

Plantation Pipeline Gasoline Pipe Line Release
Double Oak Mountain, AL
Preliminary Summary of Air Monitoring Results
September 2, 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 1, 2014 15:00 to September 2, 2014 15:00.

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.

Table 1: Work Area - Manually-Logged Real-Time Air Monitoring Summary¹
September 1, 2014 15:00 – September 2, 2014 15:00

Analyte	Instrument	Number of Readings	Number of Detections	Average of Detections	Concentration Range
Benzene	UltraRAE	28	19	0.28 ppm	0.05 - 0.6 ppm
LEL	MultiRAE Plus	24	0	NA	<1 %
O ₂	MultiRAE Plus	18	18	20.9 %	20.9 - 20.9 %
VOC	MultiRAE Plus	42	36	7.7 ppm	0.3 - 57.4 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. 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 1, 2014 15:00 – September 2, 2014 15:00

Unit	Analyte	Number of Readings	Number of Detections	Average of Detections	Concentration Range
AR06	LEL	5643	14	2.3 %	1.1 - 3.5 %
	O ₂	5643	5643	20.9 %	20.9 - 21.2 %
	VOC	5643	3056	3.4 ppm	0.1 - 131.4 ppm
AR08	LEL	5191	0	NA	<1 %
	O ₂	5191	5191	20.9 %	20.9 - 20.9 %
	VOC	5191	4686	4.2 ppm	0.1 - 57.5 ppm
AR09	LEL	5624	0	NA	<1 %
	O ₂	5624	5624	20.9 %	20.9 - 21.3 %
	VOC	5624	3991	4.2 ppm	0.1 - 46.9 ppm
AR10	LEL	5578	2	3.3 %	3 - 3.6 %
	O ₂	5578	5578	20.9 %	20.3 - 21.2 %
	VOC	5578	3947	10.2 ppm	0.1 - 100.1 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 1, 2014 08:10 – September 1, 2014 18:25

Unit	Analyte	Number of Readings	Number of Detections	Average of Detections	Concentration Range
Excavation Operations					
095-527887 9/1 08:22 - 9/1 14:19	LEL	1423	409	2.7 %	0.1 - 34.3 %
	O ₂	1423	1423	20.9 %	20.5 - 20.9 %
	VOC	1423	1215	3.6 ppm	0.1 - 152.7 ppm
095-527929 9/1 14:39 - 9/1 17:36	LEL	710	0	NA	<1 %
	O ₂	710	710	20.9 %	20.9 - 20.9 %
	VOC	710	692	15.1 ppm	0.1 - 141.3 ppm
Vac Operations					
095-527231 9/1 08:10 - 9/1 09:42	LEL	372	0	NA	<1 %
	O ₂	372	372	20.9 %	20.9 - 20.9 %
	VOC	372	181	2.9 ppm	0.1 - 46.5 ppm
095-527944 9/1 08:37 - 9/1 18:25	LEL	2355	0	NA	<1 %
	O ₂	2355	2355	21.0 %	20.9 - 21.3 %
	VOC	2355	438	3.1 ppm	0.1 - 42.7 ppm

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

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
8/27/2014	WB3166	490	0.04	<0.08	<0.36	0.2	0.25	<0.27
	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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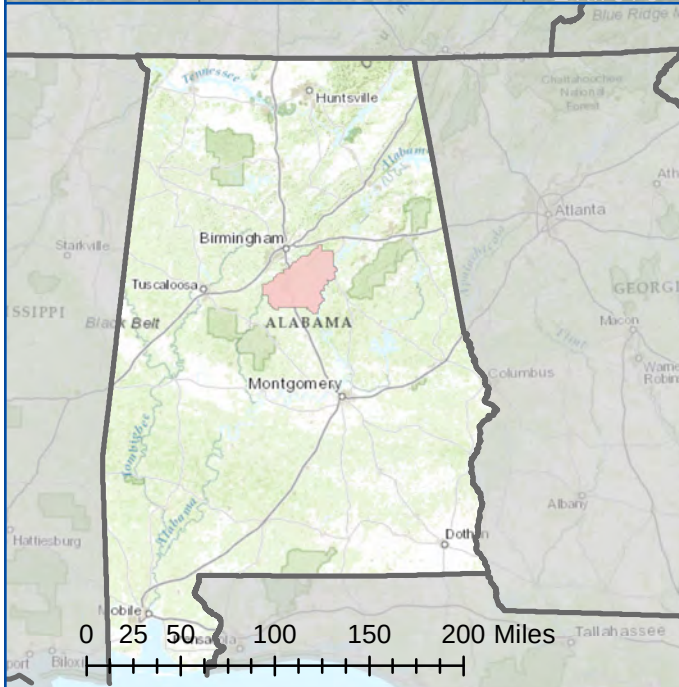
²Maximum detections preceded by the "<" symbol are considered non-detects at or above reporting limit value to the right.

* - 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.

Appendix A: Incident Maps



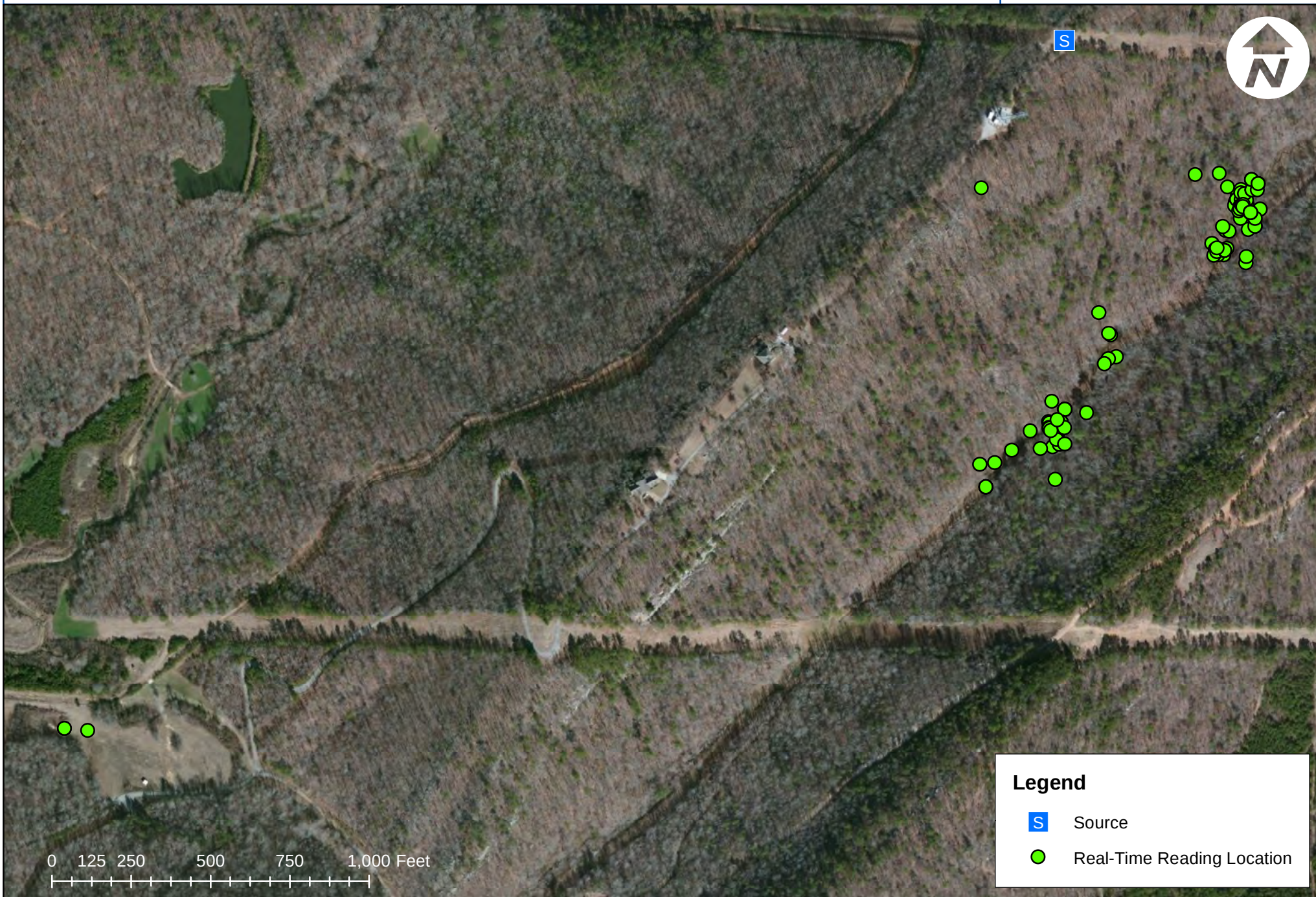
Legend

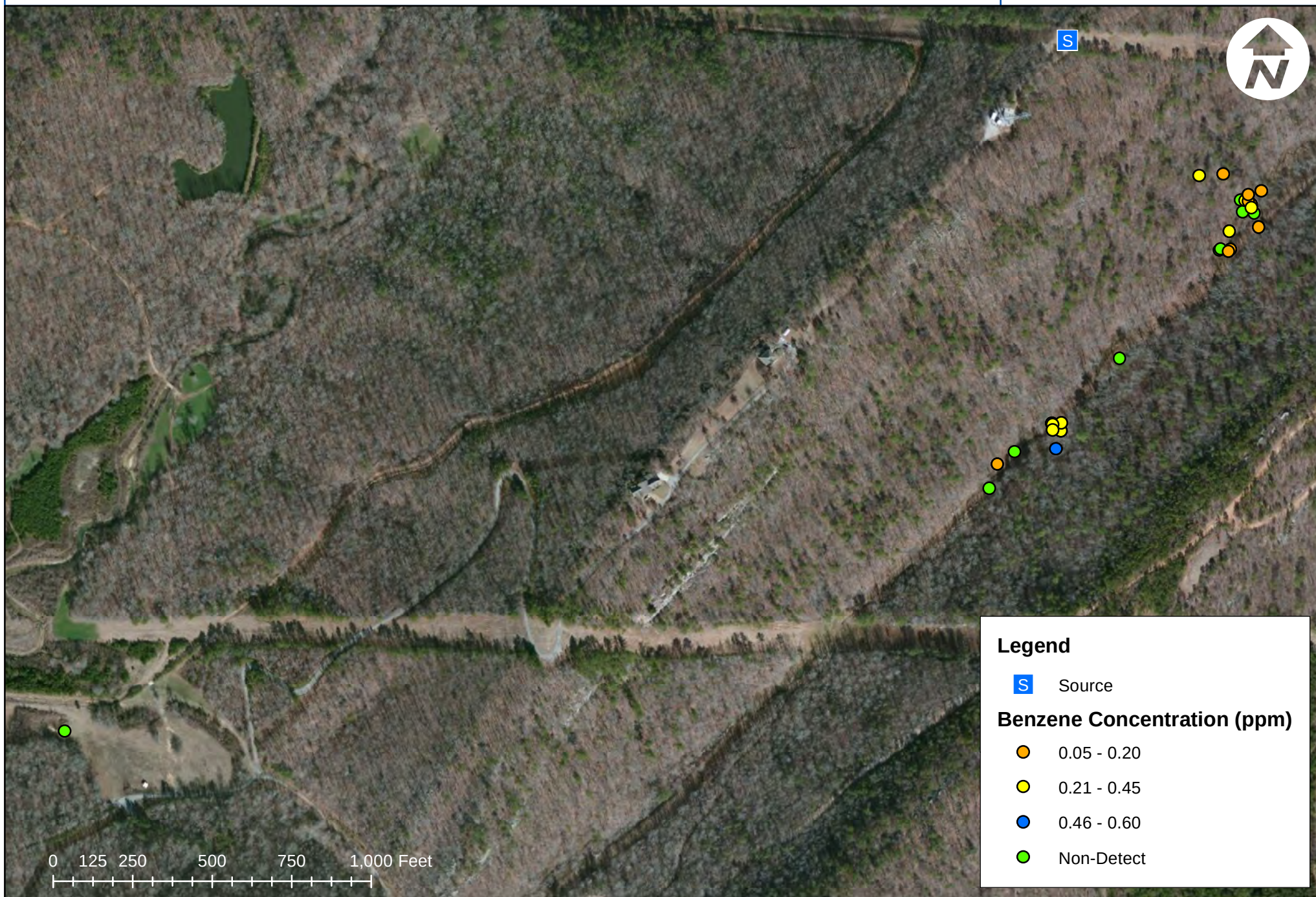
S Source

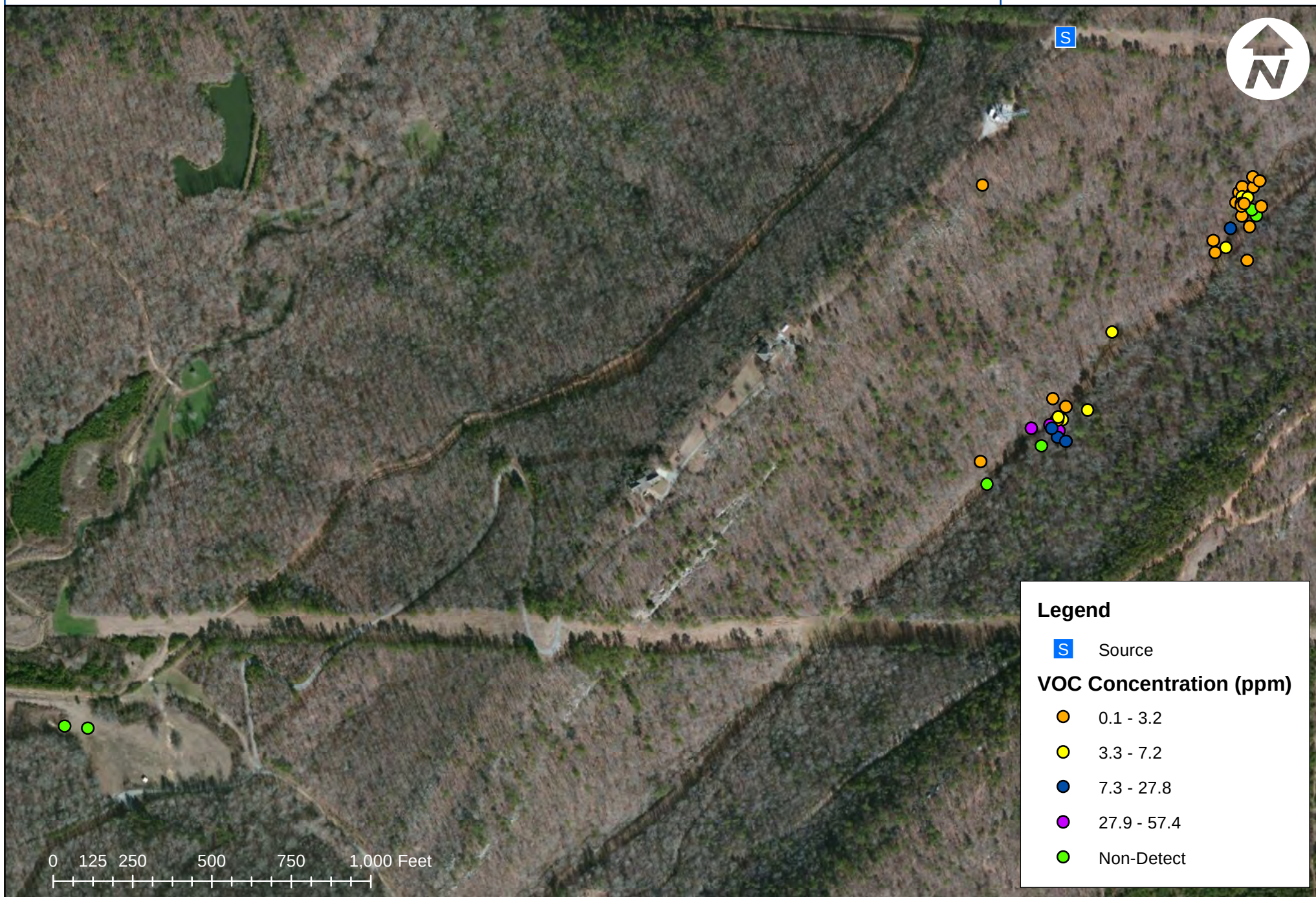


Legend

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

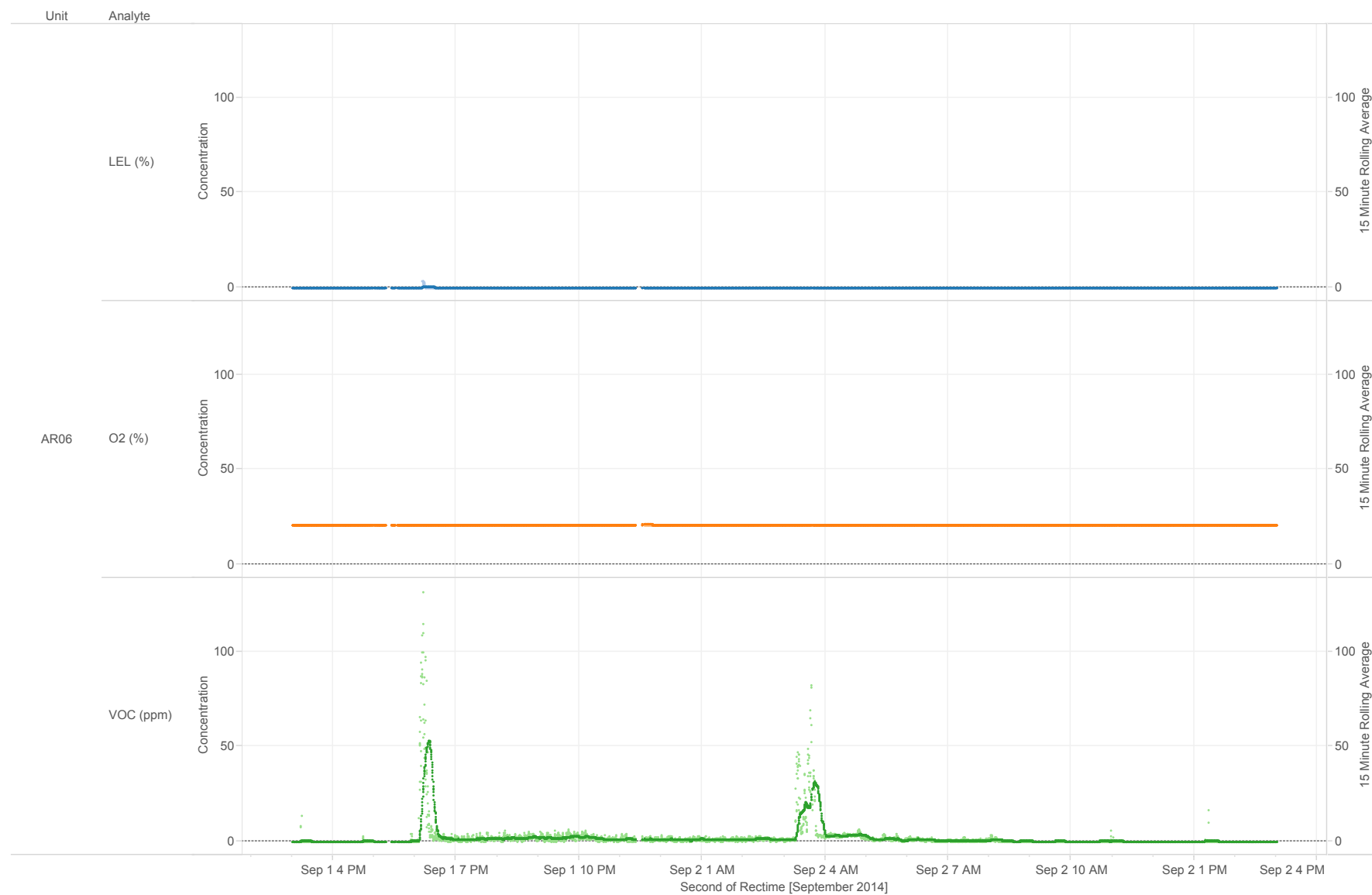






Appendix B: Remote-telemetry Air Monitoring Graphs

Remote-telemetry Air Monitoring - Double Oak Mountain, AL - 9/1/2014 15:00 - 9/2/2014 15:00

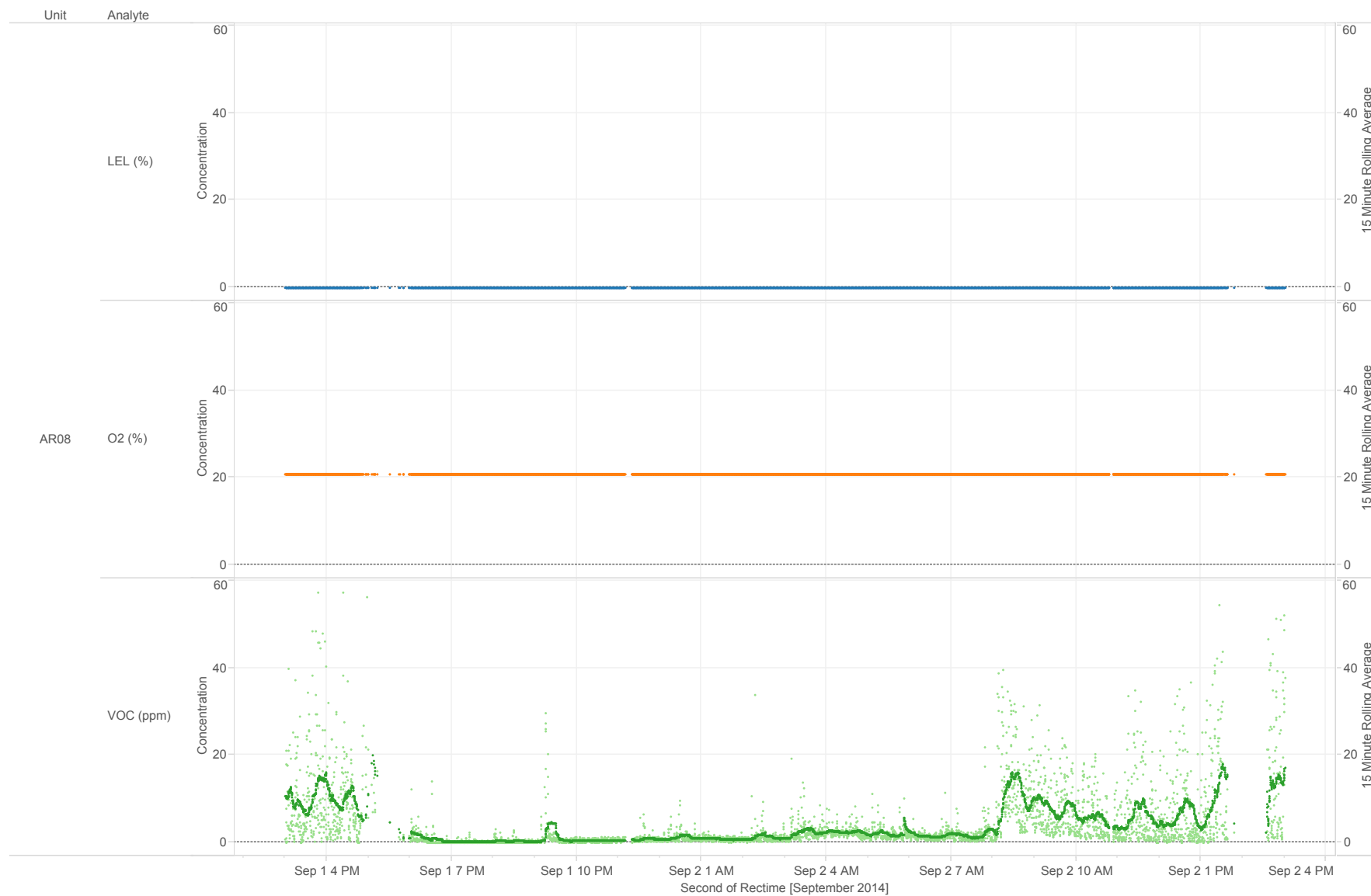


Please note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format

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 - 9/1/2014 15:00 - 9/2/2014 15:00

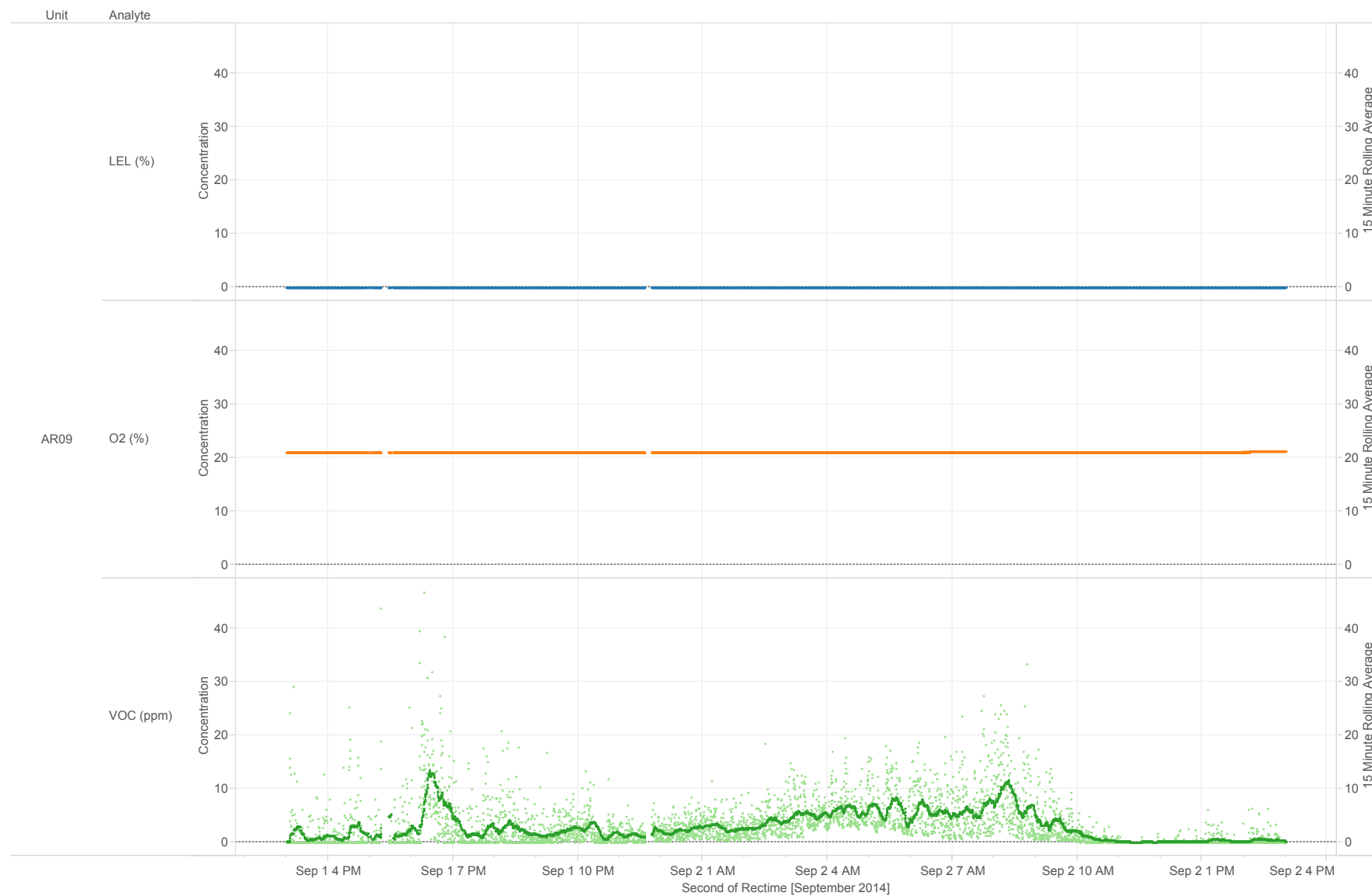


Please note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format

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 - 9/1/2014 15:00 - 9/2/2014 15:00

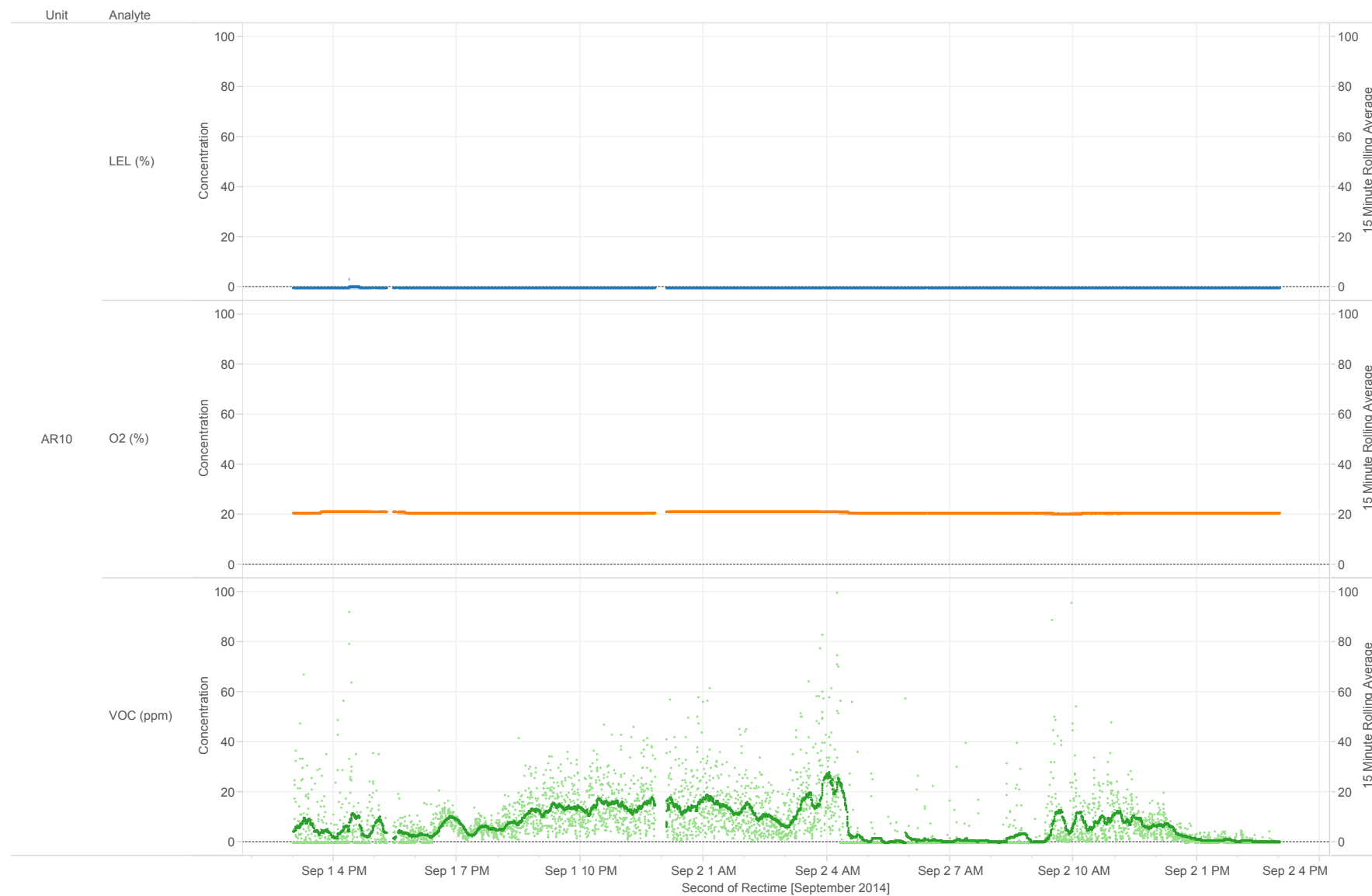


Please note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format

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 - 9/1/2014 15:00 - 9/2/2014 15:00



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

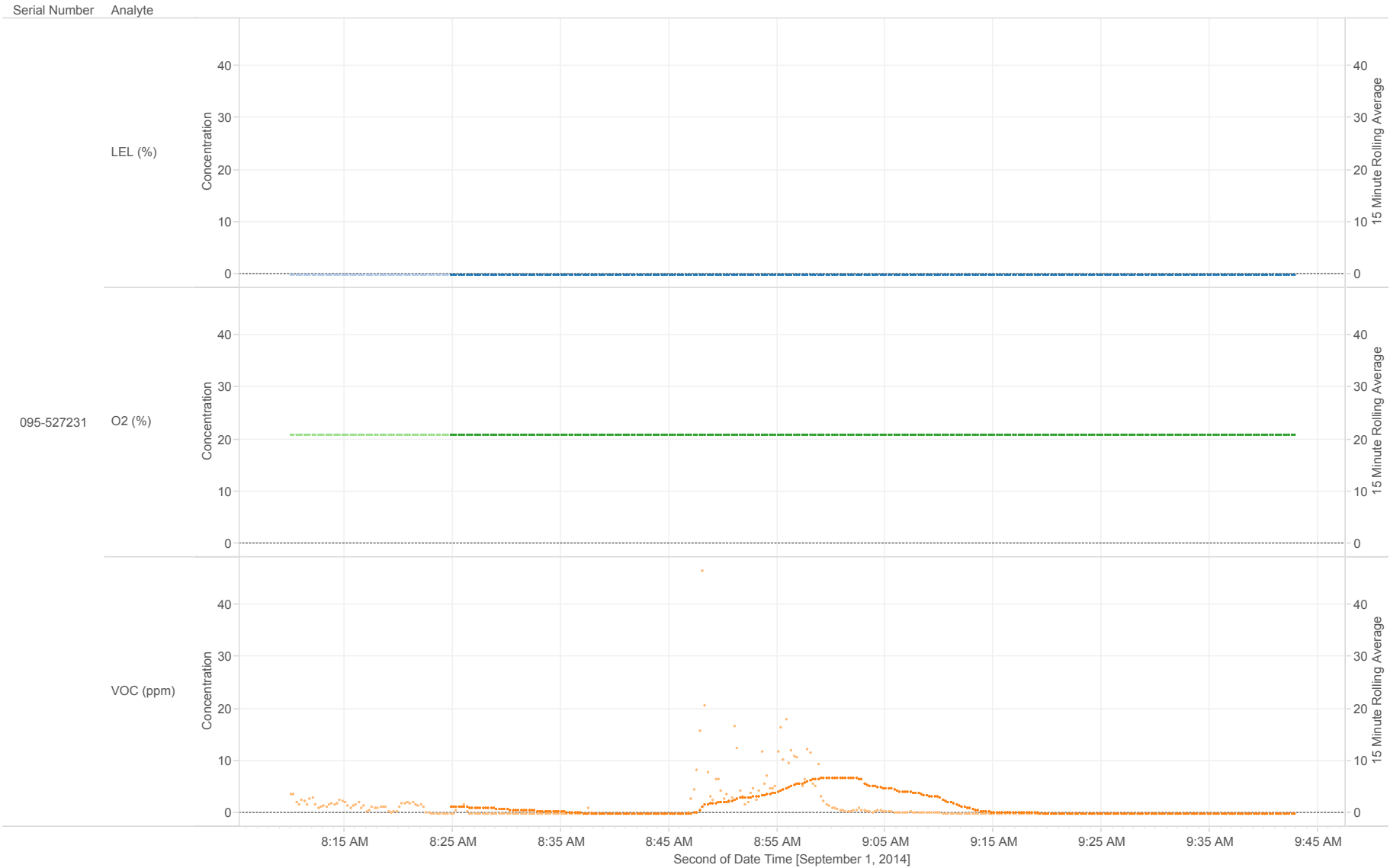
Analyte

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

Appendix C:

Data Logging Air Monitoring Graphs

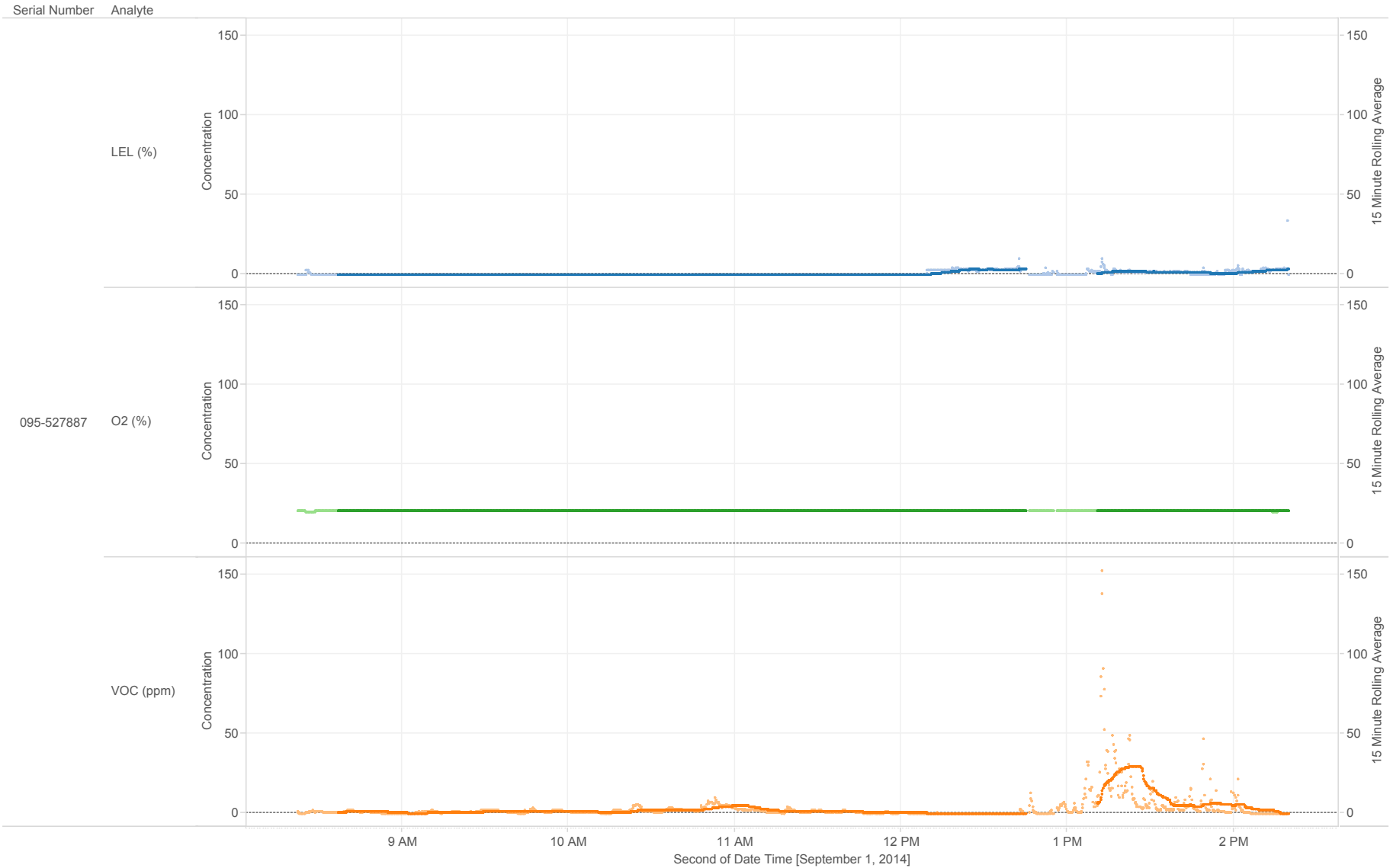
MultiRAE Data Logging Air Monitoring - Double Oak Mountain, AL - 9/1/2014 08:10 - 9/1/2014 18:25



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

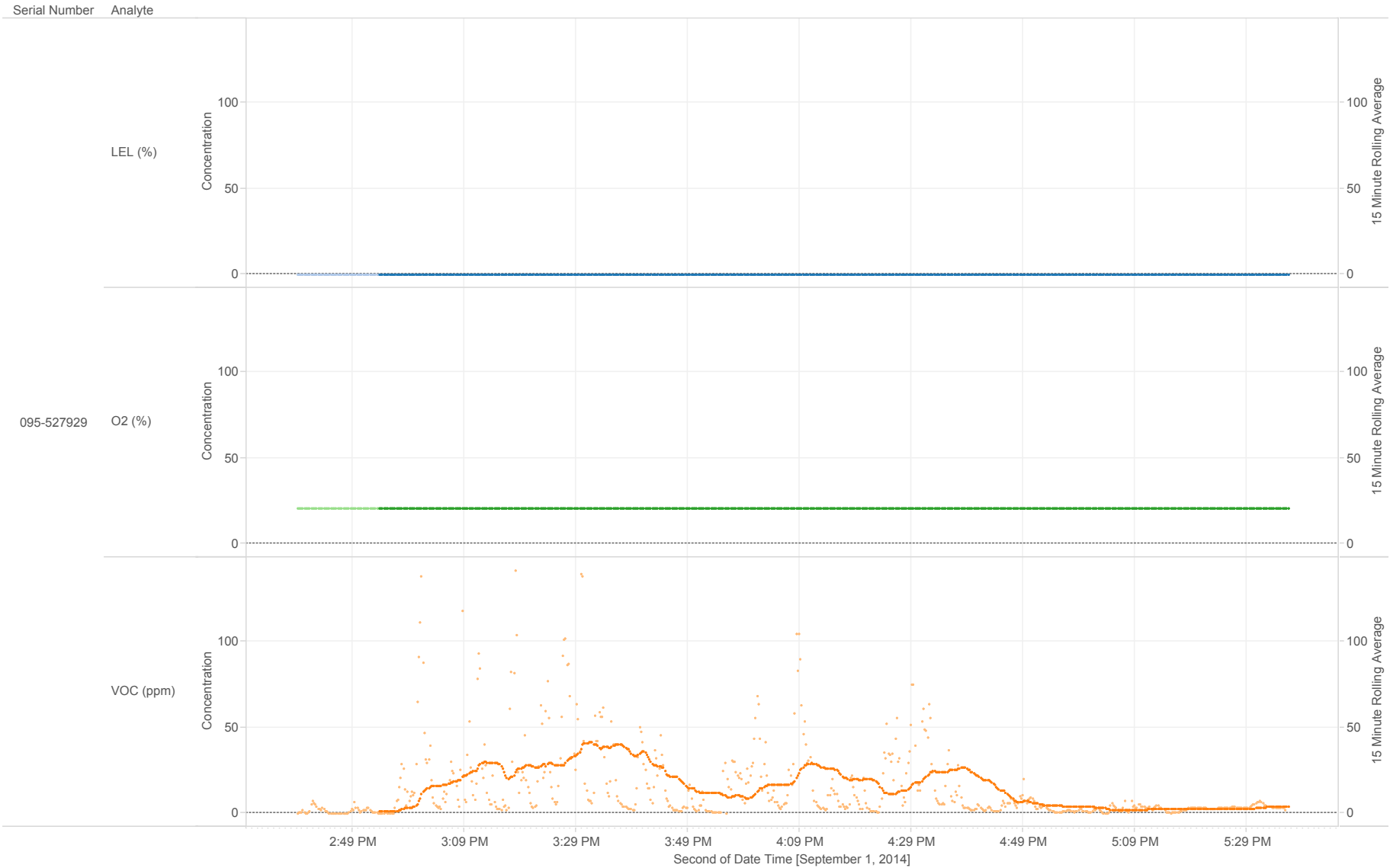
MultiRAE Data Logging Air Monitoring - Double Oak Mountain, AL - 9/1/2014 08:10 - 9/1/2014 18:25



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

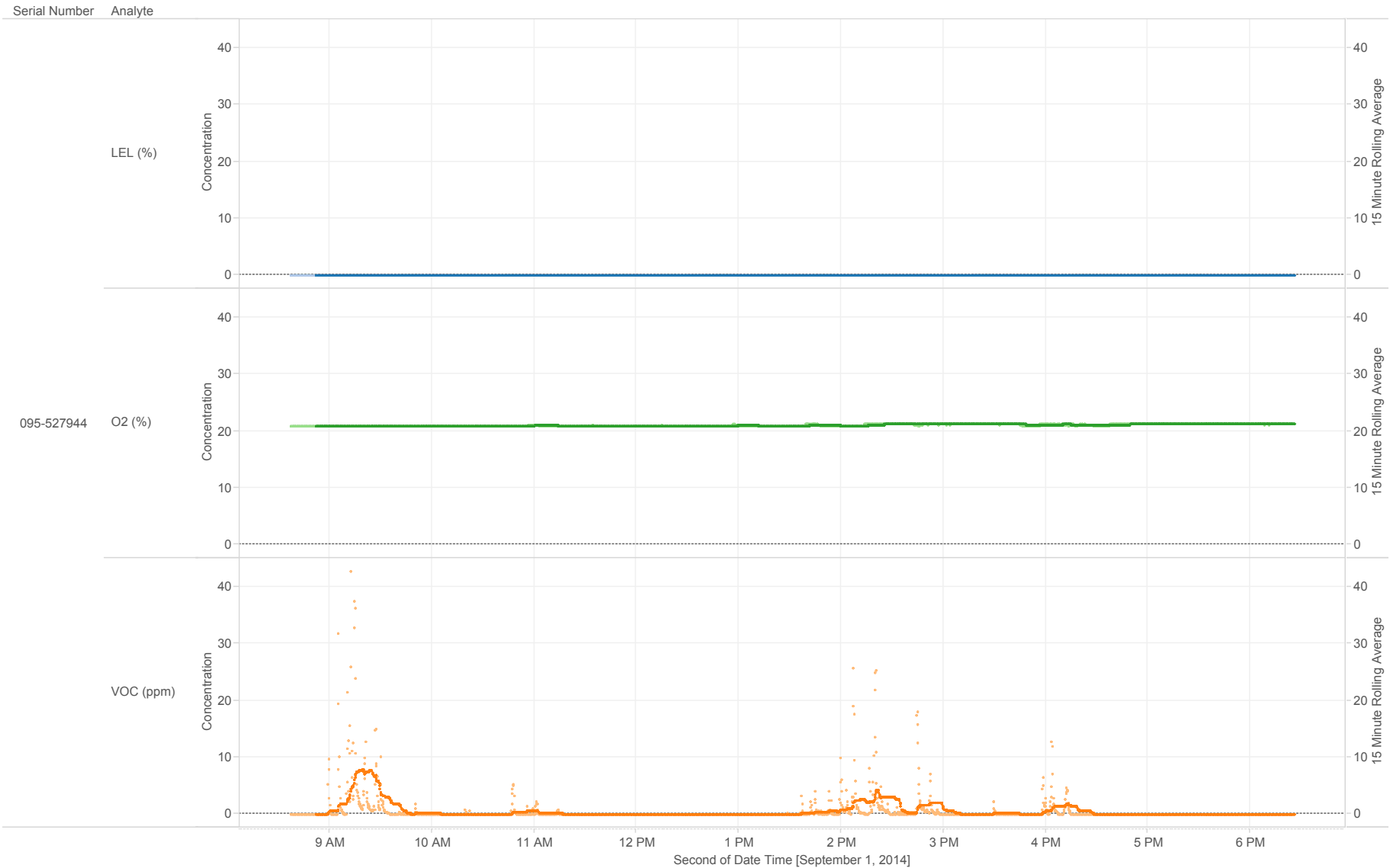
MultiRAE Data Logging Air Monitoring - Double Oak Mountain, AL - 9/1/2014 08:10 - 9/1/2014 18:25



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 - 9/1/2014 08:10 - 9/1/2014 18:25



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

Calibration Log

Date	Time	Instrument	Serial Number	Cal Gas	Concentration	Lot Number	Expiration/ Mfg. Date	Calibrated By
8/31	23:02	AR08	292-504133	ISO Quad N	100ppm 50%LEL 99.9%	971552 970235 967338	8/17 7/16 6/17	AR
	23:17	AR06	292-500716					AR
	23:29	AR09	292-504109					AR
	23:45	AR10	292-504111					AR
9/1	02:22	MRT+	095-527231	ISO Quad N	100ppm 50%LEL 99.9%	971552 970235 967338	8/17 7/16 6/17	AR
			095-528024					
	0232	UltraPac	596-901284	Benzene	5ppm	956764	4/16	AR
			596-905842					
9/1	0530	AB Pac	594-901451	ISO	10ppm	962691	12/15	AR
			594-901471					
9/1	0607	MRT+	095-527887	ISO Quad N	100ppm 50%LEL 99.9%	971552 970235 970543	8/17 7/16 7/17	AR
			095-528039					
			095-527944					
			095-527929					
			095-528161					
			095-527915		100ppm 50%LEL			
9/1	2307	AR8	292-504133	ISO Quad N	100ppm 50%LEL 99.9%	971552 970235 967338	8/17 7/16 6/17	AR
	2321	AR06	292-500716					

Project# 106608

Client Plannetec

Location Pellham, AL

Calibration Log

Date	Time	Instrument	Serial Number	Cal Gas	Concentration	Lot Number	Expiration/ Mfg. Date	Calibrated By
9/1	2336	AR09	292504108	ISO Quad N	100ppm 50%LEL 99.9%	958159 910235 967133	8/17 7/14 6/17	AR
1	2347	AR10	292504111	1	1	1	1	1
9/2	0204	MRT	045527807	1	1	1	1	AR
1	0252	UltraPac	596-901284	Benzene	5ppm	956564	4/16	AR
9/2	0325	PPB Pac	594-901471	ISO	10ppm	962691	12/15	AR
1	1	1	594-901451	1	1	1	1	1
1	0334	UltraPac	596-908842	Benzene	5ppm	968564	5/17	AR
9/2	0403	MRT	045-528024	ISO Quad N	100ppm 50%LEL 99.9%	958159 910235 910543	4/16 7/14 7/17	AR
1	0407	1	045-528061	1	1	1	1	1
1	0411	1	045-527231	1	1	1	1	1
1	0415	1	045-527944	1	1	1	1	1
1	0421	MRT	045-528039	ISO Quad N	100ppm 50%LEL 99.9%	958159 910235 910543	4/16 7/14 7/17	AR
1	0425	1	045-527929	1	1	1	1	1
9/2	0440	045-527915	MRT	1	1	1	1	AR
9/2	1100	UltraPac	596-901157	Benzene	5ppm	956564	4/16	SC

Project# 106608

Client Plantation

Location Pellham, AL