Meridian Environmental Consulting, LLC

February 5, 2019

Carrie Stoltz
Wisconsin Department of Natural Resources
107 Sutliff Avenue
Rhinelander, Wisconsin 54501

Subject: **Progress Report:**
- **SVE System Operation (2018)**
- **Recommendations**

Autostop (former)
119 W. 9th Street North
Ladymith, Wisconsin 54848
BRRTS No. 03-55-282548
PECFA No. 54848-1295-19
Meridian No. 05F630

Doug's Tire (former)
811 Lake Ave W.
Ladysmith, Wisconsin 54848
BRRTS No. 03-55-000408
PECFA No. 54848-1215-11
Meridian No. 05F786

Dear Carrie:

This letter provides a summary of the SVE system operation at the above two sites over the past 9 months (April – December 2018). We also provide our recommendations to achieve Closure.

BACKGROUND INFORMATION

The reader is referred to the project files for more detailed background information. Summary information is provided below.

A Soil Vapor Extraction (SVE) system was installed in October 2015 at the two properties known as Doug's and Autostop. The intent of the SVE system is to remove as much petroleum impacts as practicable from a targeted area (known as LNAPL Focus Area)(Figure 1). This targeted remedial approach and design was directed by DNR Staff. Petroleum vapors are removed from the LNAPL Focus Area by venting extraction wells RW-1, RW-2, RW-3, RW-4, RW-5, EX-2, EX-4, EX-5, M-1.

The SVE system is housed in a trailer located at the south end of the Autostop building (Figure 1). The mechanical system consists of a blower (5 hp) which pulls soil gas (including LNAPL vapors) from the subsurface and discharges these vapors to the atmosphere.

The extraction wells are individually connected to the SVE system via individual piping. Piping was installed under Highway 8 using directional boring equipment to connect to EX-2, EX-4, and EX-5, and M-1.

The SVE discharge was treated with a flame oxidizer for the first 4 months of operation. The VOC load decreased after the initial spike which is typical of soil vapor extraction. Therefore the flame oxidizer was removed February 29, 2016 and the air discharge vented directly to the atmosphere (25 ft stack). Discharge mass is subsequently controlled by regulating the air flow rate from the system using a VFD (variable frequency drive) on the blower motor.

SVE SYSTEM OPERATION - 2018

Regular (monthly) System Checks

The system was checked at least monthly throughout 2018. System operation data was collected including air flow rate, vacuum, and air samples. Table 1 summarizes the system operational data.

Air samples were collected from the discharge. Appendix A contains the analytical reports for the air samples. The results are summarized in Table 1.

The system removed approximately 64 lbs of benzene and 9363 lbs of VOCs (reported as gasoline) during the reporting period (2018). No discharge limits were exceeded.

The SVE system vents have been measured quarterly and operated (pulsed) to ensure maximum VOC removal rates over the past 6 months. The air discharge from each vent was measured in June and October. The field measurements are summarized in Table 2. Based on these measurements, the SVE system focused exclusively on vent M-1 based on the highest PID reading from that vent.

Appendix B contains graphs of the SVE discharge concentrations. The VOC discharge concentrations and/or removal rates have continually declined since system start-up (2015).

Ground Water and LNAPL Measurements

Table 3 summarizes the ground water and LNAPL measurements from the SVE vents. The depth to ground water and to LNAPL was measured using an Interface Probe. In addition, the product (or LNAPL) thickness was measured by using a clear bailer. Typically, the interface probe indicates more LNAPL because it measures the dissolved phase LNAPL present below the product layer.

The LNAPL thicknesses have decreased markedly at both sites. At the Autostop site, LNAPL is no longer found in RW-1, RW-2, RW-4, RW-5, EX-5. The thickness in RW-2 has decreased from several feet to no longer present. LNAPL persists in RW-3 and does not appear to respond to the SVE system due to low permeability soils.

At the Doug's Tire (former) site, the LNAPL thicknesses in EX-4, EX-5, and M-1 have decreased from several feet to a few inches.

The effectiveness of the SVE system should be enhanced by pumping each SVE vent with LNAPL when the vac truck empties the onsite product tank.

Disposal of Remediation Waste

LNAPL was bailed from the SVE vents during each measurement event. The LNAPL is currently stored in the aboveground tank. This should be pumped out this summer.

Water which accumulates in the knockout tank and pipe sumps is temporarily stored onsite in drums and subsequently disposed at the Bloomer Wastewater Treatment Plant.

CONCLUSIONS AND RECOMMENDATIONS

The VOC discharge concentrations and/or removal rates have continually declined since system start-up (2015). The system has been pulsed and measured quarterly to ensure maximum VOC removal rates over the past 6 months.

LNAPL thicknesses have continually declined during system operation and appear to have reached equilibrium status.

We recommend the following actions to obtain the data needed to complete the Closure Packets:

- We recommend the SVE system be shut off during the winter and restarted in April 2019. The system should be operated from April – December 2019 based on the continuous removal of VOCs from the subsurface by the SVE system.

- There is LNAPL in the onsite tank. A vac truck will be needed to remove this product. We recommend pumping the tank in May. While onsite, the vac truck should pump those SVE vents with LNAPL (i.e., RW-3, E-4, M-1) to enhance the SVE operation.

- The SVE vents should be measured at least quarterly (March, June, September, December) for ground water levels and LNAPL thickness.

- VOC concentrations from the SVE vents should be measured quarterly to ensure maximum VOC removal rates during 2019.

- The monitoring well network at Doug's and Autostop should be sampled quarterly throughout 2019 beginning in March (before the SVE system is restarted).

- Routine monitoring well maintenance should be completed during the initial sampling event (e.g., cut-down any frost-heaved PVC riser pipes, repair/replace manways, etc.). This will require the monitoring well elevations to be re-checked (re-surveyed).

- A Vapor Intrusion investigation should be completed at both sites. This will include installing vapor pins (Cox Colvin) in the floor of the buildings at Doug's and Autostop (now Verizon). This is subject to approval by the current occupants of each building. If access is not possible, several vapor probes (Geoprobes) should be installed around each building. This should be completed before the system restarts in April.

- An annual report will be prepared in December 2019 summarizing the system operation, ground water sampling, and recommendations to achieve Closure with GIS Registry for Soil and Ground Water. Additional Closure tools (e.g., structural impediment, cap maintenance plan) are expected to be applicable for these two properties.

Our goal is to submit these two sites for Closure with GIS Registry in early 2020. Closure will include structural impediment(s) (for Doug's remedial excavation) and Cap Maintenance Plans (at each site).

COST

A Change Order for the above recommendations will be submitted in separate correspondence.

Sincerely,
MERIDIAN ENVIRONMENTAL CONSULTING, LLC

Kenneth Shimko, PG
Project Manager

C: Gary Gilbert, P.E.– Project Engineer

TABLES

Table 1: SVE Operation Data
Autostop/Dougs

Sample Date	Sample Parameters	Lab Result (ug/m3)	Hour Meter	Hours Operation During Reporting Period	Discharge Flow Rate (SCFM)	Emission Rate (ug/sec)	Emission Rate (lbs/hr)	Cumulative Mass Removed (lbs) (before oxidizer) Benzene	Cumulative Mass Removed (lbs) (before oxidizer) Gasoline*	Vents (X = Open, Blank = Closed, F = Frozen/No Flow) (Not recorded until October 2016) R1	R2	R3	R4	R5	E2	E4	E5	M1	Vacuum (in H2O)	VFD (%)
10/26/2015	Benzene	1,100,000	4	4	160	83,072	0.66	2.63												
	Gasoline*	43,000,000				3,247,360	25.72		102.88											
10/27/2015	Benzene	650,000	12.55	8.55	160	49,088	0.39	5.96												
	Gasoline*	34,000,000				2,567,680	20.34		276.75											
10/28/2015	Benzene	43,000	24.23	11.68	160	3,247	0.03	6.26												
	Gasoline*	29,000,000				2,190,080	17.35		479.34											
11/6/2015	Benzene	360,000	238.62	214.39	125	21,240	0.17	42.32												
	Gasoline*	21,000,000				1,239,000	9.81		2583.13											
11/16/2015	Benzene	290,000	481.5	242.88	135	18,479	0.15	77.87												
	Gasoline*	20,000,000				1,274,400	10.09		5034.58											
11/18/2015	Benzene	200,000	525.32	43.82	144	13,594	0.11	82.58												
	Gasoline*	11,000,000				747,648	5.92		5294.05											
12/17/2015	Benzene	220,000	1222.7	697.38	135	14,018	0.11	160.01												
	Gasoline*	12,000,000				764,640	6.06		9517.35											
1/4/2016	Benzene	290,000	1537.7	315	170	23,270	0.18	218.06												
	Gasoline*	15,000,000				1,203,600	9.53		12520.09											
1/22/2016	Benzene	76,000	1925.3	387.6	138	4,950	0.04	233.26												
	Gasoline*	4,700,000				306,139	2.42		13459.87											
2/15/2016	Benzene	340,000	2499	573.7	125	20,060	0.16	324.41												
	Gasoline*	23,000,000				1,357,000	10.75		19625.68											
Oxidizer Offgas Treatment Removed 2/29/16 - Replaced with 25 ft stack								**Cumulative Discharge (untreated) (begin at zero - March 1)**												
								Benzene	**Gasoline***											
3/29/2016	Benzene	420,000	3529	1030	90	17,842	0.14	146												
	Gasoline*	8,800,000				373,824	2.96		3050											
4/20/2016	Benzene	120,000	4055	526	110	6,230	0.05	171												
	Gasoline*	10,000,000				519,200	4.11		5212											
5/23/2016	Benzene	99,000	4765.8	710.8	65	3,037	0.02	189												
	Gasoline*	7,300,000				223,964	1.77		6473											
6/30/2016	Benzene	71,000	5675.1	909.3	44	1,475	0.01	199												
	Gasoline*	7,200,000				149,530	1.18		7550											
8/1/2016	Benzene	150,000	6181	505.9	50	3,540	0.03	213												
	Gasoline*	14,000,000				330,400	2.62		8874											
9/26/2016	Benzene	140,000	7521	1340	54	3,568	0.03	251												
	Gasoline*	19,000,000				484,272	3.84		14013											
10/12/2016	Benzene	46,000	7907	386	60	1,303	0.01	255			X	X		X				X		
	Gasoline*	7,100,000				201,072	1.59		14628											
11/3/2016	Benzene	140,000	8435	528	120	7,930	0.06	288			X	X				X	X	X	32	100
	Gasoline*	12,000,000				679,680	5.38		17470											
12/21/2016	Benzene	130,000	9290	855	50	3,068	0.02	309			X	X				X	X	X	20	50
	Gasoline*	14,000,000				330,400	2.62		19708											
1/19/2017	Benzene	210,000	9580	290	50	4,956	0.04	321				X				X	X	X	8	60
	Gasoline*	18,000,000				424,800	3.36		20683											
2/9/2017	Benzene	100,000	9999	419	90	4,248	0.03	335			X	X				X	X	X	25	60
	Gasoline*	9,200,000				390,816	3.10		21980											

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Sample Date	Sample Parameters	Lab Result (ug/m3)	Hour Meter	Hours Operation During Reporting Period	Discharge Flow Rate (SCFM)	Emission Rate (ug/sec)	Emission Rate (lbs/hr)	Cumulative Mass Removed (lbs) (before oxidizer) Benzene	Cumulative Mass Removed (lbs) (before oxidizer) Gasoline*	Vents (X = Open, Blank = Closed, F = Frozen/No Flow) (Not recorded until October 2016) R1	R2	R3	R4	R5	E2	E4	E5	M1	Vacuum (in H2O)	VFD (%)
3/8/2017	Benzene	95,000	10643	644	90	4,036	0.03	355				X				X	X	X	26	70
	Gasoline*	7,300,000				310,104	2.46		23562											
4/8/2017	Benzene	16,000	11387	744	80	604	0.00	359				X				X			33	70
	Gasoline*	2,300,000				86,848	0.69		24074											
5/15/2017	Benzene	230,000	12274	887	90	9,770	0.08	427			X	X			X	X	X	X	30	70
	Gasoline*	5,700,000				242,136	1.92		25775											
6/14/2017	Benzene	32,000	12994	720	110	1,661	0.01	437				X				X	X	X	25	80
	Gasoline*	4,600,000				238,832	1.89		27137											
7/11/2017	Benzene	300,000	13620	626	110	15,576	0.12	514							X	X	X	X	30	90
	Gasoline*	6,500,000				337,480	2.67		28810											
8/9/2017	Benzene	220,000	14319	699	125	12,980	0.10	586				X			X	X	X	X	38	100
	Gasoline*	4,900,000				289,100	2.29		30410											
9/12/2017	Benzene	270,000	15135	816	130	16,567	0.13	693			X	X		X	X	X	X	X	22	90
	Gasoline*	7,100,000				435,656	3.45		33226											
9/22/2017	Shut system down to measure GW/LNAPL		15366	231																
9/27/2017	Restart system		15366	0				693	33226											
10/21/2017	Benzene	290,000	15940	574	120	16,426	0.13	768				X		X	X	X	X	X	NM	90
	Gasoline*	10,000,000				566,400	4.49		35801											
11/8/2017	Benzene	110,000	16369	429	100	5,192	0.04	785				X		X	X	X		X	20	70
	Gasoline*	2,600,000				122,720	0.97		36218											
12/8/2017	Benzene	53,000	17090	721	120	3,002	0.02	802			X	X		X	X	X	X	X	18	80
	Gasoline*	7,600,000				430,464	3.41		38676											
1/12/2018	Benzene	32,000	17594	504	140	2,115	0.02	811		X	X	X		X	X	X	X	X	25	100
	Gasoline*	3,500,000				231,280	1.83		39599											
1/24/2018	Benzene	*5,000*	17884	290	90	212	0.00	811		X	X	F		X	F	F	F	F	32	70
	Gasoline*	420,000				17,842	0.14		39640											
2/9/2018	Benzene	12,000	18264	380	80	453	0.00	813		X	X	F		X	F	F	F	F	32	70
	Gasoline*	1,700,000				64,192	0.51		39833											
2/26/2018	Benzene	*5,000*	18640	376	90	212	0.00	813		X	X	F		X	F	F	F	F	30	70
	Gasoline*	480,000				20,390	0.16		39894											
3/3/2018	Benzene	10,000	18759	119	120	566	0.00	814		X	X	X		X	X	X	X	X	25	80
	Gasoline*	1,700,000				96,288	0.76		39985											
3/14/2018	Benzene	90,000	19023	264	115	4,885	0.04	824			X	X			X	X	X	X	20	80
	Gasoline*	5,800,000				314,824	2.49		40643											
3/21/2018	Benzene	90,000	19192	169	115	4,885	0.04	831			X	X			X	X	X	X	18	90
	Gasoline*	5,800,000				314,824	2.49		41064											
4/12/2018	Benzene	*5,000*	19715	523	120	283	0.00	832							X	X	X	X	30	90
	Gasoline*	440,000				24,922	0.20		41168											
4/26/2018	Benzene	50,000	20048	333	130	3,068	0.02	840				X			X			X	34	90
	Gasoline*	5,700,000				349,752	2.77		42090											
5/6/2018	Benzene	53,000	20287	239	115	2,877	0.02	845				X			X			X	35	90
	Gasoline*	7,600,000				412,528	3.27		42871											
5/30/2018	Benzene	17,000	20868	581	135	1,083	0.01	850				X			X	X	X	X	28	100
	Gasoline*	2,700,000				172,044	1.36		43663											
6/6/2018	Benzene	86,000	20868	0	90	3,653	0.03	850										X	38	80
	Gasoline*	11,000,000				467,280	3.70		43663											

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7/6/2018	Benzene	26,000	21584	716	90	1,104	0.01	857										X	42	80
	Gasoline*	4,300,000				182,664	1.45		44698											
8/2/2018	Benzene	33,000	22230	646	100	1,558	0.01	865										X	43	80
	Gasoline*	7,900,000				372,880	2.95		46606											
9/10/2018	Benzene	20,000	23168	938	90	850	0.01	871										X	46	80
	Gasoline*	5,700,000				242,136	1.92		48405											
10/4/2018	Benzene	20,000	23502	334	90	850	0.01	873										X	49	80
	Gasoline*	4,100,000				174,168	1.38		48866											
11/2/2018	Benzene	*5,000*	24220	718	90	212	0.00	874										X	44	75
	Gasoline*	370,000				15,718	0.12		48955											
12/4/2018	Benzene	*5,000*	24968	748	80	189	0.00	875										X	48	80
	Gasoline*	30,000				1,133	0.01		48962											

5,000 concentration estimated as 1/2 of detection limit

Table 2: SVE POINT DATA - SVE SYSTEM

AUTOSTOP / DOUGS

LADYSMITH, WI

Meridian Nos. 05F630/786

DATE	VFD (%)	DISCHARGE FLOW (SCFM)	MANIFOLD VAC (IN/H2O)	DISCHARGE PID (PPM)	ELAPSED TIME (MIN)
RW1					
06/06/18	60	0	35	NA	5
10/01/18	60	0	44	NA	5
RW2					
06/06/18	80	90	38	35	5
06/06/18	80	90	38	35	15
10/01/18	80	50	52	43	10
RW3					
06/06/18	60	0	32	NA	5
10/01/18	60	0	40	NA	5
RW4					
06/06/18	85	90	40	<5	5
06/06/18	85	90	40	<5	15
10/01/18	85	80	48	26	10
RW5					
06/06/18	76	80	35	30	5
06/06/18	75	80	35	40	15
10/01/18	75	70	40	650	10
M1					
06/06/18	90	100	38	**80**	5
06/06/18	90	100	42	**80**	15
10/01/18	90	90	51	**1,365**	10
EX2					
06/06/18	60	5	32	35	5
06/06/18	65	5	38	38	7
06/06/18	60	5	38	45	15
10/01/18	60	0	38	NA	5
EX4					
06/06/18	80	90	38	40	5
06/06/18	80	85	40	25	10
06/06/18	80	80	40	24	15
10/01/18	80	70	48	125	10
EX5					
06/06/18	80	90	35	15	5
06/06/18	80	90	37	55	10
06/06/18	80	90	37	60	15
10/01/18	80	80	40	285	10

NOTES:

All points/wells open during the data collection process

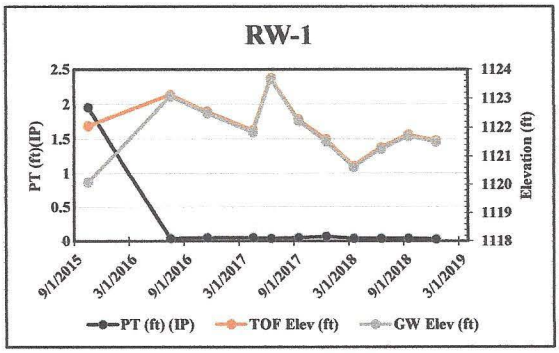
6/6 - After data collection, M1 was left open due to highest contaminant removal rate

10/1 - After data collection, M1 was left open due to highest contaminant removal rate

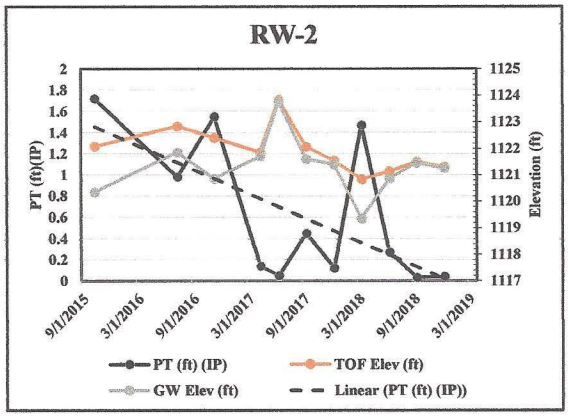
10/1 - A new PID was used for measuring the PID readings (Intertec Phocheck Tiger Ion)

AUTOSTOP SVE WELLS

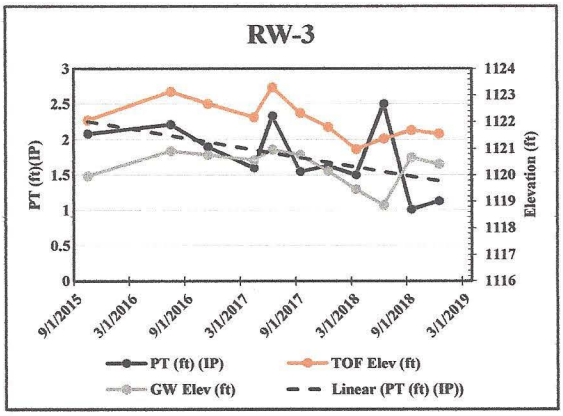
RW-1 (installed August 23, 2012)						
Surface Elevation (approx)				1144		
Top of Casing Elevation (surveyed)				1143.49		
Top of screen elevation				1125.5		
Bottom of Screen Elevation				1115.5		
Meas. Date	DTP(ft)	DTW(ft)	PT (ft) (IP)	PT(inch)(bailer)	TOF Elev (ft)	GW Elev (ft)
10/26/2015	21.45	23.4	1.95	NM	1122.04	1120.09
7/30/2016	20.38	20.42	0.04	0	1123.11	1123.07
11/3/2016	20.95	21	0.05	0	1122.54	1122.49
4/8/2017	21.6	21.65	0.05	0	1121.89	1121.84
6/14/2017	19.8	19.84	0.04	0	1123.69	1123.65
9/27/2017	21.22	21.27	0.05	0	1122.27	1122.22
12/20/2017	21.9	21.97	0.07	NM	1121.59	1121.52
3/21/2018	22.83	22.87	0.04	0	1120.66	1120.62
6/6/2018	22.19	22.23	0.04	0	1121.3	1121.26
9/27/2018	21.75	21.79	0.04	0	1121.74	1121.7
12/20/2018	21.95	21.98	0.03	0	1121.54	1121.51



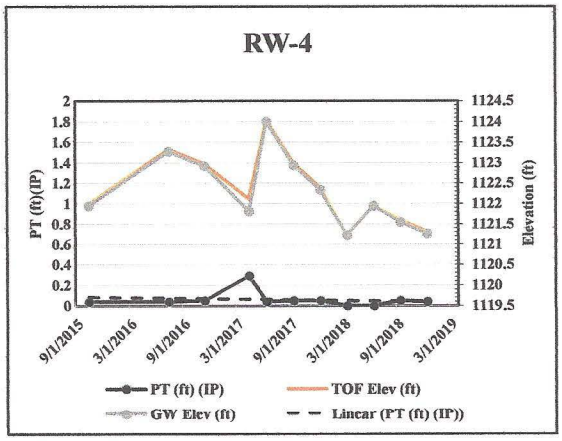
RW-2 (installed August 23, 2012)						
Surface Elevation (approx)				1144		
Top of Casing Elevation (surveyed)				1143.85		
Top of screen elevation				1126		
Bottom of Screen Elevation				1116		
Meas. Date	DTP(ft)	DTW(ft)	PT (ft) (IP)	PT(inch)(bailer)	TOF Elev (ft)	GW Elev (ft)
10/26/2015	21.78	23.5	1.72	NM	1122.07	1120.35
7/30/2016	21.02	22	0.98	12	1122.83	1121.85
11/3/2016	21.45	23	1.55	1	1122.4	1120.85
4/8/2017	22.01	22.15	0.14	0.5	1121.84	1121.7
6/14/2017	20.03	20.08	0.05	0	1123.82	1123.77
9/27/2017	21.8	22.25	0.45	0.5	1122.05	1121.6
12/20/2017	22.33	22.45	0.12	NM	1121.52	1121.4
3/21/2018	23.03	24.5	1.47	3	1120.82	1119.35
6/6/2018	22.73	23	0.27	0.375	1121.12	1120.85
9/27/2018	22.37	22.4	0.03	0	1121.48	1121.45
12/20/2018	22.56	22.6	0.04	0	1121.29	1121.25



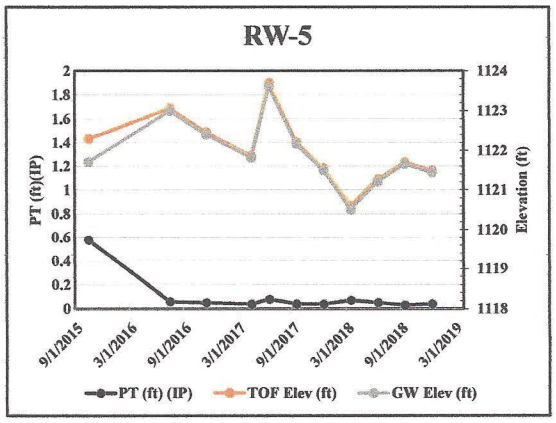
RW-3 (installed August 23, 2012)						
Surface Elevation (approx)				1144		
Top of Casing Elevation (surveyed)				1143.96		
Top of screen elevation				1125.5		
Bottom of Screen Elevation				1115.5		
Meas. Date	DTP(ft)	DTW(ft)	PT (ft) (IP)	PT(inch)(bailer)	TOF Elev (ft)	GW Elev (ft)
10/26/2015	21.92	24	2.08	NM	1122.04	1119.96
7/30/2016	20.84	23.05	2.21	21	1123.12	1120.91
11/3/2016	21.3	23.2	1.9	12	1122.66	1120.76
4/8/2017	21.8	23.4	1.6	16	1122.16	1120.56
6/14/2017	20.67	23	2.33	3	1123.29	1120.96
9/27/2017	21.65	23.2	1.55	16	1122.31	1120.76
12/20/2017	22.17	23.8	1.63	NM	1121.79	1120.16
3/21/2018	23	24.5	1.5	14	1120.96	1119.46
6/6/2018	22.6	25.1	2.5	10	1121.36	1118.86
9/27/2018	22.29	23.3	1.01	3	1121.67	1120.66
12/20/2018	22.42	23.55	1.13	8	1121.54	1120.41



RW-4 (installed June 12, 2015)						
Surface Elevation (approx)				1146		
Top of Casing Elevation (surveyed)				1145.62		
Top of screen elevation				1131		
Bottom of Screen Elevation				1116		
Meas. Date	DTP(ft)	DTW(ft)	PT (ft) (IP)	PT(inch)(bailer)	TOF Elev (ft)	GW Elev (ft)
10/26/2015	23.63	23.67	0.04	NM	1121.99	1121.95
7/30/2016	22.3	22.34	0.04	NM	1123.32	1123.28
11/3/2016	22.65	22.7	0.05	NM	1122.97	1122.92
4/8/2017	23.51	23.8	0.29	0	1122.11	1121.82
6/14/2017	21.58	21.62	0.04	0	1124.04	1124
9/27/2017	22.63	22.68	0.05	0	1122.99	1122.94
12/20/2017	23.23	23.28	0.05	NM	1122.39	1122.34
3/21/2018	24.39	24.39	0	0	1121.23	1121.23
6/6/2018	23.67	23.67	0	0	1121.95	1121.95
9/27/2018	24.02	24.07	0.05	0	1121.6	1121.55
12/20/2018	24.32	24.36	0.04	0	1121.3	1121.26

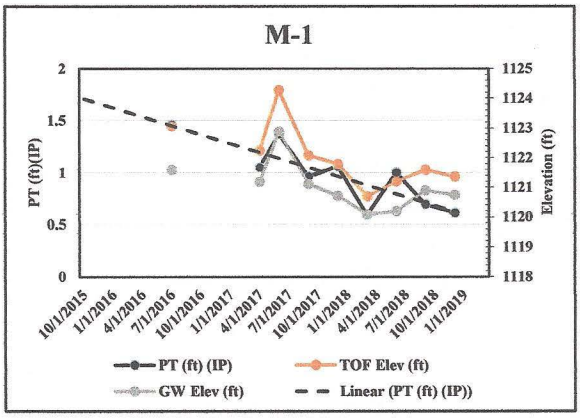


RW-5 (installed June 12, 2015)						
Surface Elevation (approx)				1144.5		
Top of Casing Elevation (surveyed)				1144.11		
Top of screen elevation				1129.5		
Bottom of Screen Elevation				1114.5		
Meas. Date	DTP(ft)	DTW(ft)	PT (ft) (IP)	PT(inch)(bailer)	TOF Elev (ft)	GW Elev (ft)
10/26/2015	21.82	22.4	0.58	NM	1122.29	1121.71
7/30/2016	21.05	21.11	0.06	0	1123.06	1123
11/3/2016	21.65	21.7	0.05	0	1122.46	1122.41
4/8/2017	22.25	22.29	0.04	0	1121.86	1121.82
6/14/2017	20.42	20.5	0.08	0	1123.69	1123.61
9/27/2017	21.9	21.94	0.04	0	1122.21	1122.17
12/20/2017	22.57	22.61	0.04	NM	1121.54	1121.5
3/21/2018	23.52	23.59	0.07	FILM	1120.59	1120.52
6/6/2018	22.85	22.9	0.05	0	1121.26	1121.21
9/27/2018	22.42	22.45	0.03	0	1121.69	1121.66
12/20/2018	22.63	22.67	0.04	0	1121.48	1121.44

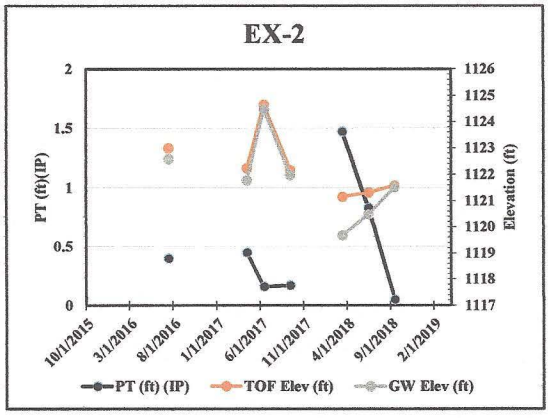


DOUGS SVE WELLS

M-1 (installed June 11, 2015)						
Surface Elevation (approx)				1145		
Top of Casing Elevation (surveyed)				1144.89		
Top of screen elevation				1130		
Bottom of Screen Elevation				1115		
Meas. Date	DTP(ft)	DTW(ft)	PT (ft) (IP)	PT(inch)(bailer)	TOF Elev (ft)	GW Elev (ft)
10/26/2015	NM	NM		NM		
7/30/2016	21.84	23.3	1.46	9	1123.05	1121.59
11/3/2016	NM	NM		14		
4/8/2017	22.65	23.7	1.05	6	1122.24	1121.19
6/14/2017	20.63	22	1.37	8	1124.26	1122.89
9/27/2017	22.82	23.78	0.96	2	1122.07	1121.11
12/20/2017	23.12	24.18	1.06	NM	1121.77	1120.71
3/21/2018	24.21	24.8	0.59	1	1120.68	1120.09
6/6/2018	23.7	24.7	1	0.25	1121.19	1120.19
9/27/2018	23.31	24	0.69	1.5	1121.58	1120.89
12/20/2018	23.54	24.15	0.61	1	1121.35	1120.74



EX-2 (installed 1/19/1992)						
Surface Elevation (approx)				1144.25		
Top of Casing Elevation (surveyed)				1144.08		
Top of screen elevation				1128		
Bottom of Screen Elevation				1113		
Meas. Date	DTP(ft)	DTW(ft)	PT (ft) (IP)	PT(inch)(bailer)	TOF Elev (ft)	GW Elev (ft)
10/26/2015	NM	NM		NM		
7/30/2016	21.1	21.5	0.4	2	1122.98	1122.58
11/3/2016	NM	NM		0		
4/8/2017	21.85	22.3	0.45	1	1122.23	1121.78
6/14/2017	19.44	19.6	0.16	0.5	1124.64	1124.48
9/27/2017	21.92	22.09	0.17	0.25	1122.16	1121.99
12/20/2017	INACCESSIBLE - FROZEN					
3/21/2018	22.93	24.4	1.47	14	1121.15	1119.68
6/6/2018	22.77	23.6	0.83	0.15	1121.31	1120.48
9/27/2018	22.5	22.55	0.05	0	1121.58	1121.53
12/20/2018	frozen					



EX-4 (installed 11/2/2002)						
Surface Elevation (approx)				1145		
Top of Casing Elevation (surveyed)				1144.89		
Top of screen elevation				1131		
Bottom of Screen Elevation				1111		
Meas. Date	DTP(ft)	DTW(ft)	PT (ft) (IP)	PT(inch)(bailer)	TOF Elev (ft)	GW Elev (ft)
10/26/2015	NM	NM		NM		
7/30/2016	21.25	23	1.75	17	1123.64	1121.89
11/3/2016	NM	NM		12		
4/8/2017	22.48	24.6	2.12	24	1122.41	1120.29
6/14/2017	20.93	21.2	0.27	0.5	1123.96	1123.69
9/27/2017	22.18	26.6	4.42	>36	1122.71	1118.29
12/20/2017	22.89	25.45	2.56	NM	1122	1119.44
3/21/2018	water flooding well area					
6/6/2018	23.51	25	1.49	2	1121.38	1119.89
9/27/2018	23.23	24.7	1.47	1	1121.66	1120.19
12/20/2018	water flooding well area					

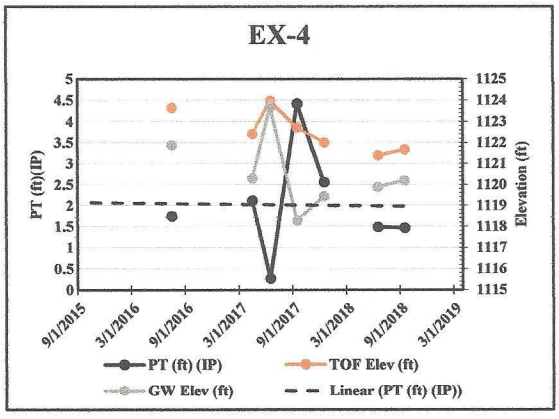
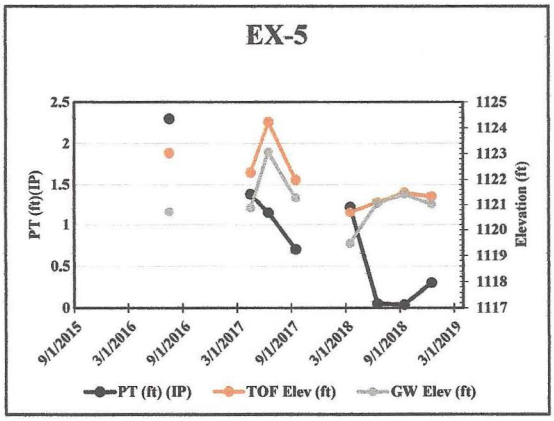


Table 3: LNAPL Thickness Measurements since SVE Startup - Extraction Wells
Autostop/Dougs

EX-5 (installed 11/2/1992)						
Surface Elevation (approx)				1145		
Top of Casing Elevation (surveyed)				1144.77		
Top of screen elevation				1130		
Bottom of Screen Elevation				1110		
Meas. Date	**DTP(ft)**	**DTW(ft)**	**PT (ft) (IP)**	**PT(inch)(bailer)**	**TOF Elev (ft)**	**GW Elev (ft)**
10/26/2015	NM	NM		NM		
7/30/2016	21.75	24.05	2.3	7	1123.02	1120.72
11/3/2016	NM	NM		12		
4/8/2017	22.52	23.9	1.38	8	1122.25	1120.87
6/14/2017	20.55	21.7	1.15	6	1124.22	1123.07
9/27/2017	22.8	23.5	0.7	1.5	1121.97	1121.27
12/20/2017	inaccessible - frozen					
3/21/2018	24.08	25.3	1.22	1	1120.69	1119.47
6/6/2018	23.68	23.73	0.05	0	1121.09	1121.04
9/27/2018	23.3	23.34	0.04	0	1121.47	1121.43
12/20/2018	23.45	23.75	0.3	0.5	1121.32	1121.02



DTP - depth to product (interface probe)
DTW - depth to water (interface probe)
PT (IP) - product thickness using interface probe (IP) (feet)
PT (bailer) - product thickness measured visually with bailer (inches)
TOF - top of fluid elevation (LNAPL and/or GW)
GW - ground water elevation using interface probe

FIGURES

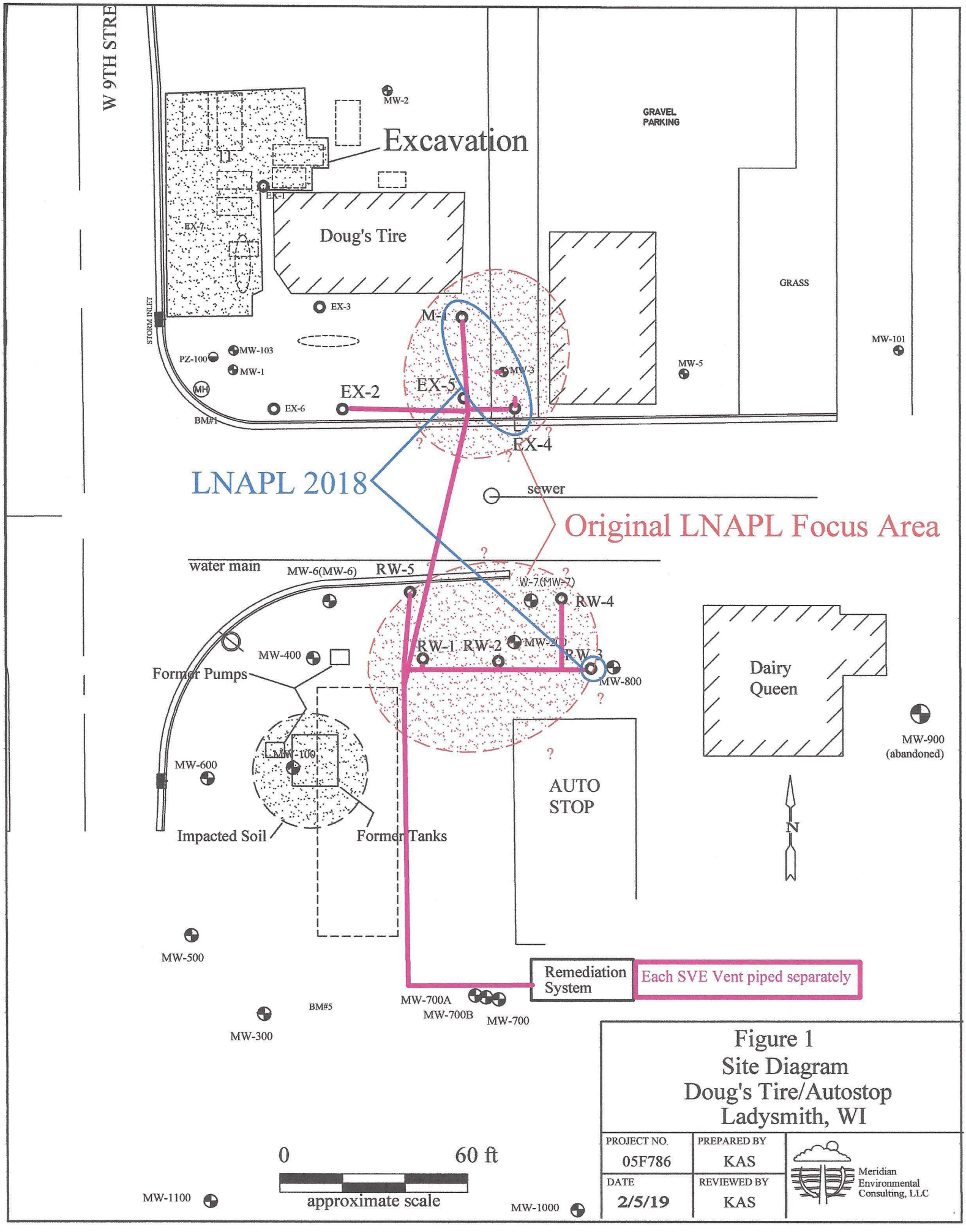


Figure 1
Site Diagram
Doug's Tire/Autostop
Ladysmith, WI

PROJECT NO.	PREPARED BY
05F786	KAS
DATE	REVIEWED BY
2/5/19	KAS

Meridian Environmental Consulting, LLC

APPENDIX A

Air Sample Lab Reports
(Results page only)

Client Sample Results

Client: Meridian Environmental Consulting LLC
Project/Site: Autostop/Doug's

TestAmerica Job ID: 310-128028-1

Client Sample ID: SVE
Date Collected: 04/12/18 00:00
Date Received: 04/16/18 11:05
Sample Air Volume: 1.02 L

Lab Sample ID: 310-128028-1
Matrix: Air
Sample Container: IH - Coconut Shell Charcoal Tube, 150 mg

Method: 1501 Sum - NIOSH Method 1501 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result ppm	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Benzene	<11	<10	<3.3		11	04/30/18 14:45	1	JCM

Method: 1550 - NIOSH Method 1550 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Gasoline	450	440			29	04/30/18 14:47	1	JCM

Client: Meridian Environmental Consulting LLC
Project/Site: Autostop/Dougs

TestAmerica Job ID: 310-129151-1

Client Sample ID: SVE Exhaust
Date Collected: 04/26/18 00:00
Date Received: 05/01/18 10:40
Sample Air Volume: 1.02 L

Lab Sample ID: 310-129151-1
Matrix: Air
Sample Container: IH - Coconut Shell Charcoal Tube, 150 mg

Method: 1501 Sum - NIOSH Method 1501 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result ppm	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Benzene	51	50	16		11	05/14/18 14:52	1	JCM

Method: 1550 - NIOSH Method 1550 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Gasoline	5800	5700			150	05/14/18 14:51	1	JCM

Client: Meridian Environmental Consulting LLC
Project/Site: Autostop/Doug's

TestAmerica Job ID: 310-129769-1

Client Sample ID: SVE Exhaust
Date Collected: 05/06/18 00:00
Date Received: 05/09/18 10:30
Sample Air Volume: 1.03 L

Lab Sample ID: 310-129769-1
Matrix: Air
Sample Container: IH - Coconut Shell Charcoal Tube, 150 mg

Method: 1501 Sum - NIOSH Method 1501 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result ppm	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Benzene	55	53	17		11	05/21/18 13:46	1	JCM

Method: 1550 - NIOSH Method 1550 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Gasoline	7900	7600			290	05/21/18 13:45	1	JCM

Client: Meridian Environmental Consulting LLC
Project/Site: Autostop, Doug's, SVE Exhaust

TestAmerica Job ID: 310-132287-1

Client Sample ID: SVE — **Lab Sample ID: 310-132287-1**
Date Collected: 05/30/18 00:00 — Matrix: Air
Date Received: 06/12/18 11:55
Sample Air Volume: 1.07 L — Sample Container: IH - Coconut Shell Charcoal Tube, 150 mg

Method: 1501 Sum - NIOSH Method 1501 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result ppm	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Benzene	18	17	5.2		11	06/14/18 16:12	1	JCM

Method: 1550 - NIOSH Method 1550 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Gasoline	2900	2700			59	06/21/18 14:37	1	JCM

Client Sample ID: SVE — **Lab Sample ID: 310-132287-2**
Date Collected: 06/06/18 00:00 — Matrix: Air
Date Received: 06/12/18 11:55
Sample Air Volume: 1.07 L — Sample Container: IH - Coconut Shell Charcoal Tube, 150 mg

Method: 1501 Sum - NIOSH Method 1501 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result ppm	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Benzene	92	86	27		11	06/14/18 16:12	1	JCM

Method: 1550 - NIOSH Method 1550 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Gasoline	12000	11000			290	06/21/18 14:37	1	JCM

Client Sample Results

Client: Meridian Environmental Consulting LLC
Project/Site: Autostop/Dougs

TestAmerica Job ID: 310-134240-1

Client Sample ID: SVE
Date Collected: 07/06/18 00:00
Date Received: 07/10/18 11:15
Sample Air Volume: 1.02 L

Lab Sample ID: 310-134240-1
Matrix: Air
Sample Container: IH - Coconut Shell Charcoal Tube, 600 mg

Method: 1501 Sum - NIOSH Method 1501 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result ppm	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Benzene	26	26	8.0		11	07/18/18 11:31	1	JCM

Method: 1550 - NIOSH Method 1550 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Gasoline	4400	4300			150	07/19/18 10:15	1	JCM

Client Sample Results

Client: Meridian Environmental Consulting LLC
Project/Site: Autostop/Doug's

TestAmerica Job ID: 310-136235-1

Client Sample ID: SVE
Date Collected: 08/02/18 00:00
Date Received: 08/06/18 11:01
Sample Air Volume: 1.03 L

Lab Sample ID: 310-136235-1
Matrix: Air
Sample Container: IH - Coconut Shell Charcoal Tube, 150 mg

Method: 1501 Sum - NIOSH Method 1501 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result ppm	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Benzene	34	33	10		11	08/13/18 11:07	1	JCM

Method: 1550 - NIOSH Method 1550 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Gasoline	8200	7900			150	08/13/18 11:06	1	JCM

Client: Meridian Environmental Consulting LLC
Project/Site: Autostop, Doug's

TestAmerica Job ID: 310-139130-1

Client Sample ID: SVE Exhaust
Date Collected: 09/10/18 00:00
Date Received: 09/13/18 09:40
Sample Air Volume: 1.02 L

Lab Sample ID: 310-139130-1
Matrix: Air
Sample Container: IH - Coconut Shell Charcoal Tube, 150 mg

Method: 1501 Sum - NIOSH Method 1501 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result ppm	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Benzene	20	20	6.2		11	09/19/18 10:51	1	JCM

Method: 1550 - NIOSH Method 1550 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Gasoline	5800	5700			150	09/20/18 09:14	1	JCM

Client: Meridian Environmental Consulting LLC
Project/Site: Autostop, Doug's, SVE

TestAmerica Job ID: 310-141281-1

Client Sample ID: SVE
Date Collected: 10/04/18 00:00
Date Received: 10/10/18 09:45
Sample Air Volume: 1.07 L

Lab Sample ID: 310-141281-1
Matrix: Air
Sample Container: IH - Coconut Shell Charcoal Tube, 150 mg

Method: 1501 Sum - NIOSH Method 1501 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result ppm	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Benzene	22	20	6.4		11	10/19/18 09:49	1	JCM

Method: 1550 - NIOSH Method 1550 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Gasoline	4300	4100			150	10/22/18 08:10	1	JCM

Client Sample Results

Client: Meridian Environmental Consulting LLC
Project/Site: Autostop, Dougs, SVE

TestAmerica Job ID: 310-143439-1

Client Sample ID: SVE
Date Collected: 11/02/18 00:00
Date Received: 11/07/18 09:45
Sample Air Volume: 1.03 L

Lab Sample ID: 310-143439-1
Matrix: Air
Sample Container: IH - Coconut Shell Charcoal Tube, 150 mg

Method: 1501 Sum - NIOSH Method 1501 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result ppm	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Benzene	<11	<10	<3.2		11	11/14/18 10:46	1	JCM

Method: 1550 - NIOSH Method 1550 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Gasoline	390	370			29	11/15/18 12:37	1	JCM

Client Sample Results

Client: Meridian Environmental Consulting LLC
Project/Site: Autostop

TestAmerica Job ID: 310-145469-1

Client Sample ID: SVE
Date Collected: 12/04/18 00:00
Date Received: 12/06/18 11:30
Sample Air Volume: 1.02 L

Lab Sample ID: 310-145469-1
Matrix: Air
Sample Container: IH - Coconut Shell Charcoal Tube, 150 mg

Method: 1501 Sum - NIOSH Method 1501 (Modified)

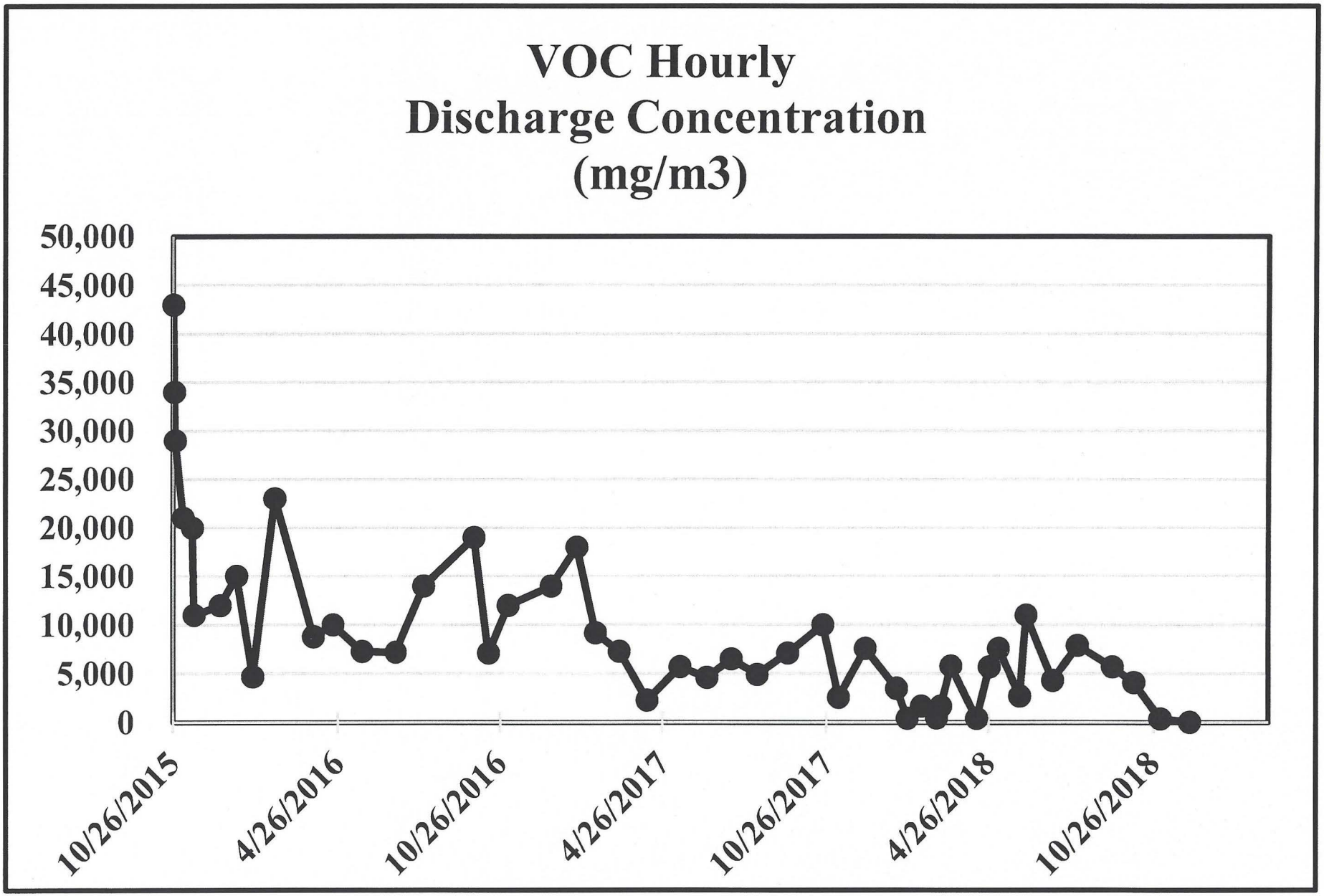
Analyte	Result ug/Sample	Result mg/m3	Result ppm	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Benzene	<11	<10	<3.3		11	12/19/18 09:07	1	JCM

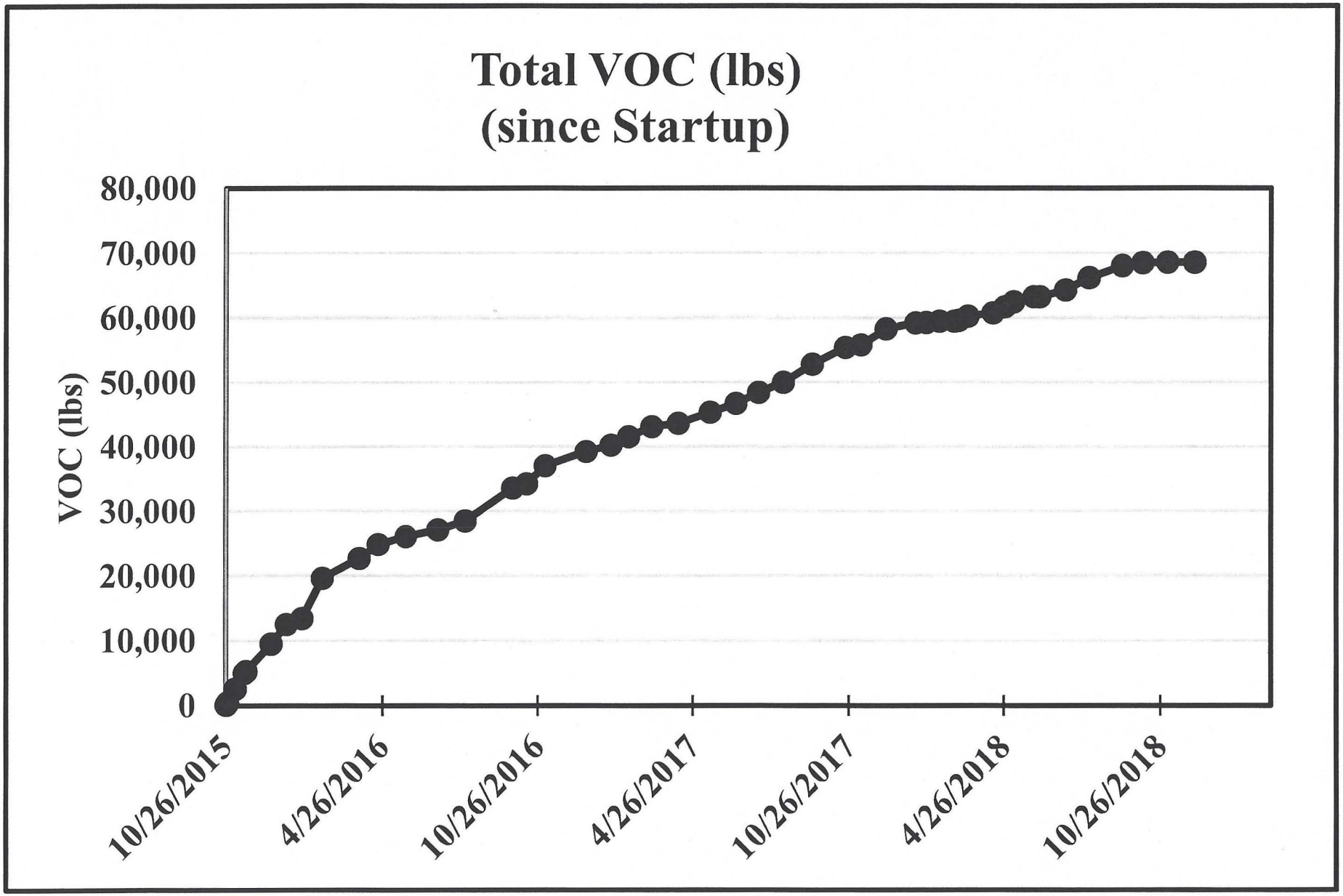
Method: 1550 - NIOSH Method 1550 (Modified)

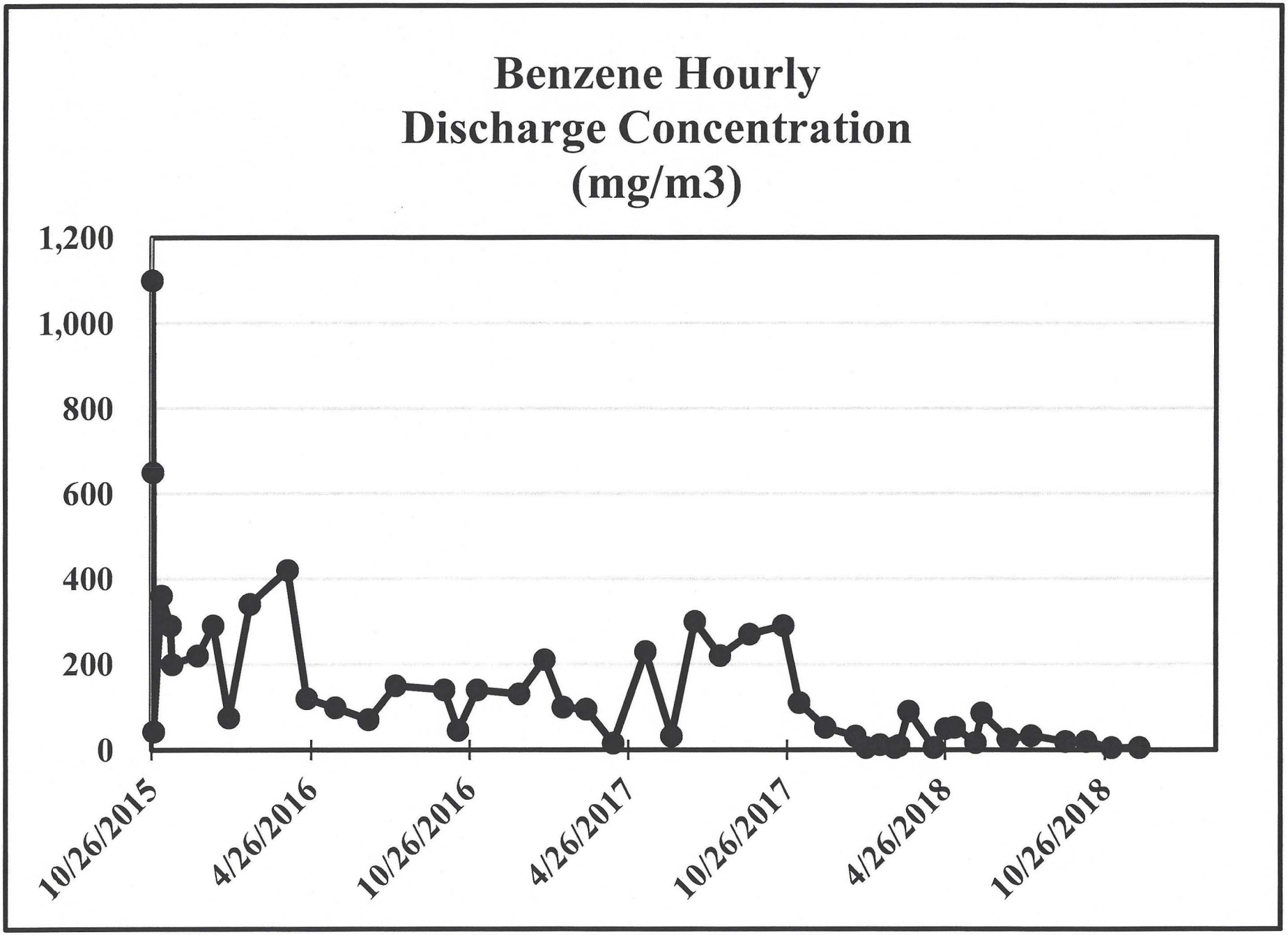
Analyte	Result ug/Sample	Result mg/m3	Result	Qualifier	RL ug/Sample	Analyzed	Dil Fac	Analyst
Gasoline	30	30			29	12/20/18 08:25	1	JCM

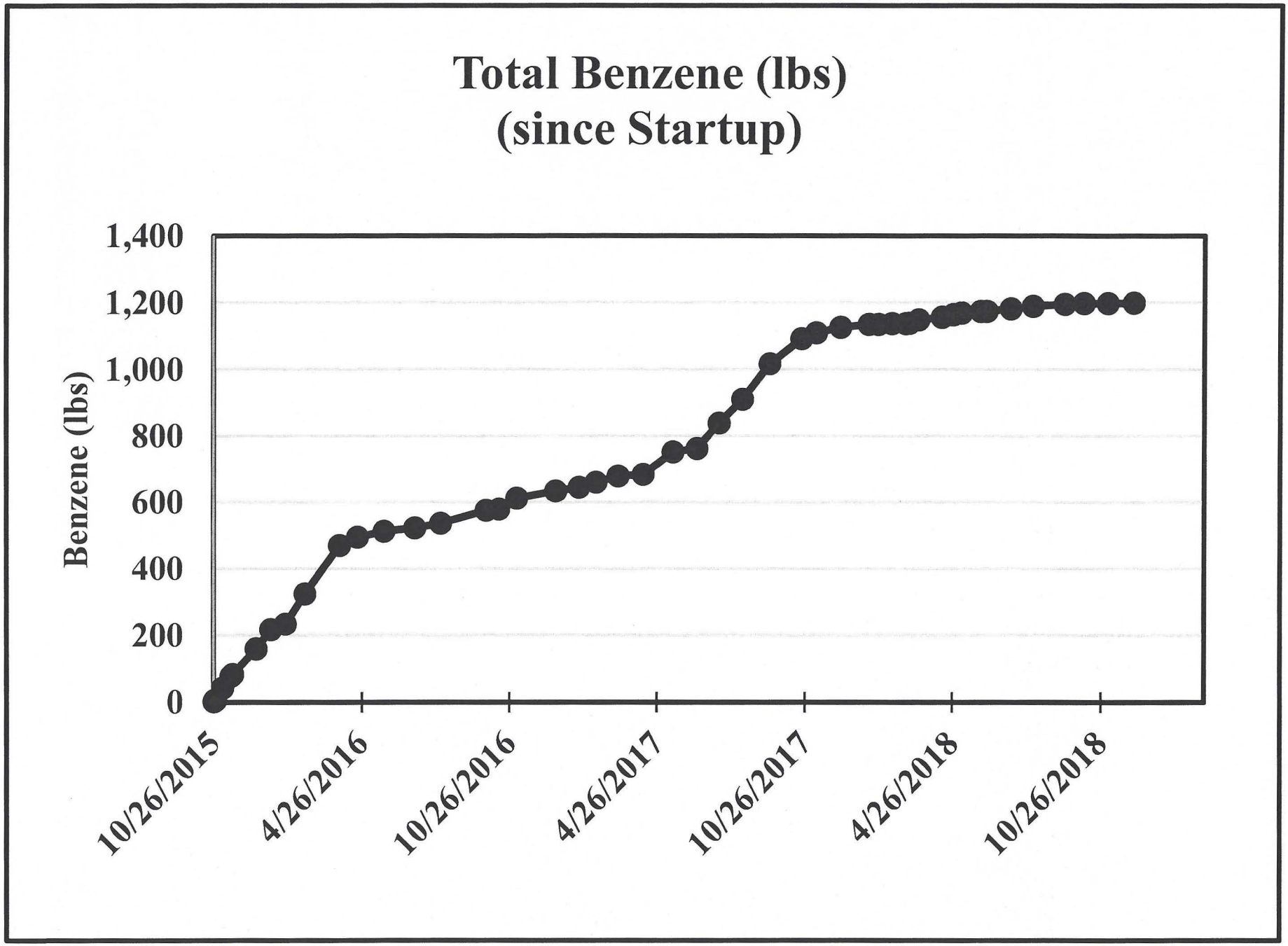
APPENDIX B

SVE Discharge Graphs


VOC Hourly
Discharge Concentration
(mg/m3)
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
10/26/2015
4/26/2016
10/26/2016
4/26/2017
10/26/2017
4/26/2018
10/26/2018


Total VOC (lbs)
(since Startup)
VOC (lbs)
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
10/26/2015
4/26/2016
10/26/2016
4/26/2017
10/26/2017
4/26/2018
10/26/2018


Benzene Hourly
Discharge Concentration
(mg/m3)
1,200
1,000
800
600
400
200
0
10/26/2015
4/26/2016
10/26/2016
4/26/2017
10/26/2017
4/26/2018
10/26/2018


Total Benzene (lbs)
(since Startup)
Benzene (lbs)
1,400
1,200
1,000
800
600
400
200
0
10/26/2015
4/26/2016
10/26/2016
4/26/2017
10/26/2017
4/26/2018
10/26/2018