Summary Memorandum

Wastewater Treatment Facility No. 1 Fence Line and Off-Site Odor Assessment

June 2020

PERKINS
ENGINEERING
CONSULTANTS, INC.

San Jacinto River Authority

Summary Memorandum

Wastewater Treatment Facility No. 1 Fence Line and Off-Site Odor Assessment

Contents

Table of Contents

Tables

Figures

Exhibits

Exhibit 1: SJRA WWTF No. 1 Area Map
Exhibit 2: WWTF No. 1 Odor Monitor Locations

Appendices:

Appendix A: Hydrogen Sulfide Monitoring Data

June 3, 2020
Supersedes April 20, 2020 Edition

1.0 Executive Summary

Perkins Engineering Consultants, Inc. was retained to assist with development of a fence line monitoring plan for monitoring of ambient hydrogen sulfide (H_2S) levels within and adjacent to the San Jacinto River Authority (SJRA) Wastewater Treatment Facility No. 1 (SJRA WWTF No. 1).

H_2S is generally the most common odor-causing compound found in wastewater, but other odor-causing compounds, such as reduced-sulfur organic compounds and nitrogen-based compounds, can be present as well. H_2S can be monitored continuously in the field, whereas reliable field instruments are not available for continuous monitoring of other odor-causing compounds. Highly sensitive H_2S recorders, capable of detecting H_2S at concentrations below levels at which most persons can recognize its smell, were deployed at multiple locations around the facility and in nearby neighborhoods for a four-week period.

Collectively, the instruments recorded 15,528 individual H_2S readings over the monitoring period. During the period monitored, there were no measured instances of H_2S concentrations exceeding 80 parts per billion (ppb) over a 30-minute average (or for even a single measurement) at or beyond the fence line. As described below, concentrations at or above 80 ppb over a 30-minute average is the regulated level determined by the Texas Commission on Environmental Quality (TCEQ). Offsite and fence line monitors measured detectable concentrations of H_2S only about two percent of the sampling time and measured concentrations high enough for a person with normal olfactory senses to smell in only one percent of the measurements made at all sites monitored. Of the monitors placed along the facility property line, the monitor mounted on the west fence of the facility (on SJRA property) had the most frequent H_2S detections, but still only registered measurable H_2S 10.6% of the time, with no measurements above 80 ppb. Measurements in this location suggest that, depending on wind conditions, the "tin man" headspace exhaust stack or the facility's headworks structure could be contributing to the odors reported in the neighborhood to the north.

2.0 Introduction

SJRA has concerns with potential odors emanating from WWTF No. 1 located on Sawdust Road as seen in **Exhibit 1** and how those odors may be impacting nearby sensitive receptors. Perkins Engineering Consultants, Inc. (PECI) was retained to develop a fence line monitoring plan to suggest locations for monitoring of ambient H_2S levels within and adjacent to the SJRA WWTF No. 1. PECI was also tasked with reviewing the H_2S data and assessing whether the conditions present a "nuisance" to the public. There are other odorous compounds from wastewater besides H_2S that could contribute to off-site odors. H_2S was the chosen compound to measure because it is the most common odorant from wastewater treatment facilities and there are instruments available to continuously monitor very low-level concentrations in ambient air.

The Texas Commission on Environmental Quality (TCEQ) has two standards for treatment facility odors:

> **30 TAC 112.31** – Prohibits hydrogen sulfide on downwind residential, business, or commercial properties from exceeding a "…net ground level concentration of 0.08 parts per million [or 80 parts per billion] averaged over any 30-minute period…"
>
> **30 TAC 101.4** – Prohibits "…air contaminants or combinations thereof, in such concentration and of such duration as are or may tend to be injurious to or adversely

> affect human health or welfare, animal life, vegetation, or property, or as to interfere with the normal use and enjoyment of animal life, vegetation, or property."

Individual sensitivity determines the level at which one can detect a smell, and different researchers have suggested varying recognition thresholds for H_2S. For the purposes of this evaluation, 7 parts per billion (ppb) is adopted as the level at which a person having "normal" olfactory senses can detect H_2S.

EXHIBIT 1:
SJRA WWTF NO. 1 AREA MAP

Image Sourced from Google Earth®

3.0 Fence Line and Off-Site Monitoring Methodology

For this study, odor monitoring was conducted at various locations along the WWTF fence line, at nearby properties adjacent to the WWTF, and at an offsite location where the wastewater collection system may be contributing to the perceived odors. Acrulogs® were used to monitor ambient H_2S levels along the SJRA WWTF No. 1 fence/property line. They were mounted inside of a weather protection guard shown in Figure 1. The concentration range for those meters was 0 to 2000 ppb. They were set to take readings every ten minutes so that a 30-minute average concentration could be calculated if persistent readings were encountered. Each monitor was calibrated by the distributor prior to being deployed.

Figure 1 Acrulog® PPB Monitors

To begin building a database of hydrogen sulfide concentrations, locations had to be chosen for monitoring. These locations are shown in **Exhibit 2** and were chosen based on possible downwind receptors, possible odor sources, historic prevailing winds, and the weather forecast for each week for which they were deployed. Prevailing winds in the area are from the south and southeast, as indicated in the TCEQ-published wind rose for the Houston George Bush Intercontinental Airport, shown in Figure 2, below. For modeling conducted separately and described in another document, TCEQ data from other nearby airports were used.

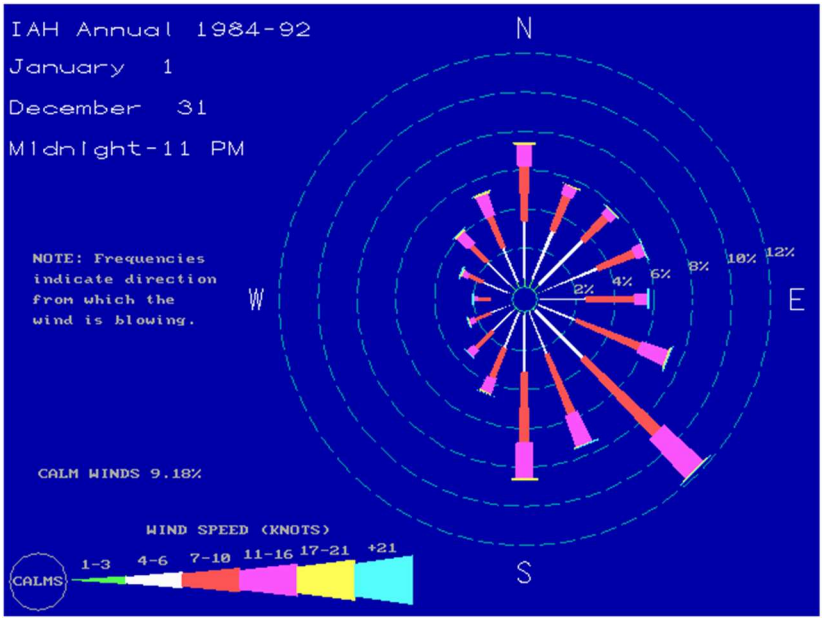


Figure 2 Houston IAH Historical Wind Rose - Yearly Average

Data collected were evaluated to assess whether the previously referenced TCEQ standard of 30-min average concentrations of no more than 0.08 ppm (80 ppb) were being exceeded at the fence line or in nearby neighborhoods. PECI set up a one-week test round and placed the four ppb monitors in different locations based on anticipated wind direction and possible odor sources. Upwind locations were monitored as well to see if there were any background H_2S concentrations that may not reasonably be attributable to the treatment facility. The gas valve locations were chosen to determine whether that could be a source that could be contributing detectable odors away from the treatment facility. Once placed, the monitors logged concentration measurements every 10 minutes for 24 hours per day over the approximately week-long testing period for the first round. The monitors were then moved to conduct three subsequent rounds of testing, each about a week-long.

Table 1 provides the corresponding location name to the number/letter designations on **Exhibit 2**. The number corresponds to one of the four monitors, and the letter designates the week that the monitor was at that location. Monitor 1 did not change locations between weeks A and B. This is the same for monitor 2 between weeks B and C.

Table 1: Odor Monitor Locations to Corresponding Code

Test Round (A-D)	Odor Monitor Number (1-4)	Code	Location
A	1	1-A	Southwest of gas valve (Northwest of WWTF)
A	2	2-A	Water Well No. 3 (North of WWTF)
A	3	3-A	North of aeration basin on fence (North fence line)
A	4	4-A	Facility entrance (South fence line)
B	1	1-B	Southwest of gas valve (Northwest of WWTF)
B	2	2-B	South of Secluded Trail (North of WWTF)
B	3	3-B	North of grit structure by fence (West fence line)
B	4	4-B	Southwest of bar screens by fence (West fence line)
C	1	1-C	Northeast area of WWTF (North fence line)
C	2	2-C	South of Secluded Trail (North of WWTF)
C	3	3-C	West fence of Facility (West fence line)
C	4	4-C	Southeast fence of Facility (East fence line)
D	1	1-D	North of gas valve (Northwest of WWTF)
D	2	2-D	2 Black Cormorant (Northeast of WWTF)
D	3	3-D	North of Tin Man (Northwest of WWTF)
D	4	4-D	Water Well No. 3 (North of WWTF)

Highlighted locations represent offsite sampling locations.

Separate monitoring was conducted for the collection system exhaust vent structure, known as the “Tin Man”. This is represented by a “T” on **Exhibit 2** and is a point where incoming sewer headspace air is exhausted to maintain upstream vacuum conditions in neighborhoods up to one mile upstream. A separate monitor was deployed at that location. This monitor recorded concentrations in parts per million (ppm) and recorded measurements for approximately one week but was not rotated to a new location thereafter.

EXHIBIT 2:
SJRA WWTF NO. 1 ODOR MONITOR LOCATIONS

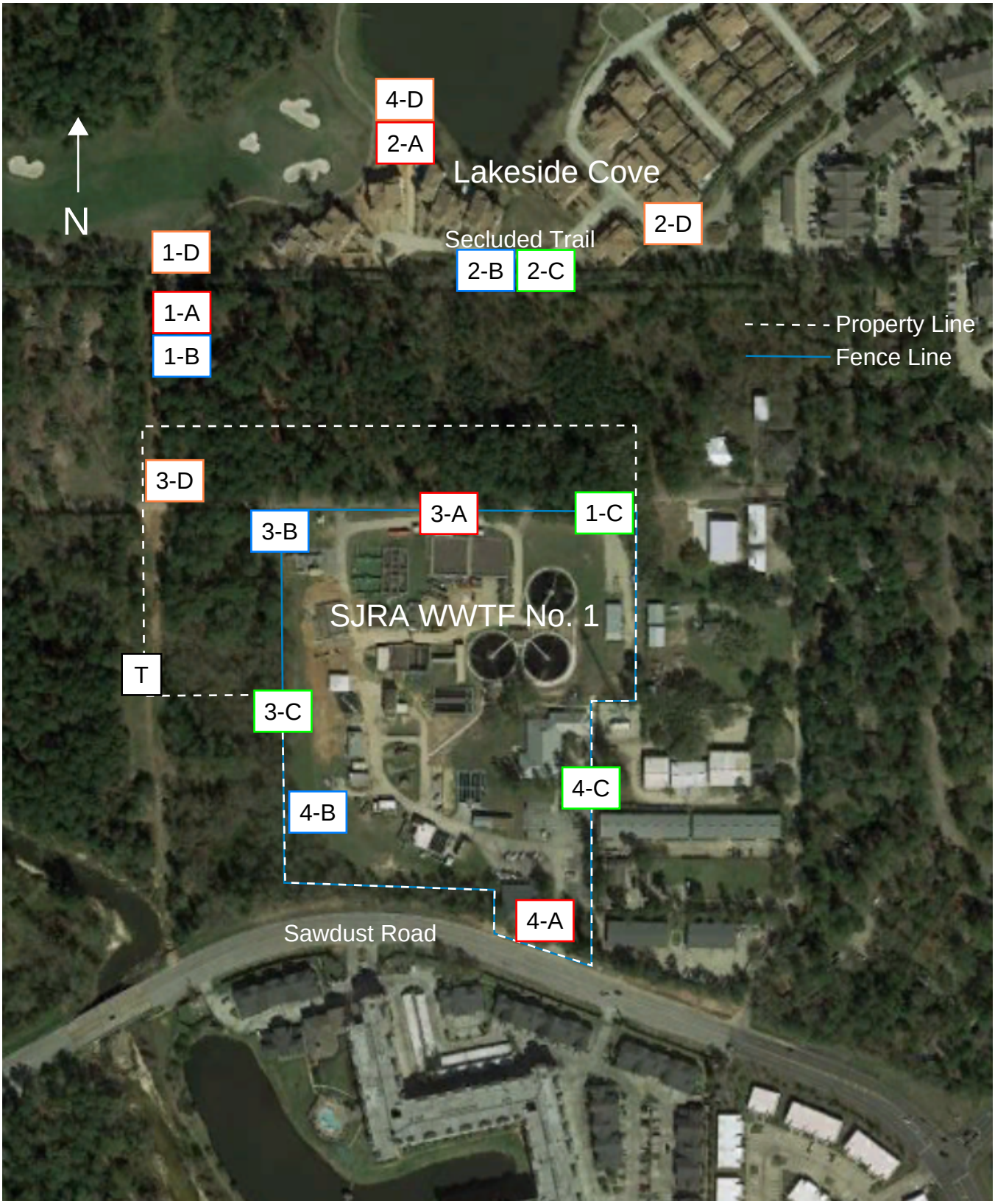


Image Sourced from Google Earth®

4.0 Results

Table 2 below provides the dates and times of the rotations of monitor locations. Monitors were left at each location for approximately one week.

Table 2: Acrulog® Placement Log

Acrulog® SN	Monitor	Round	Date Start	Approx. Time Start	Date Stop	Approx. Time Stop	Data Count	Location
1190	1	A	3/11/20*	11:09 am	3/17/20	1:39 pm	880	SW of gas valve
1490	2	A	3/11/20*	11:18 am	3/17/20	12:00 pm	863	Water Well No. 3
1484	3	A	3/11/20*	10:59 am	3/17/20	12:00 pm	865	N of aeration basin
1489	4	A	3/11/20*	10:43 am	3/17/20	12:00 pm	867	Entrance to Facility
1190	1	B	3/17/20	1:39 pm	3/25/20	9:00 am	1125	SW of gas valve
1490	2	B	3/17/20	12:00 pm	3/25/20	9:18 am	1135	S of Secluded Trail
1484	3	B	3/17/20	12:00 pm	3/25/20	9:00 am	1135	N of grit structure
1489	4	B	3/17/20	12:00 pm	3/25/20	9:00 am	1134	SW of bar screens
1190	1	C	3/25/20	9:00 am	3/31/20	9:45 am	868	NE area of WWTF
1490	2	C	3/25/20	9:18 am	3/31/30	9:45 am	868	S of Secluded Trail
1484	3	C	3/25/20	9:00 am	3/31/20	9:45 am	867	W fence of Facility
1489	4	C	3/25/20	9:00 am	3/31/20	9:45 am	867	SE fence of Facility
1190	1	D	3/31/20	10:45 am	4/7/20	11:45 am	1013	N of gas valve
1490	2	D	3/31/20	10:45 am	4/7/20	11:45 am	1013	2 Black Cormorant
1484	3	D	3/31/20	10:45 am	4/7/20	11:45 am	1014	N of Tin Man
1489	4	D	3/31/20	10:45 am	4/7/20	11:45 am	1014	Water Well No. 3

*Monitors were placed on 3/10/2020 but cellular transmission did not start until 3/11/2020

The complete sets of data from each location are attached in Appendix A. Two graphs are given for each location from the fence line monitoring plan. The first is a graph for comparing concentration levels during the day versus the night. The second is a graph that indicates the wind direction and average speed during the week. **Tables 3** and **4** below provide a brief summary of the concentrations measured at each sampling location. 15,528 discreet measurements of H_2S in ambient air were made over the course of the monitoring period.

Table 3 Data Summary Log

Location	Sampling Period	Max Instantaneous H_2S Measurement (ppb)	Max 30-Minute Average H_2S (ppb)	Average H_2S (ppb)
Southwest of gas valve (Northwest of WWTF)	3/11-3/17	21	15.33	<1
Water Well No. 3 (North of WWTF)	3/11-3/17	7	5.33	<1
North of aeration basins (North fence line)	3/11-3/17	17	7.33	<1
Facility entrance (South fence line)	3/11-3/17	6	2	<1
Southwest of gas valve (Northwest of WWTF)	3/17-3/25	57	24	<1
South of Secluded Trail (North of WWTF)	3/17-3/25	9	4.33	<1
North of grit structure (West fence line)	3/17-3/25	63	30	<1
Southwest of bar screen (West fence line)	3/17-3/25	22	18.67	<1
Northeast of WWTF (North fence line)	3/25-3/31	4	1.33	<1
South of Secluded Trail (North of WWTF)	3/25-3/31	4	1.33	<1
West fence of Facility (West fence line)	3/25-3/31	38	23.67	1.19
Southeast fence of Facility (Ease fence line)	3/25-3/31	ND	ND	ND
North of gas valve (Northwest of WWTF)	3/31-4/7	5	2.67	<1
2 Black Cormorant (Northeast of WWTF)	3/31-4/7	ND	ND	ND
North of Tin Man (Northwest of WWTF)	3/31-4/7	19	12.33	<1
Water Well No. 3 (North of WWTF)	3/31-4/7	ND	ND	ND

ND: No samples were detected above the recognition threshold

Table 4: Data Count

	Total Registered Measurements	Detectable Measurements		Measurements ≥7 ppb	
Location	**Count**	**Count**	**Percentage**	**Count**	**Percentage**
Southwest of Gas Valve	880	67	7.6%	15	1.7%
Water Well No. 3	863	6	0.7%	1	0.1%
North of Aeration Basins	865	17	2.0%	6	0.7%
Facility Entrance	867	2	0.2%	0	0%
Southwest of Gas Valve	1,125	77	6.8%	42	3.7%
South of Secluded Trail	1,135	4	0.4%	1	0.1%
North of Grit Structure	1,135	20	1.8%	11	1.0%
Southwest of Bar Screen	1,134	10	0.8%	8	0.7%
Northeast of WWTP	868	2	0.2%	0	0%
South of Secluded Trail	868	1	0.1%	0	0%
West Fence of Facility	867	92	10.6%	62	7.2%
Southeast Fence of Facility	867	0	0%	0	0%
North of Gas Valve	1,013	3	0.3%	0	0%
2 Black Cormorant	1,013	0	0%	0	0%
North of Tin Man	1,014	10	1.0%	4	0.4%
Water Well No. 3	1,014	0	0%	0	0%

There were power outages on March 23rd at approximately 1:30 and 4:30 A.M. that caused the digester blowers to go down temporarily. It is not known what the cause of the power outages was. SJRA personnel reported that there were no storm conditions that were the cause. The fence line monitors did not show any spikes in concentration during or after the outage. However, there was a spike at each of the four locations before the outage, but that could have been due to the changing wind directions at that time.

There was an employee of the gas company working on the gas valve on the morning of March 31st. Hydrogen sulfide levels picked up by that meter could have been affected by the work that was being done there. It is not known if there was work on the gas valve being done during other times that a monitor was at that location.

4.1 "Tin Man" Monitoring

In order to determine if the nearby wastewater collection system exhaust system was also contributing to potential nuisance odors for the neighboring communities, separate sampling was performed on the discharge vet of the structure. An Acrulog® monitor with a range from 0-

200 ppm (0-200,000 ppb) was placed at the discharge of the “Tin Man” as shown in Figure 3 below.

Figure 3: "Tin Man" H_2S Monitor Location

This meter was set to take measurements every 3 minutes and was recording concentrations for about a week. The resulting data is shown below.

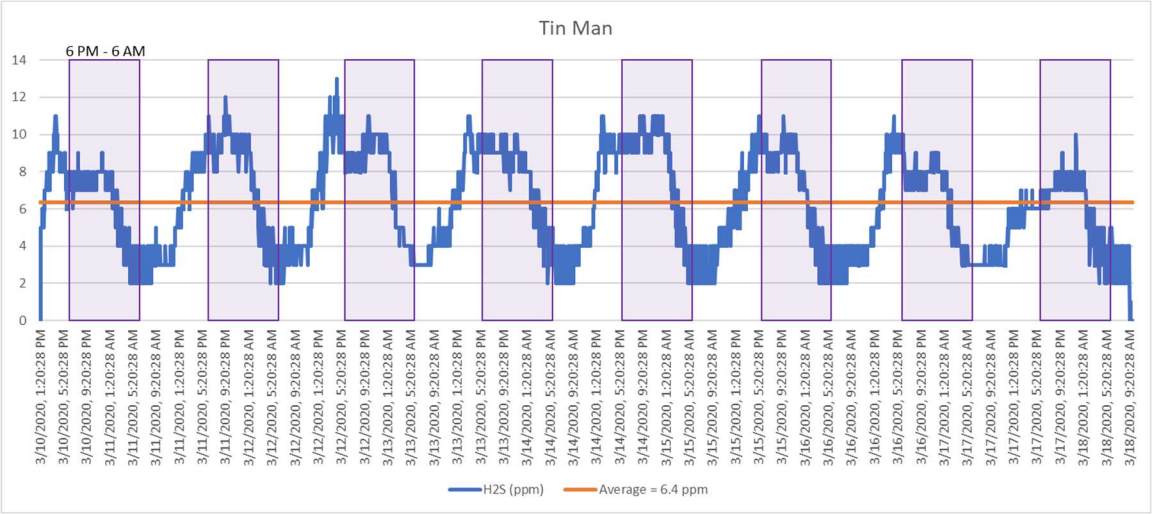


Figure 4: "Tin Man" H_2S Concentrations

The data shows a consistent diurnal (daily variation) pattern which sees high concentrations of about 8-12 ppm (or 8,000-12,000 ppb) in the evening and low concentrations of about 2-4 ppm in the morning. The average concentration of H_2S in the discharged air is about 6.4 ppm, making it a potential odor source, especially during light southerly wind conditions in the early evening hours.

Table 5: "Tin Man" Data Summary

Acrulog® SN	Date Start	Time Start	Date Stop	Time Stop	Number of Concentration Measurements	Max Instantaneous H_2S Measurement (ppm)	Average H_2S (ppm)
0605	3/10/20	1:30 pm	3/18/20	10:00 am	3,775	13	6.4

Although this structure is discharging foul air with H_2S concentrations above 80 ppb, this does not mean the WWTF is out of compliance. The "Tin Man" is within the SJRA property line, so it is the downwind concentrations that must stay below 80 ppb. None of the offsite monitors registered a concentration of 80 ppb.

Subsequent evaluations are being performed on potential dispersion and control techniques for this location.

5.0 Summary of Observations

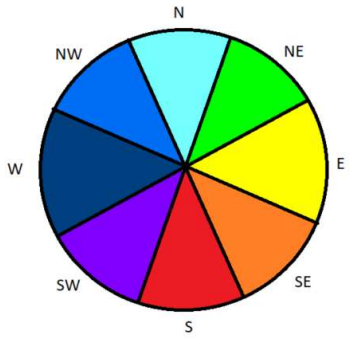
During the period monitored, there were no measured instances of H_2S concentrations of 80 ppb over a 30-minute average at or beyond the fence line. Offsite and fence line monitors measured detectable concentrations of H_2S only about two percent of the sampling time and measured concentrations high enough **for a person with normal olfactory senses to smell in only one percent of the measurements made at all sites monitored.** As seen in **Table 6** below, the offsite monitors registered fewer instances of H_2S concentrations than the fence line monitors. Of the offsite monitors, those placed near the gas valve registered the highest amount of H_2S concentrations. Multiple gas lines, both transmission and distribution, run through the area. The type of line determines what odorants may be present in the gas. Gathering lines transfer sour gas which contains H_2S. In transmission lines, the gas has been treated to remove H_2S, but has not been processed for distribution. The distribution lines have mercaptans added so that the gas can be smelled if there is a leak. Of the monitors placed along the property line, the monitor mounted on the west fence of the facility had the most frequent H_2S detections, but none of these measurements were above 80 ppb. Measurements in this location suggest that, depending on wind conditions, the "tin man" or the grit structure could be contributing to the concentrations detected.

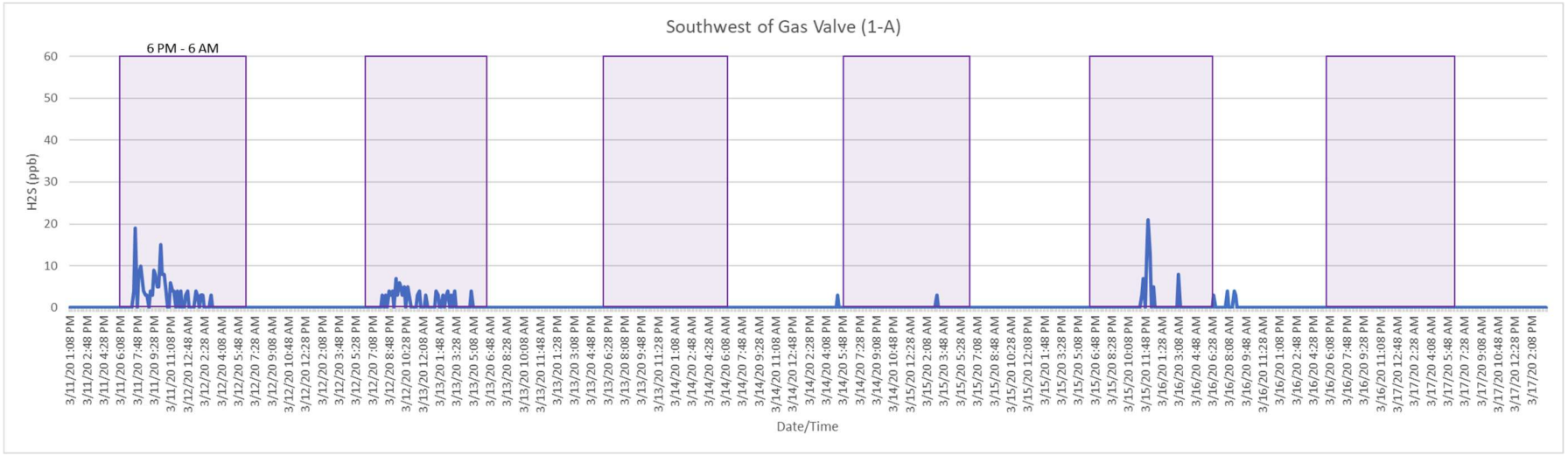
Table 6: Offsite vs Fence Line Data Summary

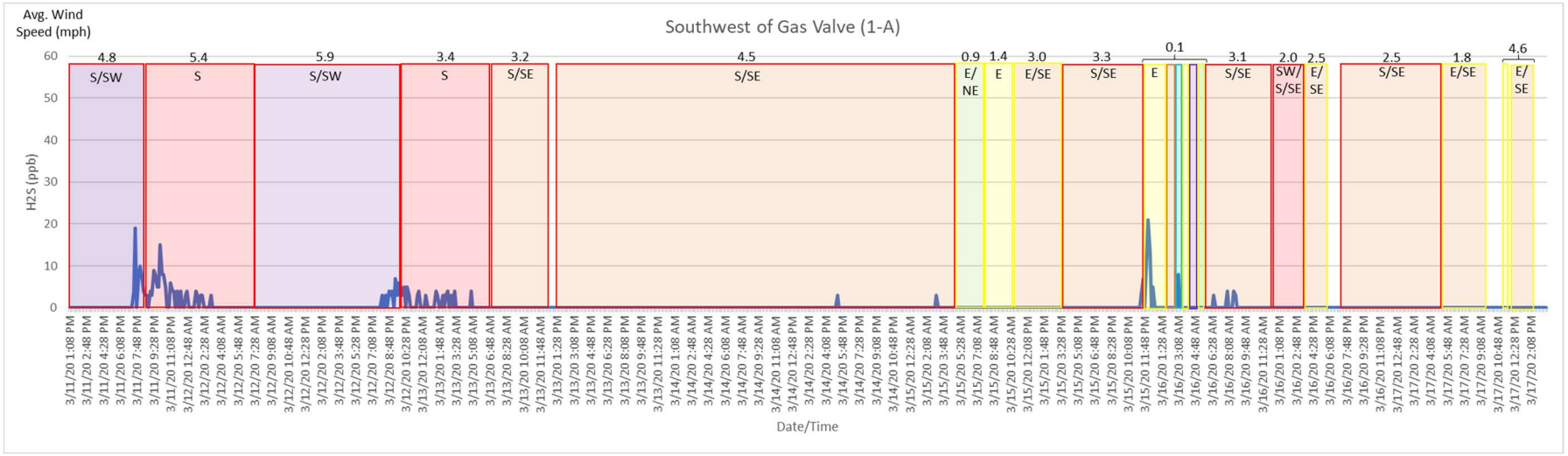
	Offsite	Fence Line
Number of measurements	8925	6603
Number (%) of detectable measurements	168 (1.9%)	143 (2.2%)
Number (%) of measurements ≥7 ppb	63 (0.7%)	87 (1.3%)
Number (%) of samples at TCEQ nuisance level (≥80 ppb over 30-minute average)	0 (0%)	0 (0%)

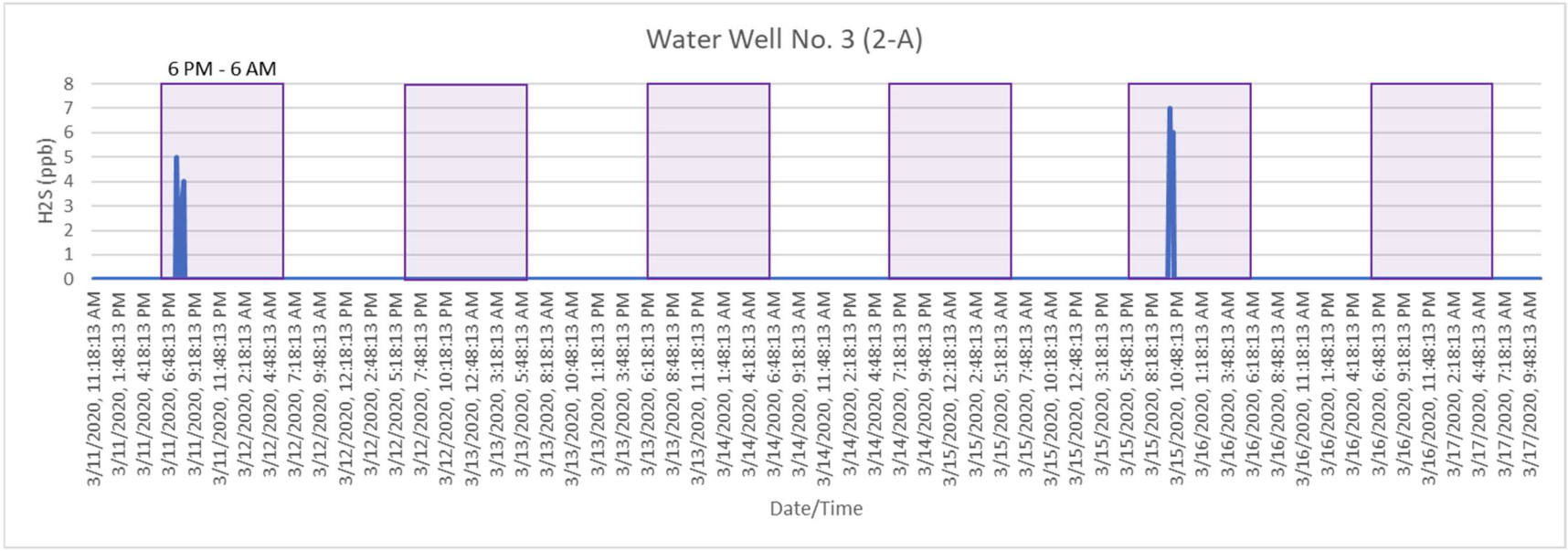
APPENDIX A
HYDROGEN SULFIDE MONITORING DATA

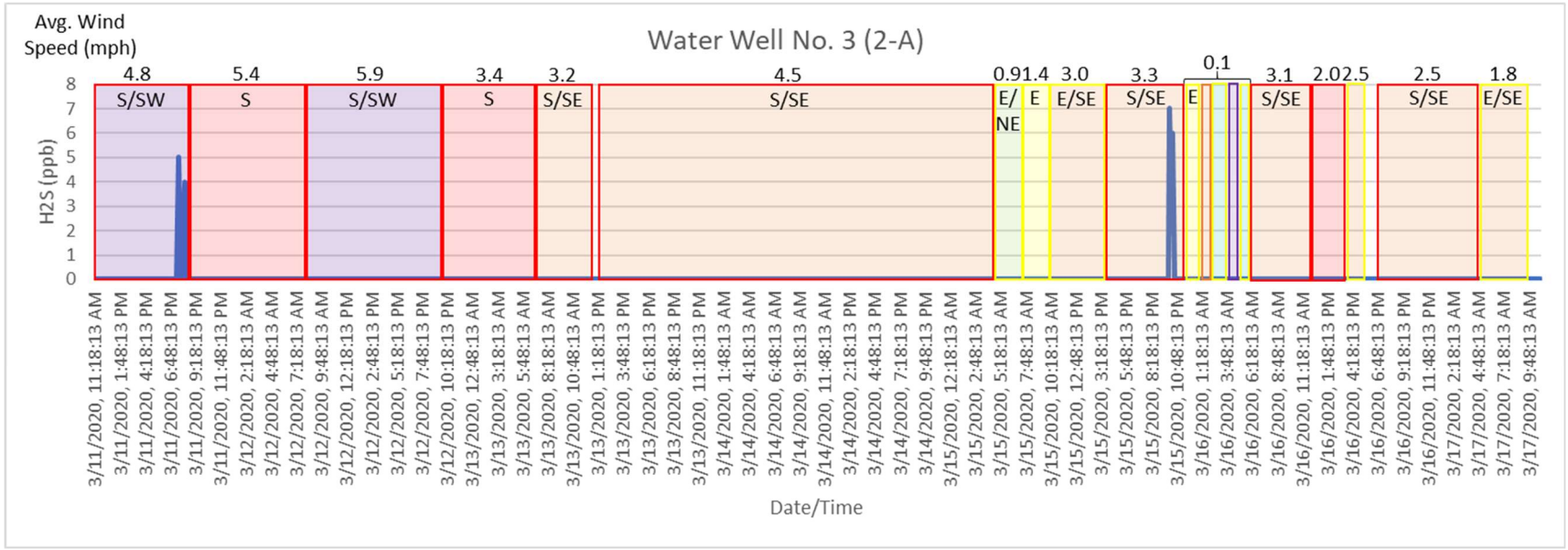
For graphs that indicate wind direction, use the following to determine direction:

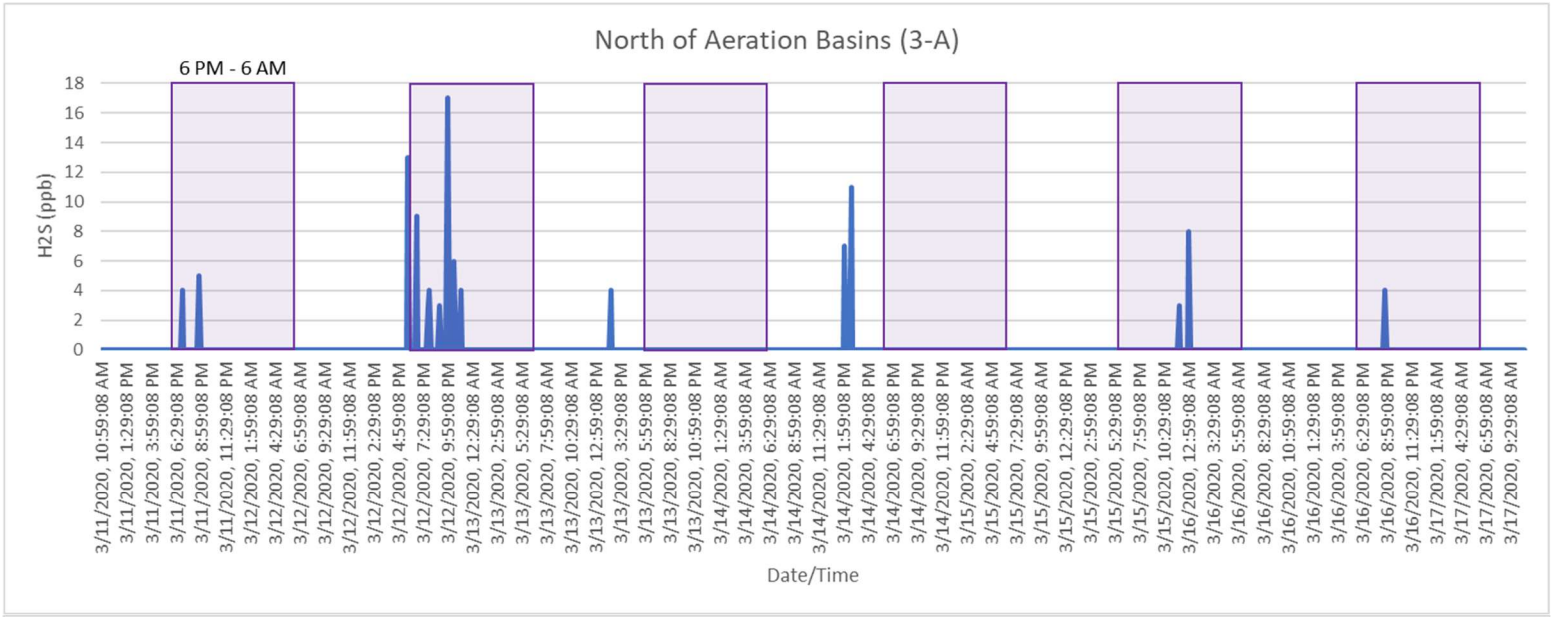


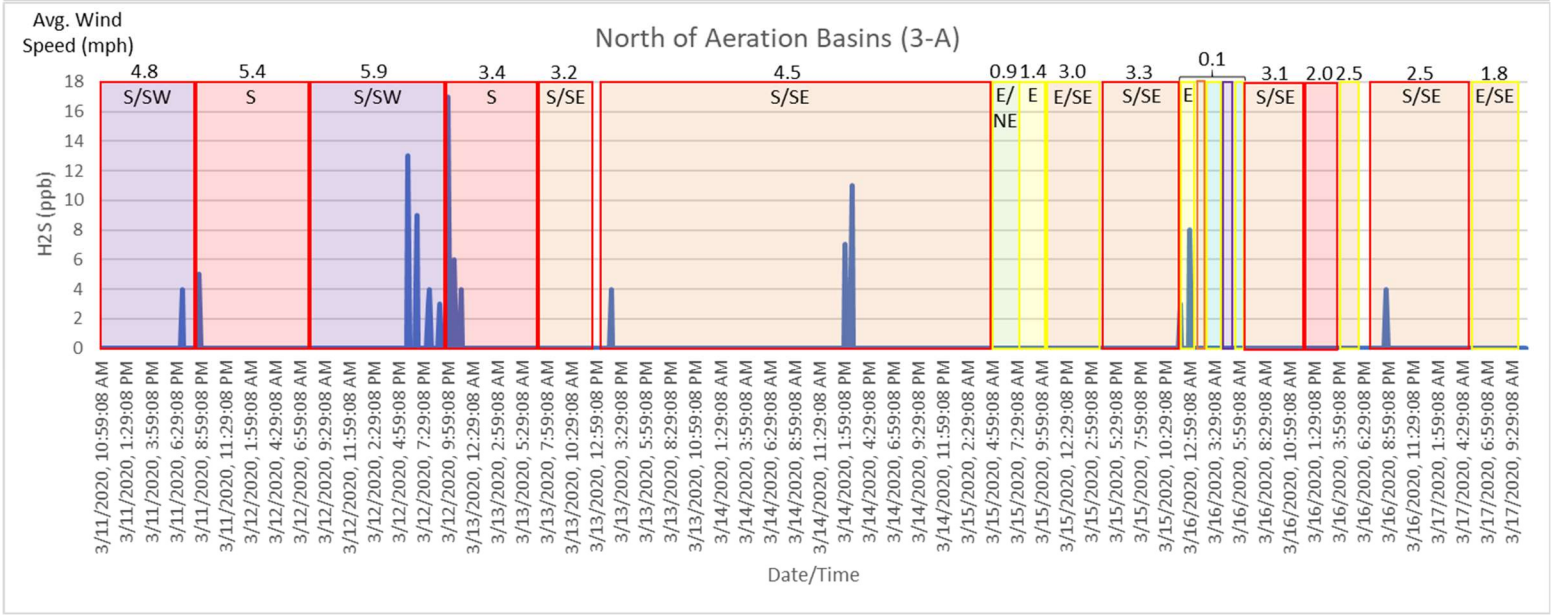

Southwest of Gas Valve (1-A)
6 PM - 6 AM
H2S (ppb)
Date/Time

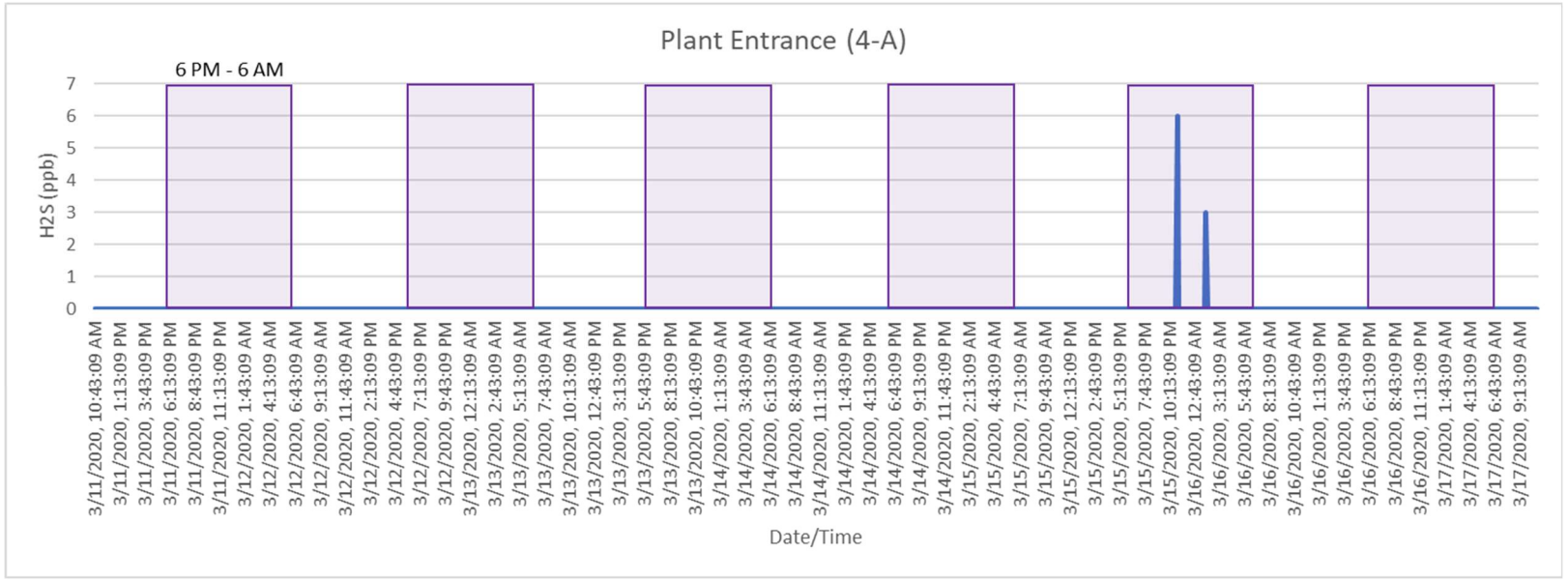

Avg. Wind Speed (mph)
Southwest of Gas Valve (1-A)
4.8 S/SW
5.4 S
5.9 S/SW
3.4 S
3.2 S/SE
4.5 S/SE
0.9 E/ NE
1.4 E
3.0 E/SE
3.3 S/SE
0.1 E
3.1 S/SE
2.0 SW/ S/SE
2.5 E/ SE
2.5 S/SE
1.8 E/SE
4.6 E/ SE
H2S (ppb)
Date/Time

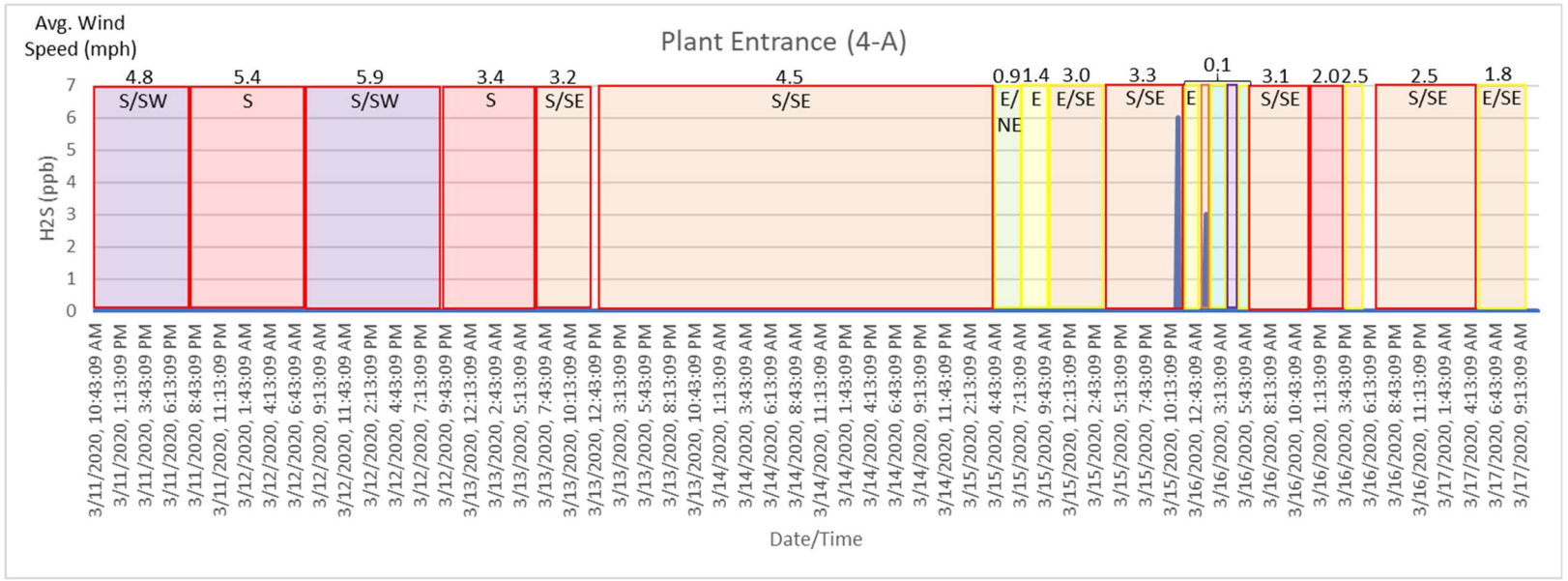

Water Well No. 3 (2-A)
6 PM - 6 AM
H2S (ppb)
Date/Time

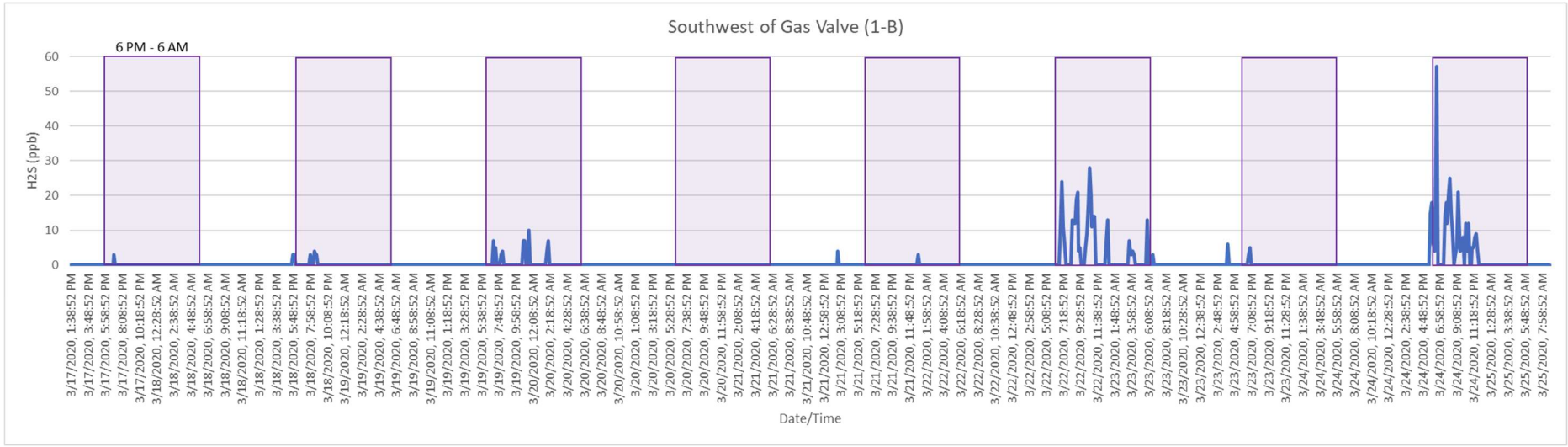

Avg. Wind Speed (mph)
Water Well No. 3 (2-A)
4.8 S/SW
5.4 S
5.9 S/SW
3.4 S
3.2 S/SE
4.5 S/SE
0.9 E/NE
1.4 E
3.0 E/SE
3.3 S/SE
0.1 E
3.1 S/SE
2.0
2.5 S/SE
1.8 E/SE
H2S (ppb)
Date/Time

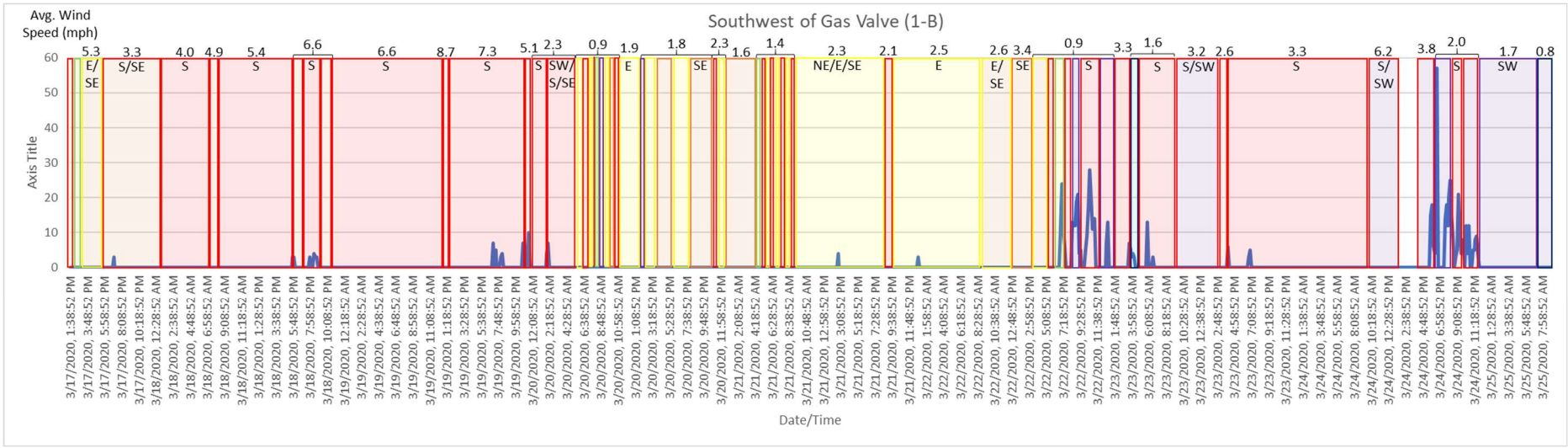

North of Aeration Basins (3-A)
6 PM - 6 AM
H2S (ppb)
Date/Time

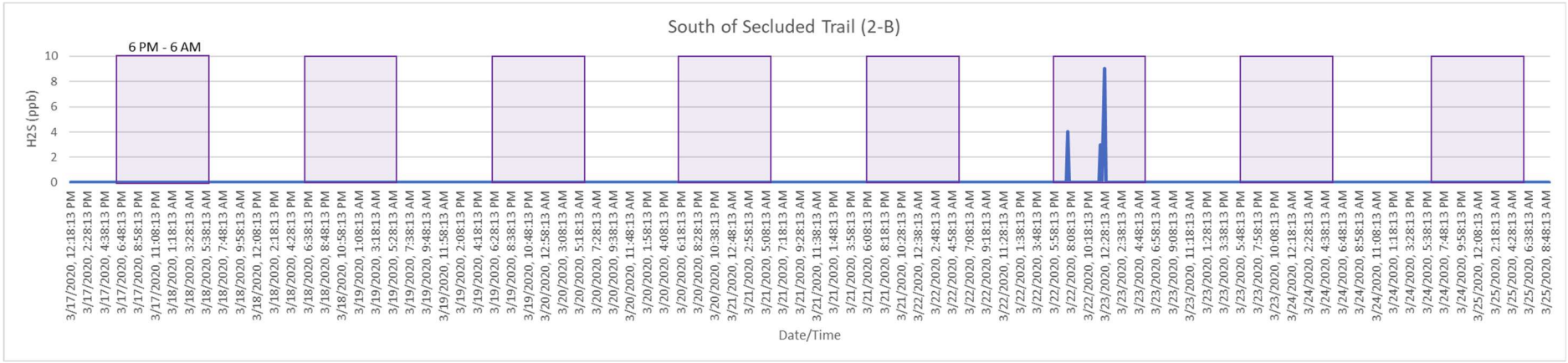

Avg. Wind Speed (mph)
North of Aeration Basins (3-A)
4.8 S/SW
5.4 S
5.9 S/SW
3.4 S
3.2 S/SE
4.5 S/SE
0.9 E/NE
1.4 E
3.0 E/SE
3.3 S/SE
0.1 E
3.1 S/SE
2.0
2.5
2.5 S/SE
1.8 E/SE
H2S (ppb)
Date/Time

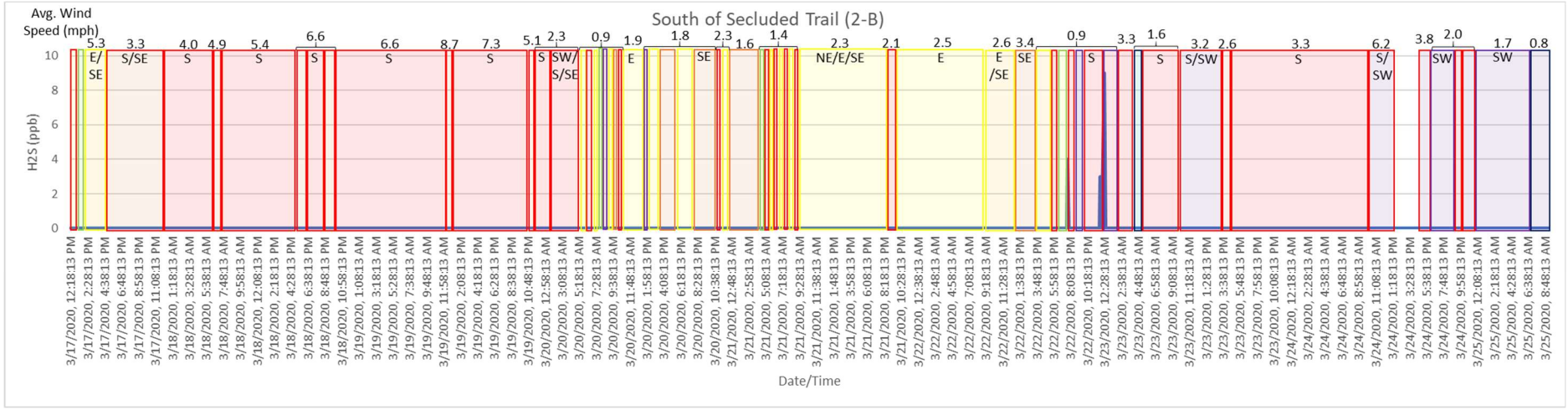

Plant Entrance (4-A)
6 PM - 6 AM
H2S (ppb)
Date/Time

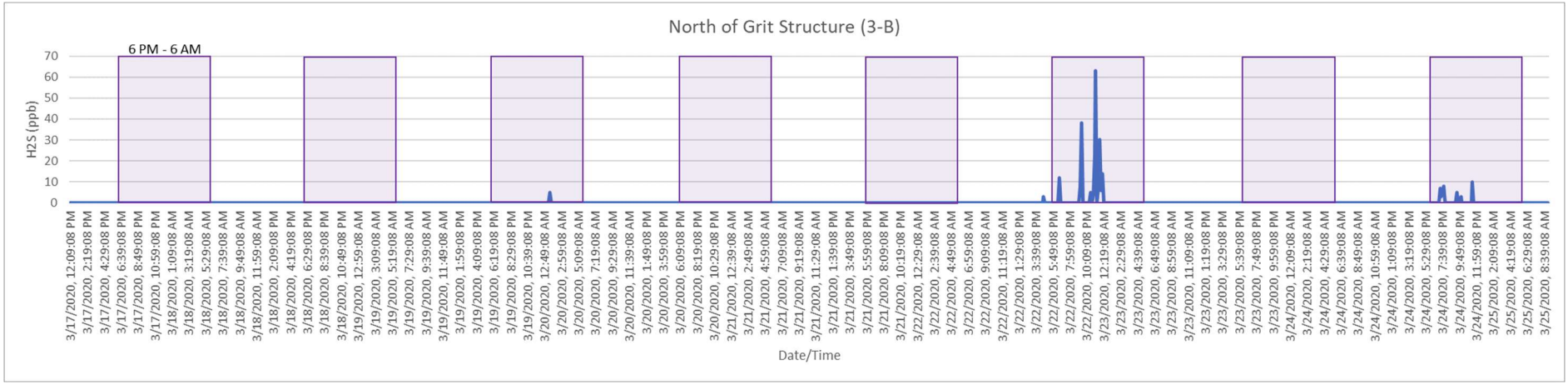

Avg. Wind Speed (mph)
Plant Entrance (4-A)
4.8 S/SW
5.4 S
5.9 S/SW
3.4 S
3.2 S/SE
4.5 S/SE
0.9 E/ NE
1.4 E
3.0 E/SE
3.3 S/SE
0.1 E
3.1 S/SE
2.0
2.5 S/SE
1.8 E/SE
H2S (ppb)
Date/Time

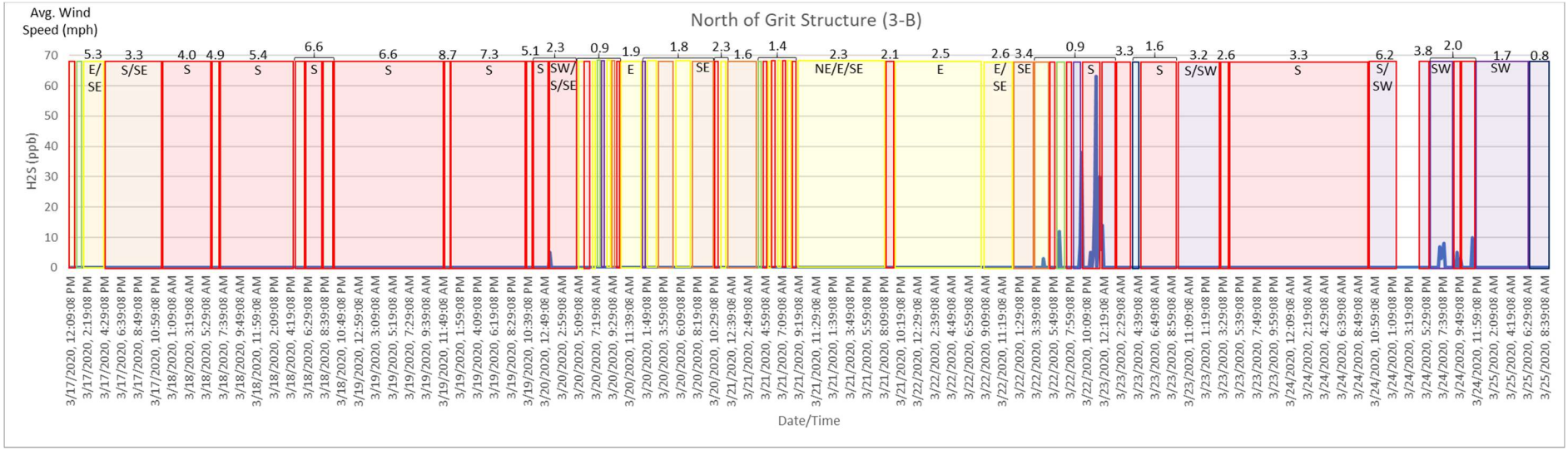

Southwest of Gas Valve (1-B)
6 PM - 6 AM
H2S (ppb)
Date/Time

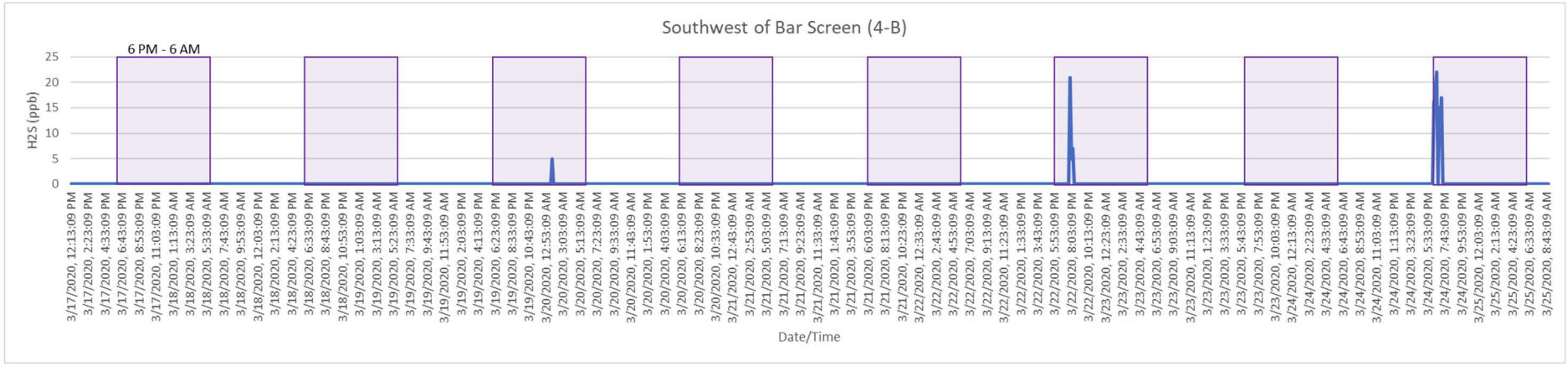

Avg. Wind Speed (mph)
Southwest of Gas Valve (1-B)
Axis Title
Date/Time

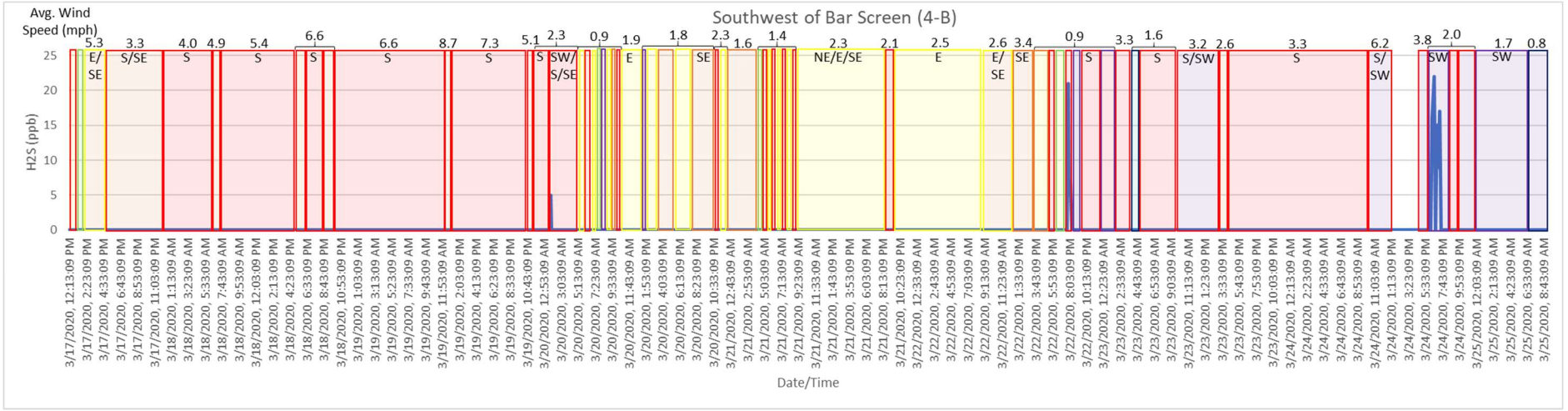

South of Secluded Trail (2-B)
6 PM - 6 AM
H2S (ppb)
Date/Time

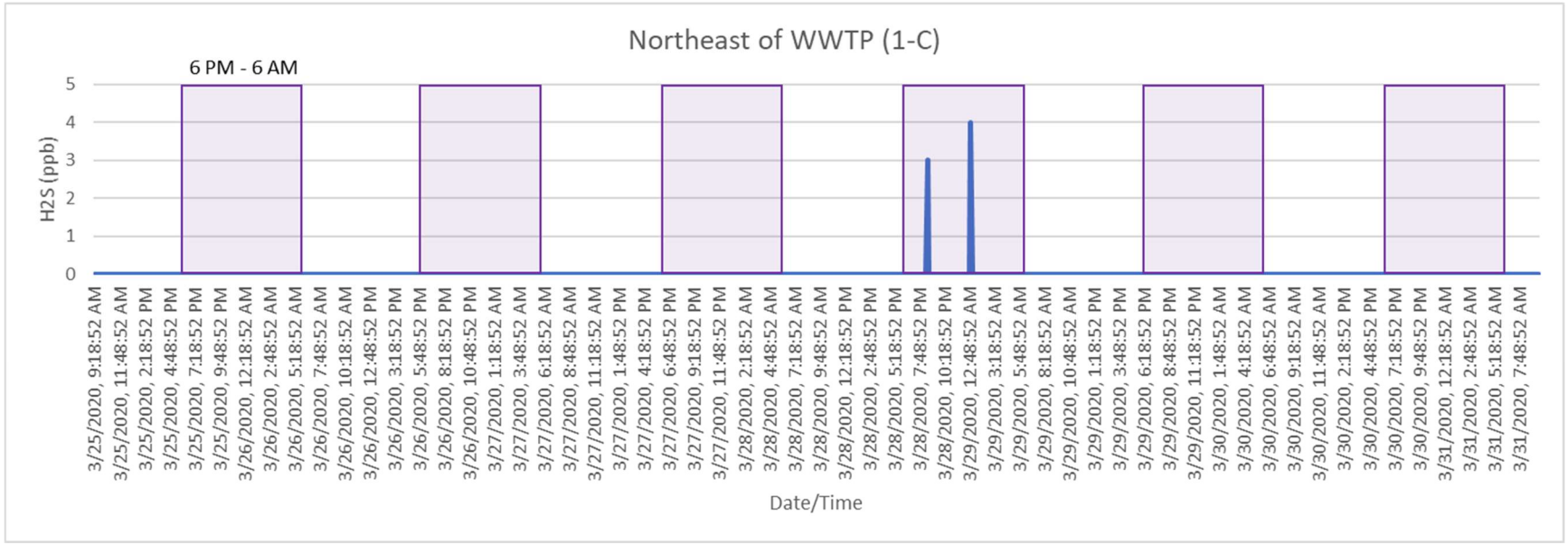

Avg. Wind Speed (mph)
South of Secluded Trail (2-B)
H2S (ppb)
Date/Time

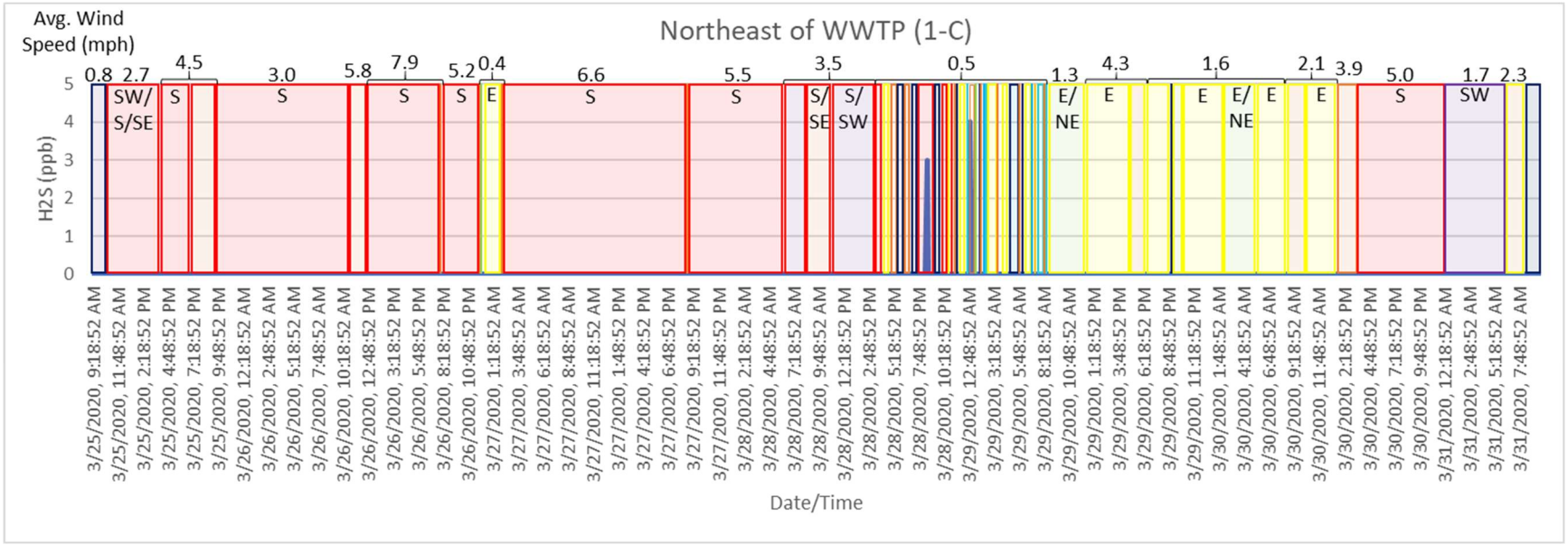

North of Grit Structure (3-B)
6 PM - 6 AM
H2S (ppb)
Date/Time

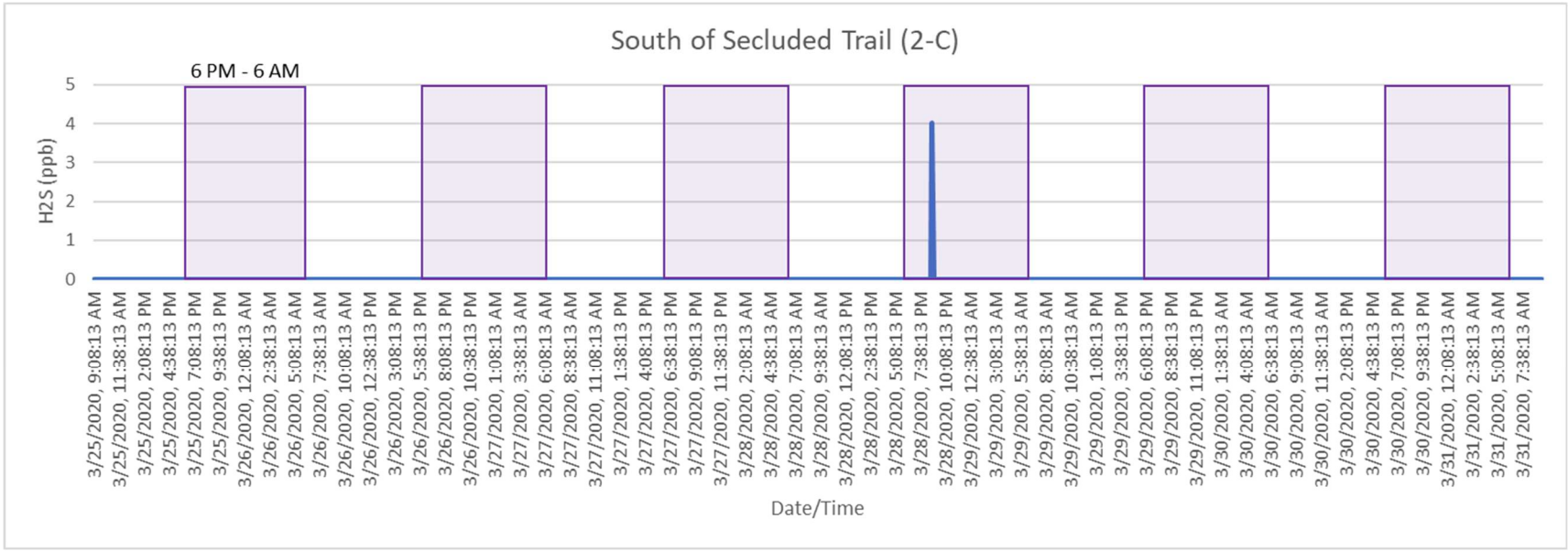

Avg. Wind Speed (mph)
North of Grit Structure (3-B)
H2S (ppb)
Date/Time

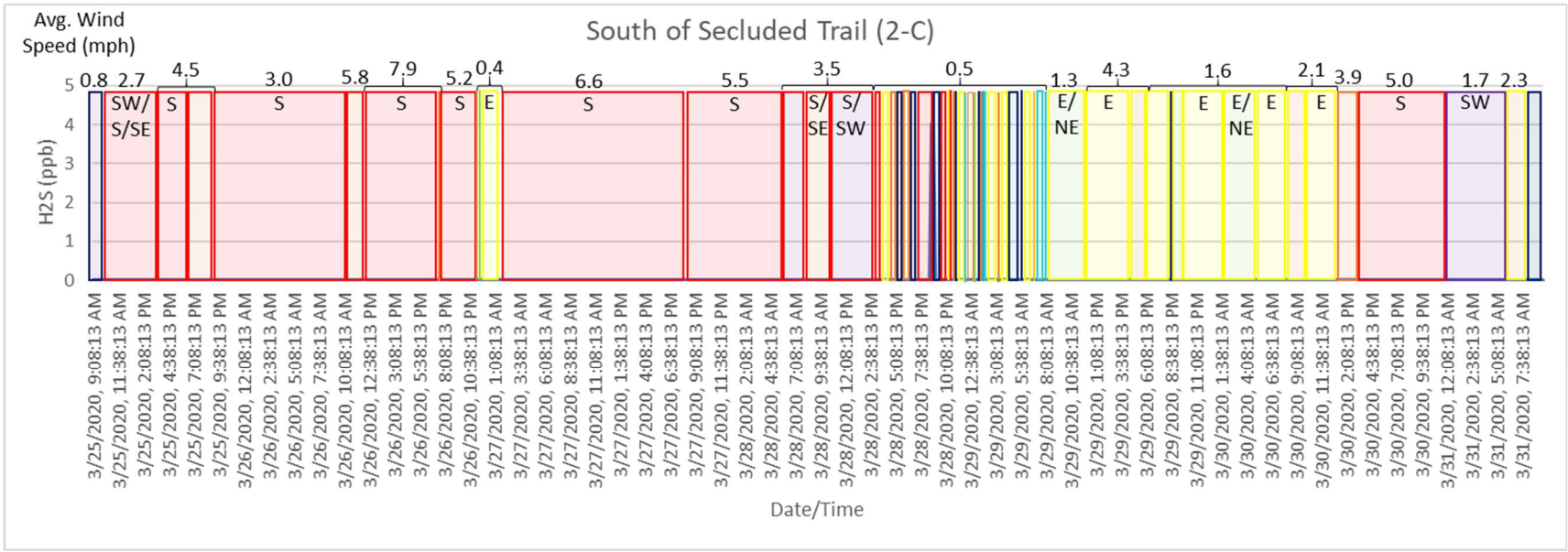

Southwest of Bar Screen (4-B)
6 PM - 6 AM
H2S (ppb)
Date/Time

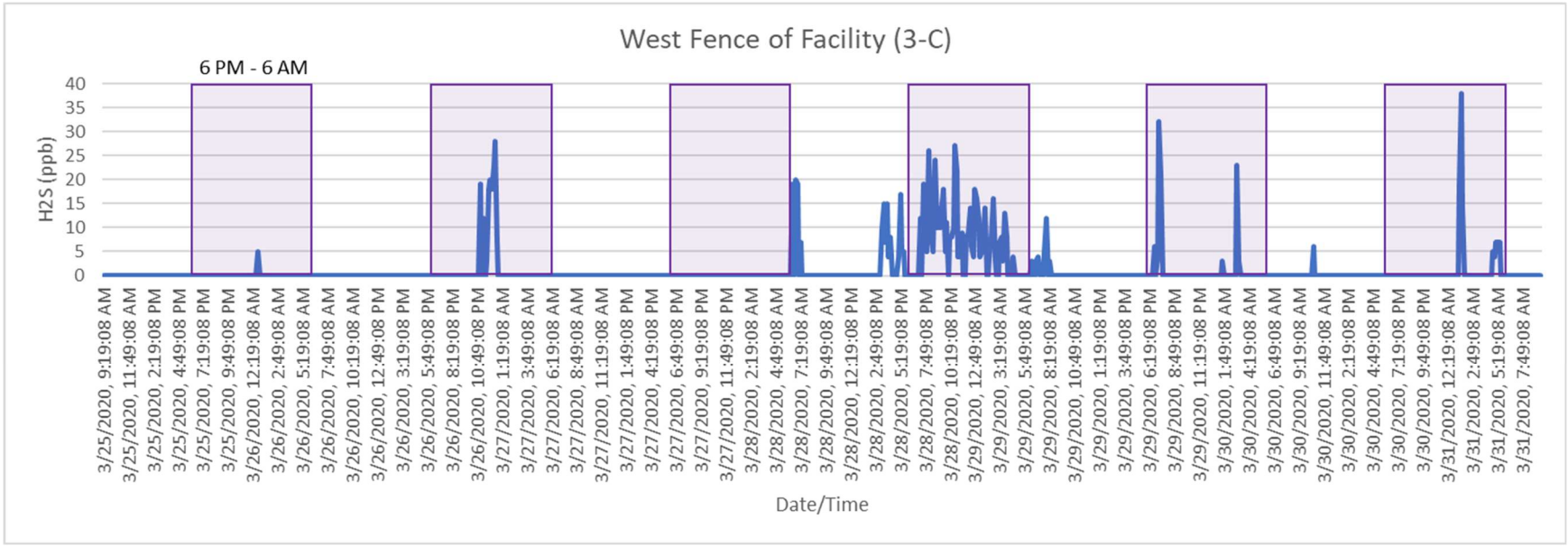

Avg. Wind Speed (mph)
Southwest of Bar Screen (4-B)
H2S (ppb)
Date/Time

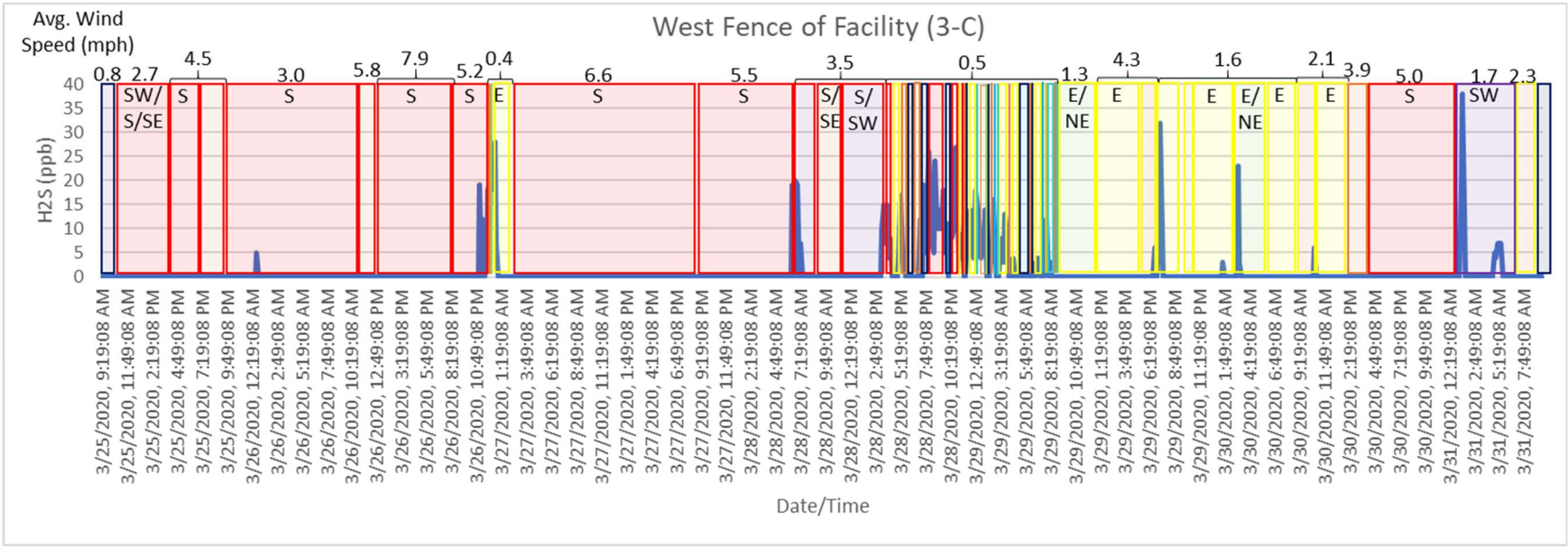

Northeast of WWTP (1-C)
6 PM - 6 AM
H2S (ppb)
0
1
2
3
4
5
Date/Time

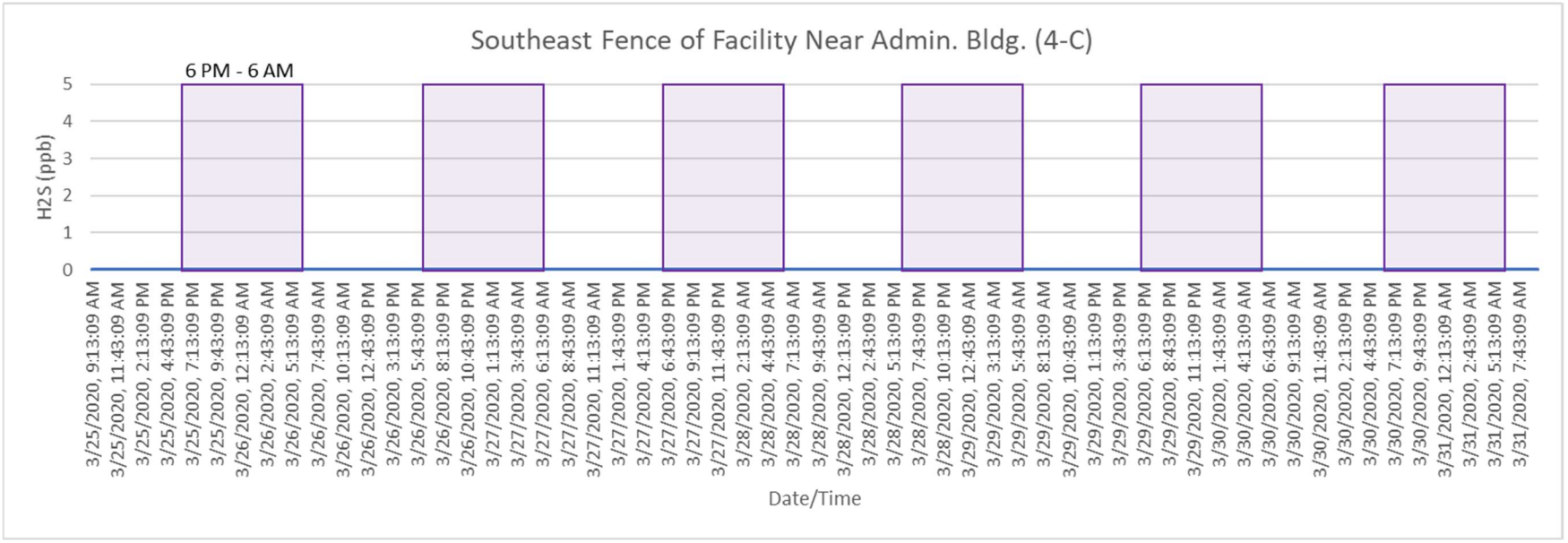

Avg. Wind Speed (mph)
Northeast of WWTP (1-C)
0.8 SW/ S/SE
2.7
4.5 S
3.0 S
5.8
7.9 S
5.2 S
0.4 E
6.6 S
5.5 S
3.5 S/ SE
S/ SW
0.5
1.3 E/ NE
4.3 E
1.6 E
E/ NE
E
2.1 E
3.9
5.0 S
1.7 SW
2.3
H2S (ppb)
0
1
2
3
4
5
Date/Time

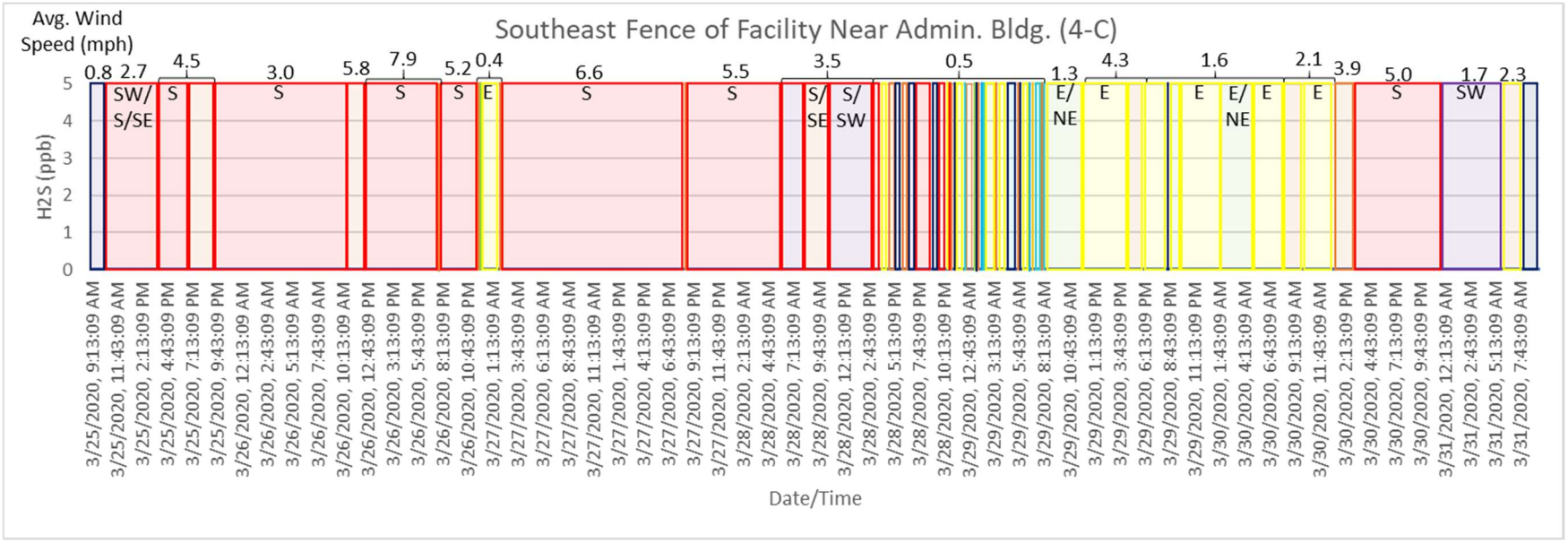

South of Secluded Trail (2-C)
6 PM - 6 AM
H2S (ppb)
Date/Time

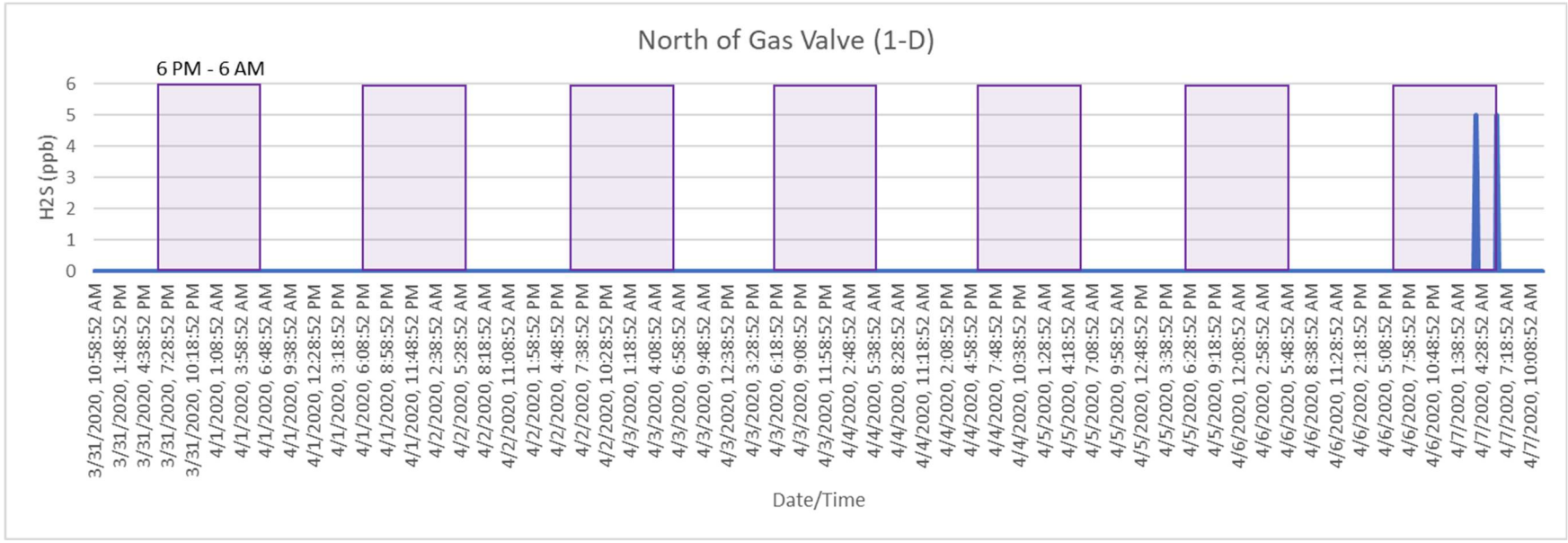

Avg. Wind Speed (mph)
South of Secluded Trail (2-C)
H2S (ppb)
Date/Time

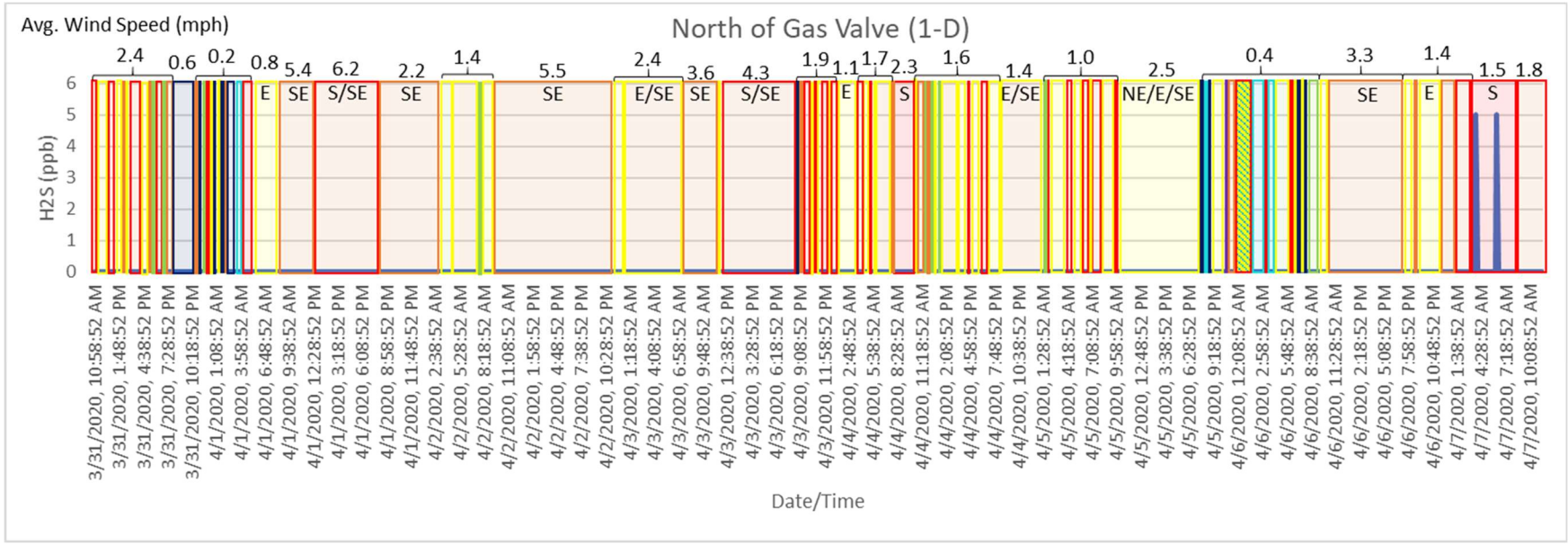

West Fence of Facility (3-C)
6 PM - 6 AM
H2S (ppb)
Date/Time

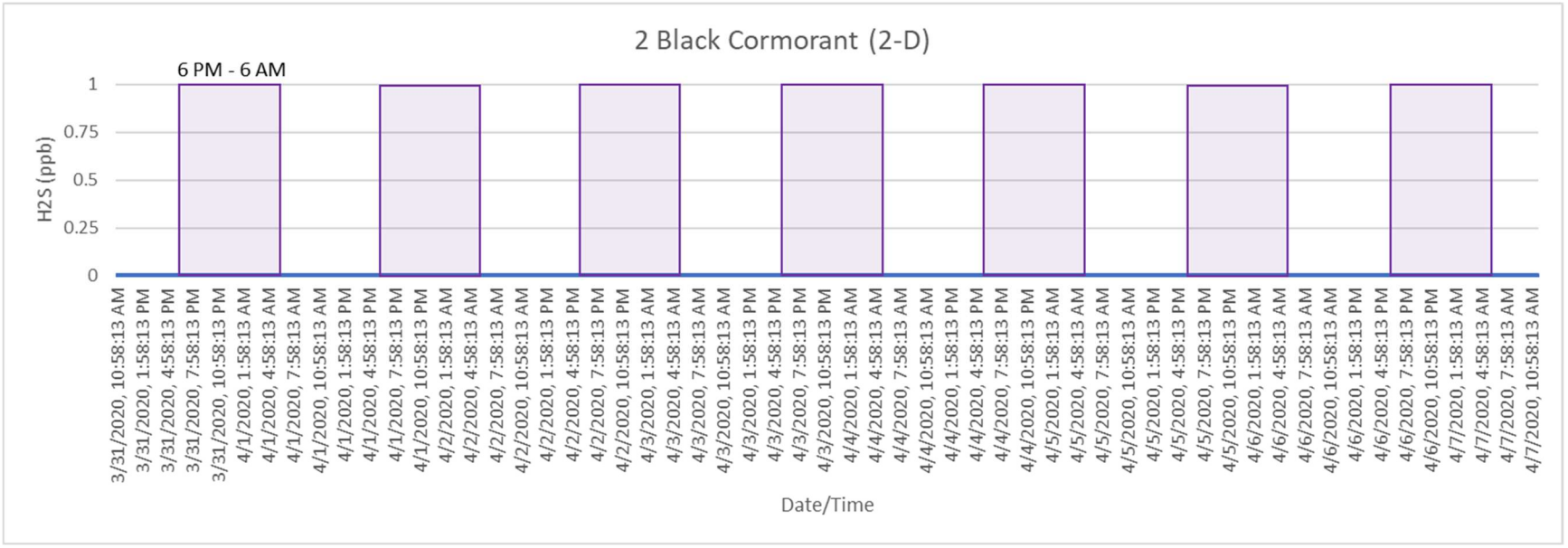

Avg. Wind Speed (mph)
West Fence of Facility (3-C)
H2S (ppb)
Date/Time

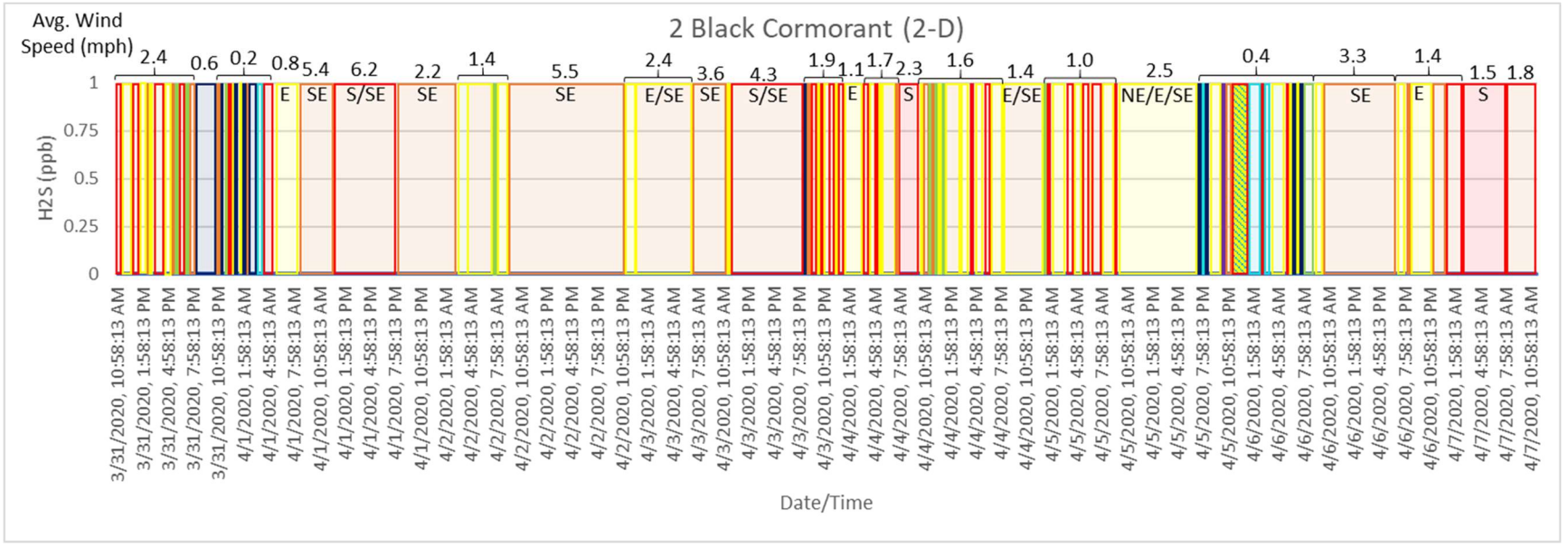

Southeast Fence of Facility Near Admin. Bldg. (4-C)
6 PM - 6 AM
H2S (ppb)
Date/Time

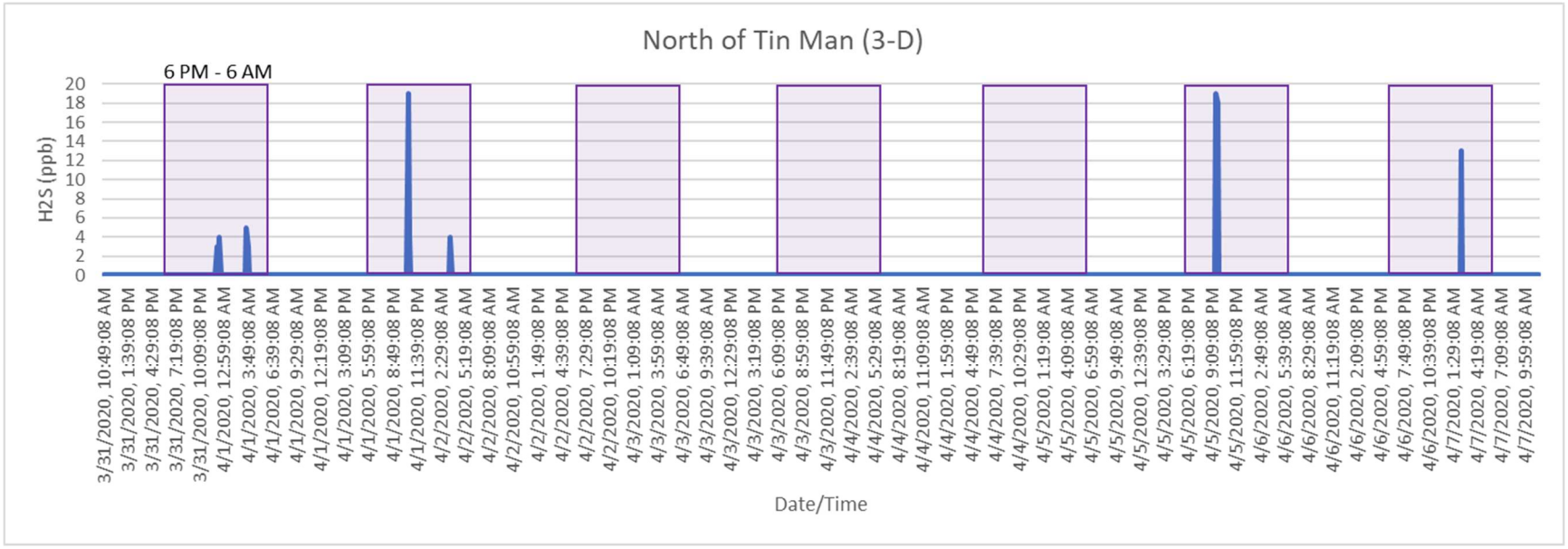

Avg. Wind Speed (mph)
Southeast Fence of Facility Near Admin. Bldg. (4-C)
0.8 2.7 4.5 3.0 5.8 7.9 5.2 0.4 6.6 5.5 3.5 0.5 1.3 4.3 1.6 2.1 3.9 5.0 1.7 2.3
SW/ S/SE
S
E
E/ NE
S/ SE
S/ SW
SW
H2S (ppb)
Date/Time

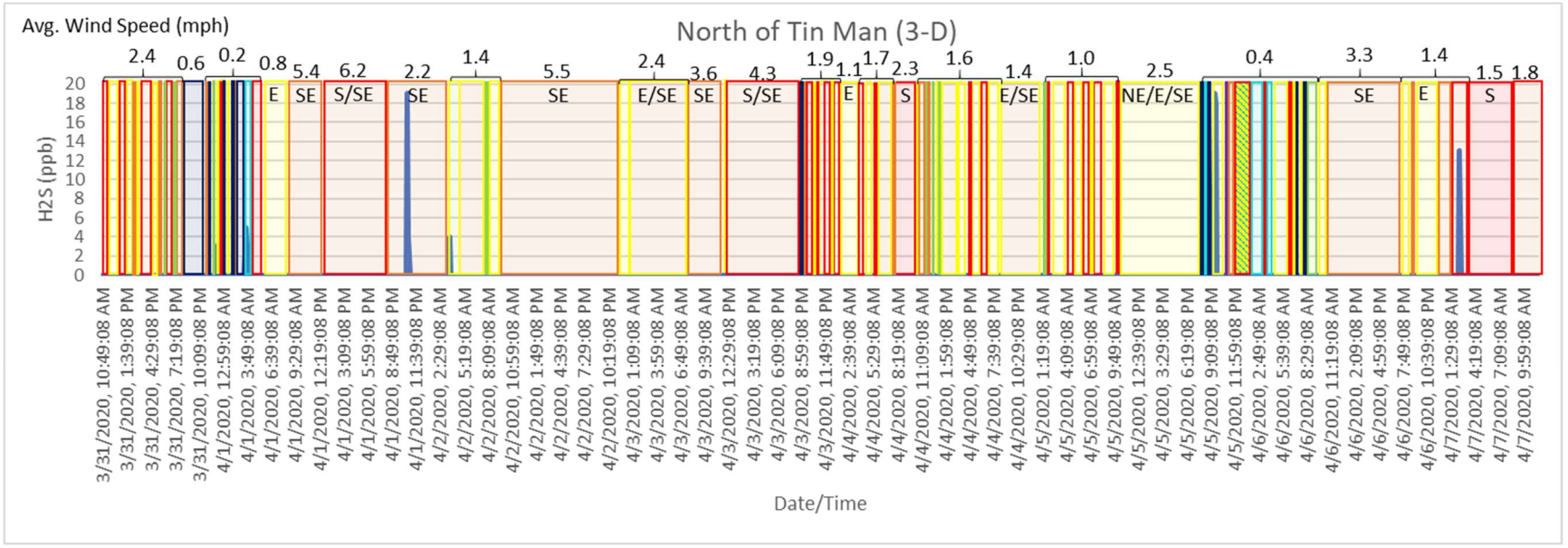

North of Gas Valve (1-D)
6 PM - 6 AM
H2S (ppb)
Date/Time

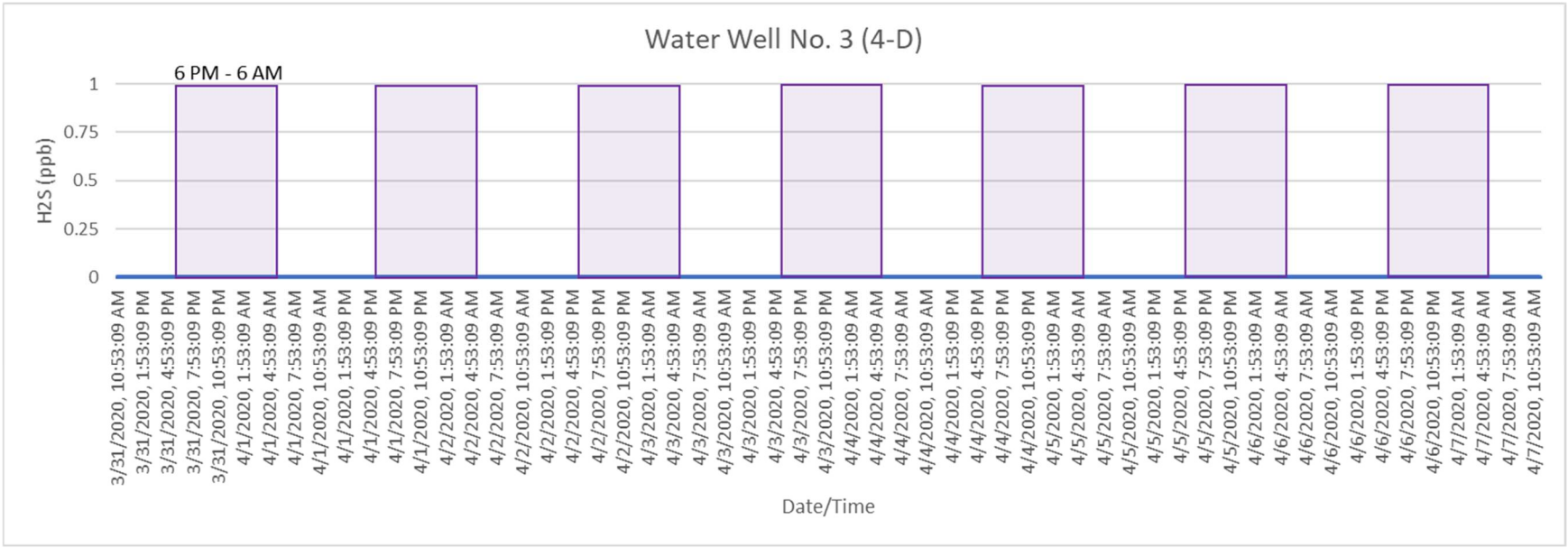

Avg. Wind Speed (mph)
North of Gas Valve (1-D)
2.4 0.6 0.2 0.8 5.4 6.2 2.2 1.4 5.5 2.4 3.6 4.3 1.9 1.1 1.7 2.3 1.6 1.4 1.0 2.5 0.4 3.3 1.4 1.5 1.8
E SE S/SE SE SE E/SE SE S/SE E S E/SE NE/E/SE SE E S
H2S (ppb)
Date/Time

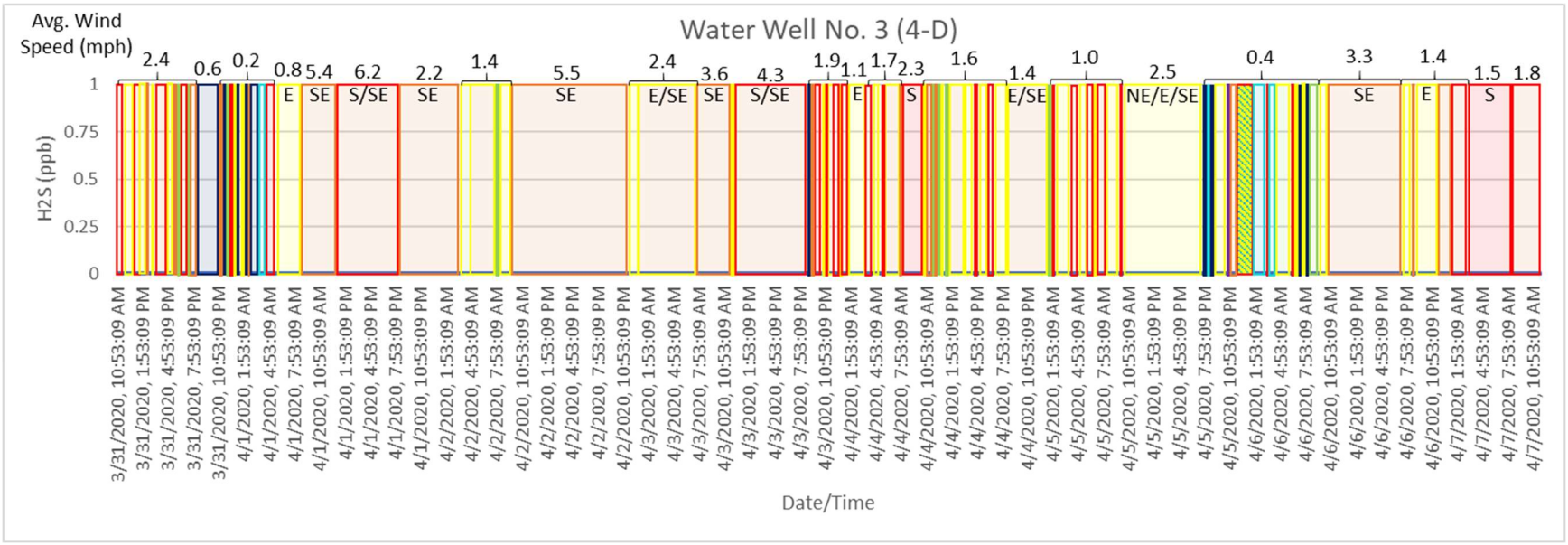

2 Black Cormorant (2-D)
6 PM - 6 AM
H2S (ppb)
1
0.75
0.5
0.25
0
Date/Time


Avg. Wind Speed (mph)
2 Black Cormorant (2-D)
2.4 0.6 0.2 0.8 5.4 6.2 2.2 1.4 5.5 2.4 3.6 4.3 1.9 1.1 1.7 2.3 1.6 1.4 1.0 2.5 0.4 3.3 1.4 1.5 1.8
E SE S/SE SE SE E/SE SE S/SE E S E/SE NE/E/SE SE E S
H2S (ppb)
1
0.75
0.5
0.25
0
Date/Time


North of Tin Man (3-D)
6 PM - 6 AM
H2S (ppb)
Date/Time


Avg. Wind Speed (mph)
North of Tin Man (3-D)
2.4 0.6 0.2 0.8 5.4 6.2 2.2 1.4 5.5 2.4 3.6 4.3 1.9 1.1 1.7 2.3 1.6 1.4 1.0 2.5 0.4 3.3 1.4 1.5 1.8
E SE S/SE SE SE E/SE SE S/SE E S E/SE NE/E/SE SE E S
H2S (ppb)
Date/Time


Water Well No. 3 (4-D)
6 PM - 6 AM
H2S (ppb)
1
0.75
0.5
0.25
0
Date/Time


Water Well No. 3 (4-D)
Avg. Wind Speed (mph)
2.4 0.6 0.2 0.8 5.4 6.2 2.2 1.4 5.5 2.4 3.6 4.3 1.9 1.1 1.7 2.3 1.6 1.4 1.0 2.5 0.4 3.3 1.4 1.5 1.8
E SE S/SE SE SE E/SE SE S/SE E S E/SE NE/E/SE SE E S
H2S (ppb)
1
0.75
0.5
0.25
0
Date/Time