



NOISE MITIGATION PLAN

Submitted with Form 2A Application for the

Blue 3-65 33-32-31

Date of Plan: August 18, 2021

Date of Submittal: September 14, 2021

Date Resubmitted: October 26, 2021

Crestone Peak Resources' Noise Mitigation Plan was developed in accordance with COGCC Rule 423.a.

Introduction

Crestone Peak Resources Operating, LLC (“Crestone”) is committed to safe and responsible operations. Crestone will comply with all applicable regulations of the Colorado Oil and Gas Conservation Commission (COGCC) for mitigating noise. Crestone’s operations at the proposed Blue 3-65 33-32-31 Pad (the “Blue” location) will be conducted in a manner such that noise and vibrations do not constitute a nuisance or hazard to public health, safety and welfare.

This Noise Mitigation Plan (NMP) advances Crestone’s safety policies and provides accountability and transparency to our operations. This NMP outlines Crestone’s processes and best management practices for noise and vibration mitigation.

Topography

From Limon, Colorado to the Front Range of the Rocky Mountains is the Colorado Piedmont, a region characterized by rolling grasslands, patchy pine forests, and cottonwood groves along stream valleys east of the Rocky Mountains. The general description of the topography of the region also describes the topography of the area adjacent to the Blue well site. In addition to the natural features of the area, the area adjacent to the Blue also has many anthropological features like Interstate Highway 70 running east and west directly to the south of the location. 26th Avenue running east and west to the north of the location. Martin Marietta operates an asphalt plant northwest of the proposed Blue location. These features add significant levels of background noise to the Blue site. When planning the noise mitigation for a site, the topography of an area is a major planning and siting factor. Figure 1 shows the planned location of the Blue well pad.

There are no Residential Building Units (RBUs) within 2,000 ft. of the Working Pad Surface of the Blue well pad. Based on the absence of an RBU within 2,000 ft. of the Working Pad Surface, Crestone is not identifying a Point of Compliance during the operations of this location pursuant to Rule 423.a.(5).

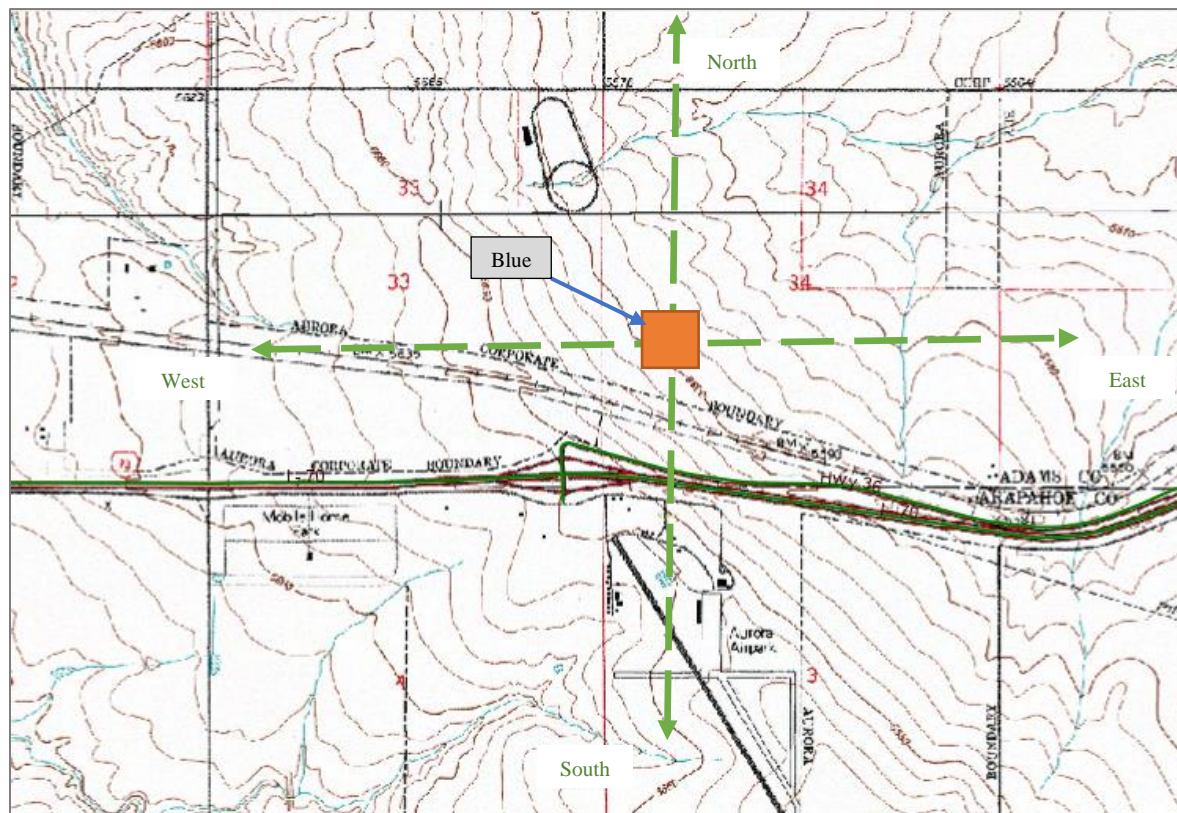


Figure 1- Topographic Map

Elevation Profile

The Blue well pad is located on a small ridge that runs northeast to southwest. The topography of this area offers no benefits or challenges to the noise mitigation of the Blue location given the gradual elevation changes are offset by the proposed berm on the South side of the Well Site during all phases of operations.

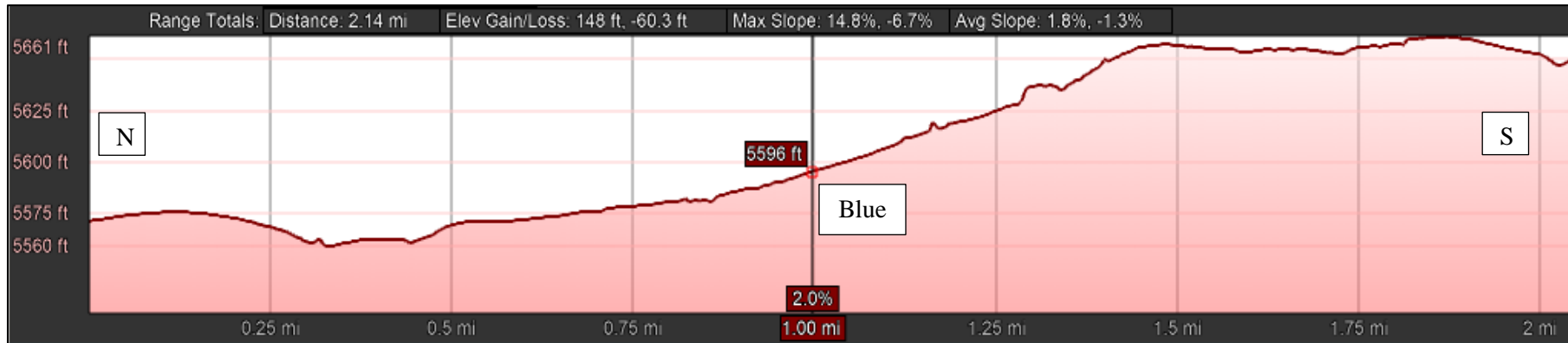


Figure 2 – Elevation Profile (North to South)



Figure 3 – Elevation Profile (West to East)

From the Working Pad Surface to the north the elevation remains relatively flat over a mile of distance. Over the same distance to the south, the elevation increases by 65 feet in the first half of mile from the Working Pad Surface and then remains flat from a half mile to the mile to the south.

The elevation from west to east decreases consistently by approximately 85 feet of elevation change per mile across the two-mile vector centered on the Working Pad Surface.

Operations Plan

Crestone plans to begin pre-production phases at the Blue in Q1 2023 and transition to the production phase in Q4 2023. All preliminary noise models indicate that Crestone will remain under the current noise limits outlined in Rule 423.b.(1) during all phases of operation at the Blue well pad.

Phase of Operations		Planned Start Date	Planned End Date	Duration	Estimated noise levels @ POC	
					dBA	dBC
Pre-production	Drilling	February 2023	April 2023	3 months	40-45	60-65
	Completions	April 2023	August 2023	2 months	45-50	60-65
	Flowback	September 2023	September 2023	1 month	45-50	55-60
Production		October 2023	January 2053	30 years	40-45	55-60

Figure 5 - Estimated noise levels by operation

Proposed Best Management Practices

Crestone follows an impact hierarchy process when evaluating the impacts from potential nuisance issues, like noise. When addressing the potential negative impacts from noise there are two types of solutions, avoid the impact or minimize the impact to an acceptable level through the installation of barriers or other noise dampening equipment on the noise source, like a muffler.

- Avoidance means reducing or eliminating the impact by selecting a least-impactful operation, site selection, equipment selection, and temporal factors, to name a few. Avoidance is achieved through an analysis of appropriate and practicable alternatives and a consideration of impact footprint.
- Minimization means mitigating an impact by managing the severity of the impacts on receptors near the operations site. Minimization is achieved through the incorporation of appropriate and practicable design measures.

Avoidance:

1. Site selection
 - This site was selected to maximize distance to the nearest RBU which is over 2,000 feet from edge of working pad surface.
2. Equipment selection
 - Quiet-Fleet™ hydraulic fracturing technology will be utilized to decrease noise

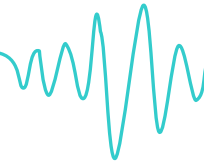
Minimization:

1. Eight foot visual berm will be installed on the south side of the Well Site.
2. Drilling rig engine exhausts are pointed straight up.
3. Crestone will install “quash” sound damping material in all permanent buildings that house noise sources.
4. Crestone has completed an ambient sound level survey for this location (see attached Appendix 1).

Appendix 1

Behrens and Associates, Inc.

Environmental Noise Control



May 3, 2021

Crestone Peak Resources
370 17th St.
Denver, Colorado 80202

Attention: Scott Farkas
Subject: Ambient Sound Level Report
Re: Blue South Pad Site

Dear Mr. Farkas:

Per your request, an ambient sound level survey was performed near the proposed Blue South pad location (39.745279°, -104.657071°) in Aurora, Colorado from Thursday, April 22 to Monday, April 26, 2021 to measure and document the ambient sound levels near the site. No pad construction activities were taking place during the duration of this survey. The following report documents our findings.

Ambient Sound Level Survey

An ambient survey including A-weighted dB(A) and C-weighted dB(C) sound pressure levels was performed for the proposed Blue South pad location to measure and document ambient sound levels for hourly and 15-minute Leq (logarithmic averages). Per the Colorado Oil and Gas Conservation Commission (COGCC), data collected where winds over five (5) miles per hour are present, are inadmissible. The daytime and nighttime sound level averages in Table 1 omit the data collected where the wind speed exceeded 5 miles per hour. Attachments 6 through 17 include all the unfiltered data.

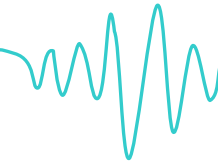
Sound Measurement Instrumentation

The instrumentation used for the monitoring locations were Class 1 Svantek Model 971 integrating and logging sound level meters, which were calibrated prior to deployment, along with a Davis Vantage Vue Weather Station. The metering systems were approximately 5 feet above ground level per COGCC guidelines and in a locked box for security. Attachment 1 shows an aerial view of the monitoring locations and Attachments 2 through 5 show the deployed monitors. The measured noise levels are presented graphically in Attachments 6 through 13, and in tabulated form in Attachments 14 through 17.

The ambient noise levels were used to determine the typical daytime (7am to 7pm) and nighttime (7pm to 7am) Leq values at the monitored location. The daytime and nighttime logarithmic averages were calculated using the 15-Minute noise levels measured at the location. The calculated ambient daytime and nighttime noise levels are summarized in Table 1.

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Ambient Sound Level Survey Results

Table 1 shows the measured Leq results from the survey. The nighttime values at Locations 3 & 4 appear to be elevated due to the close proximity to I-70 and Location 2 appears to have been affected by wind gusts more than the other locations.

Table 1 – Ambient Sound Level Survey Results

Day	Location 1				Location 2			
	Daytime Leq Ambient Noise Levels		Nighttime Leq Ambient Noise Levels		Daytime Leq Ambient Noise Levels		Nighttime Leq Ambient Noise Levels	
	dBA	dB(C)	dBA	dB(C)	dBA	dB(C)	dBA	dB(C)
1	61	69	59	69	58	68	55	74
2	58	69	48	63	53	71	50	69
3	60	78	54	68	57	78	51	77
4	49	71	56	73	58	83	60	81
5	*	*	-	-	*	*	-	-
Overall Leq	59	75	54	70	57	78	56	78

Table 1 Continued – Ambient Sound Level Survey Results

Day	Location 3				Location 4			
	Daytime Leq Ambient Noise Levels		Nighttime Leq Ambient Noise Levels		Daytime Leq Ambient Noise Levels		Nighttime Leq Ambient Noise Levels	
	dBA	dB(C)	dBA	dB(C)	dBA	dB(C)	dBA	dB(C)
1	59	69	61	74	65	71	61	74
2	53	66	56	67	59	67	54	64
3	55	69	53	69	60	71	56	70
4	54	73	57	74	51	76	58	77
5	*	*	-	-	*	*	-	-
Overall Leq	57	70	57	71	62	72	57	74

Note: Day 1 Daytime is an Leq from 2pm to 7pm and Day 5 Daytime is an Leq from 7am until 8am. An asterisk (*) denotes a time period without wind speeds under 5 mph.

Best regards,

Colin M. Drolshagen
Lead Acoustical Technician

Corporate Office: Hawthorne, California

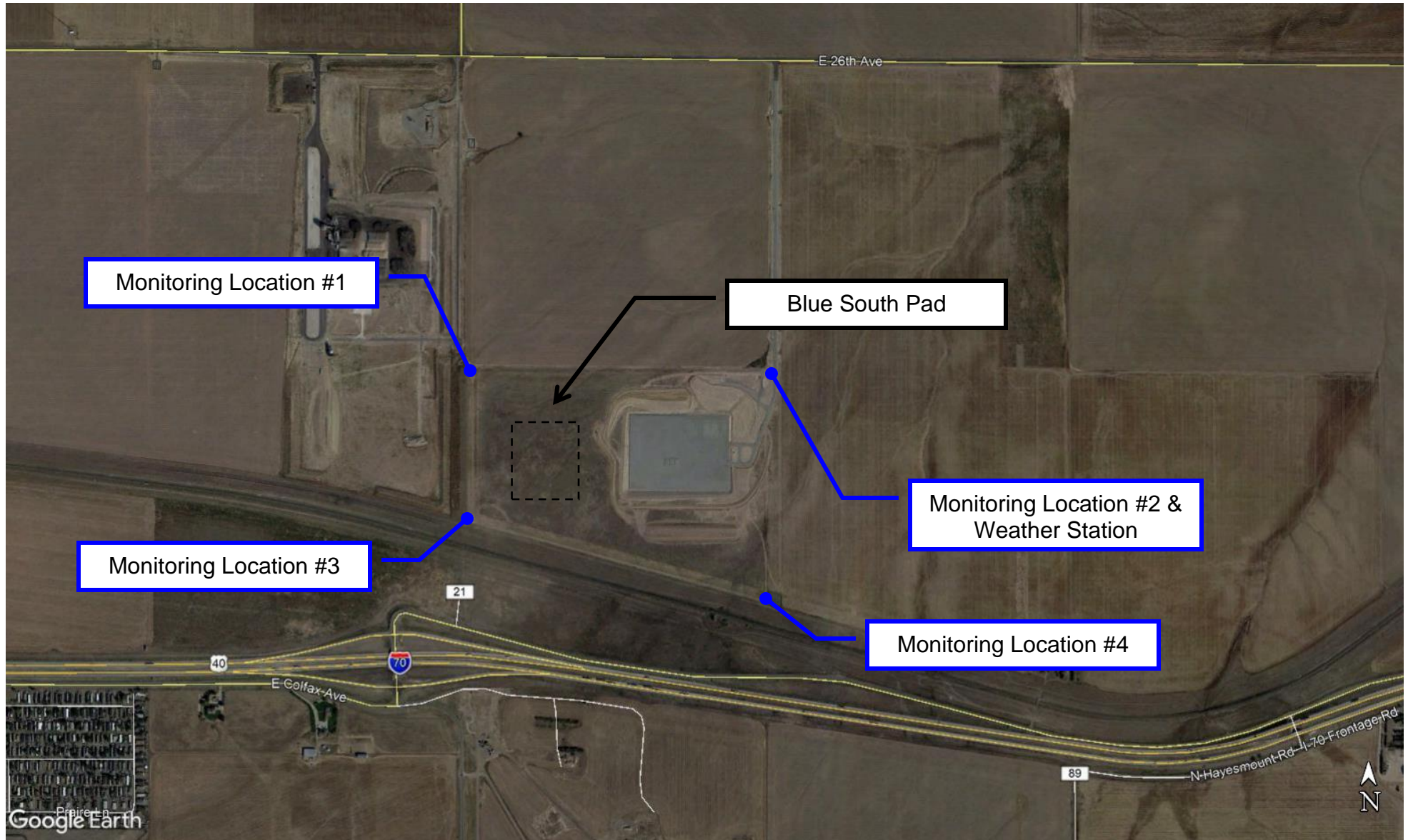
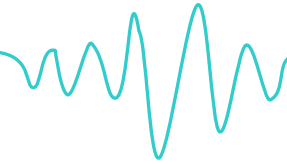
Carson, California ~ Aledo, Texas ~ Napa, California ~ Longmont, Colorado ~ McDonald, Pennsylvania ~ Calgary, Canada

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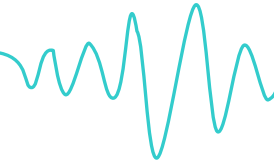
Environmental Noise Control



Attachment 1
Ambient Noise Monitoring Locations

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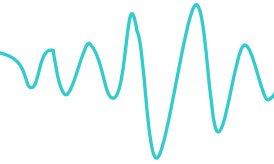
Environmental Noise Control



Attachment 2
Ambient Noise Monitoring Location 1 (39.747192°/-104.658998°)

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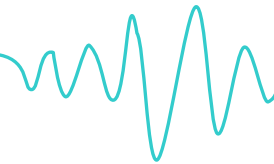
Environmental Noise Control



Attachment 3
Ambient Noise Monitoring Location 2 (39.747209°/-104.649985°)

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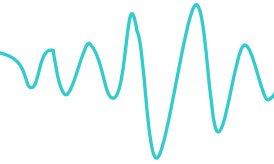
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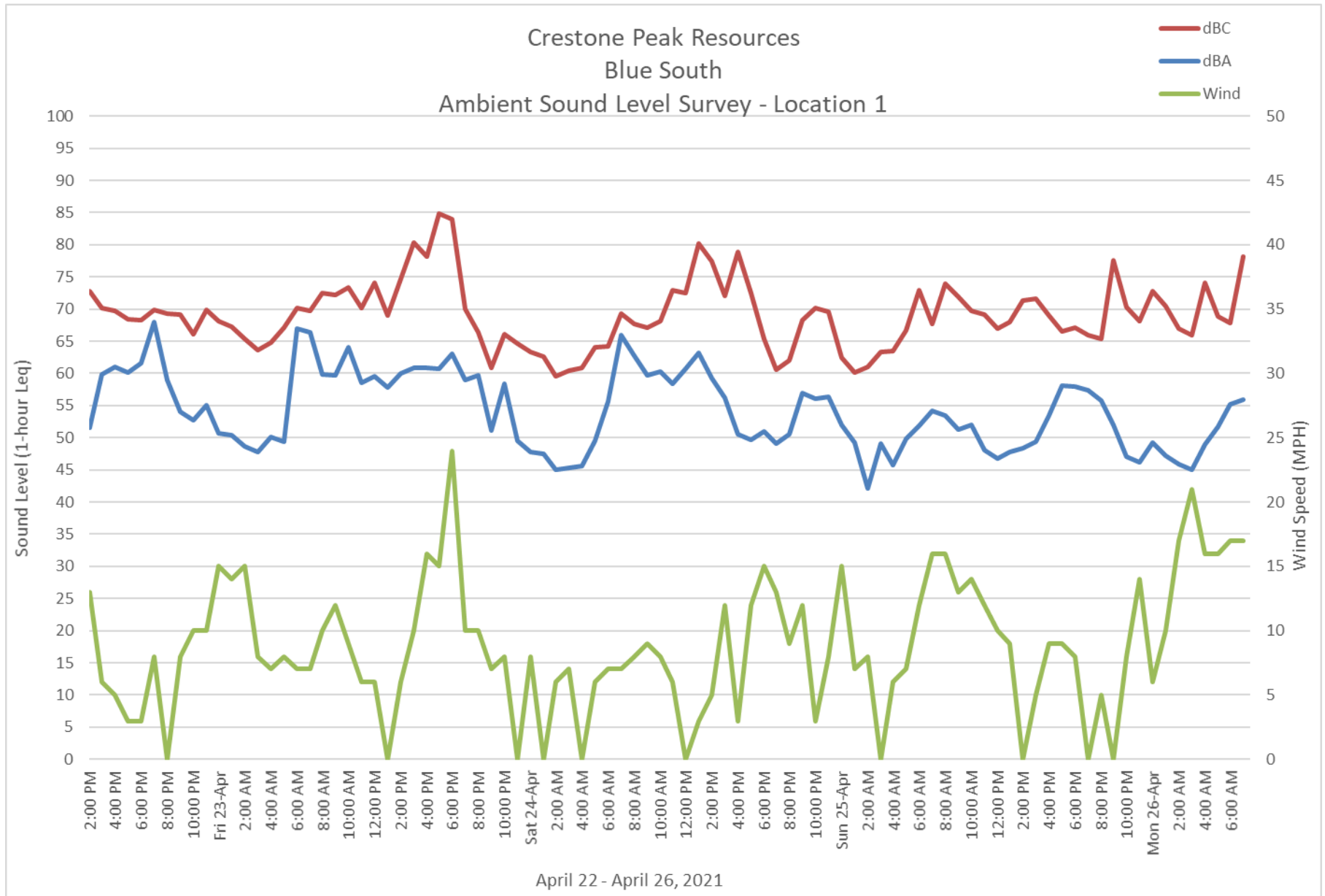
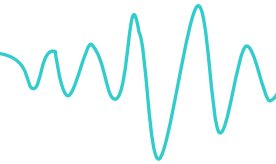
Attachment 4
Ambient Noise Monitoring Location 3 (39.741675°/-104.650160°)

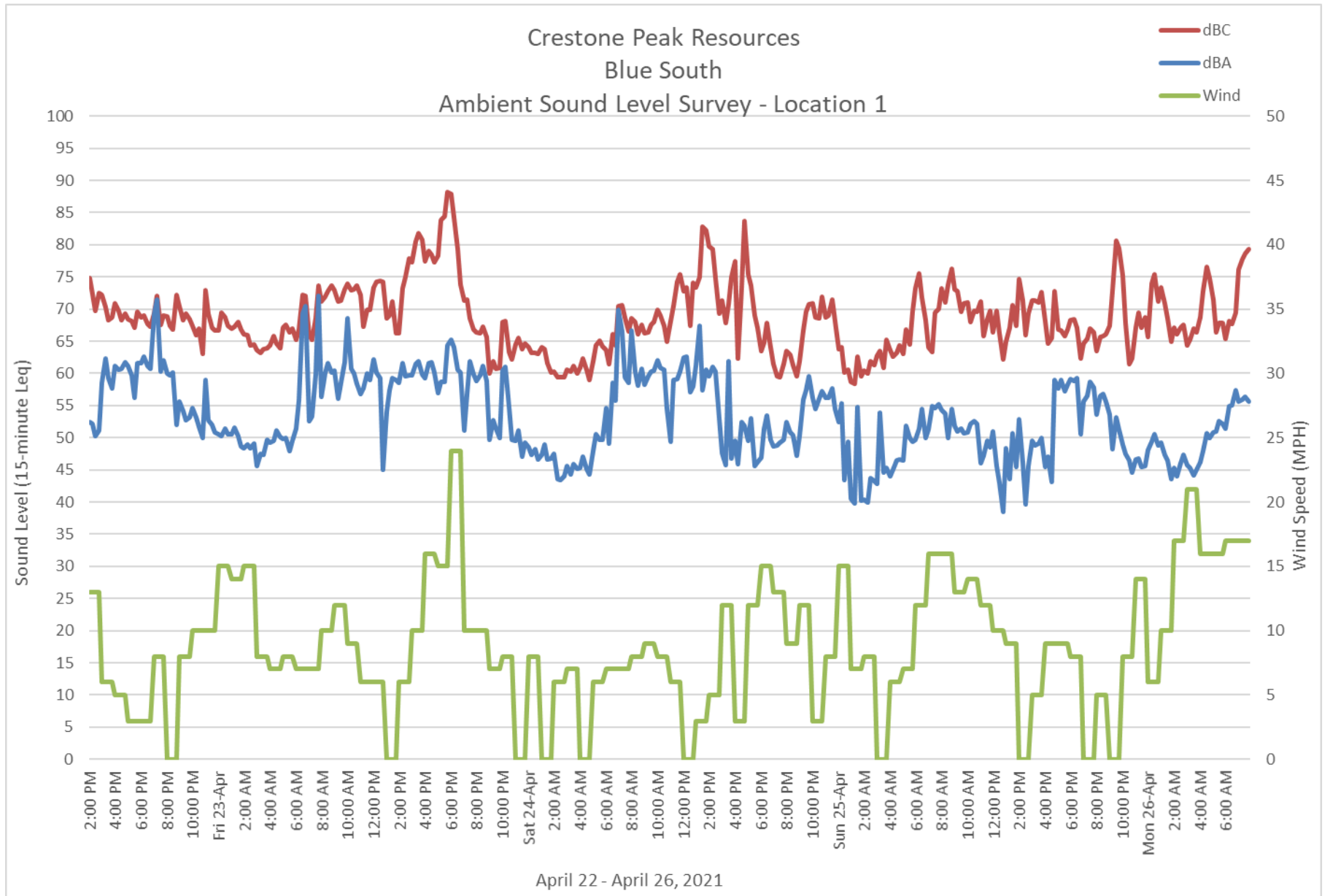
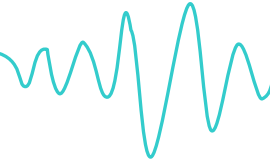
Behrens and Associates, Inc.

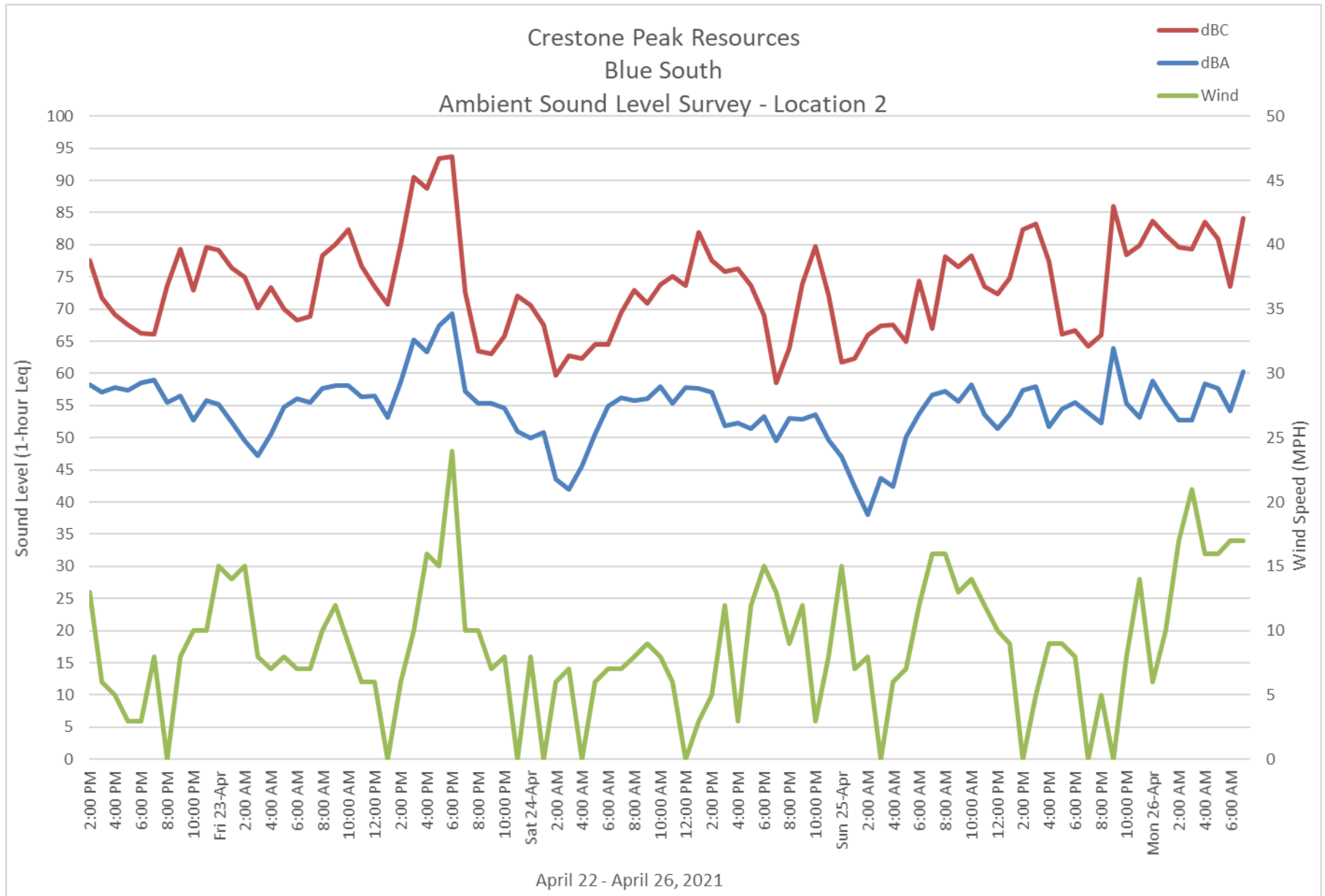
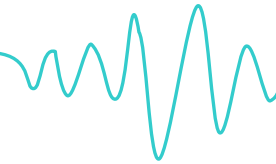
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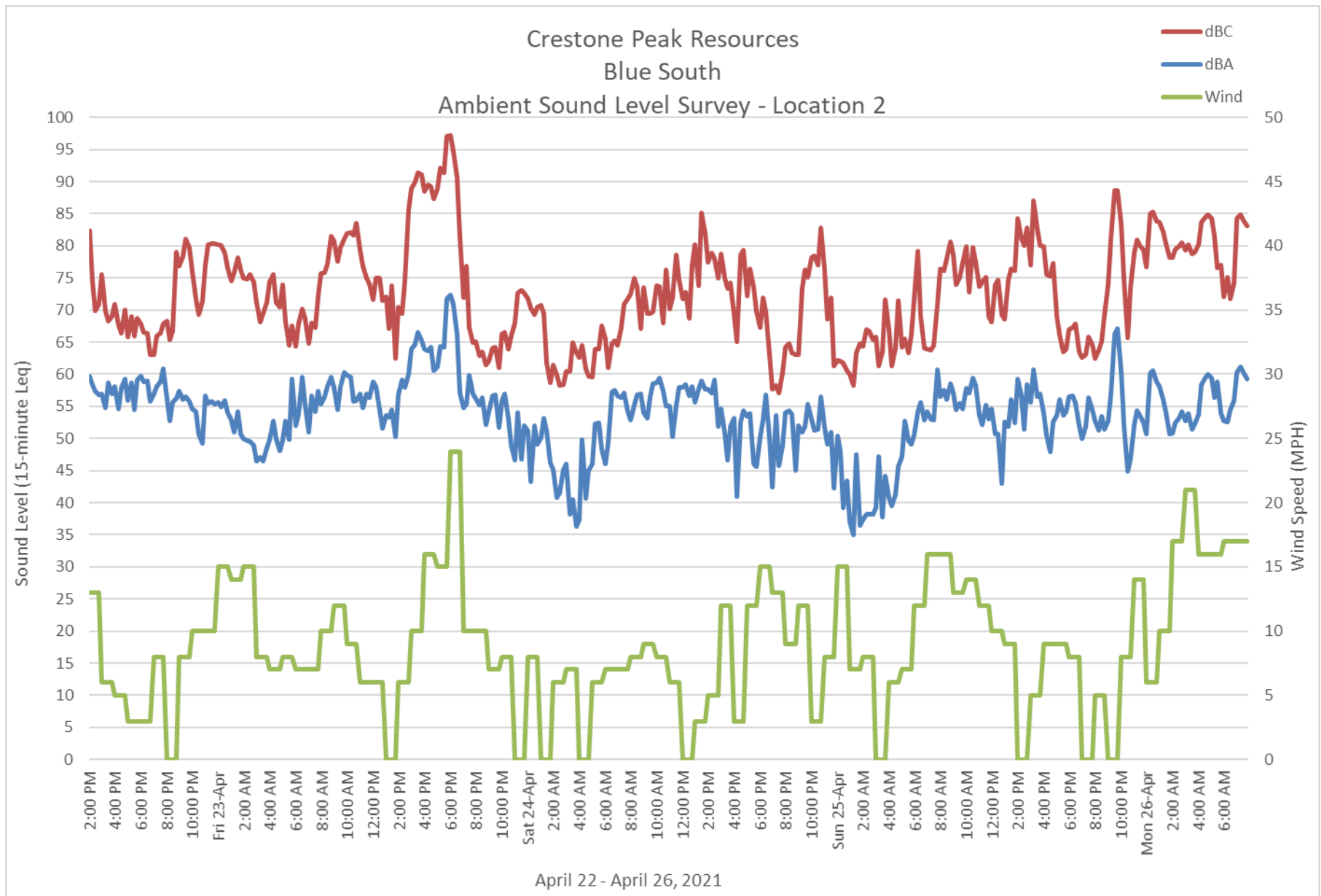
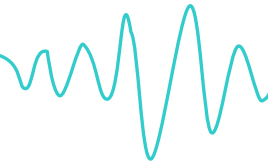


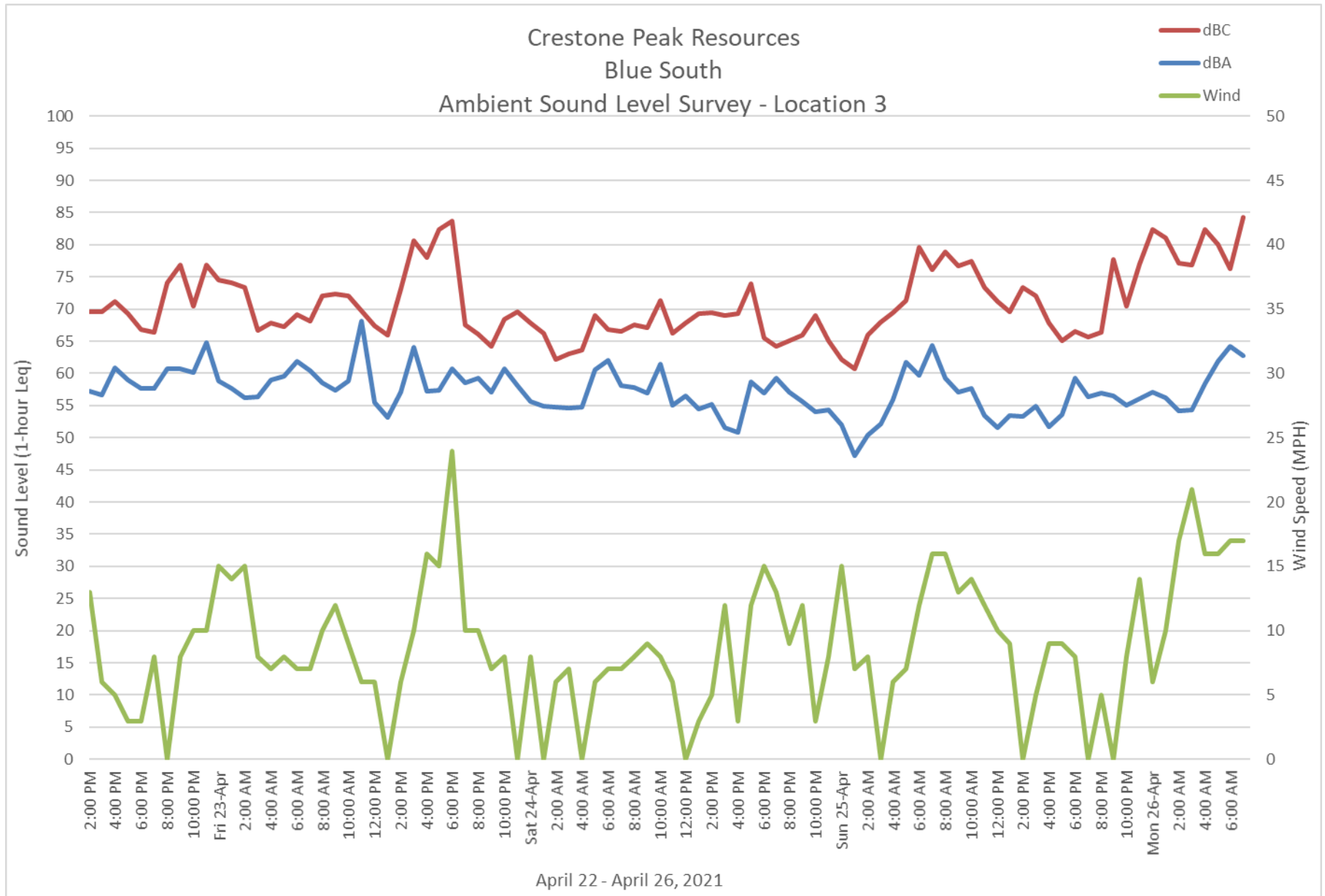
Attachment 5
Ambient Noise Monitoring Location 4 (39.743589°/-104.659223°)

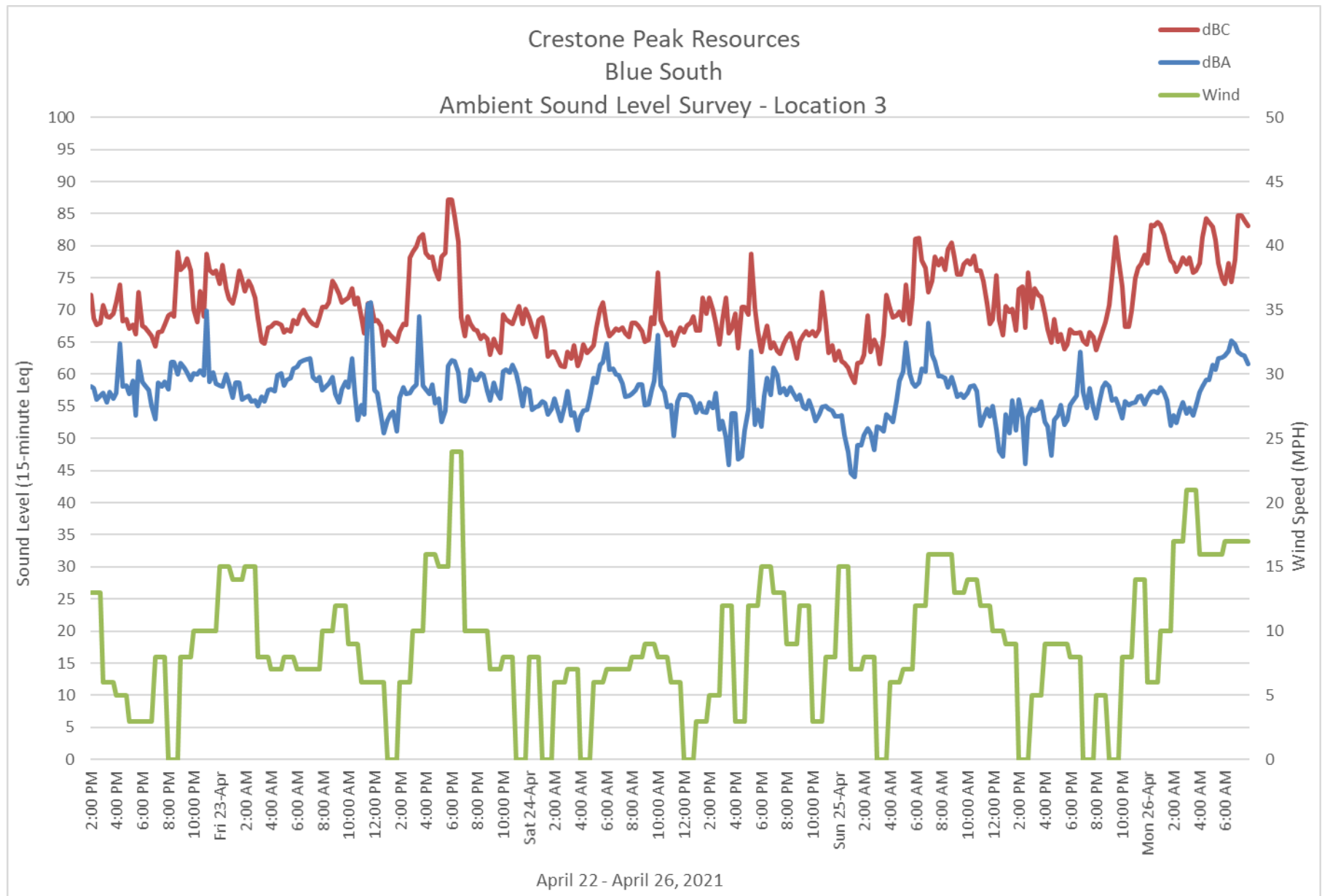


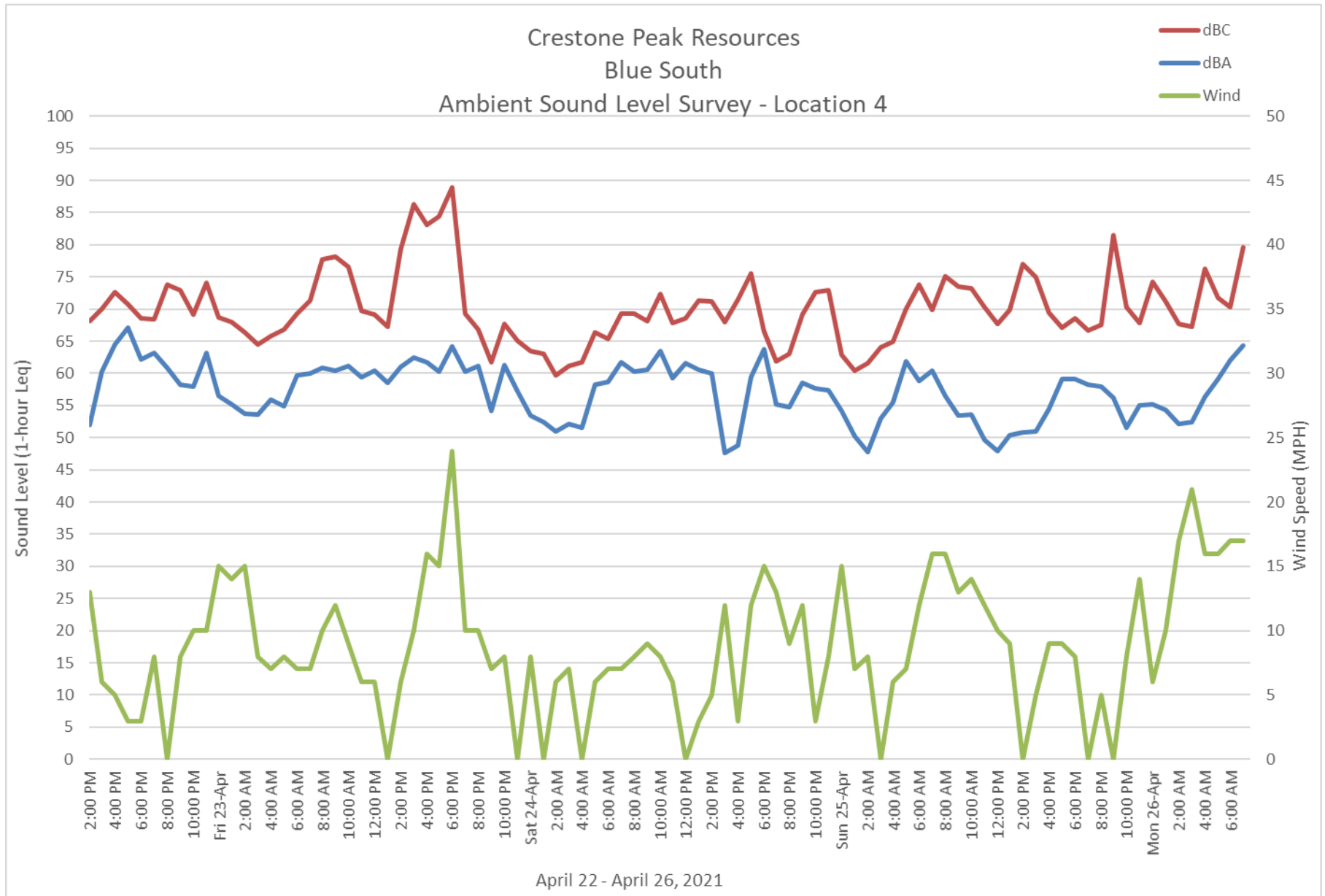
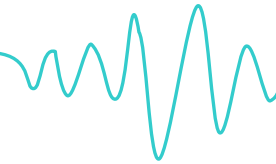


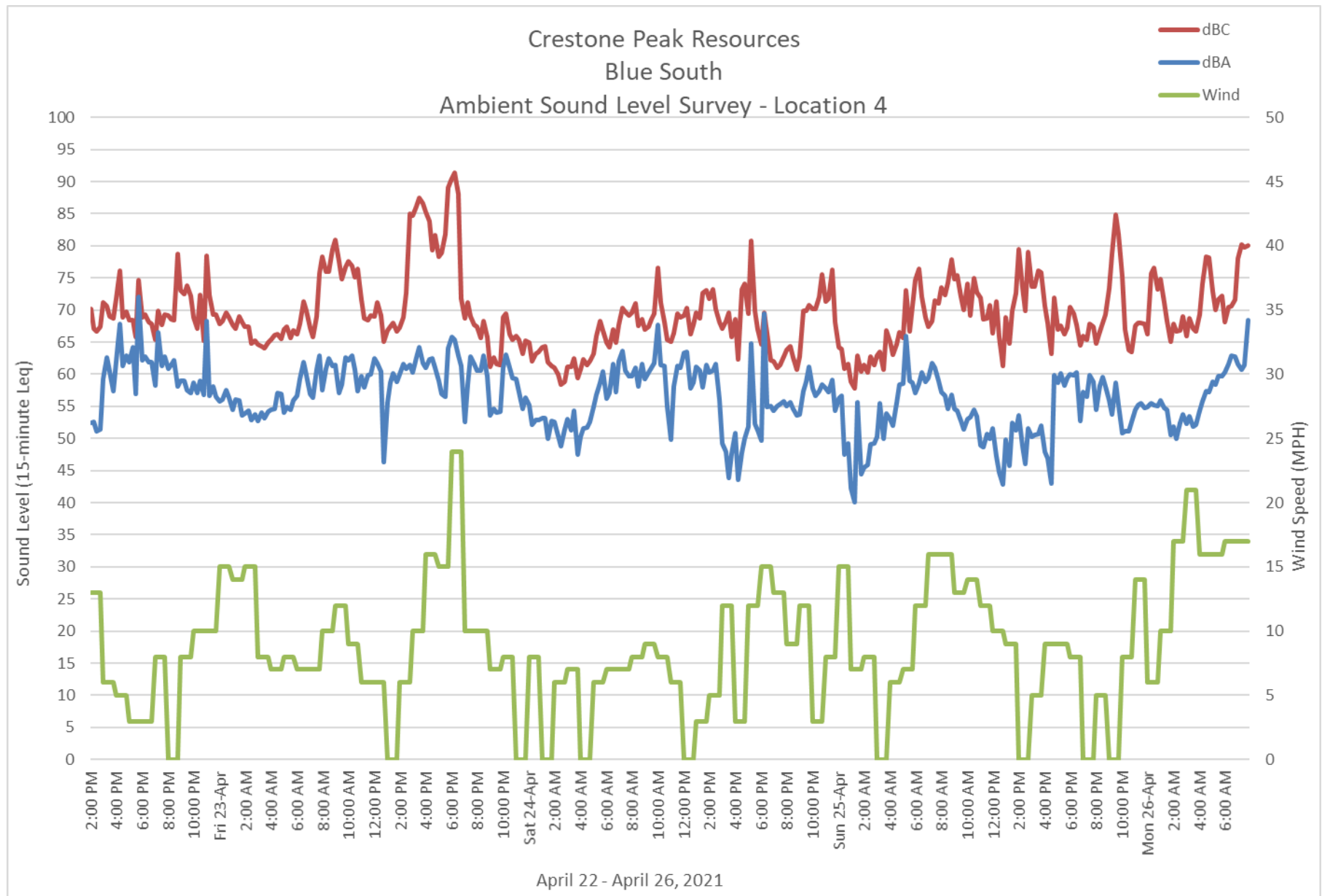






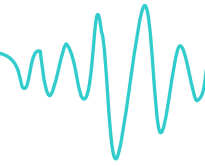






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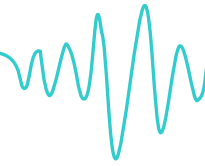
Environmental Noise Control



Crestone Peak Resources - Blue South					
Location 1 - Hourly Leq					
Time	dBA	dB	Time	dBA	dB
2:00 PM	52	73	11:00 AM	58	73
3:00 PM	60	70	12:00 PM	61	73
4:00 PM	61	70	1:00 PM	63	80
5:00 PM	60	68	2:00 PM	59	77
6:00 PM	62	68	3:00 PM	56	72
7:00 PM	68	70	4:00 PM	51	79
8:00 PM	59	69	5:00 PM	50	72
9:00 PM	54	69	6:00 PM	51	65
10:00 PM	53	66	7:00 PM	49	61
11:00 PM	55	70	8:00 PM	51	62
Fri 23-Apr	51	68	9:00 PM	57	68
1:00 AM	50	67	10:00 PM	56	70
2:00 AM	49	65	11:00 PM	56	70
3:00 AM	48	64	Sun 25-Apr	52	62
4:00 AM	50	65	1:00 AM	49	60
5:00 AM	49	67	2:00 AM	42	61
6:00 AM	67	70	3:00 AM	49	63
7:00 AM	66	70	4:00 AM	46	64
8:00 AM	60	72	5:00 AM	50	67
9:00 AM	60	72	6:00 AM	52	73
10:00 AM	64	73	7:00 AM	54	68
11:00 AM	59	70	8:00 AM	53	74
12:00 PM	59	74	9:00 AM	51	72
1:00 PM	58	69	10:00 AM	52	70
2:00 PM	60	75	11:00 AM	48	69
3:00 PM	61	80	12:00 PM	47	67
4:00 PM	61	78	1:00 PM	48	68
5:00 PM	61	85	2:00 PM	48	71
6:00 PM	63	84	3:00 PM	49	72
7:00 PM	59	70	4:00 PM	54	69
8:00 PM	60	66	5:00 PM	58	67
9:00 PM	51	61	6:00 PM	58	67
10:00 PM	58	66	7:00 PM	57	66
11:00 PM	50	65	8:00 PM	56	65
Sat 24-Apr	48	63	9:00 PM	52	78
1:00 AM	48	63	10:00 PM	47	70
2:00 AM	45	60	11:00 PM	46	68
3:00 AM	45	60	Mon 26-Apr	49	73
4:00 AM	46	61	1:00 AM	47	70
5:00 AM	50	64	2:00 AM	46	67
6:00 AM	56	64	3:00 AM	45	66
7:00 AM	66	69	4:00 AM	49	74
8:00 AM	63	68	5:00 AM	52	69
9:00 AM	60	67	6:00 AM	55	68
10:00 AM	60	68	7:00 AM	56	78

Behrens and Associates, Inc.

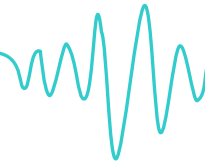
Environmental Noise Control



Crestone Peak Resources - Blue South					
Location 2 - Hourly Leq					
Time	dBA	dB	Time	dBA	dB
2:00 PM	58	78	11:00 AM	55	75
3:00 PM	57	72	12:00 PM	58	74
4:00 PM	58	69	1:00 PM	58	82
5:00 PM	57	68	2:00 PM	57	78
6:00 PM	59	66	3:00 PM	52	76
7:00 PM	59	66	4:00 PM	52	76
8:00 PM	55	74	5:00 PM	51	74
9:00 PM	56	79	6:00 PM	53	69
10:00 PM	53	73	7:00 PM	50	59
11:00 PM	56	80	8:00 PM	53	64
Fri 23-Apr	55	79	9:00 PM	53	74
1:00 AM	52	76	10:00 PM	54	80
2:00 AM	50	75	11:00 PM	50	72
3:00 AM	47	70	Sun 25-Apr	47	62
4:00 AM	51	73	1:00 AM	42	62
5:00 AM	55	70	2:00 AM	38	66
6:00 AM	56	68	3:00 AM	44	67
7:00 AM	55	69	4:00 AM	42	68
8:00 AM	58	78	5:00 AM	50	65
9:00 AM	58	80	6:00 AM	54	74
10:00 AM	58	82	7:00 AM	57	67
11:00 AM	56	77	8:00 AM	57	78
12:00 PM	57	74	9:00 AM	56	77
1:00 PM	53	71	10:00 AM	58	78
2:00 PM	59	80	11:00 AM	54	74
3:00 PM	65	90	12:00 PM	51	72
4:00 PM	63	89	1:00 PM	54	75
5:00 PM	67	93	2:00 PM	57	82
6:00 PM	69	94	3:00 PM	58	83
7:00 PM	57	73	4:00 PM	52	77
8:00 PM	55	63	5:00 PM	54	66
9:00 PM	55	63	6:00 PM	56	67
10:00 PM	55	66	7:00 PM	54	64
11:00 PM	51	72	8:00 PM	52	66
Sat 24-Apr	50	71	9:00 PM	64	86
1:00 AM	51	68	10:00 PM	55	78
2:00 AM	44	60	11:00 PM	53	80
3:00 AM	42	63	Mon 26-Apr	59	84
4:00 AM	46	62	1:00 AM	56	82
5:00 AM	51	65	2:00 AM	53	80
6:00 AM	55	64	3:00 AM	53	79
7:00 AM	56	69	4:00 AM	58	84
8:00 AM	56	73	5:00 AM	58	81
9:00 AM	56	71	6:00 AM	54	74
10:00 AM	58	74	7:00 AM	60	84

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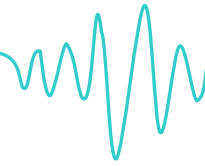
Environmental Noise Control



Crestone Peak Resources - Blue South					
Location 3 - Hourly Leq					
Time	dBA	dBC	Time	dBA	dBC
2:00 PM	57	70	11:00 AM	55	66
3:00 PM	57	70	12:00 PM	56	68
4:00 PM	61	71	1:00 PM	54	69
5:00 PM	59	69	2:00 PM	55	69
6:00 PM	58	67	3:00 PM	52	69
7:00 PM	58	66	4:00 PM	51	69
8:00 PM	61	74	5:00 PM	59	74
9:00 PM	61	77	6:00 PM	57	66
10:00 PM	60	70	7:00 PM	59	64
11:00 PM	65	77	8:00 PM	57	65
Fri 23-Apr	59	75	9:00 PM	56	66
1:00 AM	58	74	10:00 PM	54	69
2:00 AM	56	73	11:00 PM	54	65
3:00 AM	56	67	Sun 25-Apr	52	62
4:00 AM	59	68	1:00 AM	47	61
5:00 AM	60	67	2:00 AM	50	66
6:00 AM	62	69	3:00 AM	52	68
7:00 AM	60	68	4:00 AM	56	69
8:00 AM	59	72	5:00 AM	62	71
9:00 AM	57	72	6:00 AM	60	80
10:00 AM	59	72	7:00 AM	64	76
11:00 AM	68	70	8:00 AM	59	79
12:00 PM	56	67	9:00 AM	57	77
1:00 PM	53	66	10:00 AM	58	78
2:00 PM	57	73	11:00 AM	53	73
3:00 PM	64	81	12:00 PM	52	71
4:00 PM	57	78	1:00 PM	53	70
5:00 PM	57	82	2:00 PM	53	73
6:00 PM	61	84	3:00 PM	55	72
7:00 PM	59	68	4:00 PM	52	68
8:00 PM	59	66	5:00 PM	54	65
9:00 PM	57	64	6:00 PM	59	67
10:00 PM	61	68	7:00 PM	56	66
11:00 PM	58	70	8:00 PM	57	66
Sat 24-Apr	56	68	9:00 PM	57	78
1:00 AM	55	66	10:00 PM	55	70
2:00 AM	55	62	11:00 PM	56	77
3:00 AM	55	63	Mon 26-Apr	57	82
4:00 AM	55	64	1:00 AM	56	81
5:00 AM	61	69	2:00 AM	54	77
6:00 AM	62	67	3:00 AM	54	77
7:00 AM	58	67	4:00 AM	58	82
8:00 AM	58	68	5:00 AM	62	80
9:00 AM	57	67	6:00 AM	64	76
10:00 AM	61	71	7:00 AM	63	84

Behrens and Associates, Inc.

Environmental Noise Control



Crestone Peak Resources - Blue South					
Location 4 - Hourly Leq					
Time	dBA	dBC	Time	dBA	dBC
2:00 PM	52	68	11:00 AM	59	68
3:00 PM	60	70	12:00 PM	62	69
4:00 PM	64	73	1:00 PM	61	71
5:00 PM	67	71	2:00 PM	60	71
6:00 PM	62	69	3:00 PM	48	68
7:00 PM	63	68	4:00 PM	49	71
8:00 PM	61	74	5:00 PM	59	76
9:00 PM	58	73	6:00 PM	64	67
10:00 PM	58	69	7:00 PM	55	62
11:00 PM	63	74	8:00 PM	55	63
Fri 23-Apr	56	69	9:00 PM	59	69
1:00 AM	55	68	10:00 PM	58	73
2:00 AM	54	66	11:00 PM	57	73
3:00 AM	54	64	Sun 25-Apr	54	63
4:00 AM	56	66	1:00 AM	50	60
5:00 AM	55	67	2:00 AM	48	62
6:00 AM	60	69	3:00 AM	53	64
7:00 AM	60	71	4:00 AM	55	65
8:00 AM	61	78	5:00 AM	62	70
9:00 AM	60	78	6:00 AM	59	74
10:00 AM	61	77	7:00 AM	60	70
11:00 AM	59	70	8:00 AM	56	75
12:00 PM	60	69	9:00 AM	53	74
1:00 PM	59	67	10:00 AM	54	73
2:00 PM	61	79	11:00 AM	50	70
3:00 PM	62	86	12:00 PM	48	68
4:00 PM	62	83	1:00 PM	50	70
5:00 PM	60	84	2:00 PM	51	77
6:00 PM	64	89	3:00 PM	51	75
7:00 PM	60	69	4:00 PM	54	70
8:00 PM	61	67	5:00 PM	59	67
9:00 PM	54	62	6:00 PM	59	69
10:00 PM	61	68	7:00 PM	58	67
11:00 PM	57	65	8:00 PM	58	68
Sat 24-Apr	53	64	9:00 PM	56	81
1:00 AM	52	63	10:00 PM	52	70
2:00 AM	51	60	11:00 PM	55	68
3:00 AM	52	61	Mon 26-Apr	55	74
4:00 AM	52	62	1:00 AM	54	71
5:00 AM	58	66	2:00 AM	52	68
6:00 AM	59	65	3:00 AM	52	67
7:00 AM	62	69	4:00 AM	56	76
8:00 AM	60	69	5:00 AM	59	72
9:00 AM	61	68	6:00 AM	62	70
10:00 AM	64	72	7:00 AM	64	80