: Sept 2009

**Table I**  
**Indoor Air and Sub-Slab**  
**Vapor Concentrations**

Analyte	Sample VI-107-CSA Sub-slab Concentration Pantry- east side of Clinic (ug/m3)	Sample VI-107-CIA Indoor Air Concentration Hall - eastern portion of Clinic (ug/m3)	Sample VI-108-CSA Sub-slab Concentration SW Corner of Clinic (ug/m3)	Sample VI-108-CIA Indoor Air Concentration SW Corner of Clinic (ug/m3)
Vinyl Chloride	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND
Methylene Chloride	ND	0.24	ND	0.2
trans-1,2-Dichloroethene	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND
Methyl tert-Butyl Ether	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	0.083	ND	ND
Chloroform	ND	1.7	ND	3.2
1,2-Dichloroethane	ND	0.29	ND	0.51
1,1,1-Trichloroethane	ND	0.061	ND	0.053
Benzene	ND	0.63	ND	0.52
Carbon Tetrachloride	ND	0.69	ND	0.57
Bromodichloromethane	ND	0.11	ND	0.15
Trichloroethene	470	0.35	420	0.16
Toluene	ND	3.8	ND	3.4
Tetrachloroethene	36000	19	20000	6.4
Bromofluorobenzene	98	97	95	97



Table II  
Leon Valley  
Veterinary Clinic  
PID Readings  
June 4, 2009

Location	PID Reading	Map Location
Front wall hall socket	0.0	A
Front bathroom sink, hot & cold piping, sewer water penetration	0.0, 0.0, 0.0, 0.0	B
Front bathroom wall baseboard	0.0	C
Front bathroom sewer	0.0	D
Front bathroomroom mop closet sink	0.0	E
Front storage closet base boards	0.0	F
Exam RM two sink drain, hot & cold piping	0.0, 0.0, 0.0	G
Exam RM two wall socket	0.0	H
Exam RM two counter socket	0.0	I
Exam RM two baseboard	0.0	J
Vet Lab sink	0.0	K
Receptionist/ Waiting room wall sockets (3)	0.0, 0.0, 0.0	L
Washer drain	0.0	M
Sink on entrance to surgery, hot & cold piping	0.0, 0.0, 0.0	N
Treatment room tub drain and piping	0.0, 0.0	O
sink near fridge	12.0	P
Dog kennel wall switches (2)	0.0, 0.0	Q
Dog kennel drain	0.0	R1
Dog kennel drain	0.0	R2

Table II  
Leon Valley  
Veterinary Clinic  
PID Readings  
June 4, 2009

Location	PID Reading	Map Location
Light Switch entrance to treatment room	0.0	S
VI-108-CSA	0.0	
VI-107-CSA	0.0	
Weep Hole 1	46.1	
Weep Hole 2	50.7	
Weep Hole 3	1247	
Weep Hole 4	161	
Weep Hole 5	0.0	
Weep Hole 6	0.0	
Weep Hole 7	2.5	
Weep Hole 8	0.4	
Weep Hole 9	4.4	
Weep Hole 10	0.0	
Weep Hole 11	0.0	
Weep Hole 12	0.0	
Weep Hole 13	3.4	
Weep Hole 14	0.0	
Weep Hole 15	0.0	
Weep Hole 16	0.0	

Table III  
Leon Valley  
Veterinary Clinic  
PID Readings  
July 22, 2009

Location	PID Reading (ppm)	Map Location
Front wall hall socket	0.0	A
Front bathroom sink, hot & cold piping, sewer water penetration	0.0, 0.0, 0.0, 0.0	B
Front bathroom wall baseboard	0.0	C
Front bathroom sewer	0.0	D
Front bathroomroom mop closet sink	0.0	E
Front storage closet base boards	0.0	F
Exam RM two sink drain, hot & cold piping	0.0, 0.0, 0.0	G
Exam RM two wall socket	0.0	H
Exam RM two counter socket	0.0	I
Exam RM two baseboard	0.0	J
Receptionist/ Waiting room wall sockets (3)	0.0, 0.0, 0.0	L
Washer drain	0.0	M
Light Switch entrance to treatment room	0.0	S
VI-108-CSA	0.7	
VI-107-CSA	0.4	
Weep Hole 1	0.0	



Table III  
Leon Valley  
Veterinary Clinic  
PID Readings  
July 22, 2009

Location	PID Reading (ppm)	Map Location
Weep Hole 2	0.0	
Weep Hole 3	0.0	
Weep Hole 4	0.0	
Weep Hole 5	0.0	
Weep Hole 6	0.0	
Weep Hole 7	0.0	
Weep Hole 8	0.0	
Weep Hole 9	0.0	
Weep Hole 10	0.0	
Weep Hole 11	0.0	
Weep Hole 12	0.0	
Weep Hole 13	0.0	

**STC Project 23595 – Leon Valley Veterinary Clinic**



**PHOTO 1: The Veterinary Clinic is located 6701 Bandera Road. Photo facing West.**



**PHOTO 2: Front of the Veterinary Clinic facing Bandera Rd. Photo facing north.**

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**STC Project 23595 – Leon Valley Veterinary Clinic**



**PHOTO 3: Front entrance of the Veterinary Clinic. Facing West.**



**PHOTO 4: Northern side of the Veterinary Office. It is proposed that SSD Vent 4 will be attached to this wall near the crack in the brick veneer.**

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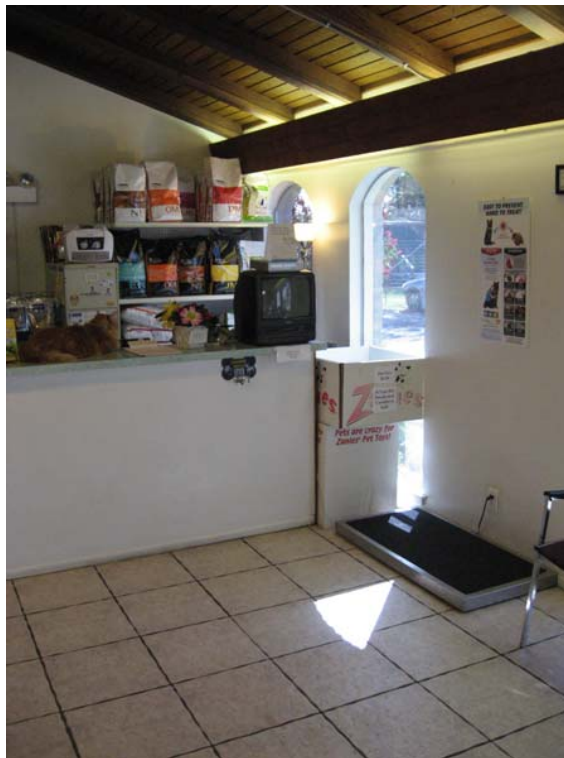
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**PHOTO 5:** This photo shows the crack in the brick veneer on the northern side of the Veterinary Clinic.



**PHOTO 6:** Photo shows the lobby of the Veterinary Clinic.

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**PHOTO 7:** This photo shows some of the kennels and washing machine located in treatment room.



**PHOTO 8:** Photo of one of the patient rooms in the Veterinary Clinic.

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**PHOTO 9:** This photo shows the hallway at the front of the vet office.



**PHOTO 10:** This photo shows the bathroom and bathroom closet.

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**STC Project 23595 – Leon Valley Veterinary Clinic**



**PHOTO 11:** This photo is of the hallway from the waiting room down to the treatment room.



**PHOTO 12:** This photo shows the larger dog kennels at the Veterinary Clinic.

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**PHOTO 13:** This photo shows rear (west) door of the Vet Clinic and the proposed area where SSD Vent 3 will be installed.



**PHOTO 14:** This photo shows north wall of the Vet Clinic and the proposed area where SSD Vent 4 will be installed.

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