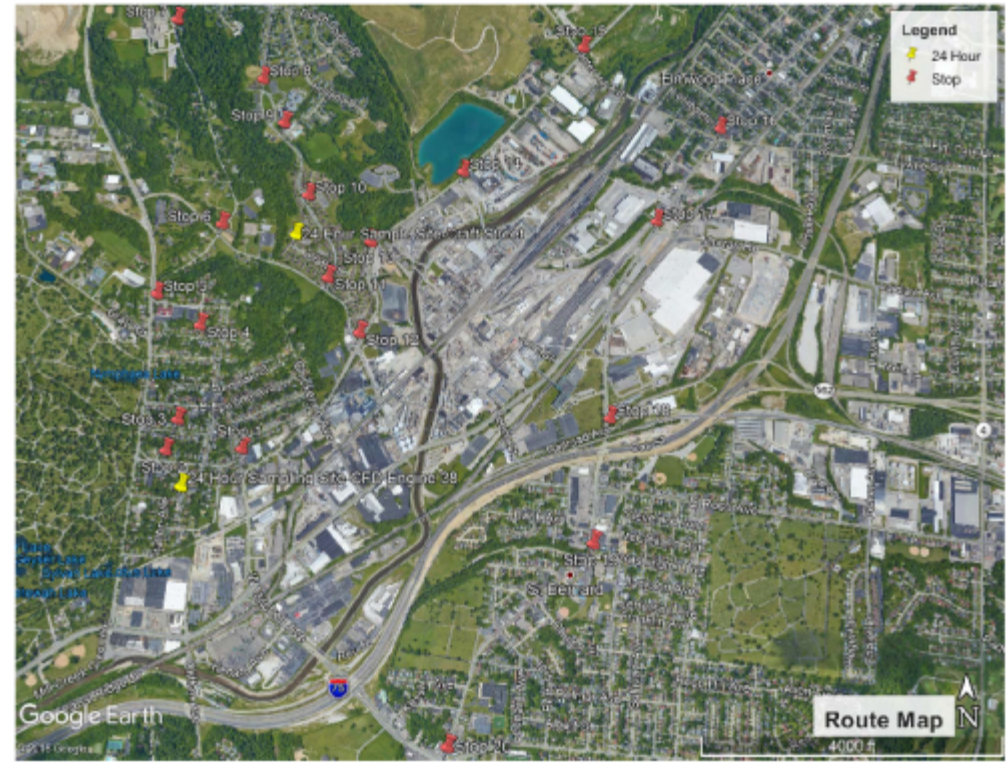
Ambient Air Monitoring Evaluation for Winton Hills, Winton Terrace and Spring Grove Village Neighborhoods



Division of Air Pollution Control
Southwest Air Quality Agency
September 2019

Overview

The Southwest Ohio Air Quality Agency (SWOAQA) in cooperation with Ohio Environmental Protection Agency, Division of Air Pollution Control conducted specialized air quality monitoring in and near the Winton Hills, Winton Terrace and Spring Grove Village neighborhoods of Cincinnati, Ohio. This monitoring supplements historic monitoring and was conducted in response to recent concerns from residents about potential exposure to air toxic contaminants associated with nearby industrial facilities. Based on specific requests from the community, ambient air monitoring was conducted in two phases. Phase 1 was conducted from December 2018 through January 2019, and Phase 2 from July 2019 through August 2019. The results from the Phase 1 analysis were summarized in a fact sheet and presented during a community meeting held on June 11, 2019. The fact sheet described the type of monitoring that was conducted in the community and described the risk-based screening tool used to evaluate the data from the Phase 1 monitoring. The results of the monitoring data collected from the Phase 1 analysis show that the measured levels of air toxic compounds were below risk-based screening levels and are consistent with historic results. To examine potential seasonal variations and continued community concern, a Phase 2 study was conducted during the summer months. The results of the monitoring data collected from the Phase 2 analysis again showed the measured levels of air toxic compounds were below risk-based screening levels and are consistent with historic results. Based on extensive historical air quality data for the communities of concern, the Phase 1 and Phase 2 air quality studies, and industrial source inspection and compliance reviews, additional sampling is not warranted at this time. All air quality data collected to date show that the measured levels do not pose an immediate or long-term health concern.

Project Description

Beginning on Dec. 12, 2018, ambient air monitoring for air toxics was conducted through August 2019. The air quality monitoring included both portable, real-time "loop" monitoring and fixed, 24-hour site monitoring. The locations of the monitoring sites are provided in Figure 1. A description for each of the loop monitoring locations is listed in Table 1 and the locations of the fixed 24-hour site are described below in the Ambient Air Monitoring section of this report.

Loop Monitoring

The loop monitoring involved measuring total volatile organic compounds using a portable instrument at 20 locations throughout Winton Terrace, Winton Hills, Spring Grove Village, Elmwood Place and St. Bernard. At a minimum, the loop monitoring was conducted on a weekly basis. During the loop monitoring, no values exceeded the 0.500 parts per million (ppm) action level* for a sustained period of one minute. The loop monitoring was conducted from December 2018 through the end of August 2019.

**If the 0.500 ppm threshold was exceeded, an air quality sample would have been taken and analyzed for specific air toxics.*

Ambient Air Monitoring

In addition to the loop monitoring, eight 24-hour air samples were collected at two different locations presented in Figure 1: one fixed monitoring site was located on Craft Street in Winton Terrace and the other was on Circle Avenue in Spring Grove Village. The samples were taken when the winds were blowing from the industrial facilities toward the community. These air samples were analyzed for more than 60 different volatile organic compounds. Phase 1 air samples were taken in December 2018 and January 2019. Phase 2 sampling was conducted in July and August of 2019.

The 24-hour samples were collected using 6-liter SUMMA canister and a critical orifice passive sampling set-up. The critical orifice is calibrated to collect a 24-hour sample that fills the pressurized canister at a regulated rate throughout the entire period. The canisters were installed by a SWOAQA staff member on a flagpole at the fire house and on a light pole at the Craft Street location. The inlet height at both locations was approximately three meters. The canister sample remains under vacuum (negative pressure) and delivered to the laboratory for analysis.

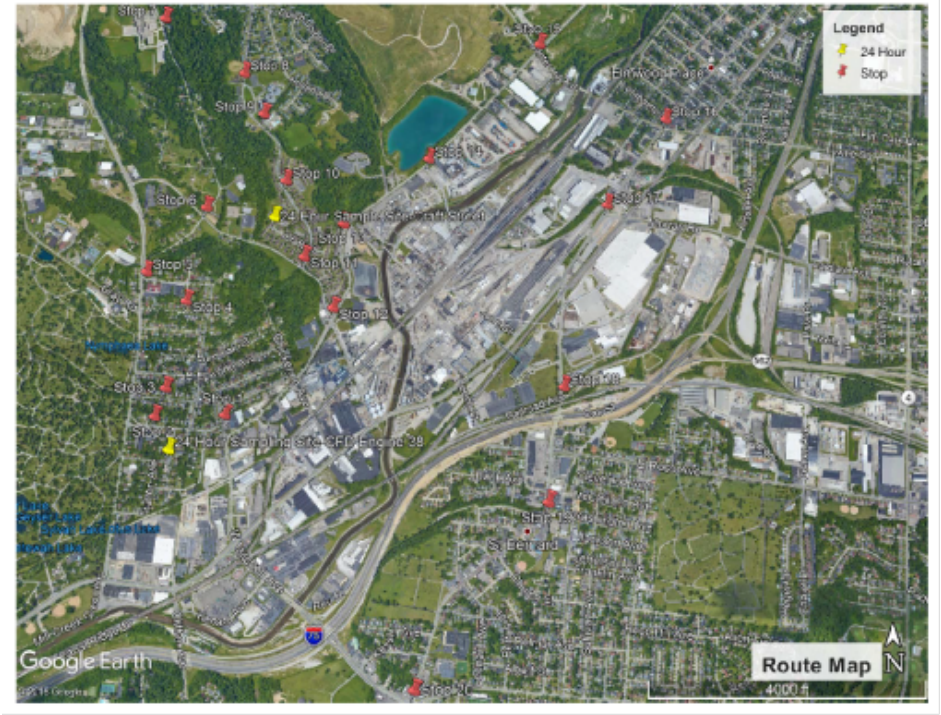


Figure 1. Loop Monitoring and Canister Locations —
Loop monitoring shown in red and 24-hour fixed monitors are presented in yellow.

Table 1. Description of Loop Monitoring Locations

Stop #	Location
1	Derby Ave. & Mitchell Ave.
2	745 Derby Ave. (old Waldorf School)
3	740 McMakin Ave.
4	Intersection of Froome & Doberrer St.
5	Winton Prep Academy (4750 Winton Rd.)
6	Intersection of Kings Run & Winton Ridge
7	Jacobs Center on Winton Ridge
8	5301 Winneste Ave.
9	Winton Hills Rec Center (5170 Winneste Ave.)
10	5013 Winneste Ave.
11	Intersection of Kings Run & Winneste Ave.
12	Intersection of Kings Run Dr. & Este Ave.
13	4847 Este Ave. (parking lot entrance off Este Ave.)
14	Gate 6 entrance for Emery/BASF on Este Ave.
15	Intersection of Center Hill Ave. & Este Ave.
16	Intersection of Vine St. & Township Ave.
17	Intersection of Murray & Vine
18	Intersection of Vine St. & Railroad
19	Intersection of Vine & Washington
20	Intersection of Vine & Mitchell

Sample Analysis Method

The 24-hour samples were analyzed by ALS Environmental in Cincinnati, Ohio using EPA Method TO-15. The analytical laboratory used sample pre-concentration and Gas Chromatograph (GC)/Mass Selective (MS) Detector analysis in Selected-ion Monitoring/Scan mode; calibration curves were performed; and daily calibration verification checks were made to ensure proper Quality Assurance (QA)/Quality Control (QC) for sample analyses.

Risk-based Screening Method

Risk assessment is a tool that is used to estimate or measure the potential for harm or unwanted effects that can be expected from exposure to a given activity or chemical agent. A risk assessment combines information about the toxic (harmful) potential of a pollutant with the measured data collected to determine if the estimated results have the potential to cause adverse effects to human health. This risk-based screening process focuses on the direct inhalation of measured compounds in ambient (outdoor) air for a given sampling period.

To determine the potential for adverse health effects to occur from exposure to detected airborne pollutants, each sample result detected was compared to the Agency for Toxic Substances and Disease Registry's (ATSDR)'s acute (short-term) health-based Minimum Risk Levels (MRLs), if available. ATSDR is a branch of the Public Health Service, U.S. Department of Health and Human Services. Toxicity assessments are performed by the ATSDR that characterize the toxicological and adverse health effects information for toxic compounds. An MRL is an estimate of the daily exposure to a hazardous substance that is likely to be without appreciable risk of adverse non-cancer health effects over a specific duration of exposure. MRLs are derived for acute (1-14 days), intermediate (15-364 days) and chronic (365 days and longer) exposure durations.

Since this study covered a short-term sampling period, the results are screened against the acute MRLs. For this evaluation, it was assumed that if a contaminant exceeded the screening criteria then there was a potential for adverse human health effects. It should be noted that these screening levels have many safety factors included in the calculations in order to present the most conservative estimate of human health risk. The actual potential for human health risk will be no greater than the estimated risk(s); in fact, the actual risk will most likely be less than those estimated in this study.

Monitoring Data

Loop Sampling

The results of the loop monitoring can be found at ***www.southwestohioair.org/monitoring/wintonterrace***

24-hour Canister Results

The results for the detected compounds from both the Phase 1 and Phase 2 Ambient Air monitoring is summarized in Figure 2. The laboratory reports for the complete canister analysis are also included on the SWOAQA website. Ten compounds were detected out of over 60 compounds included in the analysis. Five of the detected compounds were below the available ATSDR's acute screening levels. The other five compounds are less toxic over the short-term and acute risk-based screening values are not available. Therefore, the ATSDR screening level for these compounds is designated with the value of NA in Figure 2.

Figure 2. Winton Terrace Ambient Air Monitoring

Winton Terrace Ambient Air Monitoring			Detected Compounds									
			2-Butanone	2-Propanol	Acetone	Chloroform	Chloromethane	Dichlorodifluoromethane	Hexane	Naphthalene	Toluene	Tetrachloroethene
Sample ID:	Lab ID:	Collection Date:				Units:	µg/m³					
WT-Craft-12-26	1812943-01	12/26/2018	ND	2.65	8.27	ND	ND	3.17	ND	25.1	ND	ND
WT-Craft-1-4-19	1901101-01	1/4/2019	ND	ND	4.20	ND	1.22	3.17	ND	ND	ND	ND
WT-Craft-1-18	1901602-01	1/18/2019	ND	ND	4.44	ND	2.06	3.81	ND	ND	ND	ND
WT-Craft-1-31	1902208-01	1/31/2019	ND	ND	2.76	ND	1.16	ND	ND	ND	ND	ND
WT/Craft 7-9-19	1907355-02	7/8/2019	ND	ND	10.4	ND	1.3	2.47	ND	ND	ND	5.02
WTCraft 7-26-19	19071135-02	7/25/2019	ND	2.97	7.93	1.32	1.05	2.67	ND	ND	ND	ND
WT-Craft 8-1-19	1908110-01	8/1/2019	ND	3.54	7.63	ND	1.82	2.87	ND	ND	ND	ND
WTCraft 8-24-19	19081312-02	8/23/2019	ND	ND	6.39	ND	1.12	3.31	ND	ND	ND	ND
WT-FH-12-26	1812943-02	12/26/2018	ND	3.24	12.1	ND	1.47	3.26	1.94	ND	2.41	ND
WT-FH-1-4-19	1901101-02	1/4/2019	ND	ND	3.85	ND	1.3	3.21	ND	ND	ND	ND
WT-FH-1-18	1901602-02	1/18/2019	ND	ND	8.53	ND	2.04	3.76	ND	ND	ND	ND
WT FH 1-31	1902208-01	1/31/2019	ND	ND	2.68	ND	1.18	ND	ND	ND	ND	ND
WT/FH 7-9-19	1907355-01	7/8/2019	1.56	3.49	14.9	ND	1.42	ND	ND	ND	ND	ND
WTFH 7-25-19	19071135-01	7/25/2019	ND	6.02	15.4	ND	1.16	ND	2.67	ND	ND	ND
WTFH 7-25-19	1908110-02	8/1/2019	ND	4.2	10.1	ND	1.09	ND	2.92	ND	ND	ND
WTFH 8-23-19	19081312-01	8/23/2019	ND	9.95	10.2	ND	1.78	3.31	1.97	ND	2.3	ND
ND= Not detected												
ATSDR Screening Level			NA	NA	62,000	490	1000	NA	NA	NA	7,500	41
					MRL-Acute	MRL-Acute	MRL-Acute				MRL-Acute	MRL-Acute

Conclusion

SWOAQA in cooperation with Ohio Environmental Protection Agency, Division of Air Pollution Control have completed specialized air quality monitoring in and near the Winton Hills, Winton Terrace and Spring Grove Village neighborhoods in Cincinnati, Ohio. The results of the monitoring data collected from both the Phase 1 and Phase 2 analysis show that the measured levels of air toxic compounds are well below any risk-based screening levels and are consistent with historic results. The air quality data collected to date continue to show that measured levels do not pose an immediate or long-term health concern. Therefore, additional sampling is not warranted at this time. SWOAQA will continue to oversee and monitor the air quality of the community through facility inspections, permit issuance, complaint investigation, and the agency's Citizen Air Sampling Program.