

Mobile Monitoring Team Monitoring Data Summary Channelview, Texas – November 7 – 10, 2021

The Texas Commission on Environmental Quality (TCEQ) Mobile Monitoring Team (MMT) conducted ambient air monitoring in Channelview, Texas to support a Region 12 investigation of potential benzene emission sources. The potential sources are associated with elevated benzene concentrations measured at the Channelview Drive Water Tower ambient air monitoring station.

The MMT conducted stationary ambient monitoring in the Lakeside Park Estates neighborhood along De Zavalla Road (Rd), Lakeside Drive (Dr), Market Street (St), and Sheldon Rd from November 7, 2021, at 21:23 through November 10, 2021, at 23:07. Mobile surveys were conducted in the same area as well as Jacintoport Boulevard (Blvd) from November 8, 2021, at 13:19 through November 10, 2021, at 18:48. Monitoring was conducted near K-Solv (RN104963897), Patterson Tubular Services (RN100216845), Boasso Global (RN103934170), Harbor Offshore Marine (no RN), and Hartree Refining (RN100542489). During this monitoring trip, winds were light and variable overnight and generally less than 10 miles per hour (mph) from the southeast during the day.

Data were collected by the Strategic Mobile Air Reconnaissance Technology - Rapid Assessment (SMART-RA) van (Van #9427) and two SMART vans (Van #0940 and Van #5416). Volatile organic compound (VOC) data were collected by a Duvas DV3000 Ultraviolet Spectrometer (Duvas) in Van #9427 and by a Syft Voice200 Ultra Selected Ion Flow Tube Mass Spectrometer Continuous Analyzer (SIFT-MS) in both Van #0940 and Van #5416. The VOC analyte list for the SIFT-MS was 1,3-butadiene, benzene, toluene, ethylbenzene + xylenes, and styrene, which will be collectively referred to as BTEX+. Benzene was the focus of this monitoring trip, and data were compared to the 180 parts per billion by volume (ppbv) 1-hour average TCEQ short-term health-based air monitoring comparison value (AMCV) for benzene. Data were collected during 36 stationary monitoring events, 19 SIFT-MS mobile surveys, and 23 Duvas mobile surveys.

Stationary Monitoring and Mobile Surveys

Four monitoring periods were carried out during this trip: Monitoring Period 1 (November 7, 2021), Monitoring Period 2 (November 8, 2021), Monitoring Period 3 (November 9, 2021), and Monitoring Period 4 (November 10, 2021).

Van #9427 conducted 23 mobile Duvas surveys; Van #0940 conducted 16 mobile SIFT-MS surveys; and Van #5416 conducted three mobile SIFT-MS surveys in the area to identify elevated concentrations that indicated hotspots and potential sources. When potential sources were identified, Van #0940 or Van #5416 were positioned adjacent to the potential source to conduct stationary monitoring downwind. Duvas data are considered semi-quantitative and were only used for survey purposes to identify areas for additional monitoring with the SIFT-MS; therefore, Duvas data will not be discussed further in this report. Duvas data are available upon request. Summaries of the SIFT-MS surveys, including maximum and minimum values observed, are available in Attachment A.

Van #0940 performed nine stationary monitoring events. During these events, there were no instances of 1-hour average benzene concentrations above 180 ppbv. The maximum 1-hour average concentration of benzene observed by Van #0940 was 154.4 ppbv (see Attachment B), and the maximum instantaneous concentration of benzene observed by Van #0940 was 1270.4 ppbv (see Attachment C). These instances and others will be discussed further below.

Van #5416 performed 27 stationary monitoring events. During these events, there were two instances of 1-hour average benzene concentrations above 180 ppbv. The maximum 1-hour average concentration of benzene observed by Van #5416 was 534.6 ppbv (see Attachment B), and the maximum instantaneous concentration of benzene observed by Van #5416 was 2487.9 ppbv (see Attachment C). These instances and others will be discussed further below.

Benzene was the focus of this monitoring trip, and all other BTEX+ compounds did not have instantaneous values above associated AMCVs; therefore, other BTEX+ concentrations will not be discussed further in this report. Summaries of all SIFT-MS analyte concentrations are available in Attachments A, B, and C. Instantaneous SIFT-MS data are available upon request.

Monitoring Period 1 – November 7, 2021

Van #5416 conducted two stationary monitoring events on November 7, 2021. During these stationary monitoring events, the winds were light and generally from the northwest (NW) to the northeast (NE), and the maximum instantaneous concentrations of all BTEX+ compounds were less than 10 ppbv (see Attachment C).

Monitoring Period 2 – November 8, 2021

Van #5416 conducted two surveys, during which the maximum concentrations of benzene observed were 56.2 ppbv and 74.4 ppbv (see Attachment A). Van #5416 also conducted 10 stationary monitoring events. During these stationary monitoring events, four had maximum instantaneous concentrations of benzene above 1000 ppbv and two had a maximum 1-hour average benzene concentration over 180 ppbv (see Attachments B and C).

- ST01 was conducted from 02:56 to 05:00 at the corner of Lakeside Dr and DeZavalla Rd. During this stationary monitoring event, winds averaged 2.8 mph from the east-southeast (ESE). The maximum instantaneous benzene concentration was 1003.8 ppbv, and the maximum 1-hour average benzene concentration was 203.5 ppbv (see Attachment B, Attachment C, and Figure 1 in Attachment D).
- ST02 was conducted from 06:26 to 08:55 at the corner of Lakeside Dr and DeZavalla Rd. During this stationary monitoring event, winds averaged 2.7 mph from the east (E). The maximum instantaneous benzene concentration was 1218.7 ppbv, and the maximum 1-hour average benzene concentration was 162.7 ppbv (see Attachment B, Attachment C, and Figure 2 in Attachment D).

- ST06 was conducted from 13:44 to 15:45 on Lakeside Dr next to K-Solv (RN104963897). During this stationary monitoring event, winds averaged 3.0 mph from the south-southeast (SSE). The maximum instantaneous benzene concentration was 1939.6 ppbv, and the maximum 1-hour average benzene concentration was 85.2 ppbv (see Attachment B, Attachment C, and Figure 3 in Attachment D).
 - At approximately 14:10, MMT staff were standing outside of the van and heard a loud sound similar to a pressure release or gasket opening from the direction of K-Solv. Upon hearing this, staff went inside the van to observe the SIFT-MS. Approximately 45 seconds later, benzene concentrations above 500 ppbv were observed for approximately one minute, with a maximum instantaneous concentration of 1939.6 ppbv.
- ST10 was conducted from 23:35 to 02:00 on Sheldon Rd about 0.1 miles south of Market St. During this stationary monitoring event, winds averaged 1.2 mph from the southeast (SE). The maximum instantaneous benzene concentration was 2487.9 ppbv, and the maximum 1-hour average benzene concentration was 534.6 ppbv (see Attachment B, Attachment C, and Figure 4 in Attachment D).

Monitoring Period 3 – November 9, 2021

Van #0940 conducted eight surveys, during which the maximum instantaneous concentration of benzene observed was 109.5 ppbv (see Attachment A).

Van #0940 also conducted seven stationary monitoring events. One stationary monitoring event had a maximum instantaneous benzene concentration above 1000 ppbv, and there were no 1-hour average benzene concentrations over 180 ppbv (see Attachments B and C).

- ST01 was conducted from 08:34 to 09:39 on Lakeside Dr next to K-Solv. During this stationary monitoring event, winds averaged 1.7 mph from the north-northeast (NNE). The maximum instantaneous benzene concentration was 1270.4 ppbv, and the maximum 1-hour average benzene concentration was 154.4 ppbv (see Attachment B, Attachment C, and Figure 5 in Attachment D).

Van #5416 conducted four stationary monitoring events. The maximum instantaneous benzene concentration observed was 376.4 ppbv, and there were no 1-hour average benzene concentrations over 180 ppbv (see Attachments B and C).

Monitoring Period 4 – November 10, 2021

Van #0940 conducted eight surveys, during which the maximum concentration of benzene observed was 120.1 ppbv (see Attachment A).

Van #0940 also conducted two stationary monitoring events. The maximum instantaneous benzene concentration observed was 57.6 ppbv, and there were no 1-hour average benzene concentrations over 180 ppbv (see Attachment B and C).

Van #5416 conducted one survey, during which the maximum concentration of benzene observed was 66.8 ppbv (see Attachment A).

Van #5416 also conducted 11 stationary monitoring events. The maximum instantaneous benzene concentration observed was 152.5 ppbv, and there were no 1-hour average benzene concentrations over 180 ppbv (see Attachment B and C).

Quality Control

The SIFT-MS instruments quantitatively measured 1,3-butadiene, benzene, toluene, ethylbenzene + xylenes, and styrene. The SIFT-MS instruments were calibrated in Austin prior to traveling to Channelview, and quality control (QC) checks were performed on all instruments before and after the monitoring trip, as well as every 24 hours during the trip. All QC levels passed accuracy, precision, and baseline data quality objectives (DQOs) with the following exceptions:

- Styrene failed the equipment blank (EB) criteria in Van #0940 on November 8, 2021, with a 5-minute average concentration of 2.5 ppbv, above the MMT limit of detection (LOD) DQO of less than 2.0 ppbv. All styrene concentrations associated with Van #0940 collected on November 9, 2021, up until QC was performed at 18:00 on November 9, 2021, are qualified with “B1” and may be biased by ± 2.5 ppbv.
- Styrene failed the EB criteria in Van #5416 on November 9 and 11, 2021, with a 5-minute average concentration of 2.2 ppbv and 2.1 ppbv, respectively, above the MMT LOD DQO of less than 2.0 ppbv. All styrene concentrations associated with Van #5416 collected after 18:00 November 8, 2021, through November 10, 2021, are qualified with “B2” and may be biased by ± 2.2 ppbv.
- Closing QC was not completed within 24 hours of prior QC in Van #5416 and was performed the next day on November 11, 2021. Therefore, all BTEX+ data collected by Van #5416 from 18:00 on November 9, 2021, until QC was performed on November 11, 2021, are qualified with “C” to indicate QC was not performed every 24 hours.

All BTEX+ concentrations measured by the SIFT-MS below the limit of quantitation of 10 ppbv are considered estimated and are qualified with “L” to denote this.

Additionally, all BTEX+ concentrations measure by the SIFT-MS above the maximum calibration point of 1000 ppbv are considered estimated and qualified with “E” for exceeding the instrument calibration upper limit.

The Duvas monitored 14 different compounds; five of those compounds represent semi-quantitative data (benzene, toluene, sulfur dioxide, 1,3-butadiene, and styrene), the remaining nine compounds represent qualitative data (ammonia, nitric oxide, nitrogen dioxide, formaldehyde, ethylbenzene, m-xylene, o-xylene, p-xylene, and ozone). QC data are available upon request.

Attachment A - Maximum and Minimum Instantaneous Concentrations During Surveys

Maximum and Minimum Instantaneous Concentrations during Surveys										SIFT-MS						Comments	
Van ID	Date	Survey ID	Start Time	End Time	Start Location	End Location	1,3-butadiene (ppbv)		Benzene (ppbv)		Toluene (ppbv)		Ethylbenzene + Xylenes (ppbv)		Styrene (ppbv)		
							Max	Min	Max	Min	Max	Min	Max	Min	Max		Min
Van #0940	11/9/2021	MA01	6:14:12	6:35:48	Sheldon Rd and Market St (29.771362, -95.12464)	17124 Market St (29.788366, -95.092384)	22.8	0.0 ^L	109.5	0.4 ^L	26.3	0.7 ^L	70.4	0.5 ^L	12.7 ^{B1}	0.0 ^{B1,L}	
	11/9/2021	MA02	6:52:05	7:05:19	Sheldon Rd (29.759904, -95.124056)	16643 Jacintoport Blvd (29.755546, -95.104248)	6.5 ^L	0.0 ^L	20.4	0.0 ^L	11.1	0.8 ^L	9.3 ^L	1.1 ^L	4.1 ^{B1,L}	0.1 ^{B1,L}	
	11/9/2021	MA03	7:20:42	7:25:37	1015 Lakeside Dr (29.767488, -95.10356)	1015 Lakeside Dr (29.7675, -95.103616)	23.4	2.7 ^L	38.3	9.9 ^L	29.4	8.8 ^L	22.2	5.9 ^L	7.5 ^{B1,L}	2.5 ^{B1,L}	
	11/9/2021	MA04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Monitoring event was mislabeled as a survey instead of as a stationary monitoring period. See Attachments B and C, Van #0940 11/9/2021 ST00 for concentrations
	11/9/2021	MA05	19:26:56	19:37:36	Market St and Launch Rd (29.782804, -95.102568)	18300 Market St (29.792424, -95.065448)	6.7 ^L	0.0 ^L	36.3	0.5 ^L	3.0 ^L	0.1 ^L	4.8 ^L	0.3 ^L	0.8 ^L	0.0 ^L	
	11/9/2021	MA06	19:42:15	20:18:42	18300 Market St (29.792408, -95.065464)	16717 Jacintoport Blvd (29.754338, -95.102136)	19.9	0.0 ^L	65.3	0.0 ^L	11.8	0.0 ^L	8.3 ^L	0.0 ^L	14.8	0.0 ^L	
	11/9/2021	MA07	20:26:29	21:07:06	16717 Jacintoport Blvd (29.754334, -95.102136)	18300 Market St (29.79243, -95.065448)	11.8	0.0 ^L	43.4	0.0 ^L	10.4	0.0 ^L	24.3	0.0 ^L	12.6	0.0 ^L	
	11/9/2021	MA08	21:53:07	22:20:16	DeZavalla Rd and Market St (29.772246, -95.122624)	DeZavalla Rd and Elsbeth Rd (29.767224, -95.105112)	11.0	0.0 ^L	47.1	0.0 ^L	9.3 ^L	0.1 ^L	7.6 ^L	0.0 ^L	16.2	0.0 ^L	
	11/9/2021	MA09	22:34:23	23:00:47	DeZavalla Rd and Lakeside Dr (29.767224, -95.10508)	DeZavalla Rd and Pemberton St (29.769654, -95.114032)	5.7 ^L	0.0 ^L	32.1	0.0 ^L	6.6 ^L	0.2 ^L	5.2 ^L	0.0 ^L	14.6	0.0 ^L	
	11/10/2021	MA01	0:59:07	1:32:48	Market St and DeZavalla Rd (29.772234, -95.122688)	DeZavalla Rd and Lakeside Dr (29.767194, -95.105112)	5.2 ^L	0.0 ^L	42.1	0.0 ^L	8.7 ^L	0.2 ^L	6.6 ^L	0.0 ^L	13.3	0.0 ^L	
	11/10/2021	MA02	1:41:39	1:59:56	DeZavalla Rd and Lakeside Dr (29.767208, -95.105112)	River Terrace Park (29.781994, -95.10096)	6.0 ^L	0.0 ^L	43.9	0.0 ^L	10.9	0.1 ^L	5.3 ^L	0.0 ^L	8.8 ^L	0.0 ^L	
	11/10/2021	MA03	2:12:11	2:17:24	River Terrace Park (29.782, -95.10096)	River Terrace Park (29.782636, -95.10156)	0.3 ^L	0.0 ^L	54.1	0.3 ^L	1.1 ^L	0.2 ^L	1.7 ^L	0.0 ^L	14.1	0.8 ^L	
	11/10/2021	MA04	3:48:35	3:54:00	Sheldon Rd and Market St (29.770942, -95.1248)	1519 Sheldon Rd (29.752176, -95.123896)	1.2 ^L	0.0 ^L	42.4	0.3 ^L	7.7 ^L	0.3 ^L	50.4	1.5 ^L	1.8 ^L	0.0 ^L	
	11/10/2021	MA05	3:54:33	4:07:34	1519 Sheldon Rd (29.752176, -95.123896)	15415 Market St (29.771656, -95.136248)	0.8 ^L	0.0 ^L	120.1	0.3 ^L	25.8	0.4 ^L	28.3	0.6 ^L	0.8 ^L	0.0 ^L	
	11/10/2021	MA06	4:51:32	4:55:51	Sheldon Rd about 0.5 miles S of Market St (29.762822, -95.123936)	Market St and DeZavalla Rd (29.772242, -95.122624)	0.3 ^L	0.0 ^L	6.9 ^L	0.6 ^L	2.6 ^L	0.3 ^L	28.3	0.6 ^L	0.6 ^L	0.0 ^L	
	11/10/2021	MA07	4:56:18	5:11:37	Market St and DeZavalla Rd (29.772242, -95.122624)	DeZavalla Rd and Lakeside Dr (29.767188, -95.105112)	2.0 ^L	0.0 ^L	13.5	0.0 ^L	3.5 ^L	0.1 ^L	2.2 ^L	0.0 ^L	2.8 ^L	0.0 ^L	
11/10/2021	MA08	5:12:01	5:18:18	DeZavalla Rd and Lakeside Dr (29.767188, -95.105112)	River Terrace Park (29.781608, -95.1012)	5.8 ^L	0.0 ^L	43.2	0.2 ^L	8.7 ^L	0.1 ^L	4.1 ^L	0.0 ^L	7.1 ^L	0.0 ^L		
Van #5416	11/8/2021	MA01	13:19:40	13:25:54	Lakeside Dr NW of K-Solv (29.768676, -95.10356)	Elsbeth Rd and Lake Ct (29.77039, -95.105472)	61.4	0.0 ^L	56.2	0.3 ^L	49.9	0.4 ^L	33.6	0.4 ^L	21.0	0.1 ^L	
	11/8/2021	MA02	13:29:48	13:33:43	Lake Ct and Lakeside Dr (29.770332, -95.103512)	Lakeside Dr and DeZavalla Rd (29.767428, -95.105064)	23.2	0.0 ^L	74.4	0.3 ^L	48.6	0.3 ^L	14.8	0.1 ^L	24.2	0.0 ^L	
	11/10/2021	MA01	18:13:18	18:48:31	Sheldon Rd and Market St (29.771676, -95.124752)	DeZavalla Rd and Market St (29.772342, -95.122216)	2.0 ^{C,L}	0.0 ^{C,L}	66.8 ^C	0.0 ^{C,L}	235.3 ^C	0.0 ^{C,L}	117.1 ^C	0.0 ^{C,L}	9.4 ^{B2,C,L}	0.0 ^{B2,C,L}	

Bldv - Boulevard

Ct - Court

Dr - Drive

NA - not applicable

NW - northwest

ppbv - parts per billion by volume

Rd - Road

S - south

SIFT-MS - selective ion flow tube mass spectrometer

St - Street

B1 - Not all associated blank data met the bias specifications. Data may be biased by ± 2.5 ppbv.

B2 - Not all associated blank data met the bias specifications. Data may be biased by ± 2.2 ppbv.

C - Quality control samples were not analyzed every 24 hours as required due to the consolidation of daily quality control checks and end-of-project quality control checks.

L - Reported concentration is less than the limit of quantitation.

Attachment B - Maximum 1-Hour Average Concentrations During Stationary Monitoring

Maximum 1-hour Average during Stationary Monitoring					Magellan		SIFT-MS					Comments	
Van ID	Date	Survey ID	Start Time	End Time	Location	Avg Wind Speed (mph)	Avg Wind Direction (degrees)	1,3-butadiene Max Avg (ppbv)	Benzene Max Avg (ppbv)	Toluene Max Avg (ppbv)	Ethylbenzene + Xylenes Max Avg (ppbv)		Styrene Max Avg (ppbv)
Van #0940	11/9/2021	ST00	7:31:26	8:32:20	Lakeside Dr at the 90 degree corner (29.767488, -95.103544)	1.5	354	20.3	84.6	38.2	17.4	18.6 ^{B1}	Recorded in the field as a survey. File number is Van #0940 11/9/2021 MA04
	11/9/2021	ST01	8:34:18	9:39:13	Lakeside Dr at the 90 degree corner (29.767488, -95.103544)	1.7	19	46.1	154.4 ^E	51.3	14.9	9.9 ^{B1, L}	
	11/9/2021	ST02	9:40:14	12:36:01	Lakeside Dr at the 90 degree corner (29.767488, -95.103544)	2.7	88	79.7	133.0	35.9	10.2	16.3 ^{B1}	
	11/9/2021	ST03	12:41:02	13:03:58	Lakeside Dr at the 90 degree corner (29.767488, -95.103544)	3.1	74	NA	NA	NA	NA	NA	Less than 1 hour of monitoring, no hour average calculated
	11/9/2021	ST04	13:14:09	16:01:41	DeZavalla Rd and Elsbeth Rd (29.768058, -95.105512)	4.5	140	5.9 ^L	19.1	5.3 ^L	3.0 ^L	3.7 ^{B1, L}	
	11/9/2021	ST05	16:15:24	17:17:32	17002 Market St (29.787492, -95.095072)	7.0	140	0.0 ^L	2.7 ^L	3.2 ^L	22.9	0.1 ^{B1, L}	
	11/9/2021	ST06	23:02:47	0:30:57	DeZavalla Rd and Pemberton St (29.769654, -95.114032)	3.2	118	0.0 ^L	12.0	2.7 ^L	0.9 ^L	0.3 ^L	
	11/10/2021	ST01	2:17:52	3:18:14	River Terrace Park (29.782636, -95.10156)	2.7	103	0.0 ^L	5.6 ^L	1.1 ^L	0.7 ^L	0.9 ^L	
	11/10/2021	ST02	4:14:30	4:45:06	Sheldon Rd and Garland St (29.774472, -95.125176)	2.7	117	NA	NA	NA	NA	NA	Less than 1 hour of monitoring, no hour average calculated
Van #5416	11/7/2021	ST02	21:23:33	22:32:21	Launch Rd and Market St (29.782926, -95.102472)	1.1	300	0.4 ^L	3.1 ^L	2.4 ^L	1.6 ^L	1.1 ^L	
	11/7/2021	ST03	23:53:34	1:10:24	Lakeside Dr and DeZavalla Rd (29.76718, -95.105112)	0.8	67	0.3 ^L	2.9 ^L	2.2 ^L	1.4 ^L	0.5 ^L	
	11/8/2021	ST01	2:56:00	5:00:00	Lakeside Dr and DeZavalla Rd (29.767208, -95.105112)	2.8	105	19.8	203.5 ^E	44.4	19.8	3.7 ^L	
	11/8/2021	ST02	6:26:07	8:55:38	Lakeside Dr and DeZavalla Rd (29.767204, -95.105128)	2.7	96	3.7 ^L	162.7 ^E	101.8	31.8	3.4 ^L	
	11/8/2021	ST03	8:57:22	10:17:31	Lakeside Dr and DeZavalla Rd (29.767204, -95.105128)	4.0	138	1.1 ^L	17.2	13.8	5.3 ^L	1.7 ^L	
	11/8/2021	ST04	10:18:04	11:18:44	Lakeside Dr and DeZavalla Rd (29.767204, -95.105128)	6.4	149	0.0 ^L	0.8 ^L	0.8 ^L	0.4 ^L	0.2 ^L	
	11/8/2021	ST05	11:34:35	13:10:20	Lakeside Dr, NW of K-Solv (29.768644, -95.103544)	8.3	116	0.3 ^L	4.6 ^L	11.8	27.8	2.2 ^L	
	11/8/2021	ST06	13:44:15	15:45:14	Lakeside Dr next to K-Solv (29.768178, -95.103672)	3.0	160	3.8 ^L	85.2 ^E	74.4	200.6	23.0	
	11/8/2021	ST07	15:47:36	18:17:18	Lakeside Dr next to K-Solv (29.768178, -95.103672)	2.5	174	72.2	106.5	134.8 ^E	255.0	17.0	
	11/8/2021	ST08	19:26:36	20:32:37	Lakeside Dr next to K-Solv (29.768188, -95.103688)	2.0	183	35.0	45.7	23.5	19.3	1.9 ^{B2, L}	
	11/8/2021	ST09	20:45:05	21:50:20	Lakeside Dr next to K-Solv (29.768188, -95.103688)	1.4	190	64.3	85.5	37.4	20.1	1.7 ^{B2, L}	
	11/8/2021	ST10	23:35:48	2:00:20	Sheldon Rd about 0.1 mile S of Market St (29.770354, -95.12444)	1.2	125	45.9	534.6 ^E	67.8	33.0	5.3 ^{B2, L}	
	11/9/2021	ST01	3:59:44	5:35:49	Lakeside Dr and DeZavalla Rd (29.76718, -95.10524)	1.6	55	41.9	71.8	12.9	6.5 ^L	4.3 ^{B2, L}	
11/9/2021	ST02	18:35:29	19:38:32	Elsbeth Dr and DeZavalla Rd (29.767988, -95.105552)	2.9	130	0.1 ^{C, L}	1.0 ^{C, L}	1.0 ^{C, L}	0.8 ^{C, L}	0.3 ^{B2, C, L}		

Attachment B - Maximum 1-Hour Average Concentrations During Stationary Monitoring

Van ID	Date	Survey ID	Start Time	End Time	Location	Avg Wind Speed (mph)	Avg Wind Direction (degrees)	1,3-butadiene Max Avg (ppbv)	Benzene Max Avg (ppbv)	Toluene Max Avg (ppbv)	Ethylbenzene + Xylenes Max Avg (ppbv)	Styrene Max Avg (ppbv)	Comments
	11/9/2021	ST03	20:43:06	21:51:42	Sheldon Rd about 0.1 mile S of Market St (29.770256, -95.124296)	4.9	173	0.2 ^{C,L}	1.6 ^{C,L}	1.3 ^{C,L}	3.0 ^{C,L}	0.7 ^{B2, C,L}	
	11/9/2021	ST04	23:38:28	1:18:08	Harding St about 0.1 mile S of N Shore Dr (29.771268, -95.108888)	3.1	145	0.5 ^{C,L}	2.9 ^{C,L}	1.4 ^{C,L}	0.8 ^{C,L}	0.8 ^{B2, C,L}	
	11/10/2021	ST01	1:40:08	2:42:05	811 Harding St (29.771284, -95.108888)	2.3	139	0.7 ^{C,L}	4.6 ^{C,L}	2.0 ^{C,L}	1.6 ^{C,L}	2.1 ^{B2, C,L}	
	11/10/2021	ST02	3:37:53	4:39:04	DeZavalla Rd and E Channelview Dr (29.771502, -95.120768)	3.4	135	0.0 ^{C,L}	32.7 ^C	7.4 ^{C,L}	1.2 ^{C,L}	0.1 ^{B2, C,L}	
	11/10/2021	ST03	6:17:18	6:40:19	Lakeside Dr and DeZavalla Rd (29.767194, -95.105112)	2.9	126	NA	NA	NA	NA	NA	Less than 1 hour of monitoring, no hour average calculated
	11/10/2021	ST04	6:51:55	8:21:35	Elsbeth Rd and DeZavalla Rd (29.768042, -95.105552)	4.4	124	0.8 ^{C,L}	5.2 ^{C,L}	2.4 ^{C,L}	1.4 ^{C,L}	0.5 ^{B2, C,L}	
	11/10/2021	ST05	8:30:58	10:52:32	907 Elsbeth Rd (29.769746, -95.105552)	3.2	127	0.7 ^{C,L}	6.1 ^{C,L}	5.4 ^{C,L}	2.4 ^{C,L}	1.5 ^{B2, C,L}	
	11/10/2021	ST06	10:55:20	11:55:11	907 Elsbeth Rd (29.76974, -95.105552)	4.0	140	NA	NA	NA	NA	NA	Less than 1 hour of monitoring, no hour average calculated
	11/10/2021	ST07	12:00:09	12:18:14	907 Elsbeth Rd (29.76974, -95.105552)	4.0	158	NA	NA	NA	NA	NA	Less than 1 hour of monitoring, no hour average calculated
	11/10/2021	ST08	14:00:41	16:14:02	Lakeside Dr NW of K-Solv (29.769186, -95.103672)	9.4	172	0.3 ^{C,L}	7.1 ^{C,L}	5.2 ^{C,L}	4.1 ^{C,L}	1.0 ^{B2, C,L}	
	11/10/2021	ST09	16:17:29	17:20:11	Lakeside Dr NW of K-Solv (29.769194, -95.103672)	8.1	196	0.5 ^{C,L}	3.6 ^{C,L}	6.0 ^{C,L}	1.5 ^{C,L}	0.6 ^{B2, C,L}	
	11/10/2021	ST10	19:14:03	21:00:46	Lakeside Dr NW of K-Solv (29.768676, -95.10356)	4.4	152	0.3 ^{C,L}	6.6 ^{C,L}	2.8 ^{C,L}	9.6 ^{C,L}	1.7 ^{B2, C,L}	
	11/10/2021	ST11	21:18:51	23:07:02	Lakeside Dr and N Shore Dr (29.775138, -95.103024)	3.7	163	0.1 ^{C,L}	1.4 ^{C,L}	0.9 ^{C,L}	1.8 ^{C,L}	0.2 ^{B2, C,L}	

Note: all values represent the maximum 1-hour average observed during the monitoring event.

Yellow shading indicates that the value is above the Texas Commission on Environmental Quality short-term health-based air monitoring comparison value of 180 ppbv.

Dr - Drive

E - East

mph - miles per hour

N - north

NA - not applicable

NW - northwest

ppbv - parts per billion by volume

Rd - Road

S - south

SIFT-MS - selective ion flow tube mass spectrometer

St - Street

B1 - Not all associated blank data met the bias specifications. Data may be biased by ± 2.5 ppbv.

B2 - Not all associated blank data met the bias specifications. Data may be biased by ± 2.2 ppbv.

C - Quality control samples were not analyzed every 24 hours as required due to the consolidation of daily quality control checks and end-of-project quality control checks.

E - Reported average contains concentrations that exceed the instrument calibration upper limit.

L - Reported average concentration is less than the limit of quantitation.

Attachment C - Maximum Instantaneous Concentrations During Stationary Monitoring

Maximum Instantaneous Concentrations during Stationary Monitoring					Magellan		SIFT-MS					Comments	
Van ID	Date	Survey ID	Start Time	End Time	Location	Avg Wind Speed (mph)	Avg Wind Direction (degrees)	1,3-butadiene Max (ppbv)	Benzene Max (ppbv)	Toluene Max (ppbv)	Ethylbenzene + Xylenes Max (ppbv)		Styrene Max (ppbv)
Van #0940	11/9/2021	ST00	7:31:26	8:32:20	Lakeside Dr at the 90 degree corner (29.767488, -95.103544)	1.5	354	540.1	831.5	293.7	39.4	52.8 ^{B1}	Recorded in the field as a survey. File number is Van #0940 20211109 MA04
	11/9/2021	ST01	8:34:18	9:39:13	Lakeside Dr at the 90 degree corner (29.767488, -95.103544)	1.7	19	738.4	1270.4 ^E	351.1	32.6	31.1 ^{B1}	
	11/9/2021	ST02	9:40:14	12:36:01	Lakeside Dr at the 90 degree corner (29.767488, -95.103544)	2.7	88	700.2	730.6	83.4	36.0	84.2 ^{B1}	
	11/9/2021	ST03	12:41:02	13:03:58	Lakeside Dr at the 90 degree corner (29.767488, -95.103544)	3.1	74	247.8	347.0	42.9	18.9	33.5 ^{B1}	
	11/9/2021	ST04	13:14:09	16:01:41	DeZavalla Rd and Elsbeth Rd (29.768058, -95.105512)	4.5	140	63.4	106.3	18.2	11.8	13.5 ^{B1}	
	11/9/2021	ST05	16:15:24	17:17:32	17002 Market St (29.787492, -95.095072)	7.0	140	0.4 ^L	6.3 ^L	7.7 ^L	63.9	0.5 ^{B1,L}	
	11/9/2021	ST06	23:02:47	0:30:57	DeZavalla Rd and Pemberton St (29.769654, -95.114032)	3.2	118	0.5 ^L	20.4	4.7 ^L	2.1 ^L	0.9 ^L	
	11/10/2021	ST01	2:17:52	3:18:14	River Terrace Park (29.782636, -95.10156)	2.7	103	0.5 ^L	57.6	5.2 ^L	2.1 ^L	8.1 ^L	
	11/10/2021	ST02	4:14:30	4:45:06	Sheldon Rd and Garlang St (29.774472, -95.125176)	2.7	117	0.3 ^L	27.7	7.0 ^L	2.8 ^L	0.5 ^L	
Van #5416	11/7/2021	ST02	21:23:33	22:32:21	Launch Rd and Market St (29.782926, -95.102472)	1.1	300	1.4 ^L	7.5 ^L	4.9 ^L	4.4 ^L	3.1 ^L	
	11/7/2021	ST03	23:53:34	1:10:24	Lakeside Dr and DeZavalla Rd (29.76718, -95.105112)	0.8	67	1.2 ^L	6.3 ^L	4.0 ^L	3.1 ^L	3.1 ^L	
	11/8/2021	ST01	2:56:00	5:00:00	Lakeside Dr and DeZavalla Rd (29.767208, -95.105112)	2.8	105	112.6	1003.8 ^E	162.1	57.9	16.3	
	11/8/2021	ST02	6:26:07	8:55:38	Lakeside Dr and DeZavalla Rd (29.767204, -95.105128)	2.7	96	200.6	1218.7 ^E	699.7	142.8	13.8	
	11/8/2021	ST03	8:57:22	10:17:31	Lakeside Dr and DeZavalla Rd (29.767204, -95.105128)	4.0	138	8.0 ^L	249.8	167.1	42.5	9.6 ^L	
	11/8/2021	ST04	10:18:04	11:18:44	Lakeside Dr and DeZavalla Rd (29.767204, -95.105128)	6.4	149	0.4 ^L	2.6 ^L	8.6 ^L	1.9 ^L	0.6 ^L	
	11/8/2021	ST05	11:34:35	13:10:20	Lakeside Dr, NW of K-Solv (29.768644, -95.103544)	8.3	116	5.7 ^L	43.9	46.5	76.8	19.5	
	11/8/2021	ST06	13:44:15	15:45:14	Lakeside Dr next to K-Solv (29.768178, -95.103672)	3.0	160	14.8	1939.6 ^E	389.5	1436.9	52.3	
	11/8/2021	ST07	15:47:36	18:17:18	Lakeside Dr next to K-Solv (29.768178, -95.103672)	2.5	174	190.7	230.6	1387.5 ^E	816.8	43.6	
	11/8/2021	ST08	19:26:36	20:32:37	Lakeside Dr next to K-Solv (29.768188, -95.103688)	2.0	183	218.2	261.5	128.6	154.7	14.7 ^{B2}	
	11/8/2021	ST09	20:45:05	21:50:20	Lakeside Dr next to K-Solv (29.768188, -95.103688)	1.4	190	462.5	633.7	136.3	170.5	13.5 ^{B2}	
	11/8/2021	ST10	23:35:48	2:00:20	Sheldon Rd about 0.1 mile S of Market St (29.770354, -95.12444)	1.2	125	227.3	2487.9 ^E	287.4	98.7	22.3 ^{B2}	
	11/9/2021	ST01	3:59:44	5:35:49	Lakeside Dr and DeZavalla Rd (29.76718, -95.10524)	1.6	55	343.8	376.4	42.5	23.3	20.5 ^{B2}	

Attachment C - Maximum Instantaneous Concentrations During Stationary Monitoring

Van ID	Date	Survey ID	Start Time	End Time	Location	Avg Wind Speed (mph)	Avg Wind Direction (degrees)	1,3-butadiene Max (ppbv)	Benzene Max (ppbv)	Toluene Max (ppbv)	Ethylbenzene + Xylenes Max (ppbv)	Styrene Max (ppbv)	Comments
	11/9/2021	ST02	18:35:29	19:38:32	Elsbeth Dr and DeZavalla Rd (29.767988, -95.105552)	2.9	130	2.5 ^{C,L}	5.4 ^{C,L}	3.0 ^{C,L}	2.3 ^{C,L}	1.2 ^{B2,C,L}	
	11/9/2021	ST03	20:43:06	21:51:42	Sheldon Rd about 0.1 mile S of Market St (29.770256, -95.124296)	4.9	173	0.9 ^{C,L}	4.8 ^{C,L}	3.3 ^{C,L}	7.8 ^{C,L}	2.0 ^{B2,C,L}	
	11/9/2021	ST04	23:38:28	1:18:08	Harding St about 0.1 mile S of N Shore Dr (29.771268, -95.108888)	3.1	145	2.3 ^{C,L}	7.9 ^{C,L}	3.4 ^{C,L}	2.2 ^{C,L}	2.9 ^{B2,C,L}	
	11/10/2021	ST01	1:40:08	2:42:05	811 Harding St (29.771284, -95.108888)	2.3	139	2.2 ^{C,L}	10.4 ^C	4.1 ^{C,L}	3.2 ^{C,L}	4.6 ^{B2,C,L}	
	11/10/2021	ST02	3:37:53	4:39:04	DeZavalla Rd and E Channelview Dr (29.771502, -95.120768)	3.4	135	0.4 ^{C,L}	152.5 ^C	26.6 ^C	3.4 ^{C,L}	0.7 ^{B2,C,L}	
	11/10/2021	ST03	6:17:18	6:40:19	Lakeside Dr and DeZavalla Rd (29.767194, -95.105112)	2.9	126	5.3 ^{C,L}	26.5 ^C	6.4 ^{C,L}	5.9 ^{C,L}	6.2 ^{B2,C,L}	
	11/10/2021	ST04	6:51:55	8:21:35	Elsbeth Rd and DeZavalla Rd (29.768042, -95.105552)	4.4	124	4.6 ^{C,L}	33.3 ^C	7.6 ^{C,L}	10.4 ^C	8.2 ^{B2,C,L}	
	11/10/2021	ST05	8:30:58	10:52:32	907 Elsbeth Rd (29.769746, -95.105552)	3.2	127	5.0 ^{C,L}	26.3 ^C	18.6 ^C	5.8 ^{C,L}	10.4 ^{B2,C}	
	11/10/2021	ST06	10:55:20	11:55:11	907 Elsbeth Rd (29.76974, -95.105552)	4.0	140	2.3 ^{C,L}	14.2 ^C	15.4 ^C	8.2 ^{C,L}	4.1 ^{B2,C,L}	
	11/10/2021	ST07	12:00:09	12:18:14	907 Elsbeth Rd (29.76974, -95.105552)	4.0	158	2.8 ^{C,L}	22.6 ^C	19.5 ^C	5.1 ^{C,L}	3.1 ^{B2,C,L}	
	11/10/2021	ST08	14:00:41	16:14:02	Lakeside Dr NW of K-Solv (29.769186, -95.103672)	9.4	172	2.2 ^{C,L}	40.4 ^C	22.1 ^C	24.8 ^C	6.1 ^{B2,C,L}	
	11/10/2021	ST09	16:17:29	17:20:11	Lakeside Dr NW of K-Solv (29.769194, -95.103672)	8.1	196	26.1 ^C	27.2 ^C	26.8 ^C	5.2 ^{C,L}	2.6 ^{B2,C,L}	
	11/10/2021	ST10	19:14:03	21:00:46	Lakeside Dr NW of K-Solv (29.768676, -95.10356)	4.4	152	2.3 ^{C,L}	62.2 ^C	11.1 ^C	128.0 ^C	16.2 ^{B2,C}	
	11/10/2021	ST11	21:18:51	23:07:02	Lakeside Dr and N Shore Dr (29.775138, -95.103024)	3.7	163	1.0 ^{C,L}	4.3 ^{C,L}	2.5 ^{C,L}	9.5 ^{C,L}	0.9 ^{B2,C,L}	

Yellow shading indicates that the value is above the Texas Commission on Environmental Quality short-term health-based air monitoring comparison value of 180 ppbv.

Dr - Drive

E - east

mph - miles per hour

N - north

NA - not applicable

NW - northwest

ppbv - parts per billion by volume

Rd - Road

S - south

SIFT-MS - selective ion flow tube mass spectrometer

St - Street

B1 - Not all associated blank data met the bias specifications. Data may be biased by ± 2.5 ppbv.

B2 - Not all associated blank data met the bias specifications. Data may be biased by ± 2.2 ppbv.

C - Quality control samples were not analyzed every 24 hours as required due to the consolidation of daily quality control checks and end-of-project quality control checks.

E - Reported concentrations exceeds the instrument calibration upper limit.

L - Reported concentration is less than the limit of quantitation.

Attachment D – Stationary Monitoring Maps

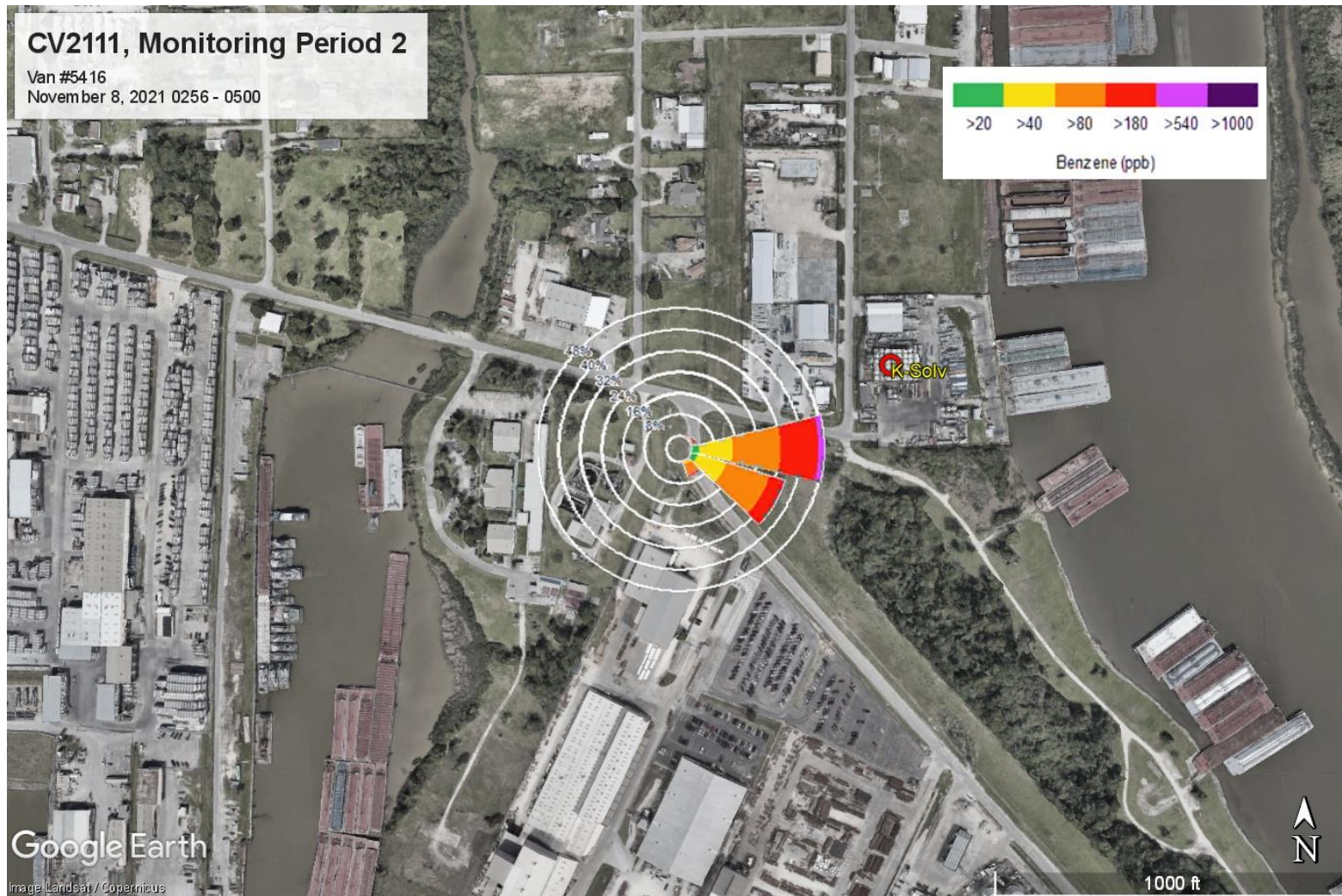


Figure 1: Van #5416 11/8/2021 ST01 stationary monitoring location with maximum instantaneous benzene concentration of 1003.8 ppbv and maximum 1-hour benzene average concentration of 203.5 ppbv on the corner of Lakeside Dr and DeZavalla Rd in Channelview, Texas (29.767208, -95.105112). This map was generated by the Monitoring Division of the Texas Commission on Environmental Quality. This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. For more information concerning this map, contact the Monitoring Division at 512-239-1716.

Attachment D – Stationary Monitoring Maps

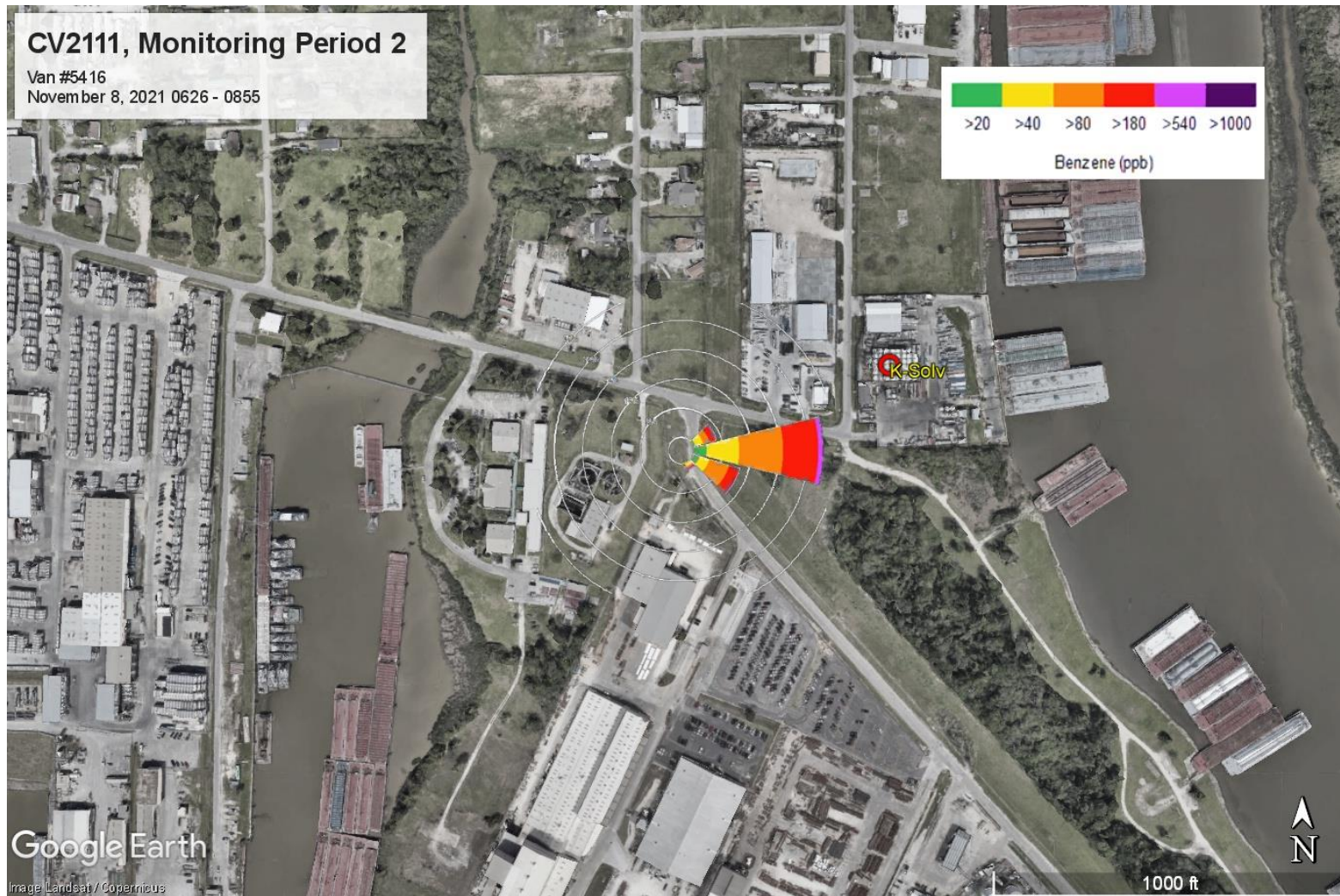


Figure 2: Van #5416 11/8/2021 ST02 stationary monitoring location with maximum instantaneous benzene concentration of 1218.7 ppbv and maximum 1-hour benzene average concentration of 162.7 ppbv on the corner of Lakeside Dr and DeZavalla Rd in Channelview, Texas (29.767204, -95.105128). This map was generated by the Monitoring Division of the Texas Commission on Environmental Quality. This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. For more information concerning this map, contact the Monitoring Division at 512-239-1716.

Attachment D – Stationary Monitoring Maps

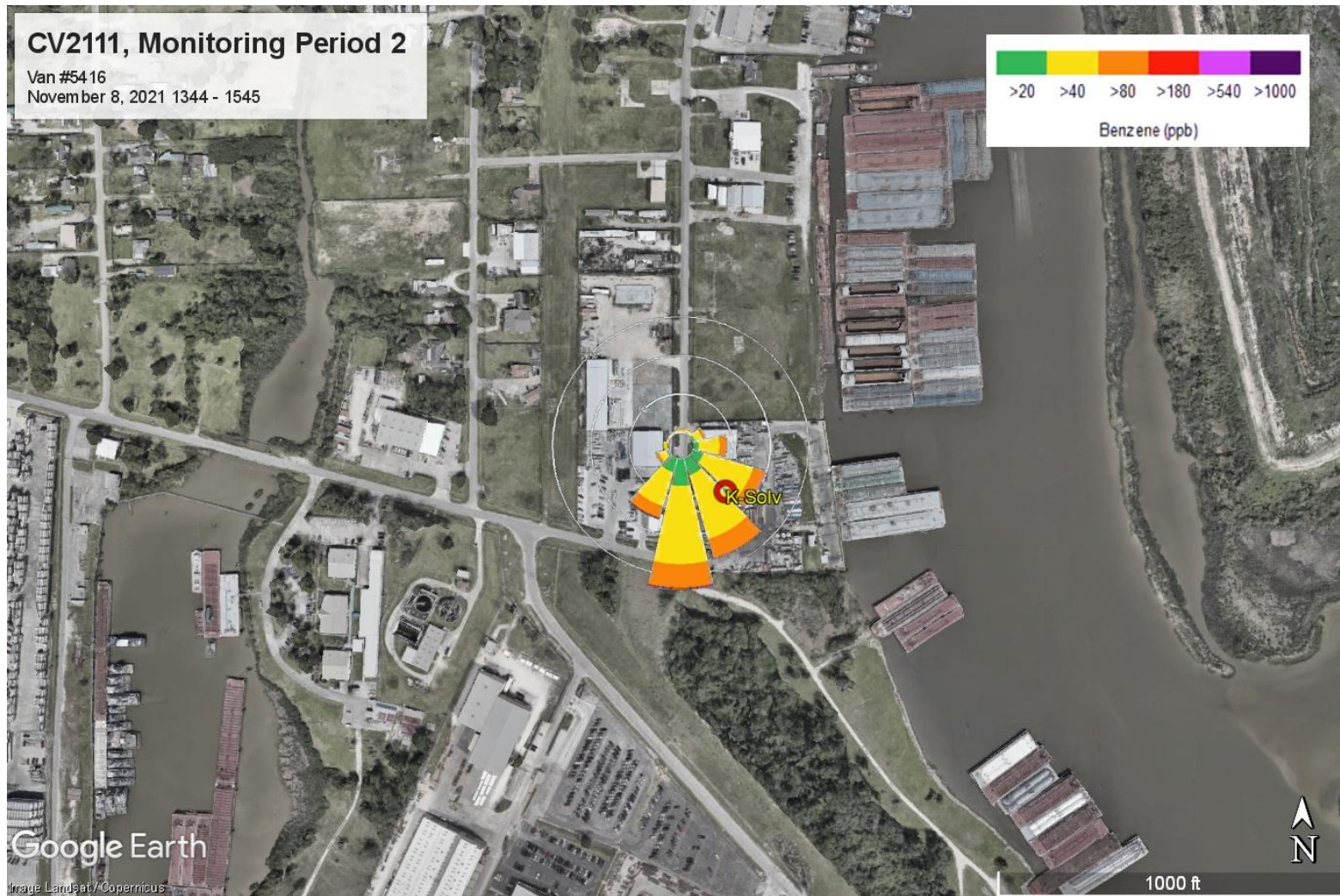


Figure 3: Van #5416 11/8/2021 ST06 stationary monitoring location with maximum instantaneous benzene concentration of 1939.6 ppbv and maximum 1-hour benzene average concentration of 85.2 ppbv on Lakeside Dr in Channelview, Texas (29.768178, -95.103672). This map was generated by the Monitoring Division of the Texas Commission on Environmental Quality. This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. For more information concerning this map, contact the Monitoring Division at 512-239-1716.

Attachment D – Stationary Monitoring Maps



Figure 4: Van #5416 11/8/2021 ST10 stationary monitoring location with maximum instantaneous benzene concentration of 2487.9 ppbv and maximum 1-hour benzene average concentration of 534.6 ppbv on Sheldon Rd approximately 0.1 miles south of Market St in Channelview, Texas (29.770354, -95.12444). This map was generated by the Monitoring Division of the Texas Commission on Environmental Quality. This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. For more information concerning this map, contact the Monitoring Division at 512-239-1716.

Attachment D – Stationary Monitoring Maps

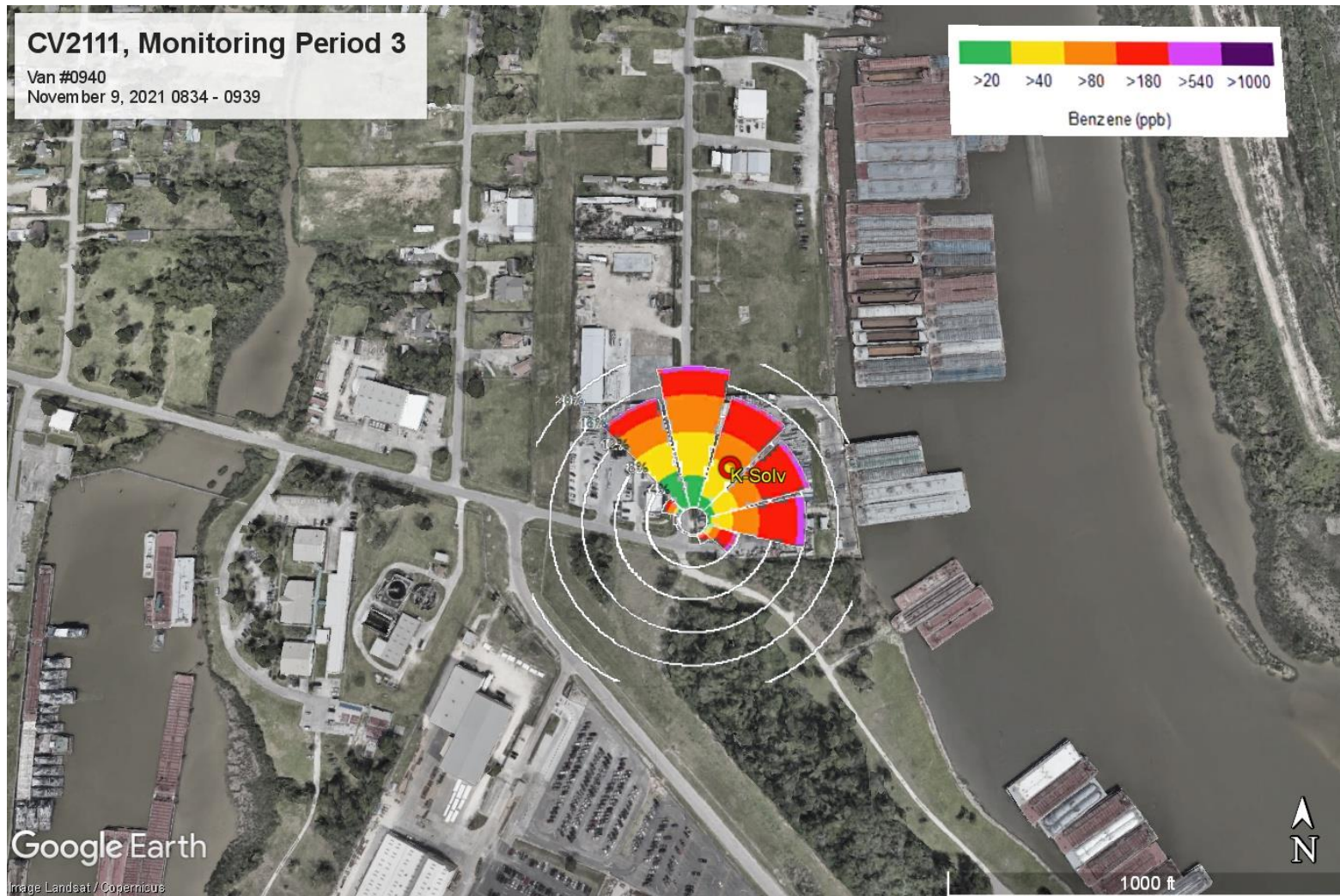


Figure 5: Van #0940 11/9/2021 ST01 stationary monitoring location with maximum instantaneous benzene concentration of 1270.4 ppbv and maximum 1-hour benzene average concentration of 154.4 ppbv on Lakeside Dr at the 90-degree corner in Channelview, Texas (29.767488, -95.103544). This map was generated by the Monitoring Division of the Texas Commission on Environmental Quality. This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. For more information concerning this map, contact the Monitoring Division at 512-239-1716.