
**Site Specific Conditional Sampler
Garfield County, Colorado**

VOC Data Summaries

Prepared for

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A decorative graphic at the bottom left of the page consists of three stylized mountain peaks in shades of green and blue.

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION	1-1
2.0 SAMPLE COLLECTION AND ANALYSIS	2-1
3.0 OPERATIONAL SUMMARY	3-1
4.0 DATA SUMMARIES	4-1
APPENDIX A Lab Results	A-1

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1-1 Map showing location of the general sampling area	1-2
1-2 Photo of upwind conditional sampler system	1-3
1-3 Photo of downwind conditional sampler system	1-3
1-4 Photo of example canister	1-4
4-1 Measured SNMOC Concentrations	4-2
4-2 Meteorological Time Series Plot – Upwind Sampler April 2018	4-3
4-3 Meteorological Time Series Plot – Downwind Sampler April 2018	4-4
4-4 Meteorological Time Series Plot – Upwind Sampler May 2018	4-5
4-5 Meteorological Time Series Plot – Downwind Sampler May 2018	4-6
4-6 Meteorological Time Series Plot – Upwind Sampler June 2018	4-7
4-7 Meteorological Time Series Plot – Downwind Sampler June 2018	4-8
4-8 Wind Rose – Upwind Sampler April 2018	4-9
4-9 Wind Rose – Downwind Sampler April 2018	4-10
4-8 Wind Rose – Upwind Sampler May 2018	4-11
4-8 Wind Rose – Downwind Sampler May 2018	4-12
4-8 Wind Rose – Upwind Sampler June 2018	4-13
4-9 Wind Rose – Downwind Sampler June 2018	4-14

LIST OF TABLES

<u>Table</u>	<u>Page</u>
3-1 Operational Summary	3-1

1.0 INTRODUCTION

In response to citizen concerns, Garfield County Public Health contracted with Air Resource Specialists, Inc. (ARS) to design and build a conditional sampler to collect canister samples near a newly developed well-pad operated by URSA Operating Company, LLC.

Figure 1-1 presents a map showing the general location of URSA operations and the monitoring location. Figures 1-2 and 1-3 show photographs of the sampling systems. This data submittal report summarizes Speciated Non-Methane Organic Compounds (SNMOC) measured at the URSA site.

Any questions regarding the content of this report or the accompanying digital data files should be addressed to:

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Figure 1-1. Map Showing General Location of the Sampling Area.



Figure 1-2. Upwind Conditional Sampler



Figure 1-3. Downwind Conditional Sampler



Figure 1-4. Example Summa Canister

2.0 SAMPLE COLLECTION AND ANALYSIS

Methodologies for the collection and analysis of Volatile Organic Compounds (VOC) at the URSA site specific conditional monitoring site meet EPA's *Compendium of Methods for Determination of Toxic Organic Compounds in Ambient Air*.

Speciated compounds are analyzed from samples collected using a SUMMA® stainless steel canister following EPA's Compendium Method TO-12, *Determination of Non-Methane Organic Compounds (NMOC) in Ambient Air Using Cryogenic Preconcentration and Direct Flame Ionization Detection (PDFID)*. Collected samples are sent to Eastern Research Group, Inc. (ERG) for analysis.

Two sampling systems collect ambient air samples when specific wind speed and direction conditions are present. The samplers operate when prevailing winds are from the southwest (215°- 235°), collecting upwind samples not likely associated with activities from the well pad using one system, and collecting downwind samples likely to be influenced by well pad activity using the other system.

For this study, each sample comprises at least a seven day period to ensure sufficient collection for VOC identification. Following exposure, samples were collected by Garfield County Public Health site operators and shipped directly to ERG for analysis. Chain-of-custody accounting is fully documented by shipping records, shipping logs, and field sampling log sheets, maintained by Garfield County Public Health. ERG performs sample analysis and data validation for samples per EPA method TO-12 requirements and provides validated data to ARS for inclusion in reports, data submittals and archives.

3.0 OPERATIONAL SUMMARY

The operational timelines for the canister samples for the reporting period are summarized in Table 3-1. The summaries include sampling times, site visits and significant events affecting data collection.

Table 3-1
Sampler Operational Timeline
April – June 2018

Month/Year	Upwind Canister Total Sampling Time	Downwind Canister Total Sampling Time
April 2018	646 minutes	639 minutes
April 17, 2018		Grab Sample
May 2018	614 minutes	628 minutes
June 2018	361 minutes	554 minutes

4.0 DATA SUMMARIES

Volatile organic compounds (VOCs) are carbon-based and hydrogen-based chemicals that exist in the gas phase or can evaporate from liquids. VOCs can react in the atmosphere to form ozone (O₃) and particulate matter. Hazardous air pollutants (HAPs) are a subset of VOC compounds, and include compounds that are known or believed to cause human health effects. Speciated Non-Methane Organic Compounds (SNMOC) are collected and analyzed according to EPA Compendium Method TO-12.

SNMOC compounds can be grouped into classifications with similar characteristics. For summary purposes, measured SNMOC compounds are grouped into the following categories:

- **Light Alkanes:** Alkanes are the simplest hydrocarbons, consisting of only carbon and hydrogen with single bonds. Light alkanes, which include alkanes with up to five carbon atoms (ethane, propane, iso/n-butane and iso/n-pentane), along with methane, are primary components of natural gas and gasoline vapors.
- **Heavy Alkanes:** The hydrocarbons in crude oil are mostly heavy alkanes, which here include alkanes with more than five carbon atoms (C₅). Crude oil products include gasoline, a refined mix of predominantly C₆ to C₁₀ hydrocarbons, and diesel, which is a refined mix ranging from approximately C₁₀ to C₁₅.
- **Alkenes:** Alkenes are more complex than alkanes, with at least one carbon to carbon double bond. These compounds are not generally found in crude oil. Alkenes are much more reactive than alkanes, and will deplete quickly in the atmosphere. Alkenes are produced in refineries when larger alkane molecules are dissociated (or cracked) into smaller compounds. Some alkene compounds, including terpenes such as isoprene and a- and b-pinene, are naturally emitted from vegetation.
- **Aromatics:** Aromatic compounds are the most abundant compounds emitted from gas-fired engines. These compounds include the BTEX parameters (benzene, toluene, ethylbenzene, and m/p-xylenes), which are commonly associated with motor vehicles, and other engine sources such as those associated with oil and gas production.

Figure 4-1 presents measured SNMOC compounds collected from the site specific conditional sampler during each week long sampling event. Associated meteorological data are presented in Figures 4-2 through 4-7 as timeline series plots. Figures 4-8 through 4-13 present monthly wind roses associated with each conditional sampling period.

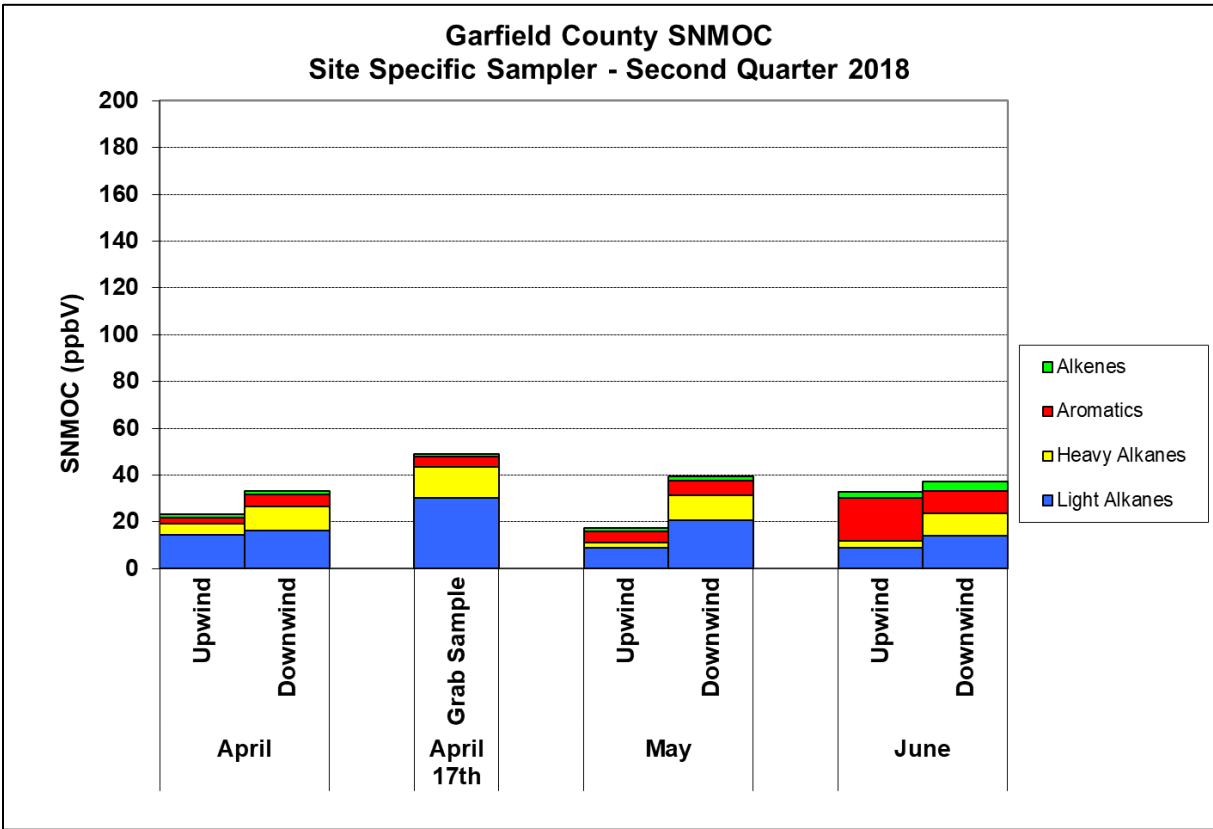


Figure 4-1. Measured SNMOC Concentrations Site Specific Conditional Sampler

Figure 4-2
Upwind Sampler
Garfield County - Meteorological Data
April 2018

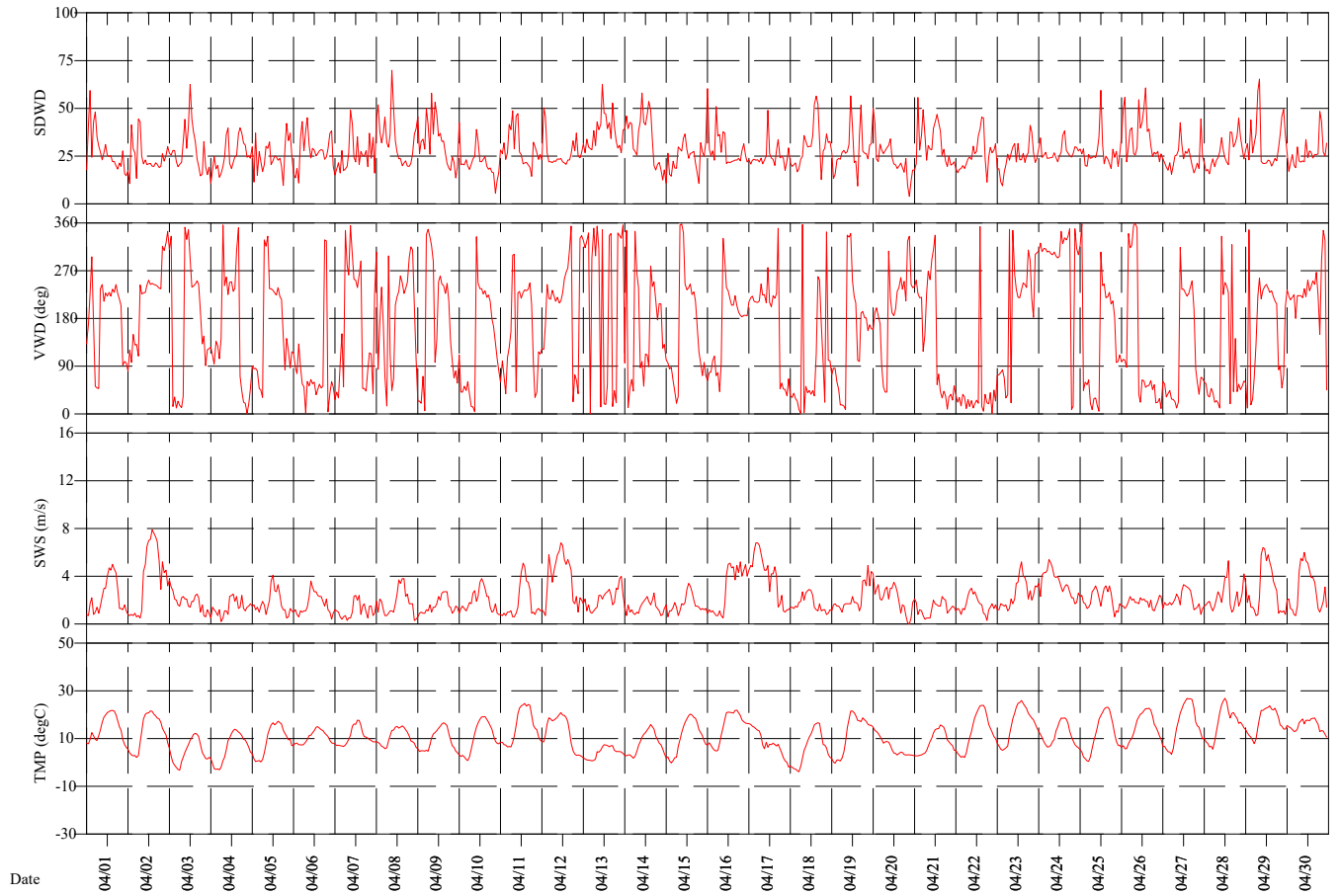


Figure 4-3
Downwind Sampler
Garfield County - Meteorological Data
April 2018

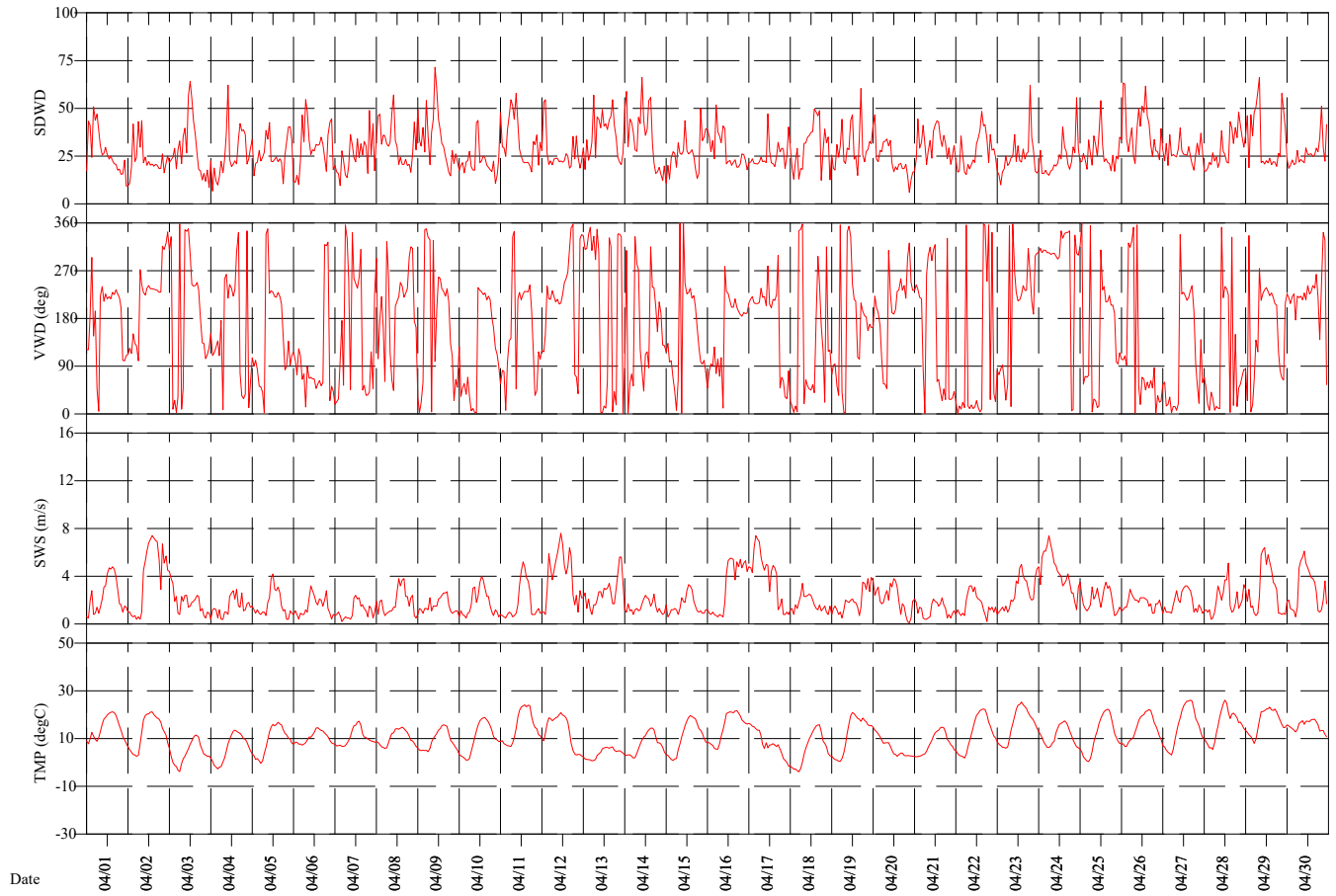


Figure 4-4
Upwind Sampler
Garfield County - Meteorological Data
May 2018

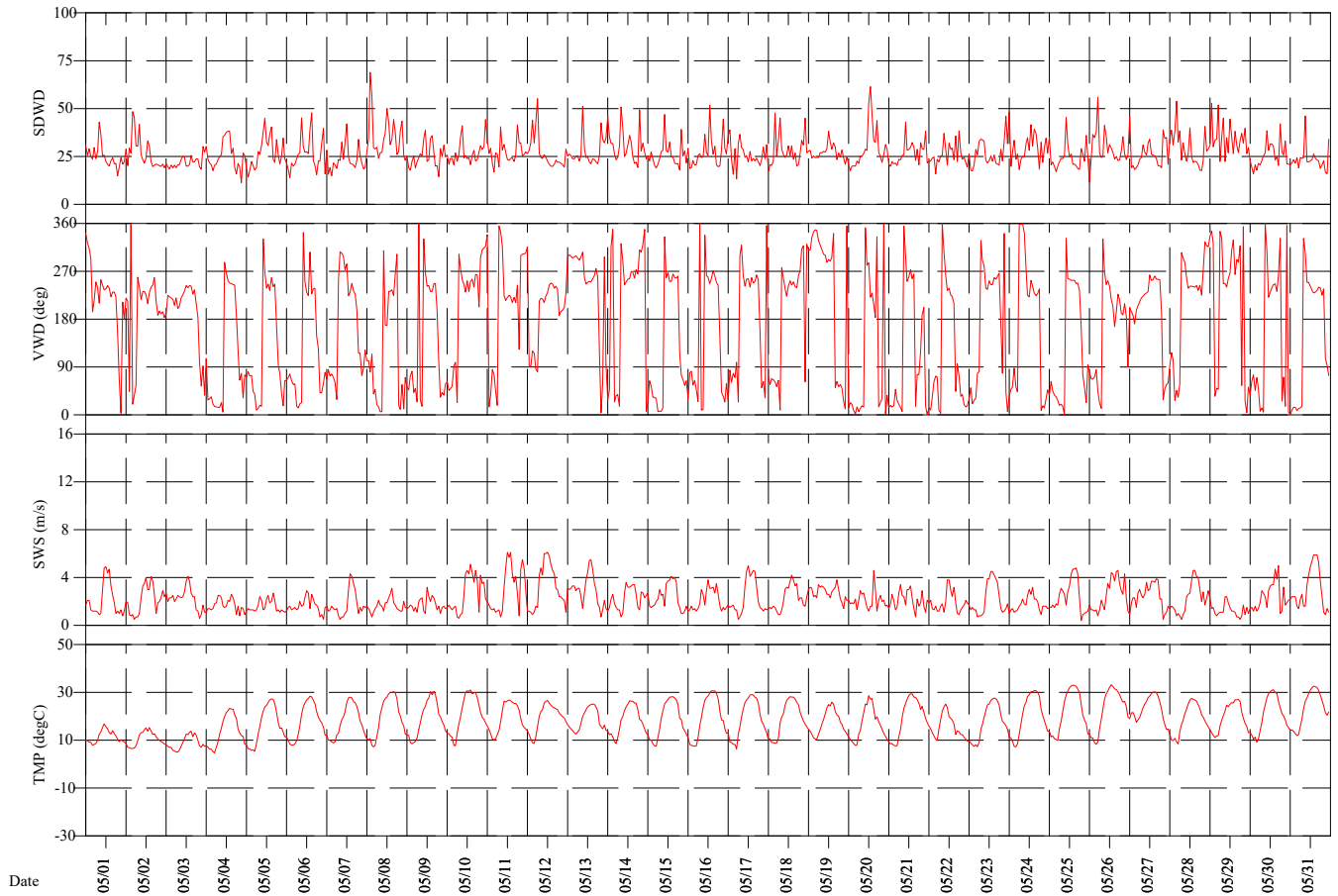


Figure 4-5
Downwind Sampler
Garfield County - Meteorological Data
May 2018

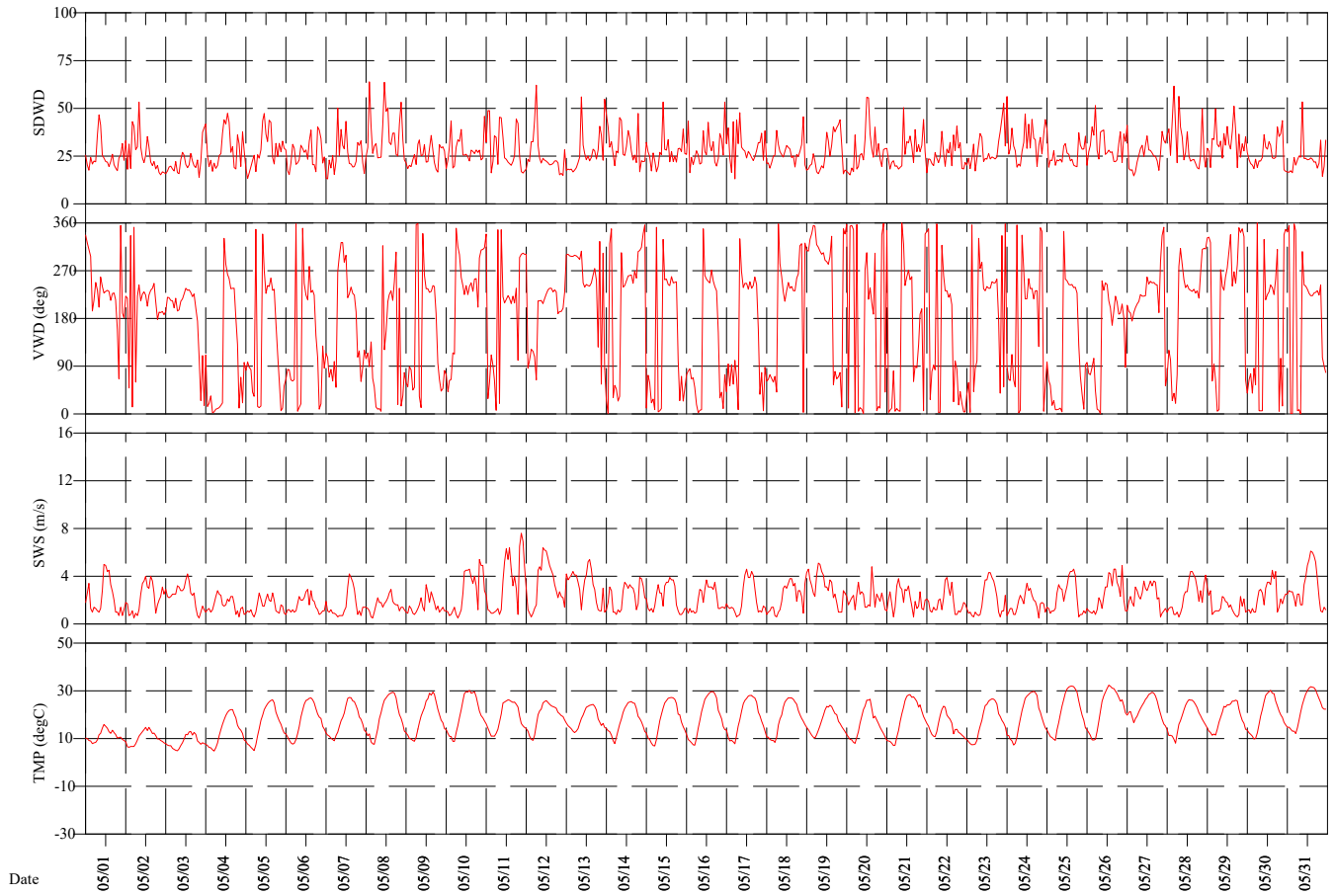


Figure 4-6
Upwind Sampler
Garfield County - Meteorological Data
June 2018

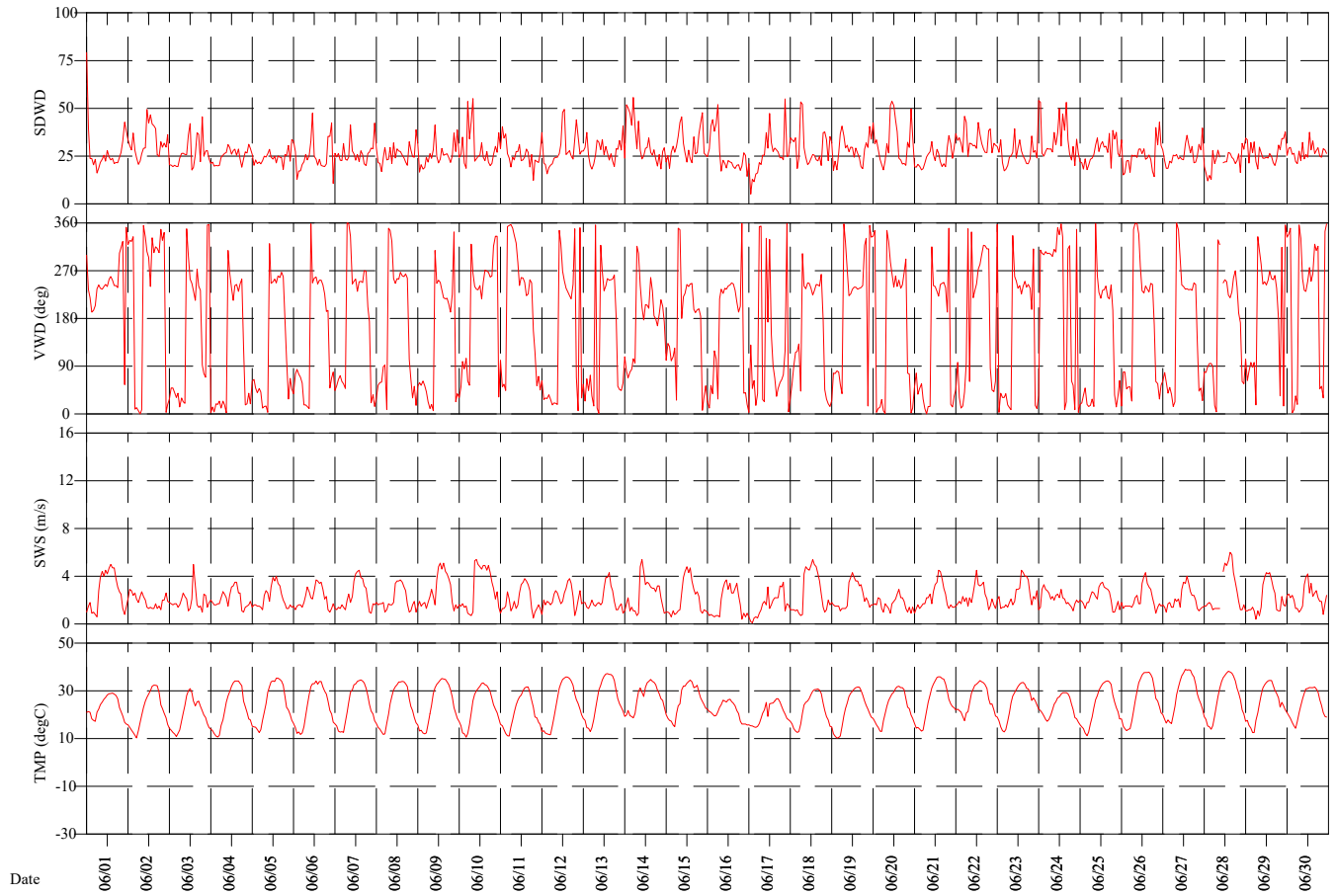
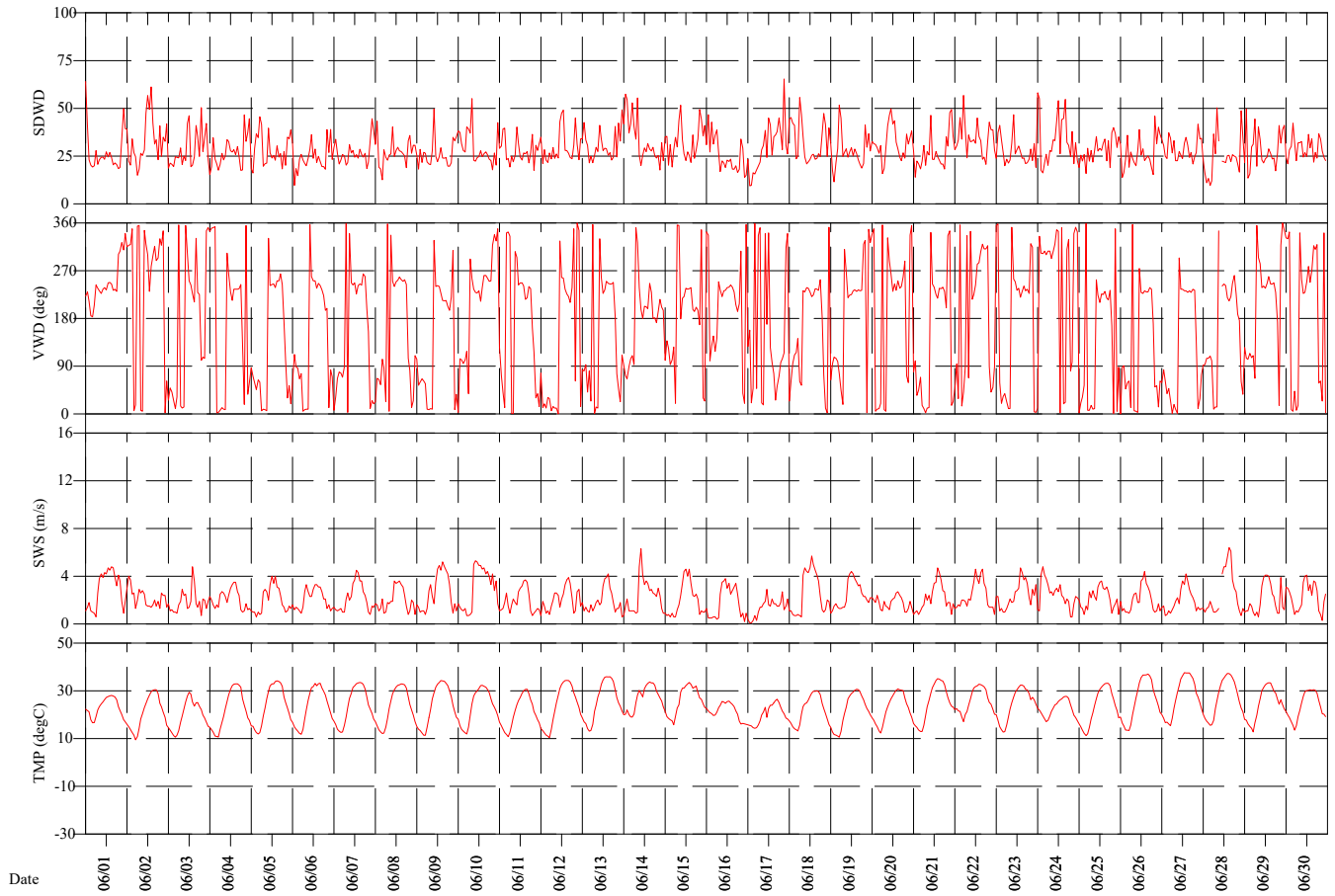


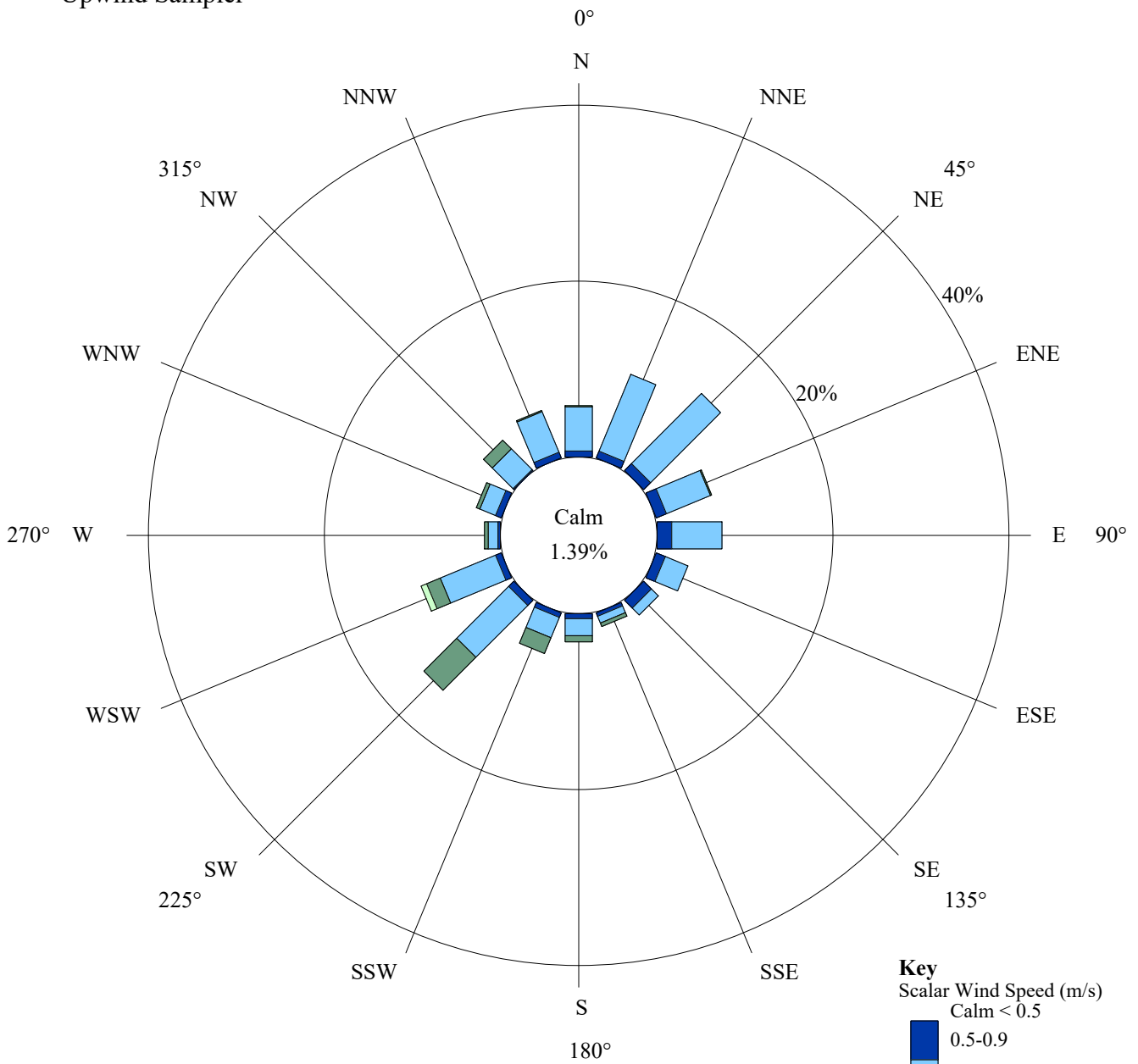
Figure 4-7
Downwind Sampler
Garfield County - Meteorological Data
June 2018



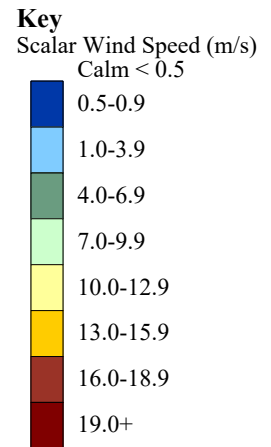
Garfield County Colorado
Upwind Sampler

Figure 4-8
Wind Rose

04/01/2018 - 04/30/2018



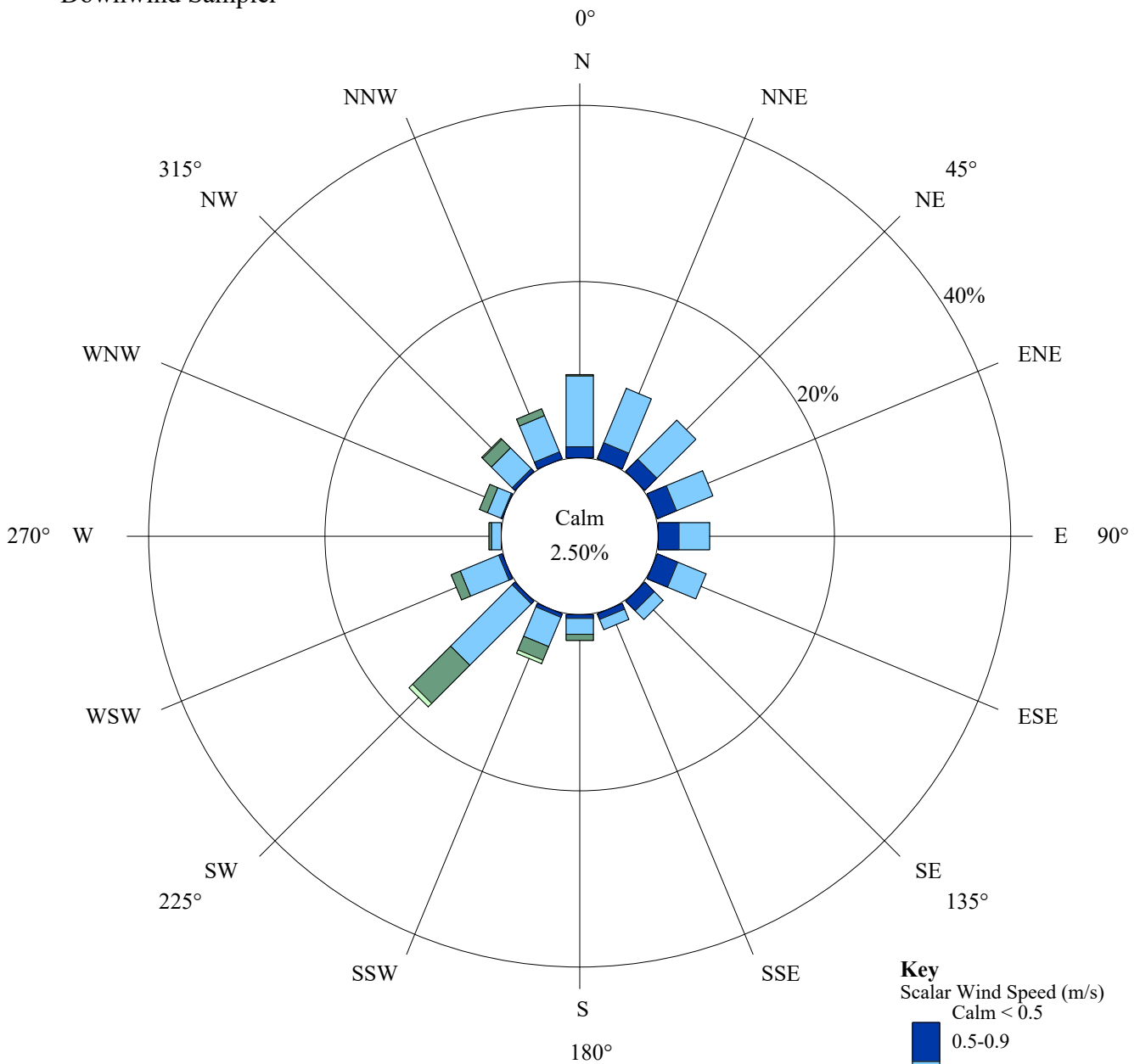
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720 Possible /720 Collected /720 Valid
Collection Statistics Include:
Wind Speed and Wind Direction
(SWS-1; VWD-1)



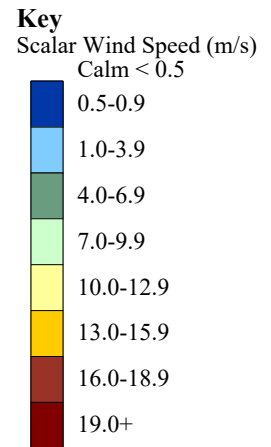
Garfiled County Colorado
Downwind Sampler

Figure 4-9
Wind Rose

04/01/2018 - 04/30/2018



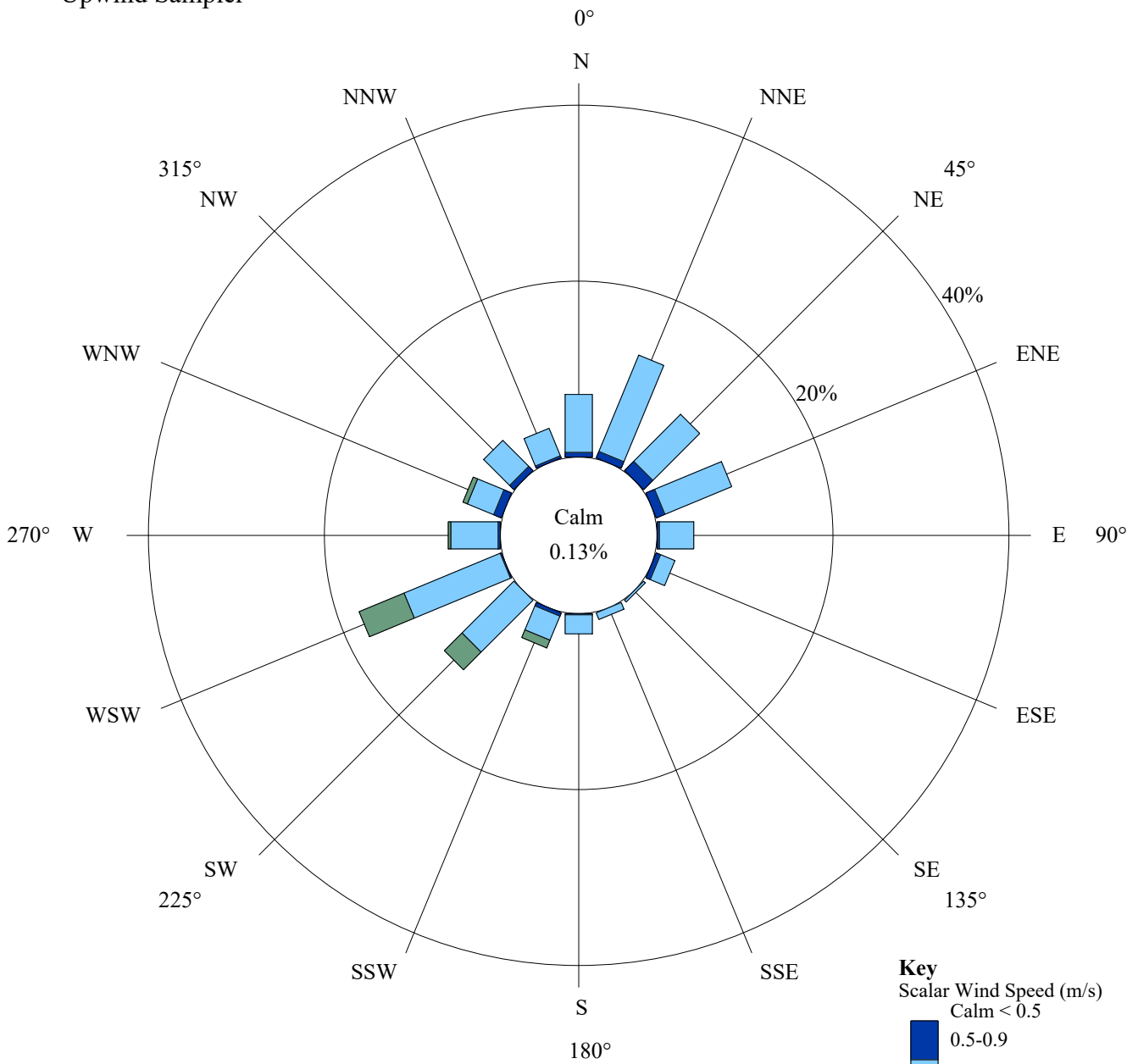
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720 Possible /720 Collected /720 Valid
Collection Statistics Include:
Wind Speed and Wind Direction
(SWS-1; VWD-1)



Garfield County Colorado
Upwind Sampler

Figure 4-10
Wind Rose

05/01/2018 - 05/31/2018



100.0% Collected 100.0% Valid
744 Possible /744 Collected /744 Valid
Collection Statistics Include:
Wind Speed and Wind Direction
(SWS-1; VWD-1)

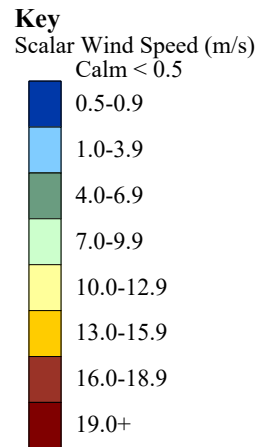
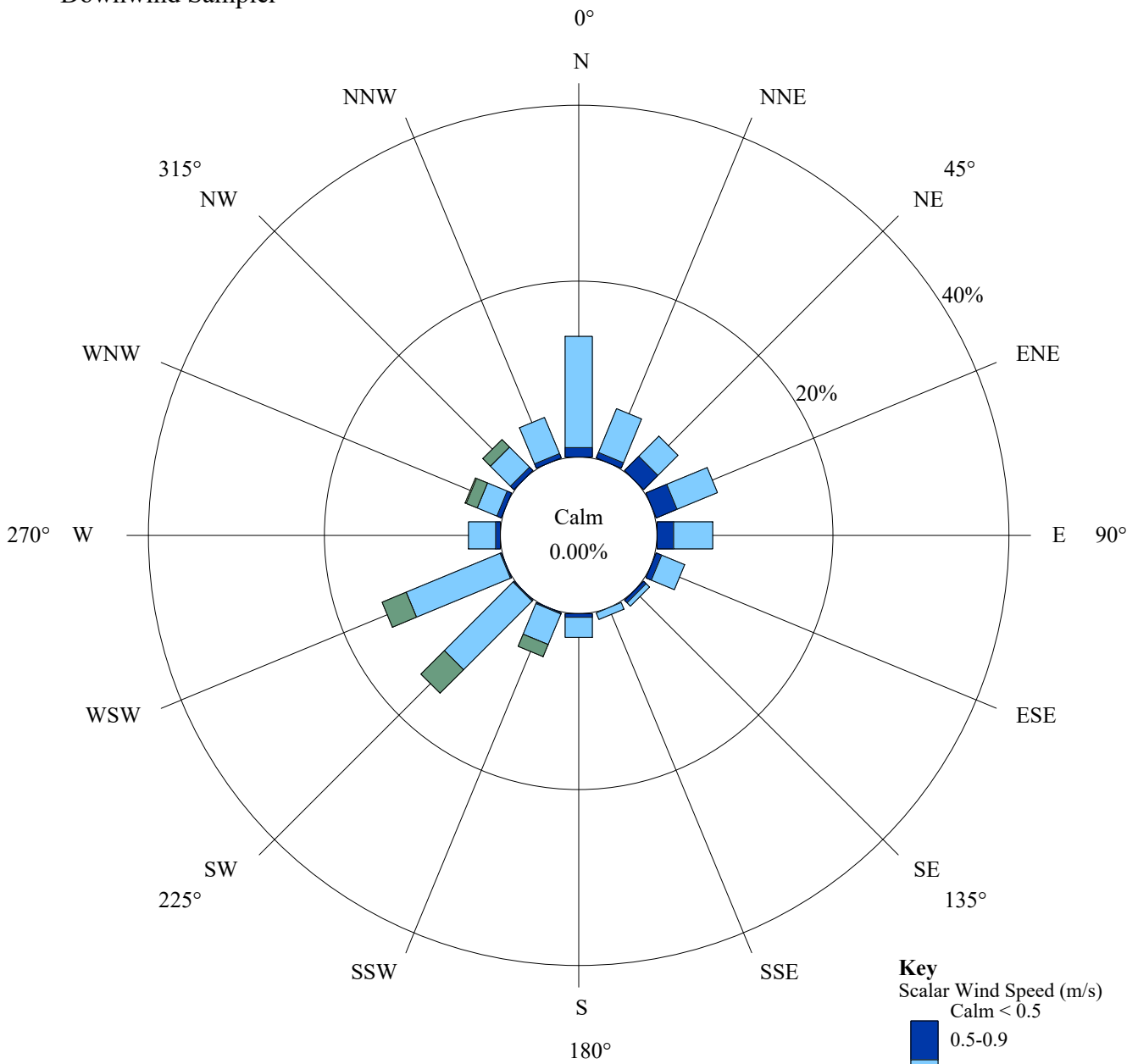


Figure 4-11

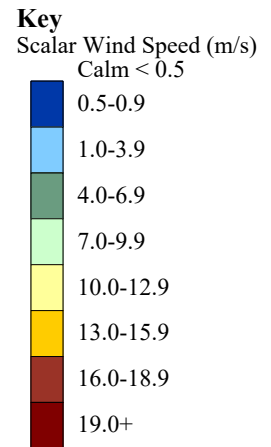
Garfiled County Colorado
Downwind Sampler

Wind Rose

05/01/2018 - 05/31/2018



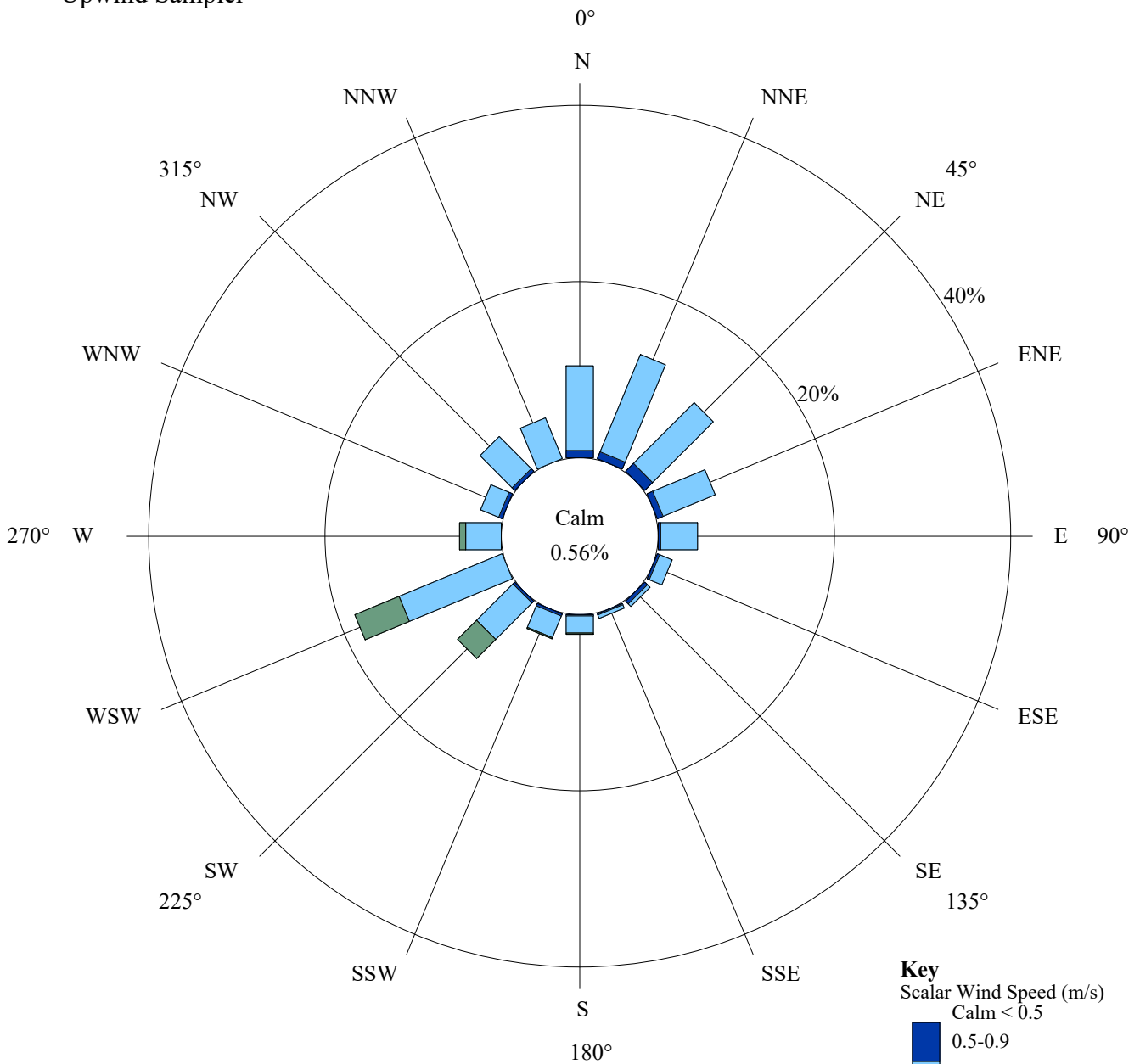
100.0% Collected 100.0% Valid
744 Possible /744 Collected /744 Valid
Collection Statistics Include:
Wind Speed and Wind Direction
(SWS-1; VWD-1)



Garfield County Colorado
Upwind Sampler

Figure 4-12
Wind Rose

06/01/2018 - 06/30/2018



99.9% Collected 99.9% Valid
720 Possible /719 Collected /719 Valid
Collection Statistics Include:
Wind Speed and Wind Direction
(SWS-1; VWD-1)

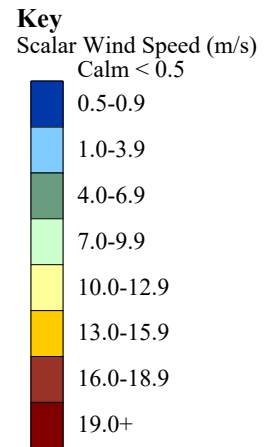
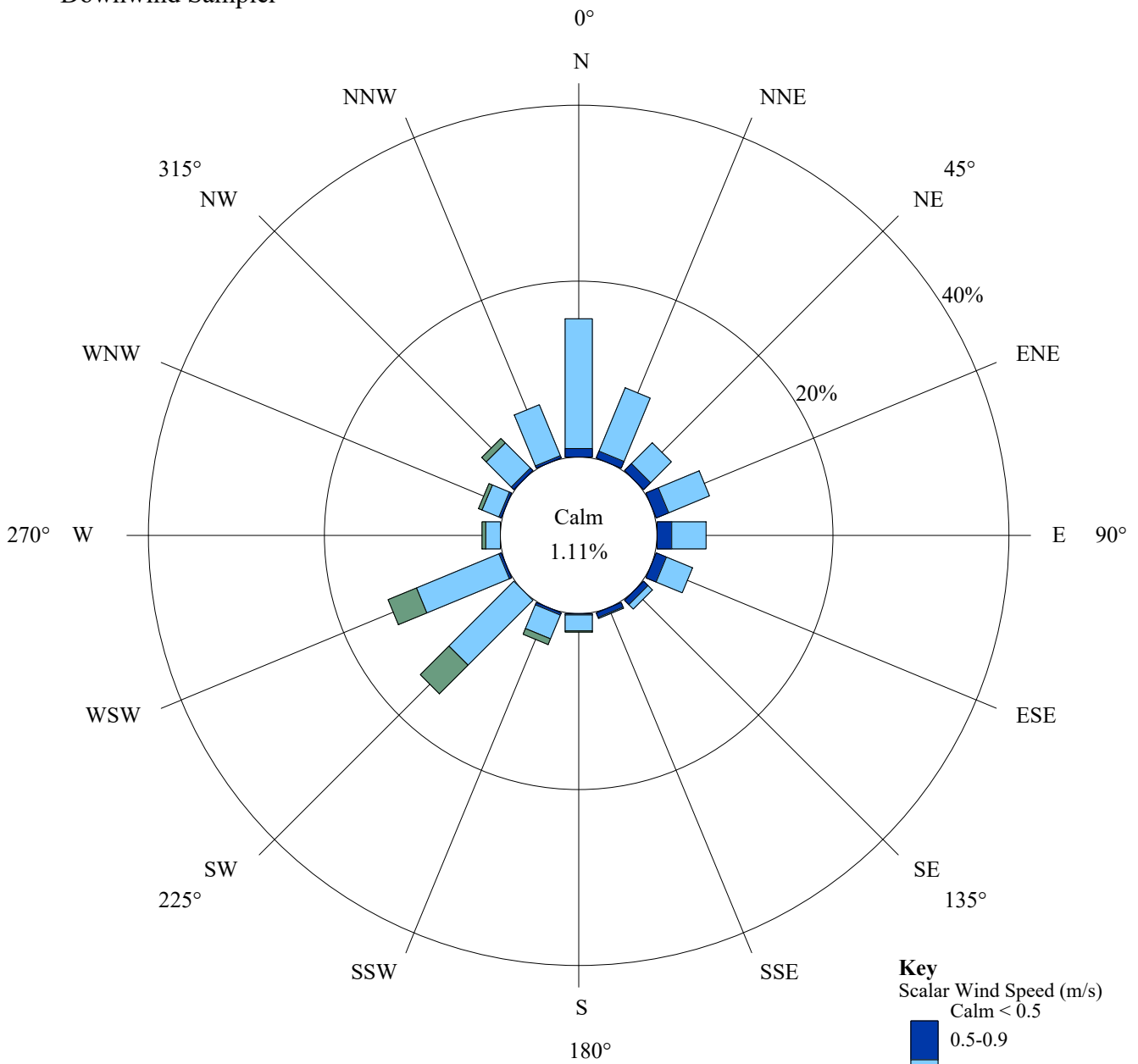


Figure 4-13

Garfiled County Colorado
Downwind Sampler

Wind Rose

06/01/2018 - 06/30/2018



99.9% Collected 99.9% Valid
720 Possible /719 Collected /719 Valid
Collection Statistics Include:
Wind Speed and Wind Direction
(SWS-1; VWD-1)

Appendix A

URSA Pad Site Specific Conditional Sampler Garfield County, Colorado

Speciated VOC Concentrations

Garfield County - URSA Pad Site Specific Conditional Sampler
 April 2018
 Upwind Canister

Detected Compound	Concentration (ppbV)	Comments
1,2,3-Trimethylbenzene	ND	U
1,2,4-Trimethylbenzene	0.62700	
1,3,5-Trimethylbenzene	ND	CE, U
1,3-Butadiene	ND	U
1-Butene	ND	CE, U
1-Dodecene	ND	U
1-Heptene	ND	U
1-Hexene	0.08600	
1-Nonene	0.22700	
1-Octene	0.49300	
1-Pentene	0.16700	
1-Tridecene	ND	U
1-Undecene	ND	U
2,2,3-Trimethylpentane	ND	U
2,2,4-Trimethylpentane	ND	U
2,2-Dimethylbutane	0.21600	
2,3,4-Trimethylpentane	ND	U
2,3-Dimethylbutane	0.43600	
2,3-Dimethylpentane	0.36300	
2,4-Dimethylpentane	0.26500	
2-Ethyl-1-butene	ND	U
2-Methyl-1-butene	ND	U
2-Methyl-1-pentene	ND	U
2-Methyl-2-butene	ND	U
2-Methylheptane	1.22000	
2-Methylhexane	ND	CE, U
2-Methylpentane	2.03000	
3-Methyl-1-butene	ND	U
3-Methylheptane	1.00000	
3-Methylhexane	1.36000	
3-Methylpentane	1.14000	
4-Methyl-1-pentene	ND	U
Acetylene	0.48700	
a-Pinene	ND	U
Benzene	1.51000	
b-Pinene	ND	U
cis-2-Butene	ND	U
cis-2-Hexene	ND	U
cis-2-Pentene	ND	U
Cyclohexane	2.66000	
Cyclopentane	0.20900	

CE = Not reportable due to co-eluting compound

U = Under detection limit

Garfield County - URSA Pad Site Specific Conditional Sampler
 April 2018
 Upwind Canister

Detected Compound	Concentration (ppbV)	Comments
Cyclopentene	ND	CE, U
Ethane	18.60000	
Ethylbenzene	0.26400	
Ethylene	2.35000	
Isobutane	2.88000	
Isobutylene	ND	CE, U
Isopentane	ND	CE, U
Isoprene	ND	U
Isopropylbenzene	0.10600	
m-Diethylbenzene	ND	U
Methylcyclohexane	8.00000	
Methylcyclopentane	1.78000	
m-Ethyltoluene	1.66000	
m-Xylene/p-Xylene	2.59000	
n-Butane	3.57000	
n-Decane	1.08000	
n-Dodecane	0.13100	U
n-Heptane	3.03000	
n-Hexane	3.14000	
n-Nonane	1.91000	
n-Octane	3.76000	
n-Pentane	2.35000	
n-Propylbenzene	ND	U
n-Tridecane	ND	U
n-Undecane	0.38000	
o-Ethyltoluene	ND	CE, U
o-Xylene	0.46900	
p-Diethylbenzene	ND	U
p-Ethyltoluene	ND	U
Propane	8.47000	
Propylene	0.47300	
Propyne	ND	U
Styrene	ND	U
Toluene	10.80000	
trans-2-Butene	ND	U
trans-2-Hexene	ND	U
trans-2-Pentene	0.038	U

CE = Not reportable due to co-eluting compound

U = Under detection limit

Garfield County - URSA Pad Site Specific Conditional Sampler
 April 2018
 Downwind Canister

Detected Compound	Concentration (ppbV)	Comments
1,2,3-Trimethylbenzene	0.34800	
1,2,4-Trimethylbenzene	1.58000	
1,3,5-Trimethylbenzene	1.61000	
1,3-Butadiene	0.08200	U
1-Butene	ND	CE, U
1-Dodecene	ND	U
1-Heptene	ND	U
1-Hexene	0.05700	U
1-Nonene	0.38600	
1-Octene	0.89900	
1-Pentene	0.13500	
1-Tridecene	ND	U
1-Undecene	ND	U
2,2,3-Trimethylpentane	ND	U
2,2,4-Trimethylpentane	ND	U
2,2-Dimethylbutane	0.29300	
2,3,4-Trimethylpentane	ND	U
2,3-Dimethylbutane	0.58000	
2,3-Dimethylpentane	0.69400	
2,4-Dimethylpentane	0.42500	
2-Ethyl-1-butene	ND	U
2-Methyl-1-butene	ND	U
2-Methyl-1-pentene	ND	U
2-Methyl-2-butene	ND	U
2-Methylheptane	3.34000	
2-Methylhexane	2.73000	
2-Methylpentane	2.39000	
3-Methyl-1-butene	ND	U
3-Methylheptane	2.61000	
3-Methylhexane	2.47000	
3-Methylpentane	1.63000	
4-Methyl-1-pentene	ND	U
Acetylene	0.57600	
a-Pinene	ND	U
Benzene	3.54000	
b-Pinene	ND	U
cis-2-Butene	ND	U
cis-2-Hexene	ND	U
cis-2-Pentene	ND	U
Cyclohexane	4.82000	
Cyclopentane	0.27300	

CE = Not reportable due to co-eluting compound

U = Under detection limit

Garfield County - URSA Pad Site Specific Conditional Sampler
 April 2018
 Downwind Canister

Detected Compound	Concentration (ppbV)	Comments
Cyclopentene	ND	CE, U
Ethane	21.90000	
Ethylbenzene	0.59200	
Ethylene	2.72000	
Isobutane	2.80000	
Isobutylene	ND	CE, U
Isopentane	ND	CE, U
Isoprene	0.04800	U
Isopropylbenzene	ND	U
m-Diethylbenzene	ND	U
Methylcyclohexane	17.30000	
Methylcyclopentane	2.80000	
m-Ethyltoluene	1.13000	
m-Xylene/p-Xylene	7.63000	
n-Butane	3.54000	
n-Decane	4.20000	
n-Dodecane	0.60800	
n-Heptane	6.33000	
n-Hexane	4.20000	
n-Nonane	6.62000	
n-Octane	10.30000	
n-Pentane	2.59000	
n-Propylbenzene	0.29700	
n-Tridecane	0.21900	U
n-Undecane	1.72000	
o-Ethyltoluene	0.74300	
o-Xylene	1.26000	
p-Diethylbenzene	ND	U
p-Ethyltoluene	0.74900	
Propane	8.68000	
Propylene	0.60800	
Propyne	ND	U
Styrene	ND	U
Toluene	16.20000	
trans-2-Butene	0.041	
trans-2-Hexene	ND	U
trans-2-Pentene	0.064	

CE = Not reportable due to co-eluting compound

U = Under detection limit

Garfield County - URSA Pad Site Specific Conditional Sampler
 April 17, 2018
 Grab Sample

Detected Compound	Concentration (ppbV)	Comments
1,2,3-Trimethylbenzene	0.37300	
1,2,4-Trimethylbenzene	1.73000	
1,3,5-Trimethylbenzene	1.80000	
1,3-Butadiene	ND	U
1-Butene	ND	CE, U
1-Dodecene	ND	U
1-Heptene	ND	U
1-Hexene	ND	U
1-Nonene	0.47700	
1-Octene	1.07000	
1-Pentene	0.07900	
1-Tridecene	ND	U
1-Undecene	ND	U
2,2,3-Trimethylpentane	ND	U
2,2,4-Trimethylpentane	ND	U
2,2-Dimethylbutane	0.39700	
2,3,4-Trimethylpentane	ND	U
2,3-Dimethylbutane	0.69800	
2,3-Dimethylpentane	0.85800	
2,4-Dimethylpentane	0.50300	
2-Ethyl-1-butene	ND	U
2-Methyl-1-butene	0.07000	U
2-Methyl-1-pentene	ND	U
2-Methyl-2-butene	ND	U
2-Methylheptane	4.24000	
2-Methylhexane	3.38000	
2-Methylpentane	2.78000	
3-Methyl-1-butene	ND	U
3-Methylheptane	3.49000	
3-Methylhexane	3.44000	
3-Methylpentane	1.66000	
4-Methyl-1-pentene	ND	U
Acetylene	0.58200	
a-Pinene	ND	U
Benzene	3.47000	
b-Pinene	ND	U
cis-2-Butene	ND	U
cis-2-Hexene	ND	U
cis-2-Pentene	ND	U
Cyclohexane	5.69000	
Cyclopentane	0.33600	

CE = Not reportable due to co-eluting compound

U = Under detection limit

Garfield County - URSA Pad Site Specific Conditional Sampler
 April 17, 2018
 Grab Sample

Detected Compound	Concentration (ppbV)	Comments
Cyclopentene	ND	U
Ethane	42.90000	
Ethylbenzene	0.81200	
Ethylene	1.80000	U
Isobutane	5.01000	
Isobutylene	ND	CE, U
Isopentane	ND	CE, U
Isoprene	ND	U
Isopropylbenzene	ND	U
m-Diethylbenzene	ND	U
Methylcyclohexane	21.60000	
Methylcyclopentane	3.20000	
m-Ethyltoluene	1.02000	
m-Xylene/p-Xylene	10.60000	
n-Butane	5.68000	
n-Decane	6.20000	
n-Dodecane	0.42000	U
n-Heptane	8.09000	
n-Hexane	4.39000	
n-Nonane	9.07000	
n-Octane	13.20000	
n-Pentane	3.40000	
n-Propylbenzene	ND	U
n-Tridecane	ND	U
n-Undecane	2.14000	
o-Ethyltoluene	1.08000	
o-Xylene	1.56000	
p-Diethylbenzene	ND	U
p-Ethyltoluene	0.95500	
Propane	15.80000	
Propylene	0.21100	
Propyne	ND	U
Styrene	ND	U
Toluene	10.8	
trans-2-Butene	ND	U
trans-2-Hexene	ND	U
trans-2-Pentene	ND	U

CE = Not reportable due to co-eluting compound

U = Under detection limit

Garfield County - URSA Pad Site Specific Conditional Sampler
 May 2018
 Upwind Canister

Detected Compound	Concentration (ppbV)	Comments
1,2,3-Trimethylbenzene	0.16900	U
1,2,4-Trimethylbenzene	0.46600	
1,3,5-Trimethylbenzene	0.27400	
1,3-Butadiene	ND	U
1-Butene	ND	CE, U
1-Dodecene	ND	U
1-Heptene	ND	U
1-Hexene	0.05400	U
1-Nonene	0.12800	
1-Octene	0.28700	
1-Pentene	0.12800	
1-Tridecene	ND	U
1-Undecene	ND	U
2,2,3-Trimethylpentane	ND	U
2,2,4-Trimethylpentane	0.45400	
2,2-Dimethylbutane	0.11300	
2,3,4-Trimethylpentane	0.35700	
2,3-Dimethylbutane	0.18200	
2,3-Dimethylpentane	0.10200	U
2,4-Dimethylpentane	0.10900	
2-Ethyl-1-butene	ND	U
2-Methyl-1-butene	ND	U
2-Methyl-1-pentene	ND	U
2-Methyl-2-butene	ND	U
2-Methylheptane	0.53000	
2-Methylhexane	ND	CE, U
2-Methylpentane	1.01000	
3-Methyl-1-butene	ND	U
3-Methylheptane	0.47900	
3-Methylhexane	0.57000	
3-Methylpentane	0.46000	
4-Methyl-1-pentene	ND	U
Acetylene	0.29500	
a-Pinene	ND	U
Benzene	1.23000	
b-Pinene	ND	U
cis-2-Butene	ND	U
cis-2-Hexene	ND	U
cis-2-Pentene	ND	U
Cyclohexane	1.09000	
Cyclopentane	0.10700	

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Garfield County - URSA Pad Site Specific Conditional Sampler
 May 2018
 Upwind Canister

Detected Compound	Concentration (ppbV)	Comments
Cyclopentene	ND	CE, U
Ethane	11.80000	
Ethylbenzene	0.19200	
Ethylene	2.21000	U
Isobutane	1.47000	
Isobutylene	ND	CE, U
Isopentane	ND	CE, U
Isoprene	0.07400	
Isopropylbenzene	ND	U
m-Diethylbenzene	1.13000	
Methylcyclohexane	3.15000	
Methylcyclopentane	0.70200	
m-Ethyltoluene	1.90000	
m-Xylene/p-Xylene	1.47000	
n-Butane	1.90000	
n-Decane	0.88500	
n-Dodecane	0.20700	U
n-Heptane	1.19000	
n-Hexane	2.16000	
n-Nonane	1.22000	
n-Octane	1.81000	
n-Pentane	1.22000	
n-Propylbenzene	0.15600	
n-Tridecane	ND	U
n-Undecane	0.40500	
o-Ethyltoluene	ND	U
o-Xylene	0.33700	
p-Diethylbenzene	ND	U
p-Ethyltoluene	ND	U
Propane	5.08000	
Propylene	0.39100	
Propyne	ND	U
Styrene	ND	U
Toluene	26.6	
trans-2-Butene	ND	U
trans-2-Hexene	ND	U
trans-2-Pentene	ND	U

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Garfield County - URSA Pad Site Specific Conditional Sampler
 May 2018
 Downwind Canister

Detected Compound	Concentration (ppbV)	Comments
1,2,3-Trimethylbenzene	0.51300	
1,2,4-Trimethylbenzene	2.05000	
1,3,5-Trimethylbenzene	2.11000	
1,3-Butadiene	0.04400	U
1-Butene	ND	CE, U
1-Dodecene	ND	U
1-Heptene	ND	U
1-Hexene	0.05700	U
1-Nonene	0.50800	
1-Octene	0.92300	
1-Pentene	0.13800	
1-Tridecene	ND	U
1-Undecene	ND	U
2,2,3-Trimethylpentane	ND	U
2,2,4-Trimethylpentane	ND	CE, U
2,2-Dimethylbutane	0.36500	
2,3,4-Trimethylpentane	0.26500	
2,3-Dimethylbutane	0.68400	
2,3-Dimethylpentane	0.75900	
2,4-Dimethylpentane	0.46800	
2-Ethyl-1-butene	ND	U
2-Methyl-1-butene	ND	U
2-Methyl-1-pentene	ND	U
2-Methyl-2-butene	0.11000	U
2-Methylheptane	3.23000	
2-Methylhexane	ND	CE, U
2-Methylpentane	2.82000	
3-Methyl-1-butene	ND	U
3-Methylheptane	2.60000	
3-Methylhexane	2.50000	
3-Methylpentane	1.71000	
4-Methyl-1-pentene	ND	U
Acetylene	0.35300	
a-Pinene	0.22200	
Benzene	4.02000	
b-Pinene	ND	U
cis-2-Butene	0.04100	
cis-2-Hexene	ND	U
cis-2-Pentene	ND	U
Cyclohexane	5.04000	
Cyclopentane	0.32800	

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Garfield County - URSA Pad Site Specific Conditional Sampler
 May 2018
 Downwind Canister

Detected Compound	Concentration (ppbV)	Comments
Cyclopentene	ND	CE, U
Ethane	28.50000	
Ethylbenzene	0.65300	
Ethylene	2.55000	
Isobutane	3.43000	
Isobutylene	ND	CE, U
Isopentane	ND	CE, U
Isoprene	0.09600	
Isopropylbenzene	ND	U
m-Diethylbenzene	ND	U
Methylcyclohexane	16.80000	
Methylcyclopentane	2.96000	
m-Ethyltoluene	1.29000	
m-Xylene/p-Xylene	8.34000	
n-Butane	4.10000	
n-Decane	6.63000	
n-Dodecane	0.68600	
n-Heptane	6.09000	
n-Hexane	4.32000	
n-Nonane	8.70000	
n-Octane	10.40000	
n-Pentane	3.20000	
n-Propylbenzene	0.38600	
n-Tridecane	0.11700	U
n-Undecane	2.66000	
o-Ethyltoluene	1.09000	
o-Xylene	1.38000	
p-Diethylbenzene	ND	U
p-Ethyltoluene	1.03000	
Propane	10.60000	
Propylene	0.54400	
Propyne	ND	U
Styrene	ND	CE, U
Toluene	23.60000	
trans-2-Butene	ND	U
trans-2-Hexene	ND	U
trans-2-Pentene	0.06	

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Garfield County - URSA Pad Site Specific Conditional Sampler
 June 2018
 Upwind Canister

Detected Compound	Concentration (ppbV)	Comments
1,2,3-Trimethylbenzene	0.65400	
1,2,4-Trimethylbenzene	1.00000	
1,3,5-Trimethylbenzene	0.38500	
1,3-Butadiene	ND	U
1-Butene	ND	CE, U
1-Dodecene	0.29400	U
1-Heptene	ND	CE, U
1-Hexene	0.20000	
1-Nonene	0.41000	
1-Octene	0.57400	
1-Pentene	0.25600	
1-Tridecene	0.08300	U
1-Undecene	ND	U
2,2,3-Trimethylpentane	ND	U
2,2,4-Trimethylpentane	ND	CE, U
2,2-Dimethylbutane	0.12200	
2,3,4-Trimethylpentane	0.42800	
2,3-Dimethylbutane	0.18900	
2,3-Dimethylpentane	0.17300	
2,4-Dimethylpentane	0.12800	
2-Ethyl-1-butene	ND	U
2-Methyl-1-butene	0.11300	
2-Methyl-1-pentene	ND	U
2-Methyl-2-butene	ND	U
2-Methylheptane	0.50800	
2-Methylhexane	ND	CE, U
2-Methylpentane	1.53000	
3-Methyl-1-butene	ND	U
3-Methylheptane	0.44700	
3-Methylhexane	0.76400	
3-Methylpentane	0.50900	
4-Methyl-1-pentene	0.07100	U
Acetylene	0.19600	
a-Pinene	ND	U
Benzene	2.46000	
b-Pinene	ND	U
cis-2-Butene	0.04300	
cis-2-Hexene	ND	U
cis-2-Pentene	ND	U
Cyclohexane	1.28000	
Cyclopentane	0.10500	

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Garfield County - URSA Pad Site Specific Conditional Sampler
 June 2018
 Upwind Canister

Detected Compound	Concentration (ppbV)	Comments
Cyclopentene	ND	CE, U
Ethane	11.50000	
Ethylbenzene	0.19000	
Ethylene	3.10000	
Isobutane	1.58000	
Isobutylene	ND	CE, U
Isopentane	ND	CE, U
Isoprene	2.08000	
Isopropylbenzene	0.44600	
m-Diethylbenzene	ND	U
Methylcyclohexane	3.16000	
Methylcyclopentane	0.75900	
m-Ethyltoluene	ND	CE, U
m-Xylene/p-Xylene	1.77000	
n-Butane	2.09000	
n-Decane	1.27000	
n-Dodecane	0.39000	U
n-Heptane	1.40000	
n-Hexane	3.23000	
n-Nonane	1.35000	
n-Octane	1.89000	
n-Pentane	1.60000	
n-Propylbenzene	ND	U
n-Tridecane	0.17200	U
n-Undecane	1.52000	
o-Ethyltoluene	39.60000	
o-Xylene	0.44600	
p-Diethylbenzene	ND	U
p-Ethyltoluene	ND	CE, U
Propane	5.04000	
Propylene	1.13000	
Propyne	ND	U
Styrene	ND	U
Toluene	91.30000	
trans-2-Butene	ND	U
trans-2-Hexene	ND	U
trans-2-Pentene	0.065	

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Garfield County - URSA Pad Site Specific Conditional Sampler
 June 2018
 Downwind Canister

Detected Compound	Concentration (ppbV)	Comments
1,2,3-Trimethylbenzene	0.64100	
1,2,4-Trimethylbenzene	2.68000	
1,3,5-Trimethylbenzene	2.22000	
1,3-Butadiene	0.03800	U
1-Butene	ND	CE, U
1-Dodecene	0.21900	U
1-Heptene	ND	U
1-Hexene	0.42000	
1-Nonene	0.84800	
1-Octene	1.40000	
1-Pentene	0.54700	
1-Tridecene	ND	U
1-Undecene	0.17900	U
2,2,3-Trimethylpentane	ND	U
2,2,4-Trimethylpentane	2.06000	
2,2-Dimethylbutane	0.28000	
2,3,4-Trimethylpentane	ND	CE, U
2,3-Dimethylbutane	0.44900	
2,3-Dimethylpentane	0.56200	
2,4-Dimethylpentane	0.36400	
2-Ethyl-1-butene	ND	U
2-Methyl-1-butene	0.10800	
2-Methyl-1-pentene	ND	U
2-Methyl-2-butene	0.17600	U
2-Methylheptane	2.64000	
2-Methylhexane	1.84000	
2-Methylpentane	2.70000	
3-Methyl-1-butene	ND	U
3-Methylheptane	2.17000	
3-Methylhexane	2.08000	
3-Methylpentane	1.18000	
4-Methyl-1-pentene	ND	U
Acetylene	0.22500	
a-Pinene	ND	U
Benzene	4.14000	
b-Pinene	ND	U
cis-2-Butene	0.08500	
cis-2-Hexene	ND	U
cis-2-Pentene	ND	U
Cyclohexane	4.01000	
Cyclopentane	0.22500	

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Garfield County - URSA Pad Site Specific Conditional Sampler
 June 2018
 Downwind Canister

Detected Compound	Concentration (ppbV)	Comments
Cyclopentene	ND	CE, U
Ethane	18.50000	
Ethylbenzene	0.77900	
Ethylene	3.99000	
Isobutane	2.52000	
Isobutylene	ND	CE, U
Isopentane	ND	CE, U
Isoprene	2.33000	
Isopropylbenzene	ND	U
m-Diethylbenzene	ND	U
Methylcyclohexane	13.00000	
Methylcyclopentane	2.18000	
m-Ethyltoluene	1.50000	
m-Xylene/p-Xylene	7.81000	
n-Butane	3.24000	
n-Decane	7.20000	
n-Dodecane	1.10000	
n-Heptane	4.70000	
n-Hexane	3.22000	
n-Nonane	8.50000	
n-Octane	8.86000	
n-Pentane	2.58000	
n-Propylbenzene	0.41400	
n-Tridecane	0.13500	U
n-Undecane	3.41000	
o-Ethyltoluene	ND	U
o-Xylene	1.35000	
p-Diethylbenzene	ND	U
p-Ethyltoluene	0.96200	
Propane	7.81000	
Propylene	1.89000	
Propyne	ND	U
Styrene	ND	U
Toluene	48.30000	
trans-2-Butene	0.382	
trans-2-Hexene	ND	U
trans-2-Pentene	0.155	

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