

Plantation Pipeline Gasoline Pipe Line Release
Double Oak Mountain, AL
Preliminary Summary of Air Monitoring Results
September 7, 2014

Prepared by
Center for Toxicology and Environmental Health, L.L.C. (CTEH®)

Introduction

On August 23, 2014, Center for Toxicology and Environmental Health, LLC (CTEH®) was contacted by Plantation Pipe Line to initiate air monitoring in support of response activities following a gasoline pipeline release in Double Oak Mountain, AL. Site monitoring consisted of manually-logged real-time monitoring as well as remote-telemetering monitoring.

This submittal summarizes air monitoring data for September 5, 2014 15:00 to September 7, 2014 00:00.

Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged monitoring was conducted for benzene, percent of the Lower Explosive Limit (LEL), oxygen (O₂), and Volatile Organic Compounds (VOCs), with instruments such as RAESystems® MultiRAEs (MRs), and RAESystems® UltraRAEs. Table 1 summarizes data for manually-logged real-time readings in the Work Area and Roll-off Staging Area.

Table 1: Manually-Logged Real-Time Air Monitoring Summary¹
September 5, 2014 15:00 – September 7, 2014 00:00

Analyte	Instrument	Number of Readings	Number of Detections	Average of Detections	Concentration Range
Roll-off Staging Area					
Benzene	UltraRAE	3	0	NA	<0.05 ppm
VOC	MultiRAE Plus	5	0	NA	<0.1 ppm
Work Area					
Benzene	UltraRAE	16	0	NA	<0.05 ppm
LEL	MultiRAE Plus	12	0	NA	<1 %
O ₂	MultiRAE Plus	10	10	20.9 %	20.9 - 20.9 %
VOC	MultiRAE Plus	28	4	1.7 ppm	0.8 - 3.8 ppm

¹Please note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

²Maximum detections preceded by the "<" symbol are considered non-detects at or above reporting limit value to the right.

Remote-telemetering Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Remote-telemetering monitoring was conducted for percent of the Lower Explosive Limit (LEL), oxygen (O₂), and Volatile Organic Compounds (VOCs) with RAESystems® AreaRAEs. The remote-telemetering units were demobilized as of September 5, 2014 17:12. Table 2 summarizes data for remote-telemetering data in the work area and Appendix B includes the remote-telemetering data graphs.

Table 2: Remote-telemetry Air Monitoring Summary¹
September 5, 2014 15:00 – September 5, 2014 17:12

Unit	Analyte	Number of Readings	Number of Detections	Average of Detections	Concentration Range
AR06	LEL	381	0	NA	<1 %
	O ₂	381	381	21.3 %	21.2 - 21.4 %
	VOC	381	102	1.1 ppm	0.1 - 4 ppm
AR08	LEL	380	0	NA	<1 %
	O ₂	380	380	20.9 %	20.9 - 20.9 %
	VOC	380	380	3.9 ppm	0.4 - 33.1 ppm
AR09	LEL	381	0	NA	<1 %
	O ₂	381	381	20.9 %	20.9 - 20.9 %
	VOC	381	11	1.5 ppm	0.1 - 3.6 ppm
AR10	LEL	381	0	NA	<1 %
	O ₂	381	381	21.1 %	20.9 - 21.2 %
	VOC	381	379	2.3 ppm	0.1 - 24 ppm

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Data Logging Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Data logging monitoring was conducted for percent of the Lower Explosive Limit (LEL), oxygen (O₂), and Volatile Organic Compounds (VOCs), with RAESystems® MultiRAEs (MRs). Table 3 summarizes data for data-logged readings in the Work Area and Appendix C includes the data logging data graphs.

Table 3: Work Area – Data Logged Air Monitoring Summary¹
September 5, 2014 08:41 – September 5, 2014 16:53

Unit	Analyte	Number of Readings	Number of Detections	Average of Detections	Concentration Range
Excavation Operations					
095-527929 9/5 09:11 - 9/5 13:46	LEL	1103	0	NA	<1 %
	O ₂	1103	1103	20.9 %	20.9 - 34.8 %
	VOC	1103	191	0.6 ppm	0.1 - 6.2 ppm
095-528061 9/5 09:26 - 9/5 16:53	LEL	1791	0	NA	<1 %
	O ₂	1791	1791	20.9 %	20.9 - 39 %
	VOC	1791	1021	2.2 ppm	0.1 - 32.1 ppm
Vac Operations					
095-528024 9/5 08:41 - 9/5 16:30	LEL	1877	0	NA	<1 %
	O ₂	1877	1877	20.9 %	20.9 - 30.6 %
	VOC	1877	423	1.0 ppm	0.1 - 58.5 ppm

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Personal Sampling

In accordance with the Occupational Safety and Health Administration (OSHA) benzene standard 29 CFR 1910.1028, analytical air samples (3M 3520 organic vapor badges) were collected in the breathing space of representative workers to monitor personal exposures to selected petroleum mixture constituents during work activities. In accordance with the OSHA access to employee exposure and medical records standard 29 CFR 1910.1020, notification letters will be produced for delivery to employees sampled. All analytical samples were shipped to an off-site accredited laboratory for chemical analysis. A detailed list of personal sampling results from the work area is provided in Table 4.

Table 4: Personal Air Sampling Results¹
August 24, 2014 – August 27, 2014

Sample Date	Sample ID	Sample Duration	Benzene (ppm)	Ethyl Benzene (ppm)	Naphthalene (ppm)	N-Hexane (ppm)	Toluene (ppm)	Xylene (ppm)
8/24/2014	NT5436^	555	<0.03	<0.07	<0.32	0.1	0.1	<0.24
	NW7912^	379	<0.05	<0.1	<0.47	<0.1	<0.1	<0.34
	WA5387^	483	0.09	<0.08	<0.36	0.31	0.38	<0.27
	WA5458^	1440	0.05	<0.03	<0.12	0.14	0.18	0.14
	WB2699^	181	0.2	<0.2	<0.97	0.77	0.62	<0.72
	WB3172^	631	1.4*	5.1*	1.6*	4.9*	19*	27*
	WB3397^	628	0.16	0.09	<0.28	0.58	0.76	0.44
8/25/2014	NT5611	517	<0.03	<0.08	<0.34	<0.08	0.1	<0.25
	NT5675^	311	<0.06	<0.1	<0.57	<0.1	<0.1	<0.42
	NV5817	558	<0.03	<0.07	<0.32	<0.08	<0.07	<0.23
8/26/2014	WA5298	429	0.07	<0.1	<0.41	0.24	0.33	<0.3
	WB3173	452	0.05	<0.09	<0.39	0.22	0.27	<0.29
	WB3243	468	0.04	<0.09	<0.38	0.2	0.24	<0.28
	WP8037	609	<0.03	<0.07	<0.29	0.1	0.17	<0.21
	WP8117	616	0.04	<0.07	<0.29	0.19	0.31	<0.21
	WB3166	490	0.04	<0.08	<0.36	0.2	0.25	<0.27
8/27/2014	WP8181	435	<0.04	<0.09	<0.41	<0.1	0.2	<0.3
	WP8209	485	0.1	<0.08	<0.36	0.28	0.41	<0.27
	WP8240	537	0.05	<0.08	<0.33	0.1	0.23	<0.24

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* - Individual wearing this exposure badge tripped, resulting in the badge falling to the ground and breaking open near the released product.

For this reason, the result of this sample may be anomalous and not representative of the individual's exposure to these volatile organic compounds

^ - Lab Results have level 2 validation through a third party validator.

Area Sampling

Analytical air samples (3M 3520 organic vapor badges) were collected in the surrounding community to monitor community exposures to selected petroleum mixture constituents during work activities. All analytical samples were shipped to an off-site accredited laboratory for chemical analysis. A detailed list of area sampling results is provided in Table 5. A map detailing sample locations is provided in appendix A.

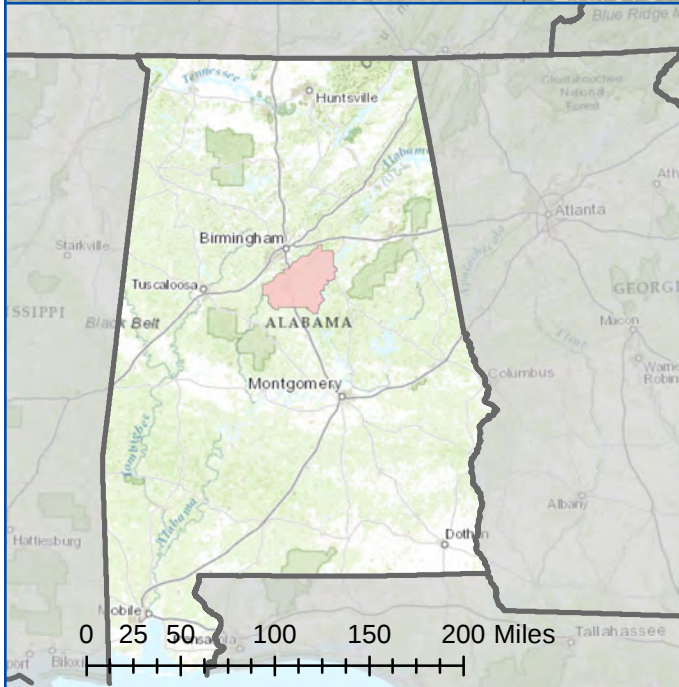
Table 5: Area Air Sampling Results¹
August 24, 2014 – August 26, 2014

Sample Date	Location	Sample ID	Benzene (ppm)	Ethyl Benzene (ppm)	Naphthalene (ppm)	N-Hexane (ppm)	Toluene (ppm)	Xylene (ppm)
8/24/2014	AS-003	NT5862	<0.04	<0.08	<0.36	<0.09	<0.08	<0.27
	AS-004	WB2716	<0.04	<0.08	<0.35	<0.09	<0.08	<0.26
8/25/2014	AS-002	NT5690	<0.04	<0.09	<0.37	<0.09	<0.09	<0.27
	AS-005	NT5454	<0.04	<0.08	<0.36	<0.09	<0.08	<0.27
	AS-009	WP8044	<0.03	<0.08	<0.34	<0.08	<0.08	<0.25
	AS-011	WP8081	<0.03	<0.08	<0.34	<0.08	<0.08	<0.25
8/26/2014	AS-006	WB3160	<0.04	<0.09	<0.37	<0.09	<0.09	<0.27
	AS-007	WB3302	<0.04	<0.09	<0.37	<0.09	<0.09	<0.27
	AS-008	WP8035	<0.04	<0.08	<0.36	<0.09	<0.08	<0.27
	AS-010	WP8076	<0.04	<0.09	<0.37	<0.09	<0.09	<0.27

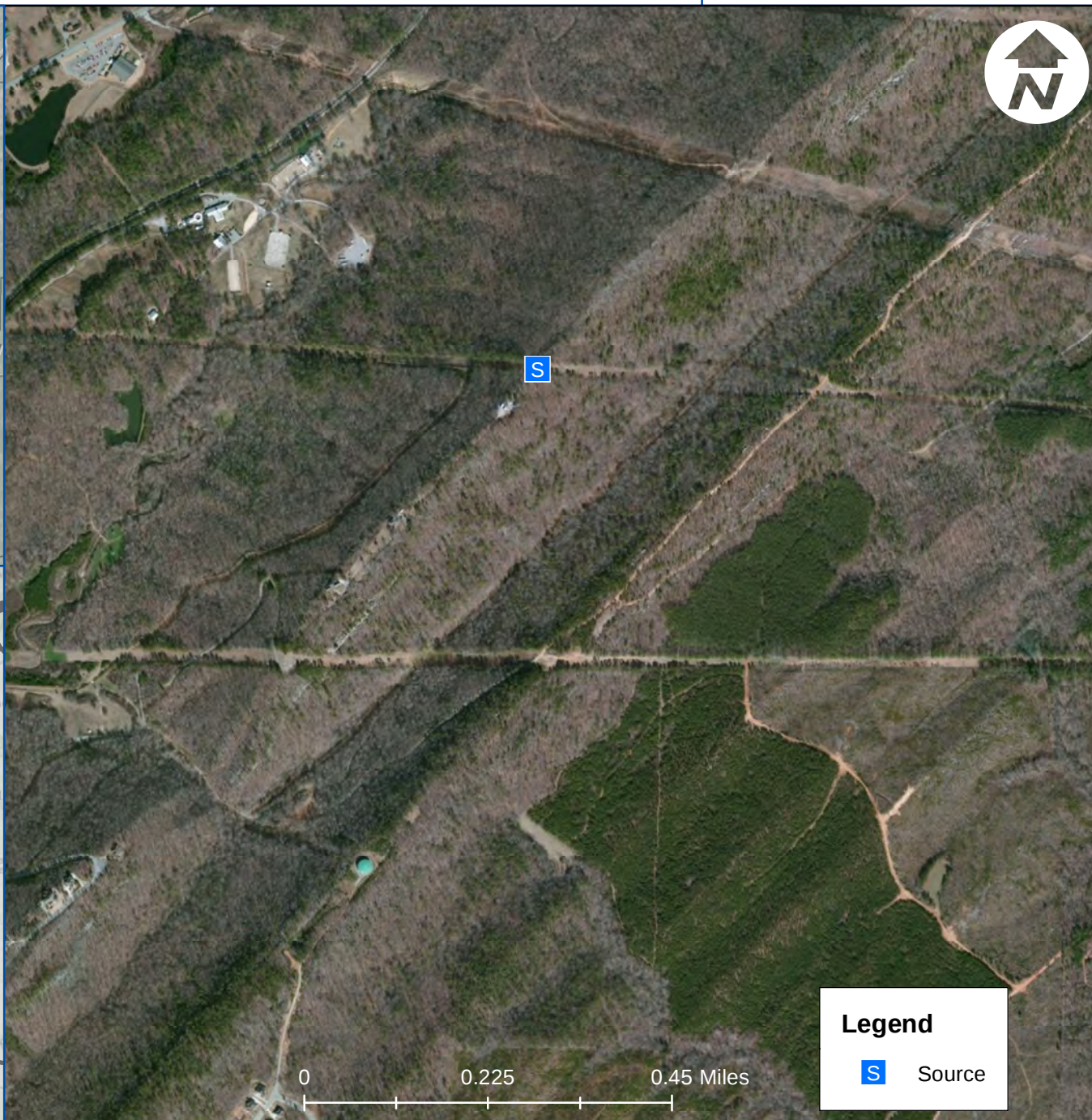
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Appendix A: Incident Maps



PROJECTION SYSTEM: UTM16 COORDINATE SYSTEM: WGS84



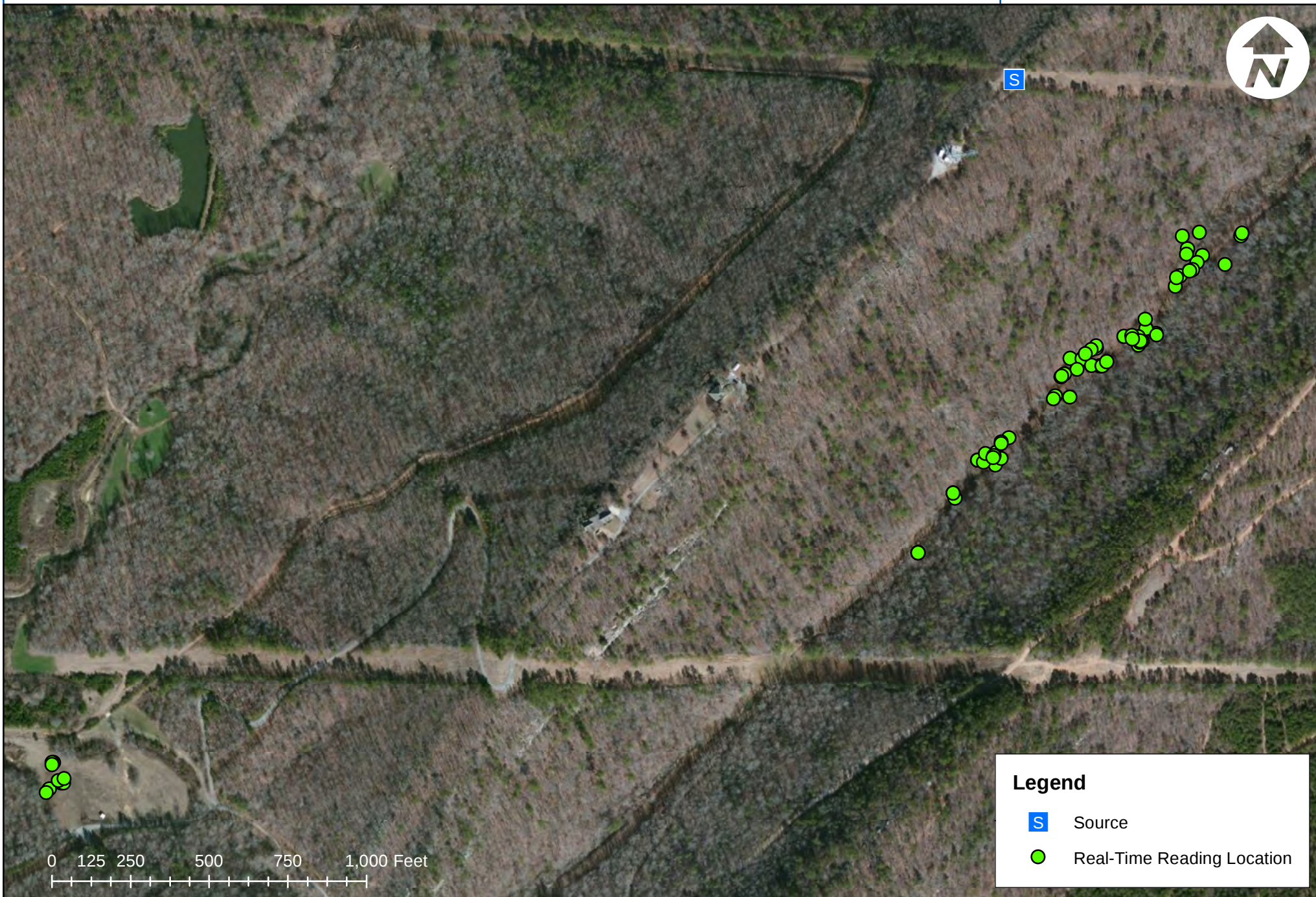
Legend

S Source



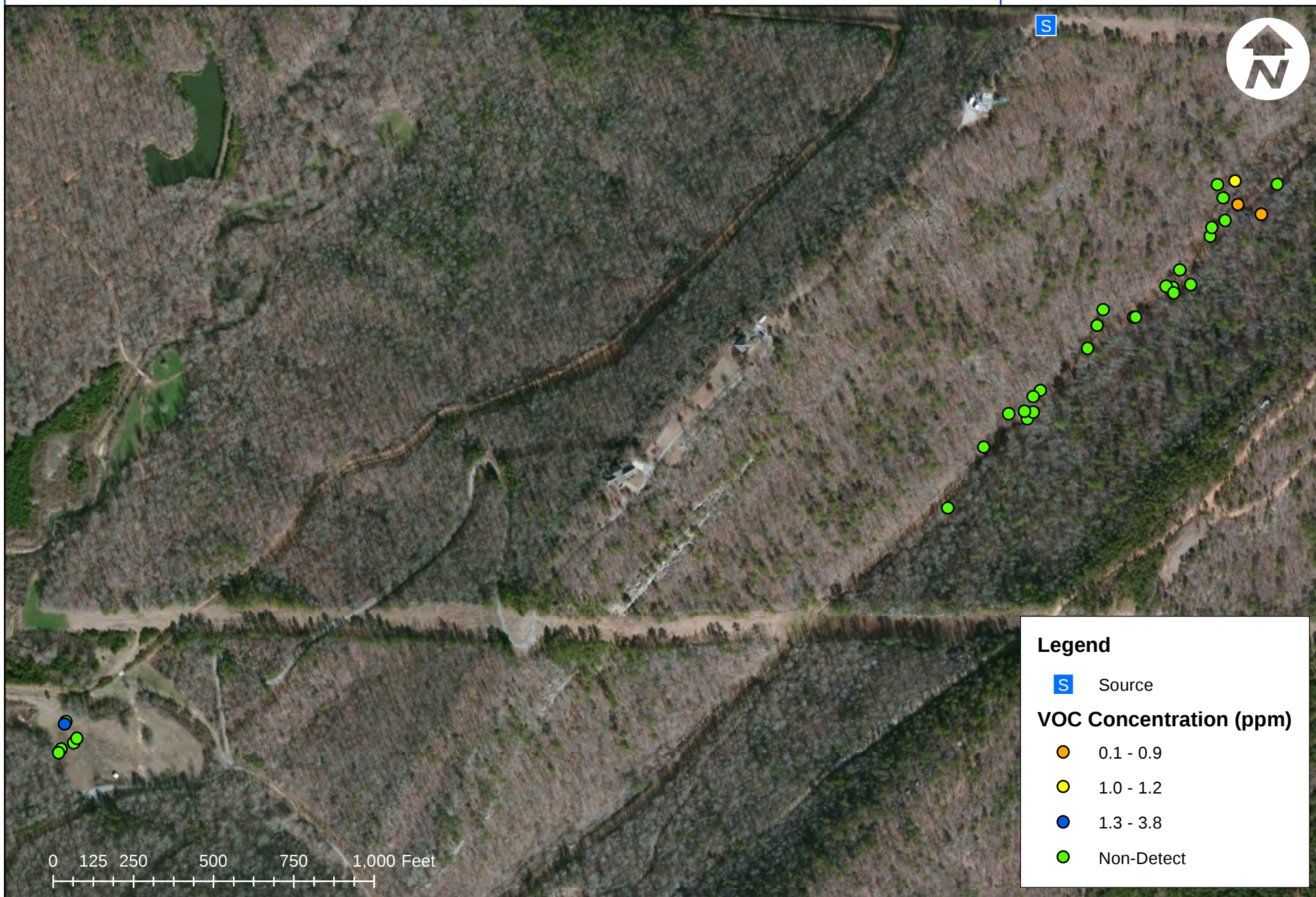
Legend

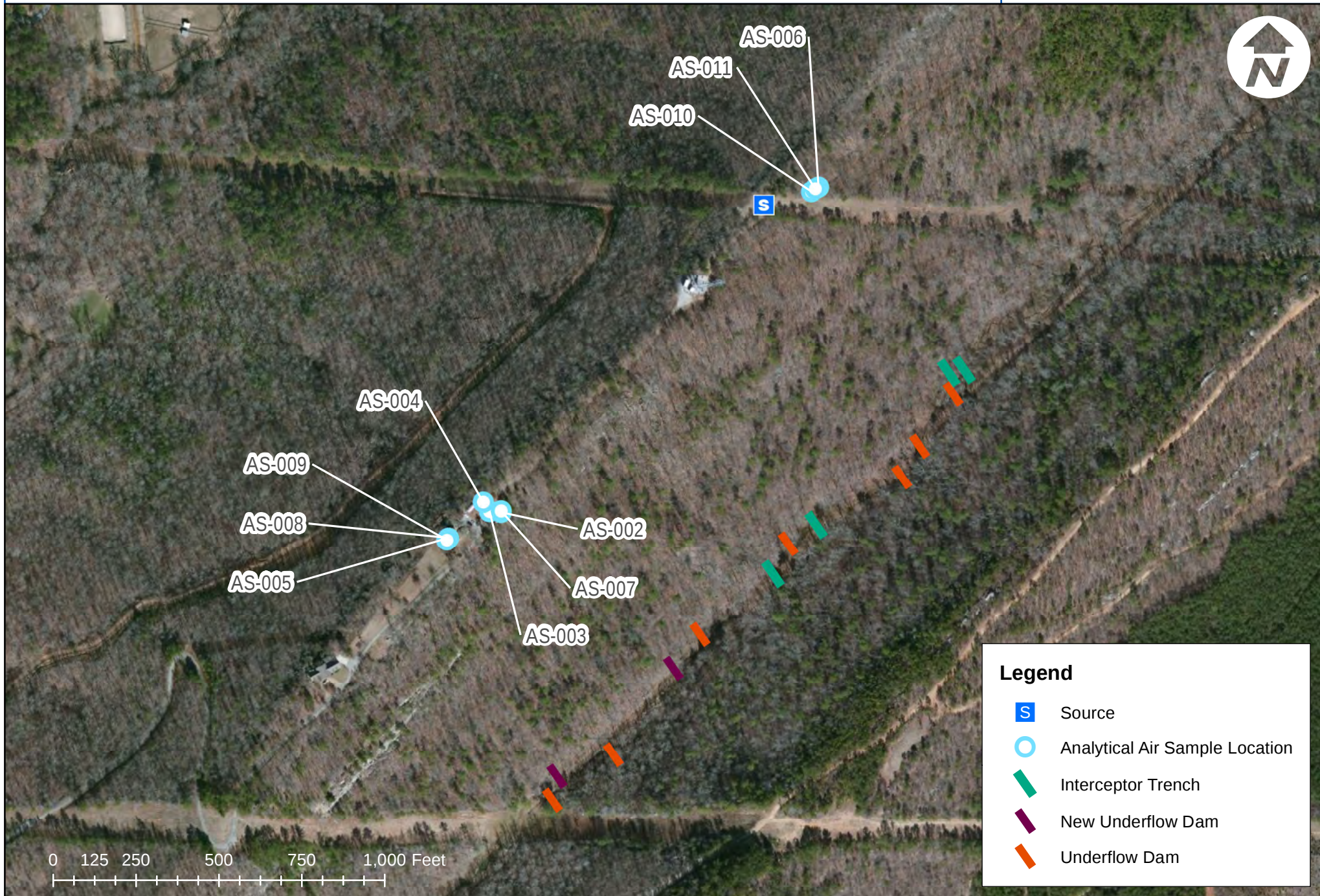
-  Source
-  AreaRAE Station
-  Interceptor Trench
-  New Underflow Dam
-  Underflow Dam



Legend

- S Source
- Real-Time Reading Location





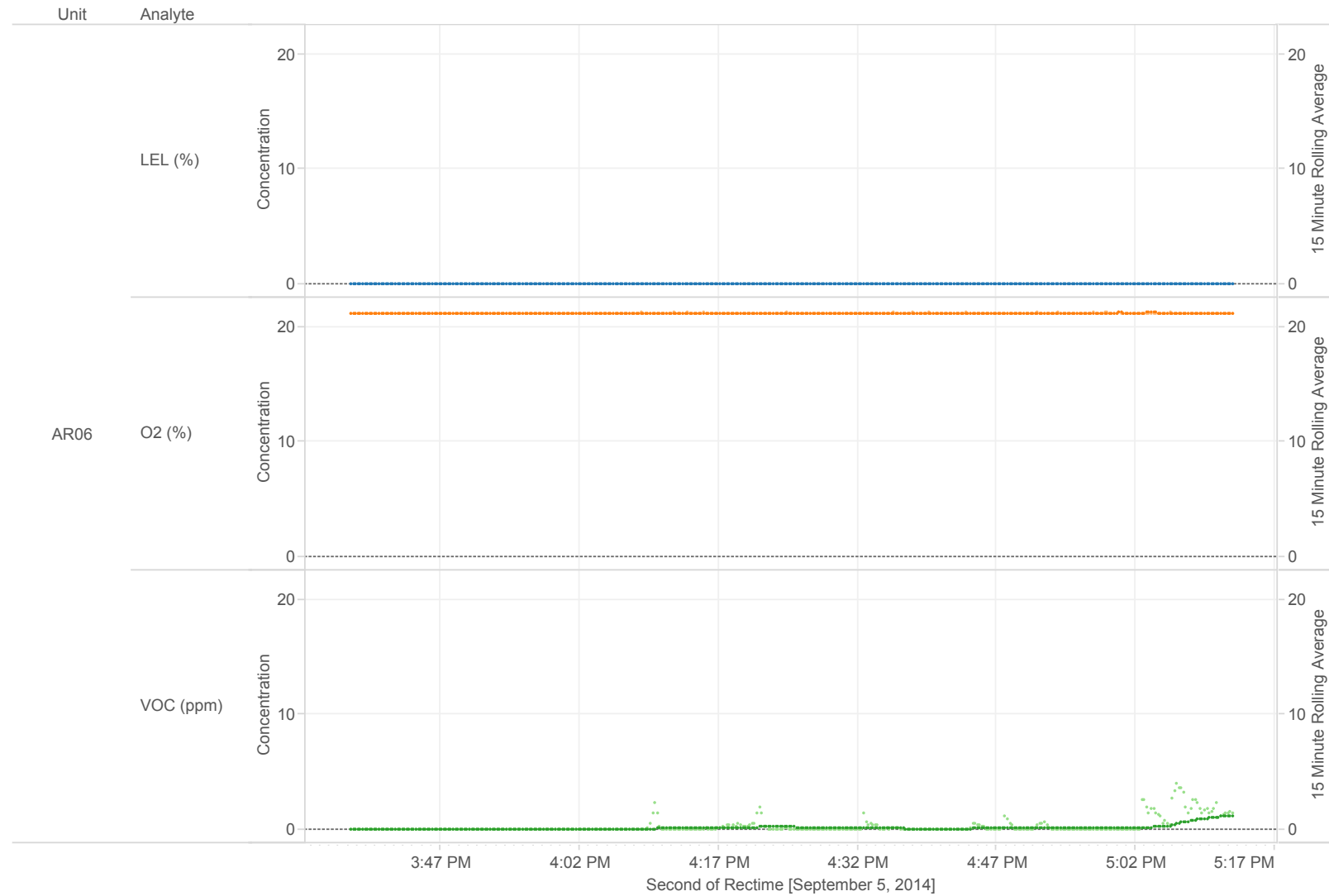
Legend

- S Source
- Analytical Air Sample Location
- Interceptor Trench
- New Underflow Dam
- Underflow Dam

Appendix B:

Remote-telemetry Air Monitoring Graphs

Remote-telemetry Air Monitoring - Double Oak Mountain, AL - 9/5/2014 15:00 - 9/5/2014 17:12

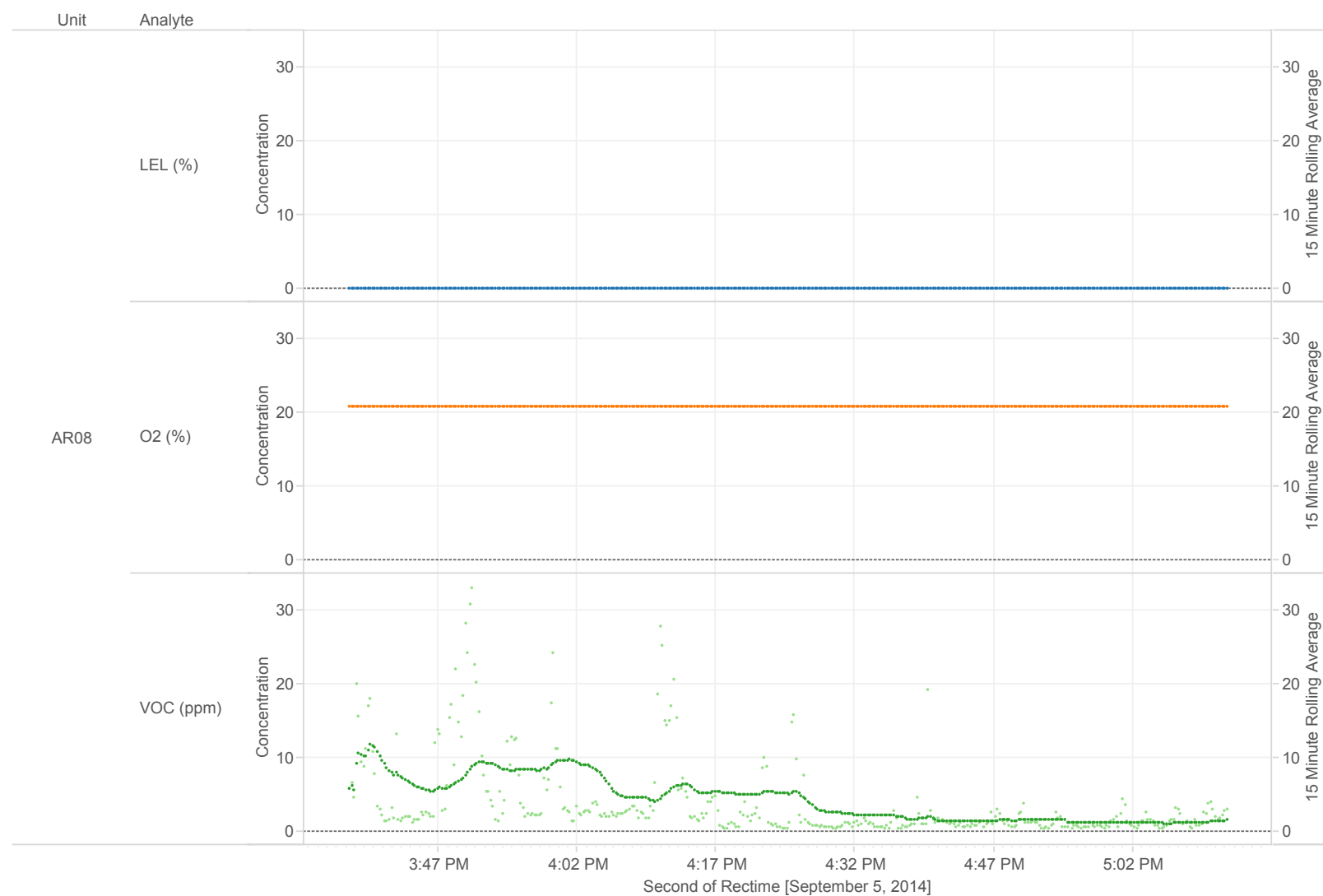


Please note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format

Analyte

- LEL (%), 15 Minute Rolling Average
- LEL (%), Concentration
- O2 (%), 15 Minute Rolling Average
- O2 (%), Concentration
- VOC (ppm), 15 Minute Rolling Average
- VOC (ppm), Concentration

Remote-telemetry Air Monitoring - Double Oak Mountain, AL - 9/5/2014 15:00 - 9/5/2014 17:12

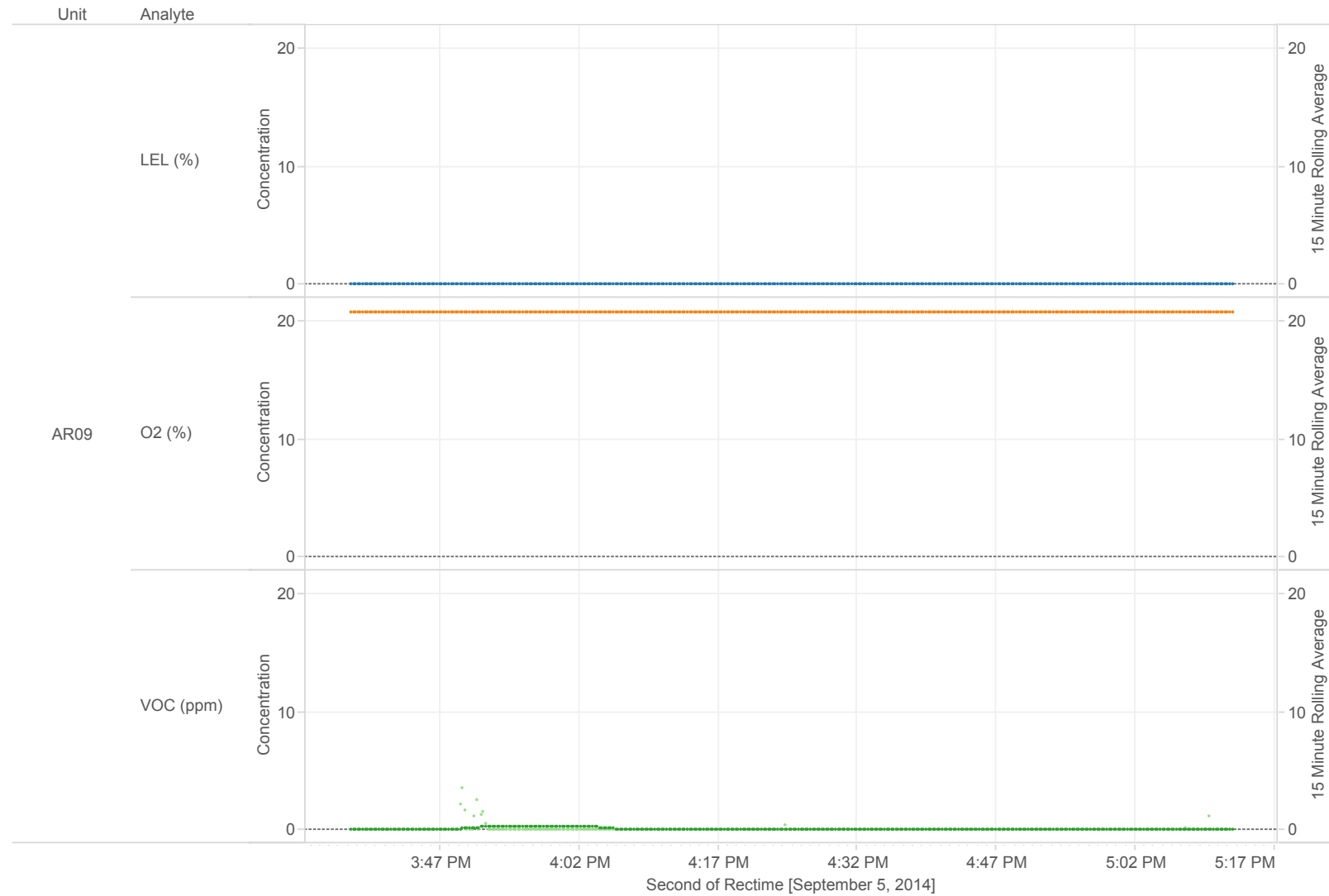


Please note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format

Analyte

- LEL (%), 15 Minute Rolling Average
- LEL (%), Concentration
- O2 (%), 15 Minute Rolling Average
- O2 (%), Concentration
- VOC (ppm), 15 Minute Rolling Average
- VOC (ppm), Concentration

Remote-telemetry Air Monitoring - Double Oak Mountain, AL - 9/5/2014 15:00 - 9/5/2014 17:12

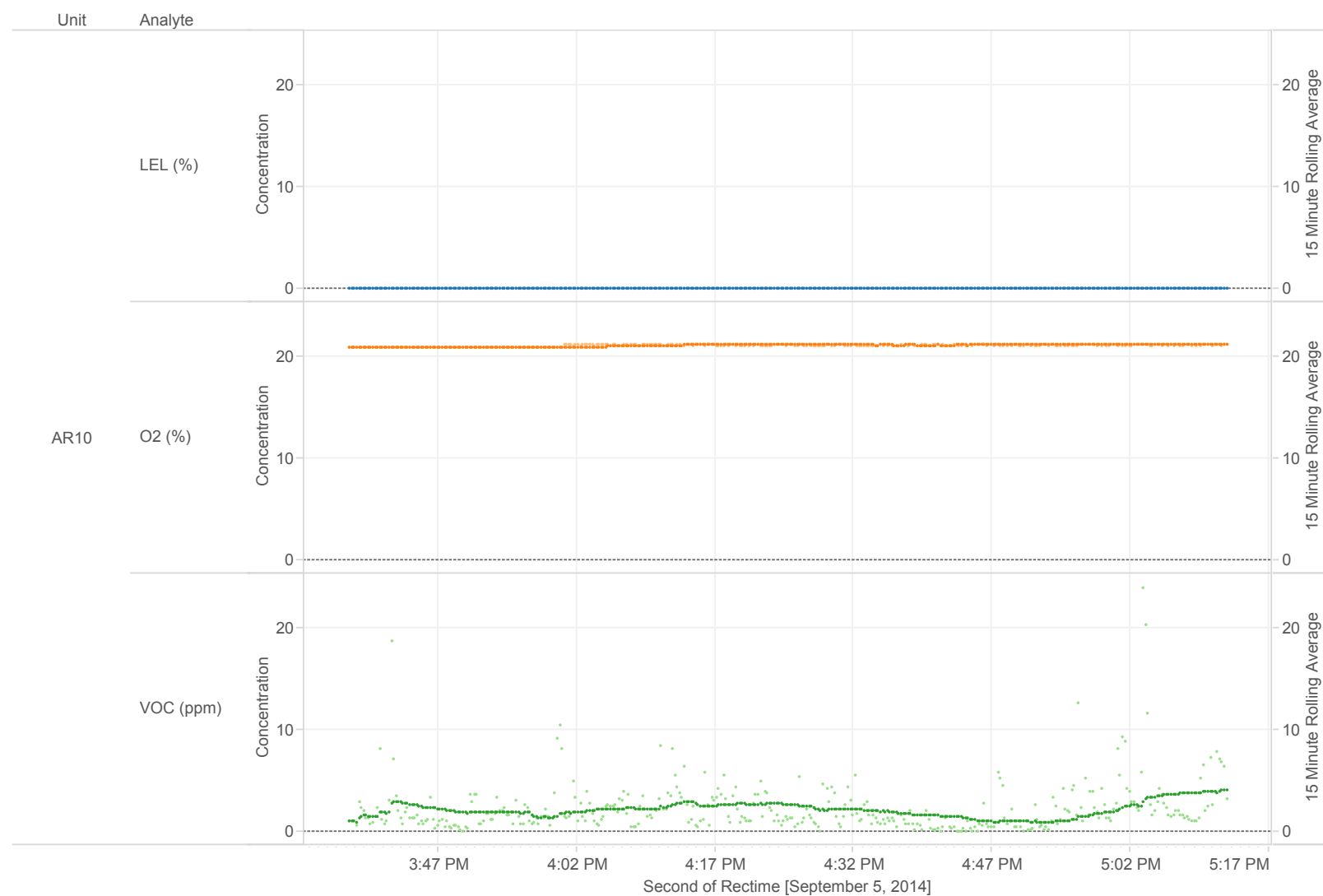


Please note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format

Analyte

- LEL (%), 15 Minute Rolling Average
- LEL (%), Concentration
- O2 (%), 15 Minute Rolling Average
- O2 (%), Concentration
- VOC (ppm), 15 Minute Rolling Average
- VOC (ppm), Concentration

Remote-telemetry Air Monitoring - Double Oak Mountain, AL - 9/5/2014 15:00 - 9/5/2014 17:12



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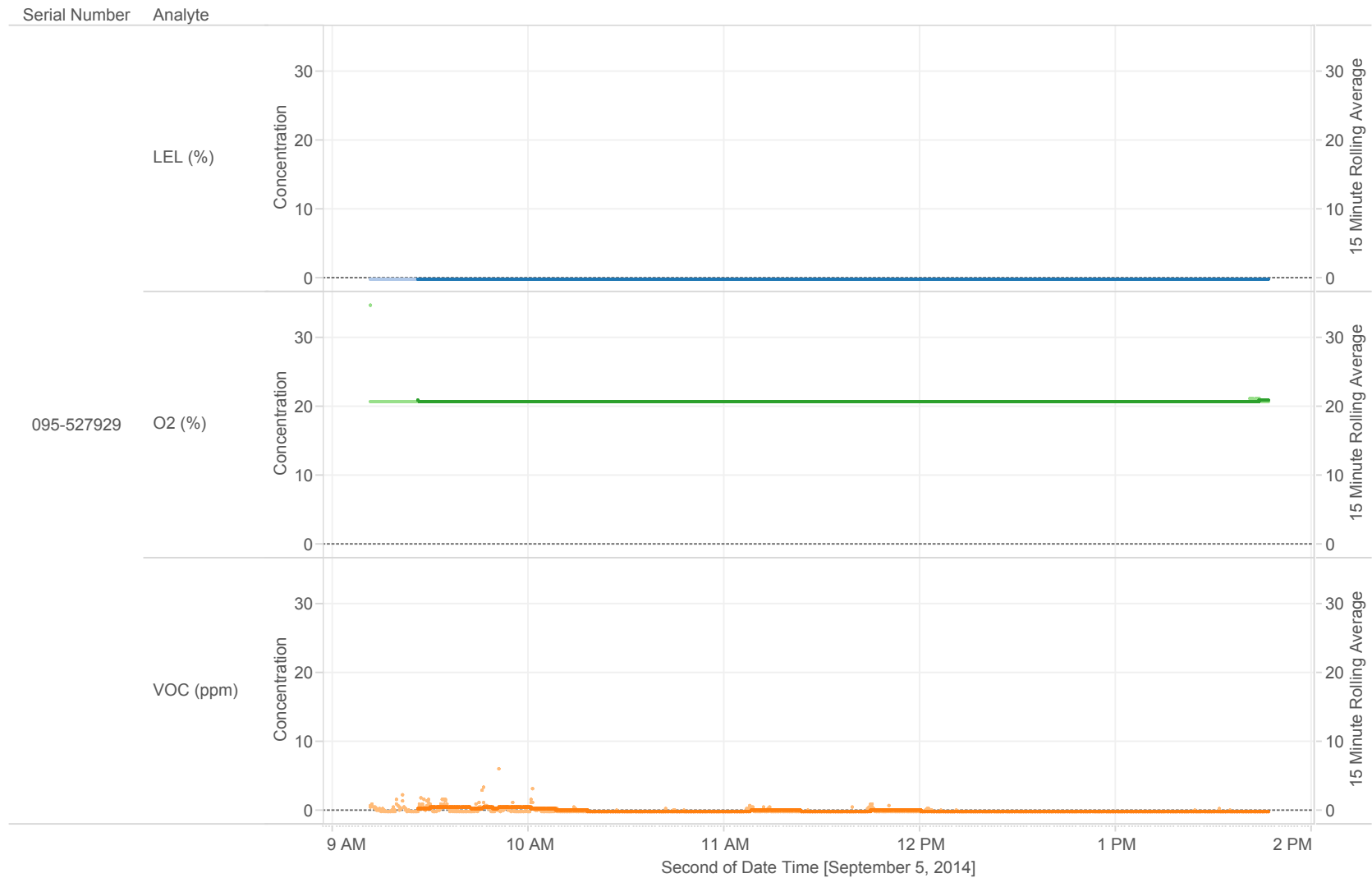
Analyte

- LEL (%), 15 Minute Rolling Average
- LEL (%), Concentration
- O2 (%), 15 Minute Rolling Average
- O2 (%), Concentration
- VOC (ppm), 15 Minute Rolling Average
- VOC (ppm), Concentration

Appendix C:

Data Logging Air Monitoring Graphs

MultiRAE Data Logging Air Monitoring - Double Oak Mountain, AL - 9/5/2014 08:41 - 9/5/2014 16:53

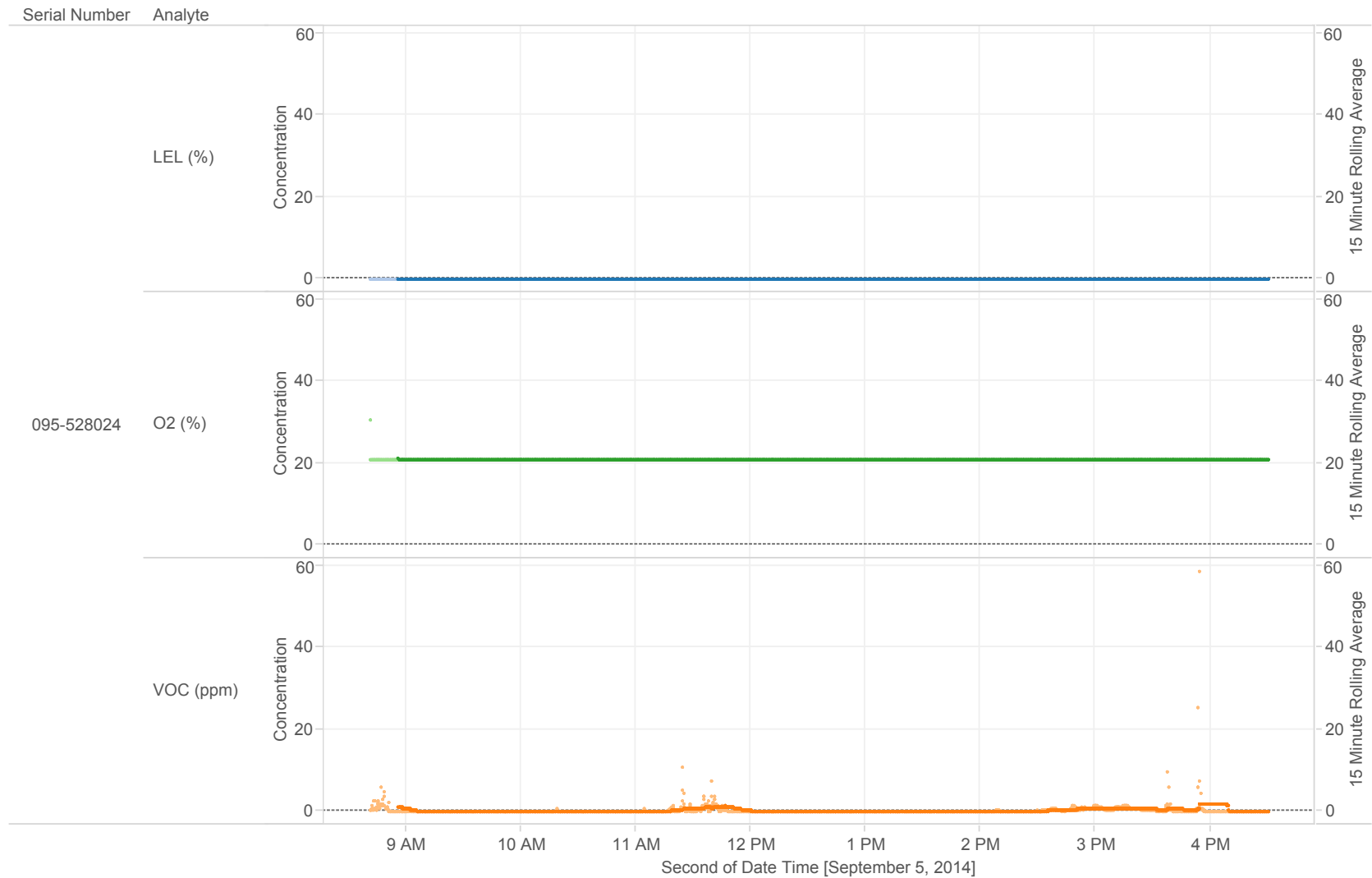


Please note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format

Analyte

- LEL (%), 15 Minute Rolling Average
- LEL (%), Concentration
- O2 (%), 15 Minute Rolling Average
- O2 (%), Concentration
- VOC (ppm), 15 Minute Rolling Average
- VOC (ppm), Concentration

MultiRAE Data Logging Air Monitoring - Double Oak Mountain, AL - 9/5/2014 08:41 - 9/5/2014 16:53

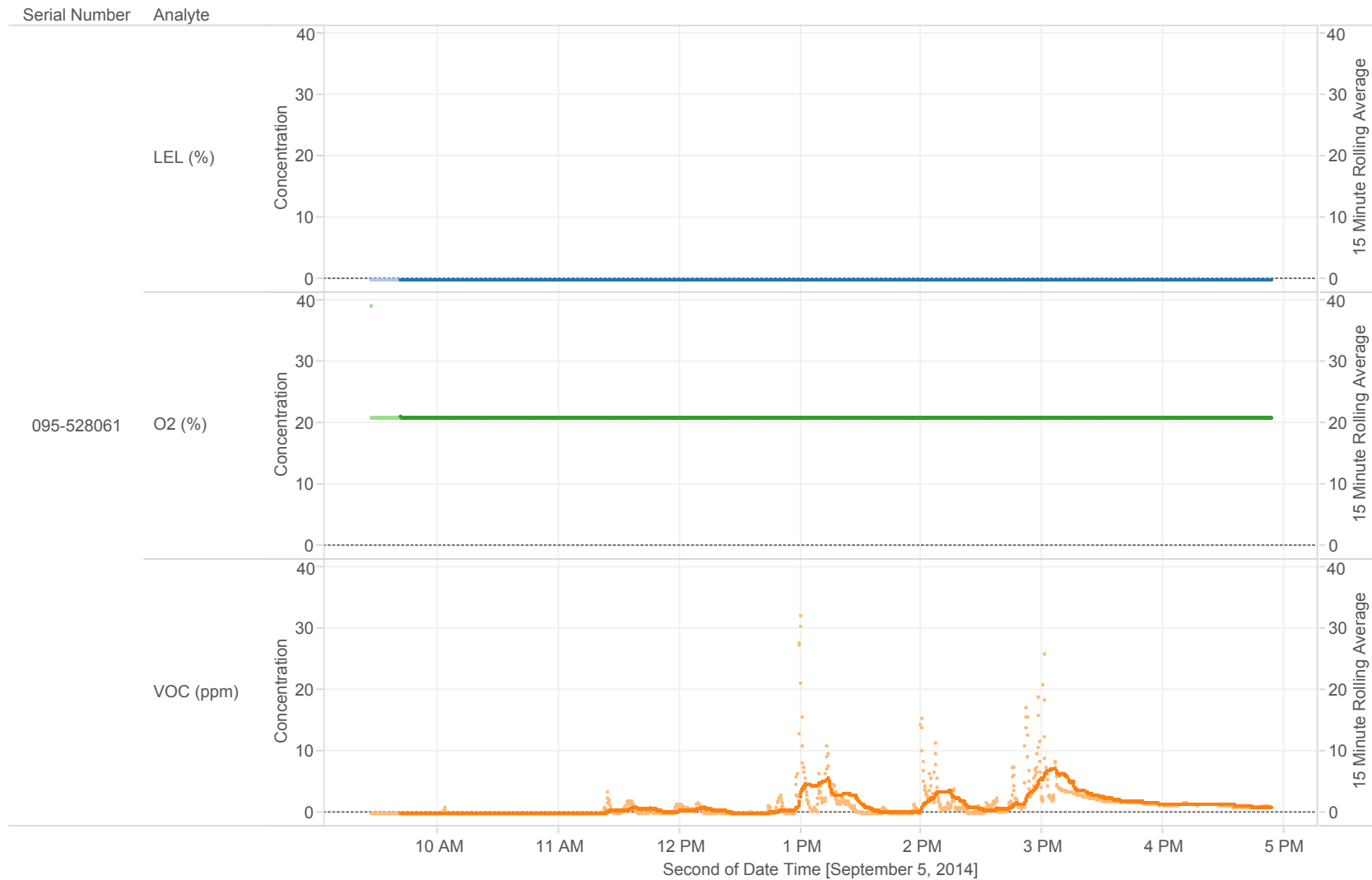


Please note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format

Analyte

- LEL (%), 15 Minute Rolling Average
- LEL (%), Concentration
- O2 (%), 15 Minute Rolling Average
- O2 (%), Concentration
- VOC (ppm), 15 Minute Rolling Average
- VOC (ppm), Concentration

MultiRAE Data Logging Air Monitoring - Double Oak Mountain, AL - 9/5/2014 08:41 - 9/5/2014 16:53



Please note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format

Analyte

- LEL (%), 15 Minute Rolling Average
- LEL (%), Concentration
- O2 (%), 15 Minute Rolling Average
- O2 (%), Concentration
- VOC (ppm), 15 Minute Rolling Average
- VOC (ppm), Concentration

Appendix D: Calibration Logs

