



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604**

DATE: November 19, 2021

SUBJECT: GEOSPATIAL MONITORING OF AIR POLLUTION REPORT FOR
STELLANTIS – DETROIT, MI **ADA COMPLIANT**

**DATA ANALYSIS
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**FIELD MONITORING
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Air Monitoring and Analysis Section

**FIELD MONITORING
REQUESTED BY:** Michigan Department of Environment, Great Lakes and Energy

**DATES OF FIELD
MONITORING:** November 16-17, 2021

**REPORT
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**REPORT
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BACKGROUND:

On November 16-17, 2021, the U.S. Environmental Protection Agency Region 5 deployed the Geospatial Monitoring of Air Pollutants (GMAP) mobile monitoring platform near the Stellantis – Mack Assembly plant in Detroit. The Michigan Department of Environment, Great Lakes and Energy (MI EGLE) requested that EPA deploy the GMAP to respond to odor complaints. The GMAP monitored for hydrogen sulfide (H₂S), methane (CH₄), benzene (C₆H₆), toluene (C₇H₈), and p-xylene (C₈H₁₀). In addition to these compounds that the GMAP measures continuously and in real-time, to better characterize and identify the specific pollutants causing the odors, EPA also collected several air samples in Summa canisters for subsequent laboratory analysis. These laboratory results will be appended to this report when they become available.

The supporting documentation, including the pre- and post-monitoring QC checks from this campaign, have been reviewed and the data validated according to the most recent Quality Assurance Project Plan (QAPP) and Standard Operating Procedure (SOP). Additional field notes from this campaign can be found in APPENDIX I, and QC documentation is included in APPENDIX II.

During the monitoring campaign around Stellantis, EPA conducted:

- 13 GMAP mobile transects;
- 2 GMAP stationary measurements;
- 4 24-hour composite canister samples;
- 1 8-hour composite canister sample; and
- 5 grab canister samples.

METHODS:

Region 5's GMAP uses a Picarro G2204 cavity ringdown spectroscopy analyzer (SN 2267-BFADS2013) to measure H₂S and CH₄ and a DUVAS DV3000 differential ultra-violet absorption spectrometer (DUVAS) (SN UV3000-2016067-DV1019) to measure C₆H₆, C₇H₈, and C₈H₁₀. The collected data are integrated with global positioning system (GPS) location information and meteorological parameters, when available, under a common time stamp using the specially designed Mobile Emission Monitoring software to quantify air pollutant concentrations and source trajectories. Additional information can be found in the GMAP SOP (R5-ARD-0002-r5) and GMAP QAPP (V4.0 2017-05-30). In addition to the GMAP measurements, EPA Air Method, Toxic Organics – 15 (TO-15) canister samples were collected to identify the presence of volatile organic compounds (VOC) for analysis by gas chromatography/mass spectrometry (GC/MS) by the MI EGLE laboratory.

Pollutant concentration values from the GMAP are detailed in the report when data are greater than the reporting limit (RL) or, through a weight of evidence approach, when greater than the minimum detection limit (MDL). Typically, values less than the RL but greater than the MDL are indicated as "<RL" and values less than the MDL are indicated as "<MDL." All values less than

the MDL are reported as null. All values greater than the MDL will appear in the data files. Values less than the RL, but greater than the MDL, are reported with a qualifier code. Any values greater than the highest QC check concentration will be flagged with a qualifier code indicating that they fall out of the calibration range for the instrument.

RESULTS:

Concentrations above the MDL were measured for H₂S, CH₄, C₆H₆, C₇H₈, and C₈H₁₀ during this campaign; data above the RL were analyzed. No reportable levels of H₂S, C₆H₆, C₇H₈, or C₈H₁₀ were measured. Levels of CH₄ were measured at background concentrations.

All concentrations were compared to threshold values, including the Agency for Toxic Substances and Disease Registry's (ATSDR) Minimal Risk Levels (MRL).¹ Table 1 depicts the maximum one-second measured concentration for each transect, instrument MDL, and ATSDR MRL for each parameter. The figures associated with each data file are also listed in Table 1. Figure numbers are denoted when the files have time-series, ribbon, and/or polar plots included.

GENERAL FINDINGS:

Stellantis:

EPA measured around Stellantis, an auto manufacturing plant in Detroit, MI. No reportable levels of H₂S, C₆H₆, C₇H₈, or C₈H₁₀ were measured during this deployment. EPA field staff did observe odors near the facility. Because the GMAP is only able to detect H₂S, CH₄, C₆H₆, C₇H₈, and C₈H₁₀, EPA also conducted Summa canister sampling. These Summa canister results may provide additional information about the pollutants causing odors near the facility.

¹ <https://www.atsdr.cdc.gov/toxprofiles/tp114.pdf> MRLs are intended to serve as a screening tool to help public health professionals decide where to look at a pollutant more closely. To be protective and conservative, ATSDR sets MRLs below levels that, based on current information, may cause adverse health effects. Exposure to a level above the MRL does not mean that adverse health effects will occur. Rather, it indicates the need to investigate the situation more closely.



Figure 1: Mobile transect (blue path) driven in Detroit, MI around the Stellantis – Mack Assembly plant

STELLANTIS MOBILE MEASUREMENTS: NOVEMBER 16 - 17, 2021

MOBILE MEASUREMENTS – NOVEMBER 16-17, 2021	H₂S (PPB)	CH₄ (PPM)	BEN (PPB)	TOL (PPB)	XYP (PPB)	FIGURE
ATSDR ACUTE (≤14 DAY) MRL	70	-	9	2000	2000	
ATSDR INTERMEDIATE (15-364 DAYS) MRL	20	-	6	-	600	
ATSDR CHRONIC (≥365 DAYS) MRL	-	-	3	1000	50	
GMAP MDL	7.86	0.00	4.80	3.69	4.05	
GMAP RL	23.58	0.00	24.00	18.45	20.25	
	max 1-second concentration					
STELLANTIS211116_MA01	<RL	5.38	<MDL	<RL	<RL	NA
STELLANTIS211116_MA02	<RL	3.49	<RL	<RL	<RL	NA
STELLANTIS211116_MA03	<RL	7.28	<MDL	<RL	<RL	NA
STELLANTIS211116_MA04	<RL	2.64	<MDL	<RL	<RL	NA
STELLANTIS211116_MA05	<RL	3.16	<MDL	<RL	<RL	NA
STELLANTIS211116_MA06	<RL	2.62	<MDL	<RL	<RL	NA
STELLANTIS211116_MA07	<RL	2.89	<MDL	<RL	<RL	NA
STELLANTIS211116_MA08	<RL	2.99	<MDL	<RL	<RL	NA
STELLANTIS211116_MA09	<RL	2.75	<MDL	<RL	<RL	NA
STELLANTIS211116_MA10	<RL	2.3	<MDL	<RL	<RL	NA
STELLANTIS211116_MA11	<RL	2.7	<MDL	<RL	<RL	NA
STELLANTIS211117_MA01	<RL	2.27	<RL	<RL	<RL	NA
STELLANTIS211117_MA02	<RL	2.23	<RL	<RL	<RL	NA

Table 1: Maximum one-second concentrations and corresponding figure numbers from mobile transects around the Stellantis – Mack Assembly plant in Detroit, MI; November 16 - 17, 2021

STELLANTIS STATIONARY MEASUREMENTS: NOVEMBER 16 - 17, 2021

STATIONARY MEASUREMENTS – NOVEMBER 16 - 17, 2021	H₂S (PPB)	CH₄ (PPM)	BEN (PPB)	TOL (PPB)	XYP (PPB)	FIGURE
ATSDR ACUTE (≤14 DAY) MRL	70	-	9	2000	2000	
ATSDR INTERMEDIATE (15-364 DAYS) MRL	20	-	6	-	600	
ATSDR CHRONIC (≥365 DAYS) MRL	-	-	3	1000	50	
GMAP MDL	7.86	0.00	4.80	3.69	4.05	
GMAP RL	23.58	0.00	24.00	18.45	20.25	
	max 1-second concentration					
STATIONARYSTELLANTIS211116_ST01	<RL	2.48	<MDL	<RL	<RL	NA
STATIONARYSTELLANTIS211117_ST01	<RL	2.27	<RL	<RL	<RL	NA

Table 2: Maximum one-second concentrations and corresponding figure numbers from stationary measurements around the Stellantis – Mack Assembly plant in Detroit, MI; November 16 - 17, 2021

STELLANTIS CANISTER LOCATIONS

Sample Name	Canister No.	Collection Date	Collection Time	Coordinates
DWND1	121 (24 hr)	11/16/21 – 11/17/21	10:19 – 07:35	42.3871959, -82.9765807
DWND2	141 (24 hr)	11/16/21 – 11/17/21	10:29 – 07:48	42.388387, -82.9783751
DWND3	118 (24 hr)	11/16/21 – 11/17/21	10:36 – 07:57	42.3885257, -82.9800109
UPWND1	135 (24 hr)	11/16/21 – 11/17/21	10:55 – 07:23	42.3784331, -82.9793055
GRAB1	70 (grab)	11/16/21	16:53 – 16:54	42.38430625, -82.98265364
GRAB2	91 (grab)	11/16/21	16:54 – 16:55	42.38430625, -82.98265364
GRAB3	111 (grab)	11/16/21	17:23 – 17:24	42.38534006, -82.98417208
GRAB4	101 (grab)	11/16/21	17:45 – 17:46	42.38589176, -82.98447801
GRAB5	193 (grab)	11/17/21	07:45 – 07:45	42.3883089, -82.97840356
DWND4	154 (8 hr)	11/17/21	07:53 – 13:19	42.388387, -82.9783751

Table 3: Canister locations taken around Stellantis – Mack Assembly plant



Figure 2: Locations of canister sampling around Stellantis – Mack Assembly plant

APPENDIX I – FIELD NOTES

11/15/21

Tuesday, November 16, 2021 5:36 AM

GENERAL

- Arrived in Troy MI @ ~ 1630 to complete QC checks near hotel

QC CHECKS

- All qc checks passed - see instrument log for more details
- END @ 1730

11/16/21 - Stellantis

Tuesday, November 16, 2021 5:37 AM

GENERAL

- Diode response performed @ 0715
- Arrived onsite @ ~0720 EST
- Low winds, dry, clear skies

SAMPLING

- Transect around facility
 - Nothing of notes measured
- Returned to area @ 0830 EST
 - Completed several transects
 - Scoped out locations for composite canister sampling
- Canisters
 - DWND1
 - Canister #: 121 Regulator #: 102
 - Valve open: 1019 EST
 - Initial pressure: -29.5 inHg
 - Valve close: 0735 on 11/17/21
 - Final pressure: -3.5 inHg
 - Location: NNE of facility, near railroad. 42.3871959, -82.9765807
 - DWND2
 - Canister #:141 Regulator #: 105
 - Valve open: 1029 EST
 - Initial pressure: -28 inHg
 - Valve close: 0748 on 11/17/21
 - Final pressure: -3 inHg
 - Location: N of facility, near railroad. 42.388387, -82.9783751
 - Detected VOC odor in area when closed valve/collected canister
 - DWND3
 - Canister #: 118 Regulator #: 101
 - Valve open: 1036 EST
 - Initial pressure: -29
 - Valve close: 0757 on 11/17/21
 - Final pressure: -2.5 inHg
 - Location: NNE of facility, telephone pole near road. 42.3885257, -82.9800109
 - Smelled VOC odor when approaching canister to close valve/collect
 - UPWND1
 - Canister #: 135 Regulator #: 104
 - Valve open: 1055 EST
 - Initial pressure: -27 inHg
 - Valve close: 0723 (11/17/21)
 - Final pressure: -2 inHg
 - Location: S of facility. 42.3784331, -82.9793055
 - GRAB1: IN odor
 - Canister #: 70
 - Valve open: 1653
 - Valve close: 1654
 - Location: access road to west of Beniteau Rd. 42.38430625, -82.98265364
 - GRAB2: IN odor

- Canister #: 91
 - Valve open: 1654
 - Valve close: 1655
 - Location: access road to west of Beniteau Rd 42.38430625, -82.98265364
- GRAB3: IN odor
 - Canister: 111
 - Valve open: 1723 EST
 - Valve close: 1724
 - Location Beniteau Rd. 42.38534006, -82.98417208
- GRAB4: IN odor
 - Canister: 101
 - Valve open: 1745 EST
 - Valve close: 1746
 - Location Beniteau Rd. 42.38589176, -82.98447801
- Resumed sampling @ ~1630
 - Received call from April & Jon about odor (paint smell) complaint on Beniteau Rd
 - Completed transects along Beniteau Rd near complainant address
 - Observed light odor on Beniteau Rd -- took 4 grab samples in VOC odors
- Finished sampling @ 1750

11/17/21 - general

Wednesday, November 17, 2021 9:46 AM

Notes about different facility monitoring have been removed.

QC CHECKS

- QC checks completed at park in Detroit
- All checks passed

11/17/21 - Stellantis

Wednesday, November 17, 2021 5:40 AM

GENERAL

- Gray skies, light mist, light winds

SAMPLING

- Arrived onsite @ ~0730 without inlet deployed (rain/misting concerns) and collected the 4 deployed 24 hr canisters
- Canisters
 - GRAB5 (in odor)
 - Canister:
 - Valve open: 0745 EST
 - Valve close: 0745
 - Location: near 24 hr canister (DWND2). 42.3883089, -82.97840356
 - DWND4 (8hr)
 - Canister: 154 Regulator: 218
 - Valve open: 0753 EST
 - Initial Pressure: -28
 - Valve close: 1318
 - Final pressure: -8
 - Location: Same location as DWND2 -- N of facility, near railroad. 42.388387, -82.9783751
 - VOC odor observed during deployment of canister
- Returned to area ~0900 with inlet deployed to meet with Jon (MI state)
- No odors observed on Beniteau road during morning hours

Haile,
Katherine

Digitally signed by Haile,
Katherine
Date: 2021.11.19
11:15:50 -06'00'

Hamilton,
Scott

Digitally signed by
Hamilton, Scott
Date: 2021.11.19
11:36:20 -06'00'

APPENDIX II - QC CHECKS

58

11/15/21
K. Hauke
S. Hamilton

59
Troy, MI
10:30
(EST)

Dilution system: ENV 6100 / SN 3485 cert 5126/21

Cylinder	SN	Conc	cert date	PSI
H ₂ S	FE19845	50-69 ppm	4/6/20	1000
H ₂ S	D941048	10.30 ppm	6/5/21	1800
CH ₄	W3D1A2	2.00 ppm	7/29/19	950
BTEX	D966312	100/198/101.9 ppb B/T/X/Y/P	8/19/20	1350

6/22/21 QC Check (file: 211115-CA01)

Time	Pollutant	T. flow	Std (ppm)	Edg (ppm)	% diff
1740	H ₂ S	5000	z	-0.0004	NA
1745	CH ₄	5000	z	0.035	NA
1750	H ₂ S	2000	2.00	2.037	1.85%
1755	H ₂ S	5000	0.500	0.515	3.0%
1758	H ₂ S	5000	0.070	0.068	-2.9%
1704	CH ₄	2500	6.00	6.02	0.3%
1709	CH ₄	2500	4.00	4.01	0.25%
1714	CH ₄	4000	2.00	1.99	-0.5%
1722	H ₂ S	NA	10.30	10.23	-0.68%
1723	CH ₄	NA	2.00	2.09	4.5%
1727	H ₂ S	5000	z	0.006	NA
1727	CH ₄	5000	z	0.2	NA

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Tracy, MI

11/15/21 cont

Q13000 QC CHECK (file: 211115-CA01)

Time	Relutant	Std(ppb)	(Adj/ppb)	% diff
1709	* diode response	2	-3	NA
1701	B	2	-2	NA
1701	T	2	1	NA
1701	XYP			
1706	B	106	106	-5.7%
1706	T	98	99	1.0%
1706	XYP	101.9	98	-3.8%
1711	B	2	-3	NA
1711	T	2	-7	NA
1711	XYP	2	0	NA

Time check:

phone

GMAP

PICARNO

1710

1708

1708

END: 1730

61

11/17/21
 K. Haule
 J. Hamilton

Derritt, MI -
 1145 EST

Dilution System: Env 61001 SN 3485 cert 5/26/21

Cylinder	SN	conc	exp date	psi
H ₂ S	FF19845	50.69 ppm	4/6/20	1100
H ₂ S	D94108	10.30 ppm	6/5/21	1900
CH ₄	63D1AL	200 ppm	7/29/19	1000
BTEX	D861312	106/98/101.9 ppb	8/9/20	1000 1300

B/T/MP

92204 QC check: (file: 211117-CAD1)

Time	Pollutant	T flow	Std (ppm)	Kcal (ppm)	diff
1153	H ₂ S	5000	z	0.001	NA
1220	CH ₄	5000	z	0.013	NA
1206	H ₂ S	2000	2.00	2.07	3.5%
1210	H ₂ S	5000	0.500	0.523	4.6%
1218	H ₂ S	5000	0.070	0.071	2.9%
1230	CH ₄	2500	6.00	6.03	0.5%
1235	CH ₄	2500	4.00	4.03	0.8%
1239	CH ₄	4000	2.00	2.03	1.5%
1245	H ₂ S	NA	10.30	10.36	0.6%
1247	CH ₄	NA	200	209	4.5%
1249	H ₂ S	5000	z	0.004	NA
1249	CH ₄	5000	z	0.12	NA

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Detroit, MI

11/17/21 cont

DV3000 QC check - file: 211119-CA01

Time	Pollutant	kg/std (ppb)	kg/lb (ppb)	diff
1153	B	z	3	NA
1153	T	z	5	NA
1153	XYP	z	7	NA
1200	B	106	95	10.4%
1200	r	98	97	-1.0%
1200	XYP	101.9	113	10.9%
1204	B	z	1	NA
1204	T	z	1	NA
1204	XYP	z	11	NA

time check

phone: 1210 Picam: 1211 GMAP: 1209

END: 1305

APPENDIX III – CANISTER DATA

**Canister data is still being analyzed by the laboratory at this time; once available, data will be appended to this report.