DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 377TH AIR BASE WING (AFMC)

Mr. Ludie W. Bitner Jr.
AFCEC/CZOW
2050 Wyoming Blvd SE
Kirtland AFB, NM 87117

March 30, 2015

Mr. Dennis McQuillan
NMED Drinking Water Bureau
1190 St. Francis Drive – Harold Runnels Bldg., Room S-2052
Santa Fe, New Mexico 87505

Dear Mr. McQuillan,

The attached letter outlines the additional thirty (30) soil-vapor-monitoring points to be included in the upcoming soil vapor extraction shutdown test. The criteria and logic used for the selection of the soil-vapor-monitoring points have also been presented in this letter.

If you have any questions with regard to this submittal, please contact Wayne Bitner at (505) 853-3484 or at ludie.bitner@us.af.mil or Scott Clark at (505) 246-9017 or at scott.clark@us.af.mil.

Sincerely

LUDIE W. BITNER JR.
Chief, Environmental Restoration

Attachment: Letter with tables and figures

cc:
NMED-EHD (Roberts) w/ attch (electronic only)
NMED (McQuillan, Longmire) w/attch (electronic and one hard copy)
NMED-HWB (Kieling, Cobrain, McDonald) w/attch (electronic only)
NMED-GWQB (Bustamate, Cook, Huddleson) w/attch (electronic only)
NMED-PSTB (Reuter) w/attch (electronic only)
NMED-OGC (Kendall) w/ attch (electronic only)
EPA Region 6 (King, Ellinger) w/ attch (electronic only)
AFCEC-CZRX (Bodour) w/ attch (electronic only)
USACE-ABQ District Office (Simpler, McBee) w/ attch (electronic only)
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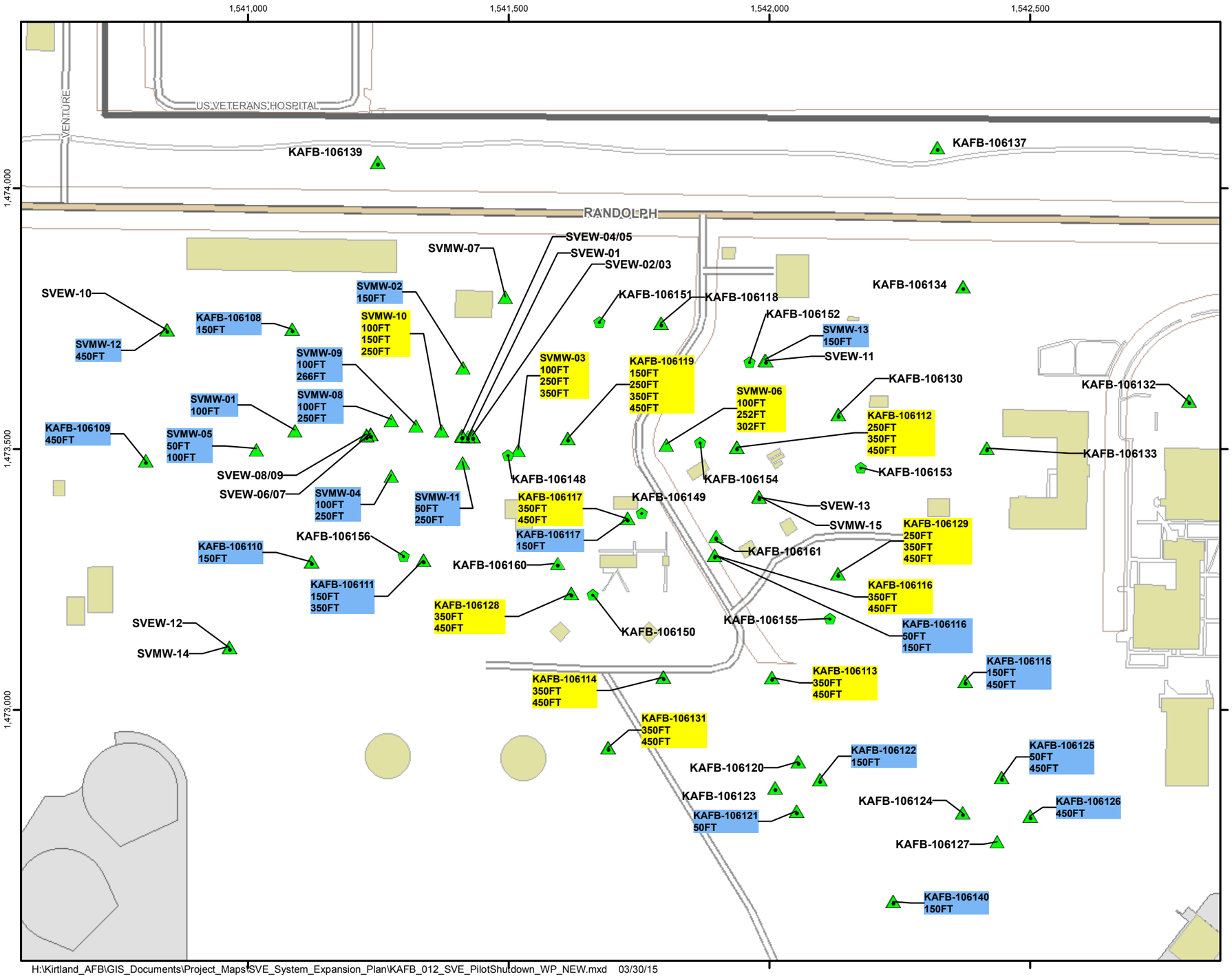
Subject: Kirtland Air Force Base Bulk Fuel Facility - Selection of additional soil-vapor-monitoring points for the in-situ respiration and short-term rebound testing as described in the Pilot Soil Vapor Extraction Shutdown Test Work Plan

The Air Force is providing the two tables and two figures as attachments to this letter to facilitate New Mexico Environment Department's review and approval of the identified soil-vapor-monitoring (SVM) points for the SVE shutdown test. The attachments are provided in accordance with Section 1.2 of the Pilot Soil Vapor Extraction (SVE) Shutdown Test Work Plan. Table 1 lists the five (5) categories that formed the basic logic framework for selecting the soil-vapor-monitoring (SVM) points for in-situ respiration and short-term rebound testing. Table 2 is contained in the Microsoft Excel file and presents Horiba Model MEXA 584L vapor analyzer data that were collected during the first quarter SVM sampling event completed in March 2015, shows the thirty one (31) pre-selected SVM points listed in the approved work plan for long-term rebound testing (highlighted in yellow), and identifies thirty (30) additional SVM points proposed for in-situ respiration and short-term rebound testing (highlighted in blue). The total of sixty one (61) SVM points completes the SVE shutdown testing monitoring network. Figure 1 shows the location and screen depths of the 61 SVM points (color coded to match Table 2 with the 30 new wells shown in blue and the 31 preselected wells shown in yellow). Figure 2 shows the 61 SVM wells color coded by their assigned category as shown in Table 2. Both figures illustrate the lateral and vertical coverage the monitoring network provides of the Bulk Fuel Facility (BFF) vadose zone.

The additional 30 SVM points were selected based on the first quarter of calendar year 2015 quarterly monitoring data from all 287 BFF SVM points. The data that were reviewed are provided in Table 2 and included total hydrocarbon (HC), oxygen (O_2), and carbon dioxide (CO_2) soil-vapor concentrations. The relationships among the concentrations across these parameters served as the logic basis for establishing the selection categories listed in Table 1. The field data were evaluated for all 287 SVM points, and each point was assigned to a category and colored coded accordingly in Table 2. The additional 30 SVM points were selected to ensure that SVM points from each category were included and that the monitoring network provided effective spatial coverage of the BFF vadose zone within the source area.



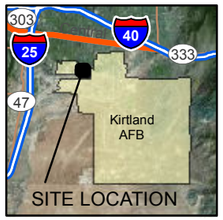
H:\Kirtland_AFB\GIS_Documents\Project_Maps\SVE_System_Expansion_Plan\KAFB_012_SVE_PilotShutdown_WP_NEW.mxd 03/30/15

Legend

- Pneulog Cluster
- SVE Extraction Well
- SVM Cluster
- Structure
- Paved Road
- Unpaved Road
- Installation Boundary

SVMW-03 100 FT 250 FT 350 FT — Selected Well Location IDs and Proposed Monitoring Depths

SVMW-13 150 FT — Newly Selected Well Location IDs and Proposed Monitoring Depths based on Q1, 2015 Sampling Event



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Revision Date: 03/30/15

N

0 100 200 400

Feet

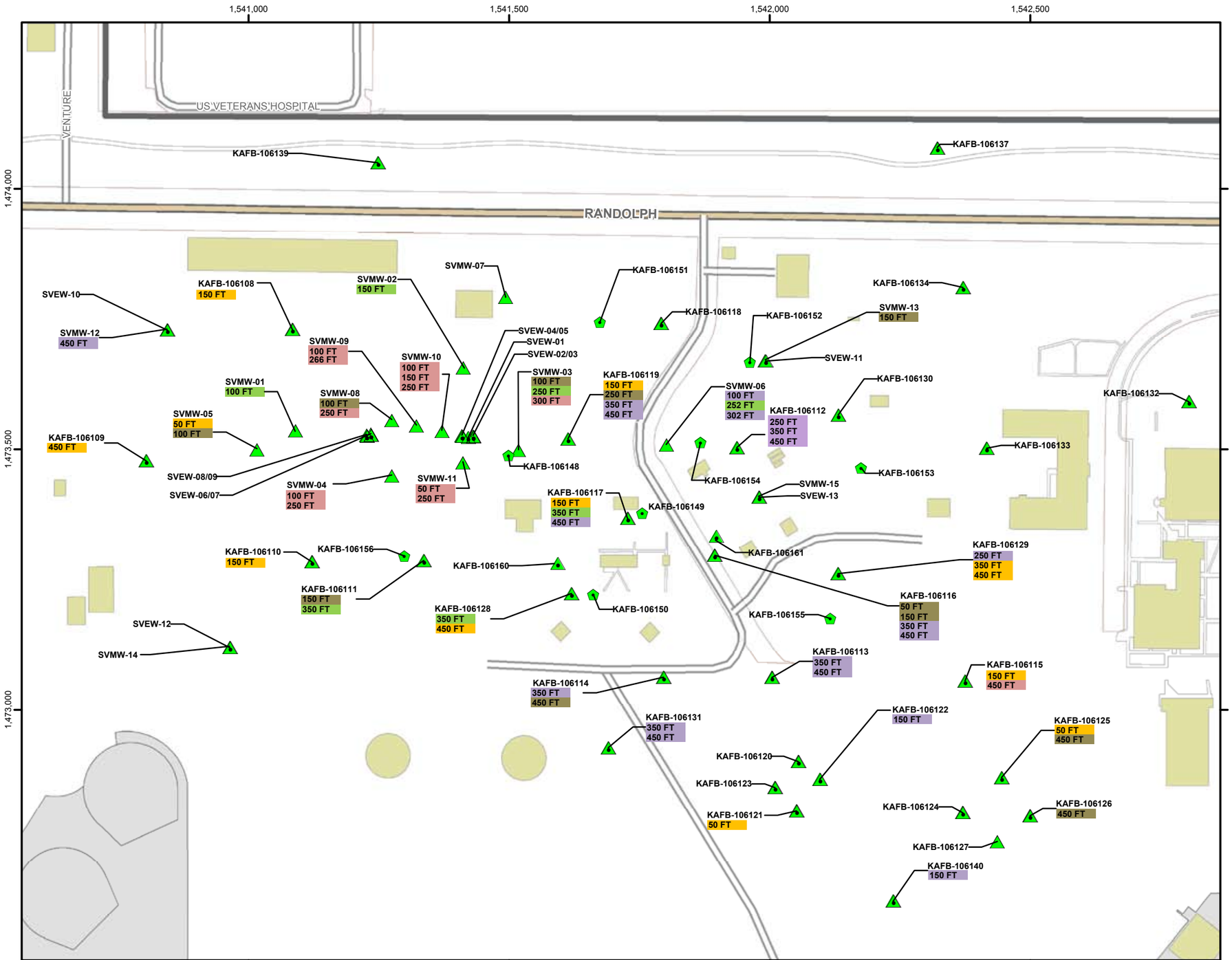
1 inch = 200 feet

Projection : NAD83 State Plane New Mexico Central FIPS3002 Feet

SVE PILOT SHUTDOWN TEST WORK PLAN
BULK FUELS FACILITY
KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE 1

SVM WELL LOCATIONS SELECTED FOR RESPIRATION, SHORT-TERM AND LONG-TERM REBOUND TESTING



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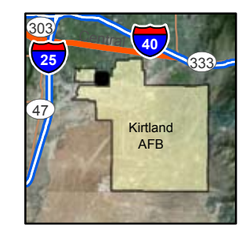
Legend

- Pneulog Cluster
- SVE Extraction Well
- SVM Cluster
- Structure
- Paved Road
- Unpaved Road
- Installation Boundary

- Category 1
- Category 2
- Category 3
- Category 4
- Category 5



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Revision Date: 03/27/15

N

0 100 200 400

Feet

1 inch = 200 feet

Projection : NAD83 State Plane New Mexico Central FIPS3002 Feet

SVE PILOT SHUTDOWN TEST WORK PLAN
BULK FUELS FACILITY
KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE 2

SVM WELL LOCATIONS SELECTED FOR RESPIRATION, SHORT-TERM AND LONG-TERM REBOUND TESTING

Table 1. Potential Observations Among HC, O_2, and CO_2 Data and the Logic for Soil-vapor Point Selection for Inclusion in the In-situ Respiration and Short Term Rebound Testing		
Category	**Data Observations**	**Implications**
1	High Hydrocarbon (>1,000 ppmv), Depressed O_2 (<19.5 %), Elevated CO_2 (>1%)	SVM points with these characteristics may coincide with high-concentration residual fuel, or may be under the influence of nearby residual fuel with a large volatile fraction remaining. The depressed O_2 combined with elevated CO_2 is a strong indicator that aerobic biodegradation is occurring during SVE operation. These SVM points would be prime candidates for in-situ respiration, and short-term and long-term rebound testing.
2	Moderate Hydrocarbon (250 – 1,000 ppmv), Depressed O_2 (<19.5%), Elevated CO_2 (>1%)	SVM points with these characteristics may be in proximity to residual fuel contamination with a large or moderately reduced volatile fraction remaining, and aerobic biodegradation is occurring under SVE operation. These SVM points would be prime candidates for in-situ respiration, and short-term and long-term rebound testing.
3	Low Hydrocarbon (250 – 50 ppmv), Depressed O_2 (<19.5%), Elevated CO_2 (>0.5%)	SVM points with these characteristics may be in proximity to residual fuel contamination with a large percentage of the volatile fraction depleted and aerobic biodegradation is occurring during SVE operation. A minimum of five SVM points showing this data signature should be included in the in-situ respiration and long-term rebound testing. If many soil-vapor points are observed in this category, points will be selected to ensure lateral and vertical coverage of the area within the influence of the SVE system. Note that short-term rebound data will be collected during the rebound test, but observation of rapid hydrocarbon rebound is not anticipated.
4	Very-low Hydrocarbon (<50), Ambient O_2 (>20%), Ambient CO_2 (<0.1%)	SVM points with these characteristics may or may not be in proximity of residual fuel contamination. A review of historic vapor data is warranted to determine how these points might be used. If available, a minimum of three SVM points with low hydrocarbon and ambient O_2 and CO_2 and previously recorded hydrocarbon concentrations greater than 1,000 ppmv should be included in the in-situ respiration and short-term rebound testing. The results from testing these SVM points will indicate residual fuel contamination that has been depleted of the volatile fraction and that would not show up on the short-term or long-term rebound test, and also will quantify the biodegradation rate of the remaining non-volatile contaminant fraction. One SVM point that matches the data observations without historic hydrocarbon detection should be included in the in-situ respiration testing and will serve to determine the background respiration rate against which the respiration rates at the other 30 SVM points will be compared.
5	Very-low Hydrocarbon (<50), Depressed O_2 (<19.5%), Elevated CO_2 (>0.5%)	SVM points with these characteristics may be in the vicinity of residual non-volatile fuel constituents that are undergoing biodegradation, but that do not substantially contribute vapor-phase concentrations. Depressed O_2 concentrations accompanied by elevated CO_2 concentrations are indicative of active biorespiration occurring in the vicinity of SVM points showing these characteristics and as such these locations are of interest for in-situ respiration testing.

Table 2. Quarter 1, 2015 Soil Vapor Horiba Data

Well ID		Date	Time	Calculated Purge Time (sec)	Actual Purge Time (sec)	HC (ppmv)	O2%	CO2%	Notes	Category
SVMW-01	SVMW-01-050	3/19/2015	935	52.47	52	2	18.26	5.54		4
	SVMW-01-100	3/19/2015	930	54.9	55	441	15.63	9.20		2
	SVMW-01-250	3/19/2015	924	75.39	75	3	19.66	0.48		4
	SVMW-01-300	3/19/2015	918	48.09	48	2	20.03	0.36		4
SVMW-02	SVMW-02-050	3/19/2015	842	52.47	52	15	20.00	1.98		4
	SVMW-02-100	3/19/2015	835	59.45	60	87	18.04	5.82		3
	SVMW-02-150	3/19/2015	828	61.69	61	716	18.26	2.26		2
SVMW-03	SVMW-03-050	3/19/2015	1158	48.099	48	24	20.26	1.12		4
	SVMW-03-100	3/19/2015	1153	54.9	55	81	18.10	6.00		3
	SVMW-03-250	3/19/2014	1147	75.3	75	488	18.76	1.16		2
	SVMW-03-300	3/19/2015	1139	82.099	82	17430	9.57	11.06		1
SVMW-04	SVMW-04-050	3/19/2015	1113	64.13	64	199	14.04	7.04		3
	SVMW-04-100	3/19/2015	1105	59.56	60	20670	11.38	14.56		1
	SVMW-04-250	3/19/2015	1058	82.14	82	4900	18.81	1.58		1
	SVMW-04-300	3/19/2015	1053	89.23	89	124	19.89	0.60		3
SVMW-05	SVMW-05-050	3/19/2015	1017	52.47	52	33	19.45	3.68		5
	SVMW-05-100	3/19/2015	1011	59.89	60	42	17.80	5.64		3
	SVMW-05-230	3/19/2015	1005	61.09	61	10	19.70	0.28		4
	SVMW-05-290	3/19/2015	959	87.7	88	5	19.70	0.46		4
SVMW-06	SVMW-06-050	3/19/2015	1309	44.4	44	17	20.55	0.60		4
	SVMW-06-100	3/19/2015	1304	54.799	56	1	20.06	3.20		4
	SVMW-06-252	3/19/2015	1258	75.6	76	653	18.40	1.72		2
	SVMW-06-302	3/19/2015	1252	82.5	83	27	20.13	0.96		4
SVMW-07	SVMW-07-050	3/24/2015	1248	44	44	19	18.70	1.28	Not a good well for shutdown test, difficult to gain access	4
	SVMW-07-100	3/24/2015	1243	51	51	46	17.95	5.32	particularly at night	3
	SVMW-07-150	3/24/2015	1235	57	57	35	19.10	3.22		3
SVMW-08	SVMW-08-050	3/25/2015	1135	45	46	46	19.46	0.60	Horiba data and lab sample not collected the same day	4
	SVMW-08-100	3/25/2015	1117	51	51	9	18.43	4.20	Horiba data and lab sample not collected the same day	3
	SVMW-08-250	3/25/2015	1058	70	70	8830	12.64	12.74	Horiba data and lab sample not collected the same day	1
SVMW-09	SVMW-09-050	3/24/2015	1421	45	45	34	18.15	3.82		3
	SVMW-09-100	3/24/2015	1416	51	51	5020	13.79	11.42		1
	SVMW-09-250	3/24/2015	1427	70	70	2930	18.06	1.62		1
	SVMW-09-266	3/24/2015	1408	72	72	4510	17.80	2.08		1
SVMW-10	SVMW-10-050	3/24/2015	833	36	36	30690	16.35	7.98		1
	SVMW-10-100	3/24/2015	825	42	42	32760	14.99	12.68		1
	SVMW-10-150	3/24/2015	815	47	53	32760	11.69	9.16		1
	SVMW-10-250	3/24/2015	803	57	57	12870	17.62	2.68		1
SVMW-11	SVMW-11-050	3/18/2015	1605	52.47	52	32760	12.82	8.78		1
	SVMW-11-100	3/18/2015	1611	59.89	60	32760	11.70	15.92		1
	SVMW-11-250	3/18/2015	1559	82	82	32760	12.70	8.20		1
	SVMW-11-260	3/18/2015	1552	83.67	84	4980	13.60	7.26		1
SVMW-12	SVMW-12-150	3/25/2015	1543	61.7	61	17	19.85	0.14		4
	SVMW-12-250	3/25/2015	1540	75.3	75	5	19.66	0.18		4
	SVMW-12-350	3/25/2015	1534	97.09	97	4	20.09	0.72		4
	SVMW-12-450	3/25/2015	1572	102.6	103	0	20.30	0.20		4 Background well
SVMW-13	SVMW-13-150	3/17/2015	945	74.04	74	178	19.87	0.90		3
	SVMW-13-250	3/17/2015	940	82.14	82	13	20.12	0.64		3
	SVMW-13-350	3/17/2015	931	106	106	36	20.39	0.56		4

Table 2. Quarter 1, 2015 Soil Vapor Horiba Data

Well ID		Date	Time	Calculated Purge Time (sec)	Actual Purge Time (sec)	HC (ppmv)	O2%	CO2%	Notes	Category
	SVMW-13-450	3/17/2015	912	153.9	154	2	20.23	0.78		4
SVMW-14	SVMW-14-150	3/17/2015	1531	82.26	82	251	18.99	0.24	Not a good well for shutdown test, difficult to gain access particularly at night	3
	SVMW-14-250	3/17/2015	1526	100.4	100	73	19.02	0.22		3
	SVMW-14-350	3/17/2015	1520	133	133	90	19.89	0.18		3
	SVMW-14-450	3/17/2015	1511	153.9	154	12	20.27	1.18		4
SVMW-15	SVMW-15-150	3/16/2015	1021	49.36	49	7	21.22	0.40		4
	SVMW-15-250	3/16/2015	1013	60.24	60	27	20.16	0.44		4
	SVMW-15-250	3/16/2015	1013	60.24	60	27	20.16	0.44		4
	SVMW-15-350	3/16/2015	1005	71.2	71	11	19.92	0.76		4
	SVMW-15-450	3/16/2015	955	82.08	82	29	20.53	0.66		4
KAFB-106028	KAFB-106028-150	3/25/2015	1123	105.42	105	41	18.99	0.10	Horiba data and lab sample not collected the same day	3
	KAFB-106028-250	3/25/2015	1116	128.91	129	77	20.35	0.24	Horiba data and lab sample not collected the same day	4
	KAFB-106028-350	3/25/2015	1110	152.22	152	56	20.35	0.28	Horiba data and lab sample not collected the same day	4
	KAFB-106028-450	3/25/2015	1102	175.54	175	19	20.37	0.40	Horiba data and lab sample not collected the same day	4
SVEW-01	SVEW-01-260	3/16/2015	1452	696.5	696	103	19.46	1.14		3
SVEW-02/03	SVEW-02-060	3/16/2015	1547	376.3	376	26140	12.86	10.42		1
	SVEW-03-160	3/16/2015	1533	594.5	595	5750	8.90	10.82		1
SVEW-04/05	SVEW-04-313	3/16/2015	1428	795.68	795	2	20.94	0.00		4
	SVEW-05-460	3/16/2015	1405	1070.57	1070	1	19.71	2.50		4
SVEW-06/07	SVEW-06-060	3/16/2015	1143	301	300	5020	9.41	10.40		1
	SVEW-07-160	3/16/2015	1127	475.99	477	32760	7.93	15.24		1
SVEW-08/09	SVEW-08-260	3/16/2015	1221	650	650	11	19.28	0.80		3
	SVEW-09-460	3/16/2015	1250	1131.8	1132	5	21.04	0.14		4
SVEW-10	SVEW-10-410	3/25/2015	1520	1058.1	1058	9	20.41	0.10		4
	SVEW-11-410	3/17/2015	905	1587.15	1587	13	20.21	0.68		4
SVEW-12	SVEW-12-410	3/17/2015	1504	1410.8	1410	2	20.30	0.24	Not a good well for shutdown test, difficult to gain access	4
	SVEW-13-410	3/16/2015	948	846.48	846	6	20.31	0.78	particularly at night	4
KAFB-106108	KAFB-106108-025	3/17/2015	837	205.68	206	20	20.46	0.28		4
	KAFB-106108-025	3/17/2015	837	205.68	206	20	20.46	0.28		4
	KAFB-106108-050	3/17/2015	826	214.68	215	7	20.15	1.82		4
	KAFB-106108-150	3/17/2015	816	251.64	252	14	17.79	5.26	low HC, but looks like biorespiration is occuring, could be interesting	5
	KAFB-106108-250	3/17/2015	805	262.25	267	35	19.66	0.46		5
	KAFB-106108-350	3/16/2015	1632	325.32	325	7	20.48	0.28		4
	KAFB-106108-450	3/16/2015	1620	2844.72	2845	3	20.61	0.54		4
KAFB-106109	KAFB-106109-025	3/16/2015	1509	205.56	207	8	20.34	0.64		4
	KAFB-106109-050	3/16/2015	1458	214.8	217	7	19.49	1.08		5
	KAFB-106109-150	3/16/2015	1449	228.65	230	10	19.36	0.16		4
	KAFB-106109-250	3/16/2015	1440	288.36	290	5	19.20	0.20		4
	KAFB-106109-350	3/16/2015	NR	216.9	217	2	20.91	0.22	Horiba data and lab sample not collected the same day	4
	KAFB-106109-450	3/16/2015	1416	2588.1	2591	14	19.90	0.88		5
KAFB-106110	KAFB-106110-025	3/16/2015	1243	186.87	187	7	20.85	0.50	A little bit of a drive to reach	4
	KAFB-106110-050	3/16/2015	1226	195.27	200	8	20.51	0.82		4
	KAFB-106110-150	3/16/2015	1214	228.76	229	41	19.05	2.86		5

Table 2. Quarter 1, 2015 Soil Vapor Horiba Data

Well ID		Date	Time	Calculated Purge Time (sec)	Actual Purge Time (sec)	HC (ppmv)	O2%	CO2%	Notes	Category
KAFB-106110	KAFB-106110-250	3/16/2015	1159	288.36	288	2	19.54	0.42		4
	KAFB-106110-350	3/16/2015	1146	325.2	327	8	20.03	0.32		4
	KAFB-106110-450	3/16/2015	1132	2847	2849	29	19.87	0.26		4
KAFB-106111	KAFB-106111-025	3/16/2015	1019	186.87	191	11	20.91	0.00	A little bit of a drive to reach	4
	KAFB-106111-050	3/16/2015	1007	195.27	200	1	20.63	0.20		4
	KAFB-106111-150	3/16/2015	942	228.76	230	127	19.19	2.32		3
	KAFB-106111-250	3/16/2015	927	262.14	230	22	19.86	0.44		4
	KAFB-106111-350	3/16/2015	917	232.37	235	834	19.59	1.16		2
	KAFB-106111-450	3/16/2015	905	2034.85	2036	31	20.16	0.34		4
KAFB-106112	KAFB-106112-025	3/19/2015	1504	137.04	137	14	20.73	0.06		4
	KAFB-106112-050	3/19/2015	1457	143.119	143	36	20.63	0.18		4
	KAFB-106112-150	3/19/2015	1450	167.67	168	8	20.44	0.68		4
	KAFB-106112-250	3/19/2015	1443	192.24	193	1	19.93	0.54		4
	KAFB-106112-350	3/19/2015	1436	216.5	217	4	20.25	0.62		4
	KAFB-106112-450	3/19/2015	1428	1894.08	1894	19	20.18	0.84		4
KAFB-106113	KAFB-106113-020	3/11/2015	1109	107.2	112	16	20.70	0.18		4
	KAFB-106113-020	3/11/2015	1109	107.2	112	16	20.70	0.18		4
	KAFB-106113-050	3/11/2015	1101	113	114	14	20.79	0.44		4
	KAFB-106113-150	3/11/2015	1055	132.4	132	3	19.64	0.80		4
	KAFB-106113-250	3/11/2015	1048	151.8	153	2	20.01	0.34		4
	KAFB-106113-350	3/11/2015	1038	171.16	171	3	20.21	0.40		4
	KAFB-106113-450	3/11/2015	1028	1423.5	1424	56	20.44	0.56		4
KAFB-106114	KAFB-106114-025	3/12/2015	935	158.12	158	8	20.82	0.10		4
	KAFB-106114-050	3/12/2015	928	165	165	38	20.98	0.24		4
	KAFB-106114-150	3/12/2015	920	193.4	193	0	21.03	0.50		4
	KAFB-106114-250	3/12/2014	912	204.6	206	0	21.09	0.32		4
	KAFB-106114-350	3/12/2015	901	250	257	1	20.14	0.24		4
	KAFB-106114-450	3/12/2015	852	2031.9	2032	23	17.90	0.36		3
KAFB-106115	KAFB-106115-025	3/11/2015	1603	136.88	136	4	20.36	0.52		4
	KAFB-106115-050	3/11/2015	1554	119.2	120	42	20.77	0.52		4
	KAFB-106115-150	3/11/2015	1545	133.26	133	8	19.72	1.92		5
	KAFB-106115-250	3/11/2015	1536	160.13	160	4	20.78	0.28		4
	KAFB-106115-350	3/11/2015	1527	180.6	180	2	20.22	0.24		4
	KAFB-106115-450	3/11/2015	1515	1497.22	1497	1092	19.28	0.86		1
KAFB-106116	KAFB-106116-025	3/12/2015	1425	120.4	120	43	21.15	0.10		4
	KAFB-106116-050	3/12/2015	1414	135.84	216	38	19.85	0.48		3
	KAFB-106116-150	3/12/2015	1403	160.4	161	2	19.44	0.74		3
	KAFB-106116-150	3/12/2015	1403	160.4	161	2	19.44	0.74		4
	KAFB-106116-250	3/12/2015	1356	184.88	185	0	19.21	0.50		4
	KAFB-106116-350	3/12/2015	1348	209.4	209	6	19.21	0.82		4
	KAFB-106116-450	3/12/2015	1340	1566.8	1567	53	20.70	0.52		4
KAFB-106117	KAFB-106117-025	3/12/2015	1245	114	114	6	20.53	0.04		4
	KAFB-106117-050	3/12/2015	1238	153.34	153	12	20.42	0.28		4
	KAFB-106117-150	3/12/2015	1231	193.47	193	2	19.88	2.12		5
	KAFB-106117-250	3/12/2015	1223	221.8	222	26	17.98	4.88		5
	KAFB-106117-350	3/12/2015	1213	171.1	171	243	18.66	2.78		2
	KAFB-106117-450	3/12/2015	1202	1674.7	1675	19	20.00	0.66		4
KAFB-106118	KAFB-106118-025	3/17/2015	1058	205.56	206	4	21.20	0.12		4
	KAFB-106118-025	3/17/2015	1058	205.56	206	4	21.20	0.12		4
	KAFB-106118-050	3/17/2015	1047	214.68	215	8	21.19	0.30		4
	KAFB-106118-160	3/17/2015	1035	255.24	255	3	20.29	1.26		4

Table 2. Quarter 1, 2015 Soil Vapor Horiba Data

Well ID		Date	Time	Calculated Purge Time (sec)	Actual Purge Time (sec)	HC (ppmv)	O2%	CO2%	Notes	Category	
	KAFB-106118-265	3/17/2015	1020	267.16	267	13	20.99	0.76		4	
	KAFB-106118-350	3/17/2015	1005	325.2	325	10	20.91	0.64		4	
	KAFB-106118-450	3/17/2015	954	2588.18	2588	11	20.33	0.58		4	
KAFB-106119	KAFB-106119-025	3/18/2015	1009	137.04	137	3	20.66	0.04		4	
	KAFB-106119-050	3/18/2015	958	143.11	143	1	20.70	0.66		4	
	KAFB-106119-150	3/17/2015	1628	251.52	251	13	16.07	5.90		5	
	KAFB-106119-250	3/17/2015	1615	288.36	288	284	16.70	2.76		3	
	KAFB-106119-350	3/17/2015	1554	361.33	361	6	20.24	0.62		4	
	KAFB-106119-450	3/17/2015	1538	3163.33	3180	2	20.43	0.62		4	
KAFB-106120	KAFB-106120-025	3/11/2015	1234	108.18	108	8	20.24	0.38		4	
	KAFB-106120-050	3/11/2015	1227	112.98	111	5	18.61	2.44		4	
	KAFB-106120-150	3/24/2015	1448	194	194	6	20.23	0.64	Bottle-Vac seal leaked, sample recollected	4	
	KAFB-106120-250	3/11/2015	1212	151.76	151	10	20.32	0.24		4	
	KAFB-106120-350	3/11/2015	1204	180.66	180	7	20.67	0.30		4	
	KAFB-106120-450	3/11/2015	1154	1480	1482	15	20.26	0.40		4	
KAFB-106121	KAFB-106121-025	3/11/2015	1213	108.19	108	29	19.43	1.96		5	
	KAFB-106121-050	3/11/2015	1206	112.99	153	9	19.80	1.96		5	
	KAFB-106121-145	3/11/2015	1153	131.45	131	96	20.11	0.54		4	
	KAFB-106121-145	3/11/2015	1153	131.45	131	96	20.11	0.54		4	
	KAFB-106121-250	3/11/2015	1142	151.77	152	30	20.08	0.22		4	
	KAFB-106121-350	3/11/2015	1131	171.16	178	10	20.47	0.26		4	
	KAFB-106121-440	3/11/2015	1120	1405.86	1406	12	21.13	0.58		4	
KAFB-106122	KAFB-106122-025	3/11/2015	1422	108.18	108	49	21.19	0.44		4	
	KAFB-106122-050	3/11/2015	1417	112.98	113	0	19.43	1.62		4	
	KAFB-106122-150	3/11/2015	1410	132.37	132	0	20.14	0.50		4	Background well
	KAFB-106122-250	3/11/2015	1404	160.2	162	2	19.82	0.18		4	
	KAFB-106122-350	3/11/2015	1357	180.67	182	4	20.35	0.28		4	
	KAFB-106122-450	3/11/2015	1348	1479.85	1479	24	20.28	0.54		4	
KAFB-106123	KAFB-106123-025	3/11/2015	1404	158.12	158	8	20.48	0.48		4	
	KAFB-106123-025	3/11/2015	1404	158.12	158	8	20.48	0.48		4	
	KAFB-106123-050	3/11/2015	1355	112.99	113	4	19.85	1.58		5	
	KAFB-106123-150	3/11/2015	1348	132.38	132	6	19.98	0.50		4	
	KAFB-106123-250	3/11/2015	1339	151.77	152	9	19.75	0.22		4	
	KAFB-106123-350	3/11/2015	1331	171.16	171	16	20.48	0.28		4	
	KAFB-106123-450	3/11/2015	1253	1473.7	1474	50	20.24	0.60		4	
KAFB-106124	KAFB-106124-025	3/10/2015	1540	113.06	114	11	20.28	0.62		4	
	KAFB-106124-050	3/10/2015	1531	111.97	113	32	19.65	1.38		5	
	KAFB-106124-150	3/10/2015	1521	138.66	140	19	19.47	0.56		4	
	KAFB-106124-250	3/10/2015	1511	159.13	163	5	19.87	0.16		4	
	KAFB-106124-350	3/10/2015	1454	179.5	181	0	20.28	0.20		4	
	KAFB-106124-450	3/10/2015	1444	1580.6	1582	58	20.52	0.32		4	
KAFB-106125	KAFB-106125-025	3/10/2015	1332	112	112	70	19.37	1.56	meets criteria 3, but very far south in "cleaner" zone	3	
	KAFB-106125-050	3/10/2015	1324	117.1	117	25	17.98	2.90		5	
	KAFB-106125-150	3/10/2015	1305	137.5	139	3	19.37	0.78		5	
	KAFB-106125-250	3/10/2015	1257	142.2	142	5	20.08	0.20		4	
	KAFB-106125-350	3/10/2015	1248	169.07	170	1	20.73	0.24		4	
	KAFB-106125-450	3/10/2015	1239	1421.58	1423	584	19.98	0.68		3	
	KAFB-106126-025	3/10/2015	1156	107.1	148	15	19.90	0.90		4	
	KAFB-106126-050	3/10/2015	1149	118.2	159	32	19.53	1.38		5	

Table 2. Quarter 1, 2015 Soil Vapor Horiba Data

Well ID		Date	Time	Calculated Purge Time (sec)	Actual Purge Time (sec)	HC (ppmv)	O2%	CO2%	Notes	Category
KAFB-106126	KAFB-106126-150	3/10/2015	1136	138.7	159	28	19.01	0.44		4
	KAFB-106126-250	3/10/2015	1127	159.1	159	32	19.70	0.16		4
	KAFB-106126-350	3/10/2015	1117	179.5	181	1	20.34	0.20		4
	KAFB-106126-450	3/10/2015	1107	1579.5	1548	236	19.90	0.56		3
KAFB-106127	KAFB-106127-025	3/10/2015	855	146.8	147	32	20.23	0.64		4
	KAFB-106127-050	3/10/2015	907	107.3	107	12	20.68	0.82		4
	KAFB-106127-150	3/10/2015	921	132.37	133	10	19.79	0.42		4
	KAFB-106127-250	3/10/2015	940	151.7	232	12	20.03	0.18		4
	KAFB-106127-350	3/10/2015	952	171.15	183	31	20.14	0.22		4
	KAFB-106127-450	3/10/2015	1025	1498.4	1498	77	20.02	0.50		4
KAFB-106128	KAFB-106128-025	3/12/2015	1110	114	114	2	20.45	0.04		4
	KAFB-106128-050	3/12/2015	1103	119	119	3	20.44	0.40		4
	KAFB-106128-150	3/12/2015	1057	119.3	120	5	20.43	2.10		4
	KAFB-106128-250	3/12/2015	1051	169.69	170	4	19.60	0.60		4
	KAFB-106128-350	3/12/2015	1039	250.15	250	823	19.74	1.08		2
	KAFB-106128-450	3/12/2015	1031	2190	2190	7	17.75	0.22		5
KAFB-106129	KAFB-106129-025	3/12/2015	1608	137.04	137	40	20.74	0.12		4
	KAFB-106129-025	3/24/2015	1506	172	173	14	20.58	0.14	Bottle-Vac seal leaked, sample recollected	4
	KAFB-106129-050	3/12/2015	1601	143.04	143	36	20.71	0.16		4
	KAFB-106129-150	3/12/2015	1548	167.7	168	1	19.51	0.16		4
	KAFB-106129-250	3/12/2015	1541	192.2	192	4	18.59	0.32		4
	KAFB-106129-350	3/12/2015	1533	216.16	216	2	19.14	1.00		5
	KAFB-106129-450	3/12/2015	1524	1900.8	1902	51	19.70	1.10		5
KAFB-106130	KAFB-106130-025	3/18/2015	1502	137.04	137	22	20.67	0.12		4
	KAFB-106130-050	3/18/2015	1501	143.11	143	27	20.55	0.14		4
	KAFB-106130-150	3/18/2015	1452	170.16	171	6	20.59	0.30		4
	KAFB-106130-250	3/18/2015	1445	192.24	192	5	20.08	0.52		4
	KAFB-106130-350	3/18/2015	1438	216.7	217	5	20.47	0.70		4
	KAFB-106130-450	3/18/2015	1429	1897.999	1899	2	20.31	0.56		4
KAFB-106131	KAFB-106131-025	3/18/2015	1342	137.04	138	16	20.34	0.30		4
	KAFB-106131-055	3/18/2015	1335	144.39	144	15	20.27	0.22		4
	KAFB-106131-150	3/18/2015	1328	167.67	168	8	19.98	0.28		4
	KAFB-106131-245	3/18/2015	1321	191.04	191	17	19.82	0.30		4
	KAFB-106131-350	3/18/2015	1313	216.79	218	4	17.48	0.20		4
	KAFB-106131-450	3/18/2015	1305	1858.71	1859	9	16.43	0.28		4
KAFB-106132	KAFB-106132-025	3/19/2015	1532	137	137	18	19.62	1.50		5
	KAFB-106132-050	3/19/2015	1540	143.119	143	21	19.36	1.84		5
	KAFB-106132-175	3/19/2015	1547	173.599	174	3	18.79	0.92		5
	KAFB-106132-250	3/19/2015	1557	192.24	192	26	20.03	0.44		4
	KAFB-106132-350	3/19/2015	1605	216.79	217	5	20.34	0.46		4
	KAFB-106132-450	3/19/2015	1641	1897.99	1898	8	20.22	1.28		4
KAFB-106133	KAFB-106133-025	3/25/2015	1002	186.87	188	3	19.54	1.60	Horiba data and lab sample not collected the same day	4
	KAFB-106133-025	3/25/2015	1002	186.87	188	3	19.54	1.60	Horiba data and lab sample not collected the same day	4
	KAFB-106133-050	3/25/2015	954	178.89999	179	1	19.35	1.66	Horiba data and lab sample not collected the same day	4
	KAFB-106133-170	3/25/2015	945	235	237	4	18.51	0.84	Horiba data and lab sample not collected the same day	4

Table 2. Quarter 1, 2015 Soil Vapor Horiba Data

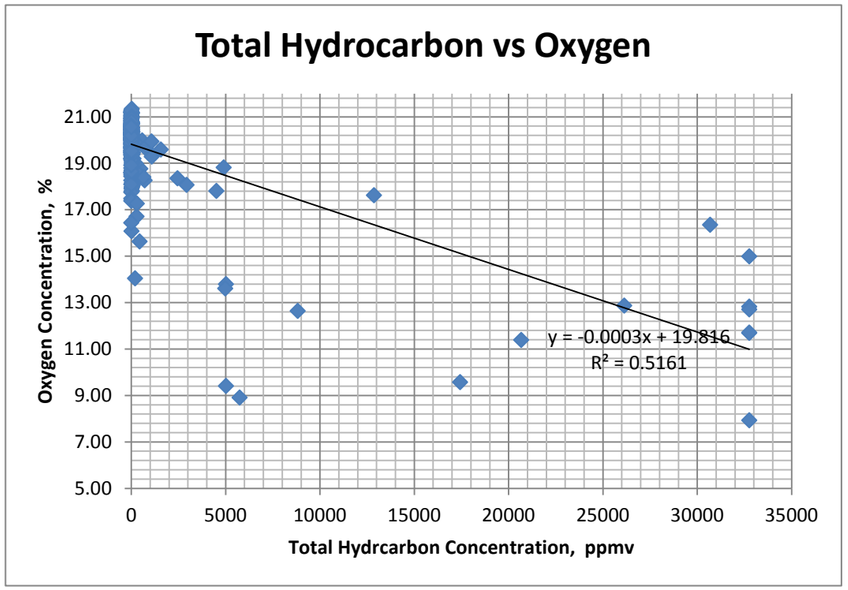
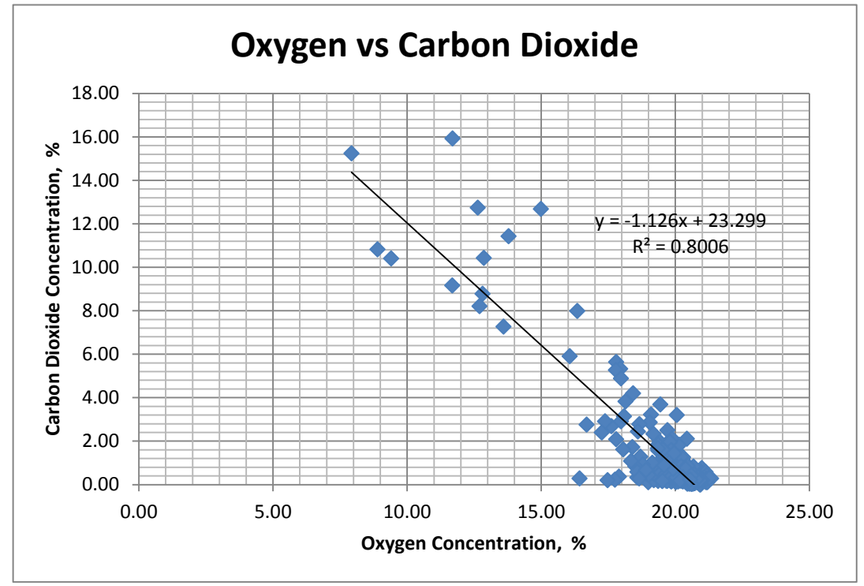
Well ID		Date	Time	Calculated Purge Time (sec)	Actual Purge Time (sec)	HC (ppmv)	O2%	CO2%	Notes	Category
	KAFB-106133-250	3/25/2015	939	262	262	3	18.59	0.58	Horiba data and lab sample not collected the same day	4
	KAFB-106133-350	3/25/2015	927	270.69999	272	6	20.22	0.84	Horiba data and lab sample not collected the same day	4
	KAFB-106133-450	3/25/2015	919	2185	2185	7	19.96	1.44	Horiba data and lab sample not collected the same day	4
KAFB-106134	KAFB-106134-025	3/25/2015	1016	293.65	293	0	20.68	0.18	Horiba data and lab sample not collected the same day	4
	KAFB-106134-050	3/25/2015	1007	306.68	307	1	20.55	0.24	Horiba data and lab sample not collected the same day	4
	KAFB-106134-170	3/25/2015	958	369.94	370	0	20.10	0.22	Horiba data and lab sample not collected the same day	4
	KAFB-106134-250	3/25/2015	947	411.94	412	8	20.00	0.34	Horiba data and lab sample not collected the same day	4
	KAFB-106134-350	3/25/2015	935	464.57	465	4	20.61	0.58	Horiba data and lab sample not collected the same day	4
	KAFB-106134-350	3/25/2015	935	464.57	465	4	20.61	0.58	Horiba data and lab sample not collected the same day	4
	KAFB-106134-450	3/25/2015	921	3163.33	3163	2	20.35	0.72	Horiba data and lab sample not collected the same day	4
KAFB-106135	KAFB-106135-025	3/19/2015	1300	228.4	228	5	20.84	0.26		4
	KAFB-106135-050	3/19/2015	1250	238.53	238	34	20.54	0.34		4
	KAFB-106135-150	3/19/2015	1243	279.46	280	1	20.28	0.14		4
	KAFB-106135-250	3/19/2015	1233	320.4	NA	3	20.76	0.22	Actual purge time not recorded, was very close to calculated purge time however	4
	KAFB-106135-350	3/19/2015	1225	361.33	361	5	20.99	0.26		4
	KAFB-106135-450	3/19/2015	1210	3163.33	3163	2	20.62	0.36		4
KAFB-106136	KAFB-106136-025	3/23/2015	1531	137	141	5	20.18	0.32		4
	KAFB-106136-050	3/23/2015	1523	143	143	27	20.07	0.26		4
	KAFB-106136-150	3/23/2015	1514	168	168	5	20.02	0.12		4
	KAFB-106136-150	3/23/2015	1514	168	168	5	20.02	0.12		4
	KAFB-106136-250	3/23/2015	1508	192	192	2	20.73	0.18		4
	KAFB-106136-350	3/23/2015	1458	217	217	2	20.55	0.18		4
	KAFB-106136-450	3/23/2015	1444	1897.99	1898	2	20.52	0.20		4
KAFB-106137	KAFB-106137-025	3/19/2015	1538	228	228	4	21.16	0.26		4
	KAFB-106137-050	3/19/2015	1530	239	239	8	20.94	0.32		4
	KAFB-106137-150	3/19/2015	1519	279	279	0	20.53	0.20		4
	KAFB-106137-250	3/19/2015	1507	320	320	26	21.34	0.28		4
	KAFB-106137-350	3/19/2015	1455	361.5	364	7	21.27	0.30	Actual purge time was written in minutes on the purge log and converted to seconds here	4
	KAFB-106137-450	3/19/2015	1441	3163.3	3163	0	20.86	0.32		4
KAFB-106138	KAFB-106138-025	3/23/2015	1004	137	137	6	18.09	3.14		5
	KAFB-106138-050	3/23/2015	957	143	143	5	17.38	2.90		5
	KAFB-106138-150	3/23/2015	949	168	168	13	18.65	0.28		4
	KAFB-106138-250	3/23/2015	941	192	192	2	20.02	0.36		4
	KAFB-106138-350	3/23/2015	931	217	217	3	20.22	0.30		4
	KAFB-106138-450	3/23/2015	918	1779.375	1779	7	20.28	0.28		4
	KAFB-106139-025	3/24/2015	1521	228.4	228	5	20.40	0.60		4
	KAFB-106139-050	3/24/2015	1508	238.53	238	5	20.46	0.86		4

Table 2. Quarter 1, 2015 Soil Vapor Horiba Data

Well ID		Date	Time	Calculated Purge Time (sec)	Actual Purge Time (sec)	HC (ppmv)	O2%	CO2%	Notes	Category	
KAFB-106139	KAFB-106139-150	3/24/2015	1453	279.46	280	4	18.91	0.66		4	
	KAFB-106139-250	3/24/2015	1441	320.4	320	2	19.47	0.56		4	
	KAFB-106139-350	3/24/2015	1430	361.33	361	2	19.64	0.48		4	
	KAFB-106139-450	3/24/2015	1416	3558.75	3558	6	20.39	0.72		4	
KAFB-106140	KAFB-106140-025	3/18/2015	1213	137.04	137	26	21.01	0.20		4	
	KAFB-106140-050	3/18/2015	1206	143.119	143	15	20.92	0.20		4	
	KAFB-106140-150	3/18/2015	1157	168.15	168	6	20.66	0.18		4	Background Well
	KAFB-106140-250	3/18/2015	1150	192.24	192	24	20.05	0.20		4	
	KAFB-106140-350	3/18/2015	1139	216.799	217	17	20.79	0.24		4	
	KAFB-106140-450	3/18/2015	1127	1897.99	1898	9	20.60	0.42		4	
KAFB-106141	KAFB-106141-025	3/23/2015	1144	137	137	7	19.87	0.38		4	
	KAFB-106141-050	3/23/2015	1137	137	137	16	19.52	0.16		4	
	KAFB-106141-170	3/23/2015	1128	173	173	9	20.10	0.14		4	
	KAFB-106141-250	3/23/2015	1119	192	192	5	20.10	0.16		4	
	KAFB-106141-350	3/23/2015	1111	217	217	2	20.44	0.08		4	
	KAFB-106141-450	3/23/2015	1103	1897.99	1898	3	20.60	0.02		4	
KAFB-106142	KAFB-106142-030	3/23/2015	1358	138	138	4	20.28	0.34		4	
	KAFB-106142-050	3/23/2015	1342	143	143	21	20.04	0.32		4	
	KAFB-106142-170	3/23/2015	1335	173	173	3	20.33	0.16		4	
	KAFB-106142-250	3/23/2015	1327	206	206	3	20.25	0.16		4	
	KAFB-106142-350	3/23/2015	1320	233	233	3	20.18	0.18		4	
	KAFB-106142-450	3/23/2015	1312	1897.99	1898	3	20.56	0.22		4	
KAFB-106160-IN	KAFB-106160-IN	3/24/2015	1455	NA	NA	2450	18.35	1.08	Well is connected to CATOX, no purge needed	1	
KAFB-106161-IN	KAFB-106161-IN	3/24/2105	1445	NA	NA	1069	19.93	0.72	Well is connected to CATOX, no purge needed	2	
CATOX-IN		3/24/2105	1430	NA	NA	1568	19.59	0.88	CATOX inlet	0	
CATOX-POST		3/24/2105	1430	NA	NA	294	17.26	2.40	CATOX exhaust	0	

NA = Not Available
NR = Not Recorded
recommended after Q1 sampling event
Preselected per the approved work plan
Extraction wells are not considered for the test due to long screen lengths and large diameter wells

Total 61 wells
category 1 = 12
category 2 = 7
category 3 = 11
category 4 = 19 (3 Background)
category 5 = 12

Table 2. Quarter 1, 2015 Soil Vapor Horiba Data

Well ID		Date	Time	Calculated Purge Time (sec)	Actual Purge Time (sec)	HC (ppmv)	O2%	CO2%	Notes	Category