

May 3, 2019  
File No. 02219702.00

Mr. Jeffery Meyer, Manager  
Division of Air Enforcement  
Bureau of Air Compliance and Enforcement  
New Jersey Department of Environmental Protection  
7 Ridgedale Avenue  
Cedar Knolls, New Jersey 07927

Subject: Additional Monitoring Report Transmittal  
Keegan Landfill  
New Jersey Sports and Exposition Authority  
EA ID#: NEA 190001-13317

Dear Mr. Meyer:

On behalf of the New Jersey Sports and Exposition Authority (NJSEA), SCS Engineers (SCS) has enclosed our report entitled 'Surface Emissions Monitoring Report' (April 2019 event), dated May 3, 2019.

Similar to the reports transmitted by the NJSEA on April 5 and as noted in the April Progress Report, we are submitting these reports for the purpose of sharing all data.

Please call with any questions or comments.

Sincerely,



Lisa K. Wilkinson  
Project Director I  
SCS Engineers

cc: T. Farrell, NJDEP  
V. Prieto, NJSEA (via email)  
T. Marturano, NJSEA (via email)  
A. Levy, NJSEA (via email)  
C. Sanz, NJSEA (via email)  
J. Stewart, Lowenstein (via email)



May 3, 2019  
File No. 02219702.00

Mr. Vincent Prieto  
President  
New Jersey Sports and Exposition Authority  
One DeKorte Park Plaza  
Lyndhurst, New Jersey 07071

**SUBJECT:** Surface Emissions Monitoring  
Keegan Landfill

Dear Mr. Prieto:

On April 13, 2019, SCS Engineers conducted a second round of surface emissions monitoring (SEM) on the remaining portions of the Keegan Landfill (Landfill) that were not monitored in March (see letter dated March 26, 2019). This letter summarizes the work performed and presents the data collected on April 13. The letter is organized as follows:

- Landfill Background
- Monitoring Methodology and Equipment
- Monitoring Results
- Findings and Conclusions
- Recommendations

## **LANDFILL BACKGROUND**

The Keegan Landfill, which is owned by New Jersey Sports and Exposition Authority (NJSEA) and operated by Waste Management, Inc. (WM), is located in the Town of Kearny, Hudson County, New Jersey. The Landfill is approximately 95 acres and accepts primarily construction and demolition waste. The Landfill is a single mound-type landfill, constructed atop a historical municipal solid waste (MSW) dump site. The Landfill began receiving construction and demolition (C&D) waste in 2009. The entire landfill footprint is surrounded by a bentonite-slurry cutoff wall, which includes a leachate collection system. Collected leachate is pretreated for hydrogen sulfide (H<sub>2</sub>S), prior to discharge to the local sewer system.

The Landfill is bordered on the northeast and east by a freshwater marsh. Industrial facilities are located to the north and south of the Landfill. Industrial facilities also bound the site to the west, but quickly transition to residential properties.

Numerous odor complaints have been made against the Landfill and a daily ambient air monitoring program was implemented on February 22, 2019 in response to the complaints. Based on the results of the daily ambient air monitoring program (submitted under separate cover), SEM for methane and H<sub>2</sub>S was recommended as a next step to supplement daily perimeter monitoring. SEM of the southwest area of the landfill was performed on March 18, 2019 (March SEM event) and the results were transmitted in a letter report dated March 26, 2019. The March 26, 2019 report



recommended expansion of the SEM to all areas of the Landfill to supplement the March SEM and to further identify areas of emissions from the Landfill.

## MONITORING METHODOLOGY AND EQUIPMENT

### Methodology

The SEM was performed on the northwest and eastern side slopes, and plateau area of the Landfill as these areas were not monitored during the March SEM event (see Drawing in **Attachment 1**).

While the Landfill is not subject to SEM requirements of the New Source Performance Standards (NSPS) for municipal solid waste landfills, 40 CFR 60 Subpart WWW, the methane monitoring was generally conducted as specified in 40 CFR 60.755 (c) and (d), and 40 CFR 60, Appendix A, Method 21.

Monitoring took place over a surface emissions monitoring route consisting of a serpentine path over the northwest and eastern side slopes, and plateau areas of the Landfill, with monitoring points at 30 meter intervals. Hydrogen sulfide monitoring was performed at the same locations as the methane SEM.

Surface monitoring was conducted at all monitoring points, with the tip of the instrument probe about five to ten centimeters (two to four inches) above the landfill surface. The SEM event was conducted on a day with typical meteorological conditions, as defined in CFR 60.755(c)(3), and excluded periods when wind speeds were measured greater than 14 mph average, as indicated by hand-held anemometer. Typical meteorological conditions should also exclude periods within 24 hours following a rain event greater than 0.25 inches total (per 24-hour period). We note that this SEM event was performed after a measured rainfall of 0.57 inches within 24 hours of the event (see weather data for Newark Airport in **Attachment 3**).

Basic meteorological conditions, including temperature, wind speed, rainfall, weather conditions and barometric pressure, were noted at the start of the day of monitoring and recorded on Calibration and Pertinent Data Forms, included in **Attachment 2**. Wind speed and direction at each monitoring location were also measured and recorded.

### Monitoring Equipment and Calibration

SEM for methane was conducted with a field portable flame ionization detector (FID), utilizing a Thermo Scientific model TVA 2020 FID. Equipment type, serial number and pertinent equipment information are recorded on Calibration and Pertinent Data Forms for the FID equipment (see **Attachment 2**).

A Jerome Model 631X meter was utilized for monitoring H<sub>2</sub>S. The equipment type, serial number and certification of calibration is included in **Attachment 2**.

A handheld Kestrel Model 4500 anemometer was used to measure wind speed and direction during monitoring (Serial No. 719611).

## Calibration

Prior to the commencement of surface emissions monitoring, the FID equipment was calibrated in accordance with the manufacturer's recommended procedures and 40 CFR 60.755 (c) and (d), and 40 CFR 60, Appendix A, Method 21, using zero air and a certified span calibration gas containing 500 ppm methane in air. The procedure for calibration precision and response time was performed prior to the SEM. A post-monitoring calibration check was also performed for the TVA at the end of each monitoring event day.

The Jerome 631-X meter's gold film sensor is inherently stable and does not require frequent field calibration. The Jerome 631-X is factory calibrated using laboratory equipment containing NIST traceable permeation tubes. In order to calibrate the Jerome 631-X, a sophisticated calibration system is required that ensures stability of the calibration gas source, eliminates any pressure in the calibration gas stream, and controls the temperature of the calibration environment. The meter was factory calibrated on January 11, 2019, in accordance with the manufacturer's specifications.

## Calibration Precision

After the initial calibration of the FID instrument each day, instrument precision was calculated by running zero air gas through the instrument and then switching to the 500 ppm methane calibration gas and recording the reading. This procedure was performed three times during each calibration event to verify instrument precision. In accordance with 40 CFR 60.755 (c) and (d), and 40 CFR 60, Appendix A, Method 21, to be considered successful, the instrument reading during the calibration precision check must be within 10 percent of calibration gas concentration (i.e. 500 ppm +/- 10%). All of the calibration precision checks performed were successful, reading within 10 percent of 500 ppm. Therefore, the instrument precision was deemed to be in compliance. Results of FID calibration precision are recorded on Calibration and Pertinent Data Forms, included in **Attachment 2**.

In accordance with the manufacturer's recommendations, the Jerome meter was regenerated and zero adjusted prior to the start of the SEM.

## Instrument Response Time

After the initial calibration of the FID instrument, instrument response time was calculated by placing the instrument on the zero air and quickly switching to the calibration gas and recording the time from switching gases until the instrument reads 90 percent of the calibration gas concentration (i.e. 500 ppm). This procedure was completed three times during each calibration event to verify instrument response time. In accordance with 40 CFR 60.755 (c) and (d), and 40 CFR 60, Appendix A, Method 21, to be considered successful, the instrument response time must be within 30 seconds. The calibration response time checks performed were successful, with an average response time less than 30 seconds. Therefore, the instrument response was deemed to be in compliance. Results of instrument response are recorded on Calibration and Pertinent Data Forms, included in **Attachment 2**.

The Jerome 631-X was operated with a response time of 30 seconds. This is the manufacturer's recommended response time for samples with concentrations ranging between 0.001 and 0.099 ppm H<sub>2</sub>S for an accuracy of +/- 0.003 ppm at 0.050 ppm.

## MONITORING RESULTS

The SEM event was performed on April 13, 2019. Weather conditions were recorded at the start of the event. Additional weather condition data, for the Newark Airport, is provided in **Attachment 3** to show the wind conditions and prior day's rainfall amount.

A total of 219 points were monitored on the operating area of the Landfill, along the pathway identified on the drawing in **Attachment 1**. The monitoring data is provided in **Attachment 3**.

NSPS considers methane concentrations above 500 ppm (0.05 percent), measured during a SEM event, as exceedances, requiring correction actions and rechecks. This is a surrogate for measurement of landfill gas that is typically generated within an MSW landfill. For non-regulatory, or informational SEM, we have considered 100 ppm as the threshold for further consideration regarding methane emissions. Methane concentrations greater than 100 ppm were detected at seven (7) locations during the event (see blue circled monitoring locations on Drawing in **Attachment 4**). There were no readings above 500 ppm measured during this SEM event.

NJDEP considers H<sub>2</sub>S concentrations in excess of 30 ppb over a 30-minute period at the property boundary as a violation of NJAC and requires corrective action. While the SEM did not continuously monitor one location for 30 minutes, we selected 30 ppb as the threshold for further consideration regarding the H<sub>2</sub>S concentrations. H<sub>2</sub>S concentrations greater than 30 ppb were detected at 44 locations during the event (see red highlighted stations on Drawing in **Attachment 4**). Of the 44 locations greater than 30 ppb, 28 locations were greater than 100 ppb (see yellow highlighted stations on Drawing in Attachment 4). The majority of the elevated concentrations were measured on the northwest plateau area of the Landfill, as well as the north side slope, downwind of the northwest plateau area.

Wind direction was generally noted from the south and southwest at speeds ranging from zero to 12.3 miles per hour (mph), as measured by the Kestrel. The wind speeds were below the NSPS regulatory limit of 14 mph.

## FINDINGS AND CONCLUSIONS

While the wind direction appeared consistent, the wind speeds were highly variable during the monitoring event. The changing wind speeds can affect the concentrations measured at a particular location. Concentrations of H<sub>2</sub>S were graphed with the wind speed. Similar to the March SEM event, there does not appear to be a correlation of lower wind speeds to higher concentrations of H<sub>2</sub>S as might be expected (see graph in **Attachment 5**).

LFG generation at C&D landfills is lower than that from MSW landfills due to waste composition and degradation rates. The highest methane concentration measured was 340 ppm (Tag 77) or 0.03 percent and only seven readings were greater than 100 ppm. This is an indication of the lower landfill gas generation rate in the Landfill.

While 30 ppb is the threshold for discussion, approximately 5-10 ppb is the concentration at which H<sub>2</sub>S can be detected by most people by smell. The majority of the H<sub>2</sub>S concentrations greater than 30 ppb appear at the break in grade and top plateau area of the area monitored. On the top plateau area, the majority of the H<sub>2</sub>S concentrations greater than 100 ppb are towards the northwest

quadrant of the monitoring area (see yellow highlighted locations on Drawing in **Attachment 4**). The combined results from the March SEM and April SEM are shown on the drawing in **Attachment 6**. This supports the conclusion of the March SEM event that H<sub>2</sub>S emissions appear to be predominantly from the western side of the landfill.

There is not a significant correlation between the methane concentrations greater than 100 ppm and the H<sub>2</sub>S concentrations greater than 30 ppb. While the majority of the monitored locations do not have significantly high methane concentrations, there are numerous locations with relatively high hydrogen sulfide concentrations that are capable of causing offsite odors.

As noted above, this SEM event was performed after a measured rainfall of 0.57 inches within 24 hours of the event. The rainfall criteria in the regulation requires the SEM be performed under 'typical meteorological conditions'. A significant rainfall event prior to a SEM event could result in a lower surface emission concentrations due to the saturation of the soil. Conversely, after the soils drain or dry, the gas that has built up in the soils could be released at higher concentrations.

Exhibit 1 below compares the SEM data from the March and April SEM events. The maximum H<sub>2</sub>S and methane concentrations measured in April were lower than the March maximums. The percentage of H<sub>2</sub>S and methane readings over the thresholds used for this analysis were also lower in April than in March. While this could be attributed to the rain event prior to the April monitoring, there are many variables such as barometric pressure or wind speed that can affect surface emissions monitoring results. The average wind speed measured during the April event was higher than in March.

Exhibit 1. March and April SEM Data Summary.

Measured Parameter	March Event	April Event
Maximum H <sub>2</sub> S reading (ppm)	14	1.36
Maximum CH <sub>4</sub> reading (ppm)	1032	340
Maximum wind speed (mph)	12.3	12.3
Average wind speed (mph)	5.5	6.0
# H <sub>2</sub> S readings >0.030 ppm	41	44
# H <sub>2</sub> S readings >0.100 ppm	20	28
% H <sub>2</sub> S readings > 0.030 ppm	36%	20%
% H <sub>2</sub> S readings >0.100 ppm	17%	13%
# CH <sub>4</sub> readings >100 ppm	6	7
% CH <sub>4</sub> readings >100 ppm	5%	3%

While the lower April results could be related to the rain event prior to monitoring, the readings from both the March and April are being used to determine areas of the landfill with the highest emissions in which installation of a collection system will be the most effective. These areas are determined to be the western side of the landfill.

## RECOMMENDATIONS

As indicated in the March SEM report, we recommend NJSEA continue to improve daily and intermediate cover procedures. During the SEM, technicians noticed irregular coverage of the waste with soil, which could provide pathways for gas to migrate from the Landfill.

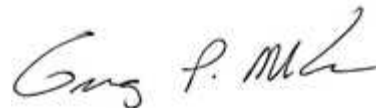
Also as indicated in the March SEM report, we recommend installation of an active LFG collection and control system. A well-designed and operated LFG collection and control system is the best management practice for LFG-related odors. While a comprehensive system may be required in the future, we recommend that the initial installation target the western top plateau area of the Landfill. We recommend provisions for expansion to the eastern side of the landfill as future conditions warrant.

Please review and call to discuss.

Sincerely,



Lisa K. Wilkinson  
Project Manager  
SCS ENGINEERS



Gregory P. McCarron, P.E.  
Project Director  
SCS ENGINEERS

cc: T. Marturano, NJSEA  
C. Sanz, NJSEA  
A. Levy, NJSEA  
J. Stewart, Lowenstein Sandler

## Attachment 1



**PRELIMINARY 4/3/2019**

- LEGEND:**
- PROPERTY LINE
  - 30' EXISTING CONTOUR
  - VEGETATION LINE
  - MW ⊕ GROUND WATER MONITORING WELL
  - MS-4 ▲ MONITORING STATION
  - 12+00 11+00 10+00 SEM PATH/SAMPLE LOCATION

701000

700000

W.E.  
2.1

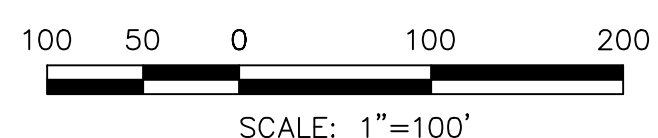
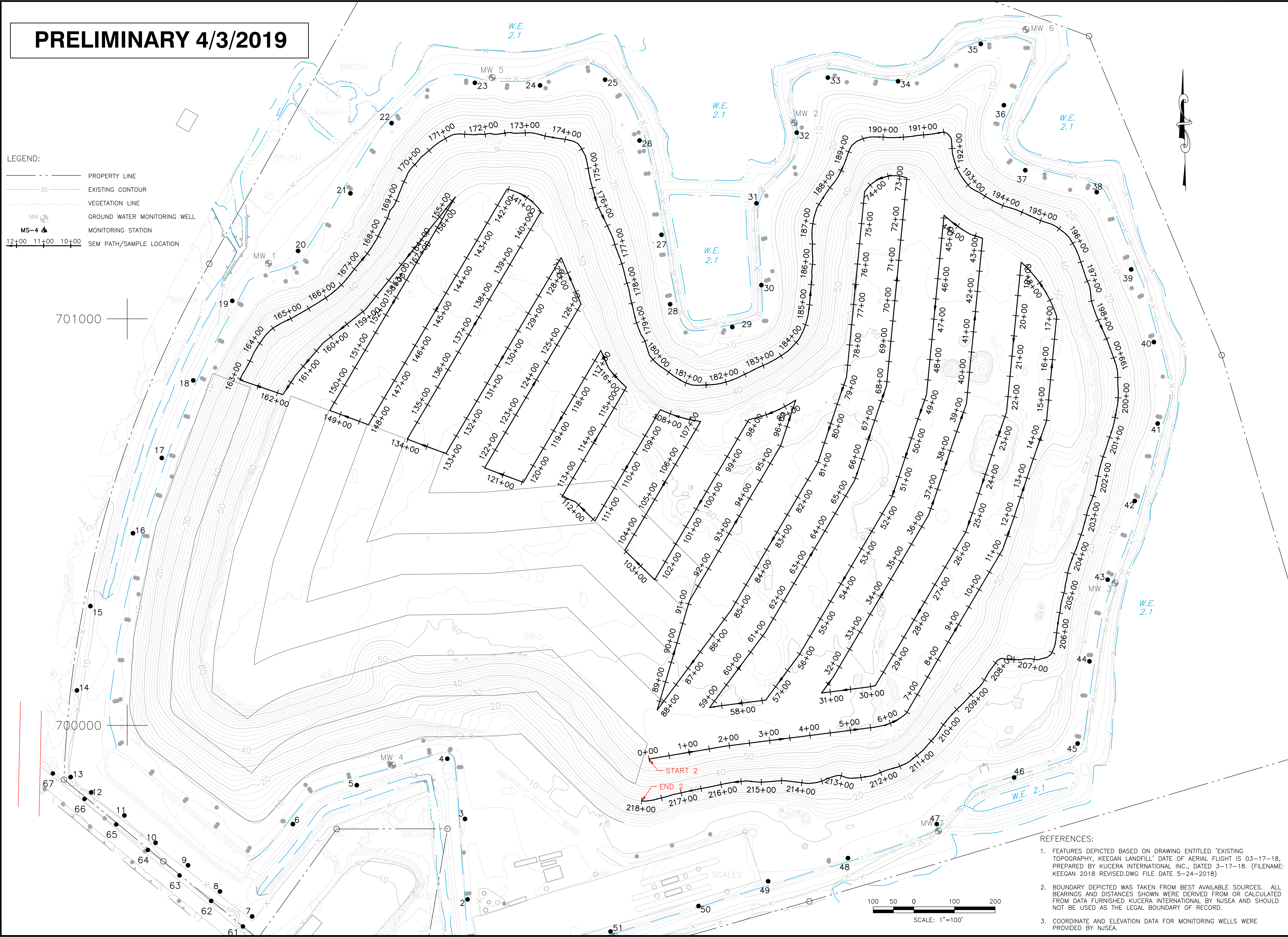
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I:\PROJECTS\02219702\00\DRAWINGS\MONITORING\_SP.DWG layout: SEM plotted on: 4/3/2019 3:37 PM Yevchuk, Sharon



- REFERENCES:**
- FEATURES DEPICTED BASED ON DRAWING ENTITLED 'EXISTING TOPOGRAPHY, KEEGAN LANDFILL' DATE OF AERIAL FLIGHT IS 03-17-18, PREPARED BY KUCERA INTERNATIONAL INC., DATED 3-17-18. (FILENAME: KEEGAN 2018 REVISED.DWG FILE DATE 5-24-2018)
  - BOUNDARY DEPICTED WAS TAKEN FROM BEST AVAILABLE SOURCES. ALL BEARINGS AND DISTANCES SHOWN WERE DERIVED FROM OR CALCULATED FROM DATA FURNISHED KUCERA INTERNATIONAL BY NJSEA AND SHOULD NOT BE USED AS THE LEGAL BOUNDARY OF RECORD.
  - COORDINATE AND ELEVATION DATA FOR MONITORING WELLS WERE PROVIDED BY NJSEA.

NO.	REVISION	DATE
1	ISSUED FOR CLIENT REVIEW	3/15/2019
2	ADD PATH 2	4/3/2019

SHEET TITLE	<b>SEM SITE PLAN</b>
PROJECT TITLE	<b>MONITORING SUPPORT KEEGAN LANDFILL</b>

CLIENT	<b>NEW JERSEY SPORTS &amp; EXHIBITION AUTHORITY</b> 1 DE KORTE PARK PLAZA, POB 640 LYNDHURST, NJ 07071
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<b>SCS ENGINEERS</b> STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC. 4 EXECUTIVE BLD. SUITE 303, SUFFERN, NY 10901 PH. (845) 357-1510 FAX. (845) 357-1049 E-MAIL: SCSENG@SCSENG.COM DWG. BY: SHY CHK. BY: LKW APP. BY: LKW	DATE: 3/15/2019 SCALE: AS SHOWN DRAWING NO. <b>1</b> of 1
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CADD FILE:	MONITORING_SP
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## Attachment 2

# SCS FIELD SERVICES

## NSPS Surface Emissions Monitoring Calibration and Pertinent Data Form

Date: 04/13/19 Site: Keegan LF Job Number: 02219702.00

Technician(s): Ben Lock

### Weather Observations

Wind Speed: 5 MPH Wind Direction: SW Barometric Pressure: 29.90 "Hg  
Air Temperature: 55 °F General Weather Conditions: Clear

### Calibration Information

Instrument Info Make/Model: TVA 2020 Serial No: 202016093665

Cal Gas Info	Manufacturer	Lot #	Expiration Date	Concentration
Span Gas:	<u>QED Landtec</u>	<u>4827601</u>	<u>10/1/2021</u>	<u>500</u> ppm
Zero Gas:	<u>QED Landtec</u>	<u>4828301</u>	<u>10/1/2021</u>	<u>0</u> ppm

### Pre-monitoring Calibration Precision Check

*Procedure: Calibrate the instrument. Make a total of three measurements by alternating zero air and the calibration gas. Record the readings and calculate the average algebraic difference between the instrument reading and the calibration gas as a percentage. **The calibration precision must be less than or equal to 10% of the calibration gas value.***

Trial	Zero Air Reading (ppm)	Cal Gas Reading (ppm)	Cal Gas Conc. - Cal Gas Reading
1	0.3	499	1
2	0.2	500	0
3	0	501	1
<b>Average Difference:</b>			1

$$\begin{aligned}
 \text{Calibration Precision} &= \text{Average Difference} / \text{Cal. Gas Conc.} \times 100\% \\
 &= \frac{1}{500} \times 100\% \\
 &= \underline{0.13} \%
 \end{aligned}$$

### Pre-monitoring Response Time Check

*Procedure: Introduce zero concentration methane/H2S into the instrument. Quickly change to the calibration gas and record stabilized reading. Record the amount of time it took the instrument to read 90% of the stabilized reading. **This average response time must be less than or equal to 30 seconds.***

Trial	Stabilized Reading on Cal Gas	90% of Stabilized Reading	Time to Reach 90% of Stabilized Reading (Seconds)
1	499	449	15
2	500	450	9
3	501	451	7
<b>Average Response Time:</b>			10

### Background Concentration Checks

Upwind Location Description: SW of site on perimeter road Reading: 0.50 ppm  
Downwind Location Description: NE of site on perimeter road Reading: 1.10 ppm  
Average Background Reading: 0.80 ppm

### Post-monitoring Calibration Precision Check

Zero Air Reading: 0 ppm Cal Gas Reading: 500 ppm

Notes/Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



3375 N. Delaware Street, Chandler, AZ 85225  
800.528.7411 | (f) 602.281.1745 | azic.com

### Certification of Instrument Calibration

AMETEK Brookfield - New Unit  
3375 N. Delaware Street  
Chandler, AZ 85225

RMA # 2624267

This is to certify that the Jerome X631 0101 Gold Film Hydrogen Sulfide Analyzer, Serial Number 3066, with Sensor Number 18-8-8-R2BS, was calibrated with standard units traceable to NIST.

Calibration Status as Received: New

	Actual	Calibration Gas	Allowable Range
<b>Incoming:</b> Range 1	ppm H2S	ppm H2S	+/- 6%
RSD %			<5%
<b>Outgoing:</b> Range 1	0.506 ppm H2S	0.500 ppm H2S	+/- 6%
RSD %	1.48		<5%

Calibration Status as Left: New

Estimated Uncertainty of Calibration System: 2.8%

Calibration Date: 11-Jan-2019      Recalibration Date: 10-Jan-2020

Temperature °F: 72.30      % Relative Humidity: 35.80

*Cheryl Hradek*

Approved By: \_\_\_\_\_  
Title: Cheryl Hradek - Quality Control

Date Approved: 11-Jan-2019

**Equipment Used:**

**H2S Calibration Standard:** CC-230020 NIST#: 1417575  
**Calibration Date:** 30-May-2017 **Calibration Date Due:** 31-May-2020

**Mass Flow Controller B:** 124604 NIST#: 215457  
**Calibration Date:** 13-Dec-2018 **Calibration Date Due:** 13-Dec-2019

**Mass Flow Controller D:** 124602 NIST#: 215454  
**Calibration Date:** 13-Dec-2018 **Calibration Date Due:** 13-Dec-2019

**Digital Multimeter:** 74620534 NIST#: 7003079  
**Calibration Date:** 16-Feb-2018 **Calibration Date Due:** 16-Feb-2019

**Flowmeter:** US04126032 NIST#: 1813; 1817; 1796  
**Calibration Date:** 17-Oct-2018 **Calibration Date Due:** 18-Oct-2019

Calibration Procedure Used: 730-0032

AMETEK Brookfield certifies that the above listed instrument meets or exceeds all published specifications and has been calibrated using standards whose accuracy are traceable to the NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY within the limitations of the Institute's calibration services, or have been derived from accepted values of natural physical constants, or have been derived by the ratio type of self-calibration techniques.

Disclaimer: Any unauthorized adjustments, removal or breaking of QC seals, or other customer modifications on your Jerome Analyzer WILL VOID this factory calibration. Because any of the above acts could affect the calibration and readings of the instrument, their certification will no longer be valid and, further, AMETEK Brookfield WILL NOT be responsible for any liabilities created as a result of using the instrument after such adjustments, seal removal, or modifications.

As long as a functional test is within range, according to the procedure outlined in the Operator's Manual, the instrument is performing correctly.

This document shall not be reproduced, except in full, without the written approval of AMETEK Brookfield.



# INSTRUMENT CALIBRATION REPORT

**Pine Environmental Services LLC**

92 North Main St, Building 20  
Windsor, NJ 08561  
Toll-free: (800) 301-9663

## **Pine Environmental Services, Inc.**

**Instrument ID** 44911  
**Description** Arizona Instruments 631-X Hydrogen Sulfide Analyzer  
**Calibrated** 2/18/2019 3:57:20PM

**Manufacturer** Arizona  
**Model Number** 631-X  
**Serial Number/ Lot Number** 3066  
**Location** New Jersey  
**Department**

**State Certified**  
**Status** Pass  
**Temp °C** 22.8  
**Humidity %** 19

### Calibration Specifications

**Group #** 1  
**Group Name**  
**Test Performed: Yes**      **As Found Result: Pass**      **As Left Result: Pass**

### Test Instruments Used During the Calibration

(As Of Cal Entry Date)

<u>Test Standard ID</u>	<u>Description</u>	<u>Manufacturer</u>	<u>Model Number</u>	<u>Serial Number / Lot Number</u>	<u>Last Cal Date/ Opened Date</u>	<u>Next Cal Date / Expiration Date</u>
NJ HYDROGEN SULFIDE - 872248	NJ Hydrogen Sulfide 10 PPM - 872248	Pine Environmental Services, Inc.	31691	872248		1/1/2020

### Notes about this calibration

**Calibration Result** Calibration Successful  
**Who Calibrated** Daniel Teller

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

**Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment**  
**Please call 800-301-9663 for Technical Assistance**

## Attachment 3

**Methane and Hydrogen Sulfide Surface Emission Monitoring Results  
Keegan Landfill**

Monitoring Station (x100')	TIME	CH4 Concentration (ppm)	H2S Concentration (ppm)	Wind Direction	Wind Speed (mph)	Comments
<b>Top Plateau of Landfill</b>						
0	9:33:16	3.5	0.003	S	11.7	
1	9:35:16	210	0.003	S	8.2	
2	9:36:34	27.3	0.003	S	6.0	
3	9:38:55	10.1	0.003	S	7.2	
4	9:41:04	20.9	0.003	S	8.3	
5	9:43:02	14.1	0.003	S	8.3	
6	9:44:24	4	0.003	S	5.8	
7	9:46:30	5.1	0.003	S	5.7	
8	9:48:17	3.1	0.004	S	6.1	
9	9:49:41	2.5	0.004	S	4.1	
10	9:51:07	16.7	0.003	S	6.1	
11	9:54:51	25.2	0.003	S	3.3	
12	9:56:17	5.4	0.003	S	5.7	
13	9:58:17	11.9	0.004	S	6.2	
14	9:59:57	6.4	0.004	S	6.6	
15	10:01:27	13.1	0.004	S	5.5	
16	10:04:14	10.1	0.004	S	6.9	
17	10:05:53	12	0.003	S	3.4	
18	10:08:58	3.1	0.005	S	4.1	
19	10:11:08	2.4	0.003	S	3.4	
20	10:13:01	4.9	0.004	S	5.0	
21	10:14:32	30.8	0.004	S	6.8	
22	10:16:17	29.8	0.004	S	3.5	
23	10:17:41	11.3	0.004	S	4.4	
24	10:19:25	12.8	0.005	S	7.8	
25	10:21:41	7.8	0.004	S	5.4	
26	10:22:53	89.3	0.004	S	6.1	
27	10:25:20	5.2	0.004	S	5.5	
28	10:26:44	11.4	0.004	S	7.8	
29	10:28:06	7.5	0.004	S	5.5	
30	10:29:38	20.7	0.005	S	3.7	
31	10:30:58	3.7	0.003	S	4.5	
32	10:39:04	83.6	0.004	S	6.7	
33	10:41:01	49.8	0.003	S	6.8	
34	10:42:33	15.1	0.003	S	11.2	
35	10:44:22	32	0.004	S	7.3	
36	10:47:55	11.8	0.004	S	4.7	
37	10:49:46	98.2	0.004	S	5.3	
38	10:52:20	13.7	0.004	S	8.7	
39	10:55:03	19.2	0.004	S	5.2	
40	10:57:22	4.7	0.004	S	4.7	
41	10:59:57	3.5	0.004	S	7.1	
42	11:01:48	3.3	0.004	S	5.7	
43	11:04:29	14.6	0.005	S	6.7	
44	11:05:35	9	0.006	S	8.6	
45	11:08:35	3.2	0.005	S	6.4	
46	11:11:12	5.1	0.004	S	8.1	
47	11:12:42	6.7	0.004	S	8.0	
48	11:13:50	8.6	0.004	S	7.2	
49	11:15:16	16.6	0.005	S	7.4	

Monitoring Station (x100')	TIME	CH4 Concentration (ppm)	H2S Concentration (ppm)	Wind Direction	Wind Speed (mph)	Comments
50	11:16:54	8.5	0.005	S	7.7	
51	11:20:17	62.9	0.004	S	7.2	
52	11:21:53	18.4	0.004	S	5.1	
53	11:23:33	12.9	0.004	S	5.8	
54	11:25:05	18.1	0.006	S	9.4	
55	11:26:56	10.1	0.005	S	7.9	
56	11:28:38	30.1	0.005	S	6.0	
57	11:30:39	20.2	0.005	S	4.6	
58	11:33:28	24.4	0.004	S	5.6	
59	11:36:31	23.2	0.004	S	6.9	
60	11:38:01	9.5	0.004	S	7.3	
61	11:39:54	9.7	0.005	S	5.7	
62	11:41:58	22.1	0.004	S	8.6	
63	11:43:41	12.4	0.005	S	7.5	
64	11:45:19	3.3	0.005	S	7.8	
65	11:47:22	25.4	0.004	S	6.4	
66	11:49:05	10.1	0.004	S	5.7	
67	11:50:51	3.5	0.005	S	6.4	
68	11:52:15	7.2	0.005	S	1.5	
69	11:53:58	20.1	0.019	S	6.0	
70	11:55:50	10	0.005	S	4.4	
71	11:57:24	9	0.004	S	4.1	
72	11:58:25	10.6	0.004	S	4.6	
73	11:59:30	9.8	0.004	S	8.0	
74	12:01:25	2.6	0.007	S	5.3	
75	12:02:52	2	0.008	S	5.5	
76	12:05:00	12.1	0.008	S	2.0	
77	12:06:15	340	0.015	S	1.0	
78	12:07:37	24.9	0.009	S	0.0	
79	12:08:41	3.3	0.009	S	0.0	
80	12:10:32	3.7	0.009	S	6.9	
81	12:12:28	6.1	0.008	S	1.7	
82	12:15:14	8.7	0.004	S	7.2	
83	12:16:48	26.7	0.009	S	5.0	
84	12:17:51	34	0.004	S	4.9	
85	12:19:48	18.7	0.008	S	5.5	
86	12:21:01	7.3	0.004	S	4.6	
87	12:24:02	1.8	0.004	S	4.4	
88	12:25:38	5.4	0.015	SSW	5.7	odors
89	12:27:28	44.4	0.014	SSW	6.0	odors
90	12:54:27	44.3	0.082	SSW	8.0	odors
91	12:56:34	20.7	0.073	SSW	5.7	odors
92	12:57:37	6	0.028	SSW	7.1	odors
93	12:59:37	9.9	0.059	SSW	5.9	odors
94	13:01:04	20.3	0.006	SSW	6.9	
95	13:04:13	7.5	0.006	SSW	6.8	
96	13:05:23	7	0.004	SSW	4.0	
97	13:08:26	11.7	0.005	SSW	11.3	
98	13:11:33	0.8	0.005	SSW	4.4	
99	13:13:21	3.1	0.004	SSW	6.7	
100	13:14:38	3.6	0.006	SSW	3.4	
101	13:15:55	77.3	0.01	SSW	6.2	
102	13:19:00	4.4	0.005	SSW	6.0	
103	13:23:42	17.3	0.018	SSW	3.5	odors
104	13:27:11	12.4	0.051	SSW	8.0	odors
105	13:28:46	4.1	0.004	SSW	3.7	odors

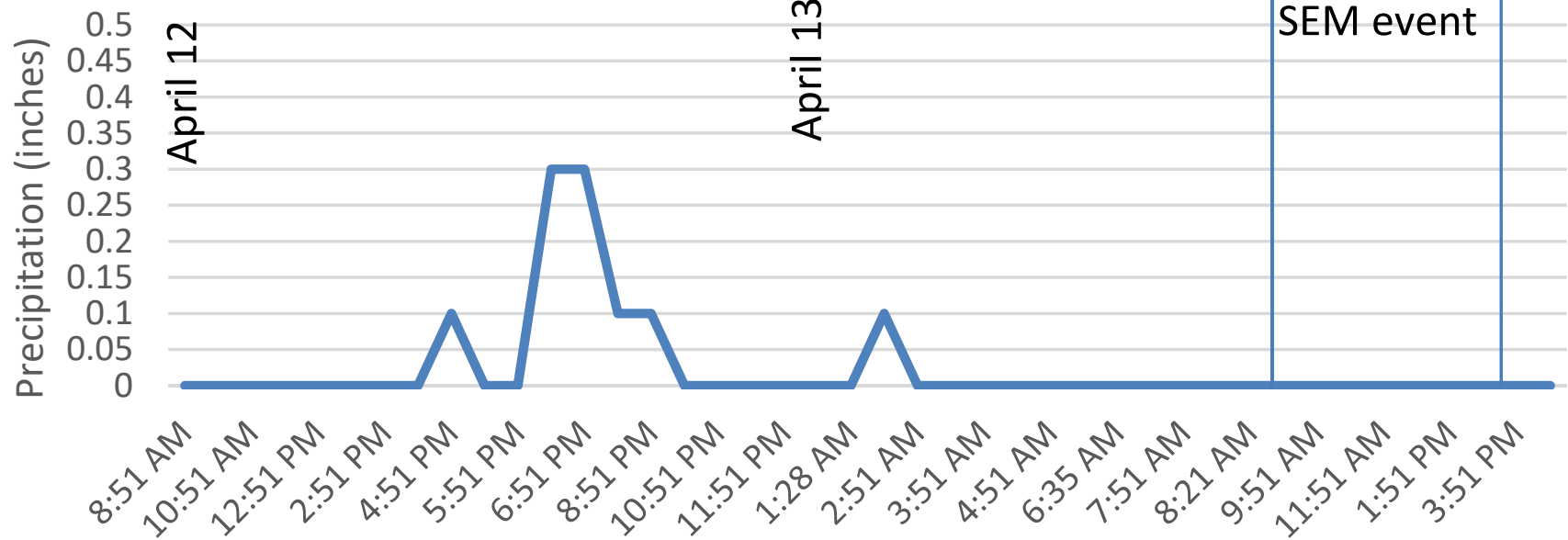


Monitoring Station (x100')	TIME	CH4 Concentration (ppm)	H2S Concentration (ppm)	Wind Direction	Wind Speed (mph)	Comments
106	13:30:38	10.2	0.33	SSW	8.7	odors
107	13:31:44	140	0.015	SSW	5.3	
108	13:33:36	11	0.16	SSW	6.2	
109	13:35:03	21.2	0.016	SSW	5.7	
110	13:37:09	120	0.008	SSW	8.7	
111	13:38:17	4.5	0.15	SSW	7.2	odors
112	13:40:13	21.9	0.007	SSW	4.1	odors
113	13:41:55	1.5	0.019	SSW	5.9	odors
114	13:43:09	8.6	0.16	SSW	4.4	odors
115	13:45:27	6.4	0.125	SSW	1.8	odors
116	13:46:53	15.6	0.15	SSW	3.0	odors
117	13:48:14	26.2	0.014	SSW	8.0	odors
118	13:50:00	42.1	0.11	SSW	6.3	odors
119	13:51:26	12.3	0.03	SSW	6.6	odors
120	13:53:00	10.1	0.042	SSW	6.5	odors
121	13:54:29	10.3	0.007	SSW	6.3	odors
122	13:57:14	21.1	0.022	SSW	5.1	odors
123	13:58:33	1.4	0.015	SSW	3.4	odors
124	13:59:45	6	0.011	SSW	4.1	odors
125	14:01:28	28.6	0.038	SSW	3.1	odors
126	14:03:20	42.1	0.15	SSW	2.2	odors
127	14:04:15	5.3	0.01	SSW	5.0	odors
128	14:06:15	26.7	0.012	SSW	6.4	odors
129	14:08:21	2.9	0.013	SSW	11.3	odors
130	14:09:42	74.4	0.039	SSW	9.1	odors
131	14:10:55	27.3	0.24	SSW	10.0	odors
132	14:12:28	95.6	0.065	SSW	3.4	odors
133	14:13:52	39.9	0.25	SSW	3.5	odors
134	14:15:32	189	0.25	SSW	5.7	odors
135	14:17:00	51.1	0.021	SSW	3.6	odors
136	14:18:28	11.1	0.012	SSW	3.2	odors
137	14:20:08	57.6	0.058	SSW	8.2	odors
138	14:21:20	34.2	0.036	SSW	8.0	odors
139	14:22:50	11.5	0.11	SSW	9.1	odors
140	14:24:02	25.2	0.05	SSW	9.3	odors
141	14:25:41	45.8	0.12	SSW	1.8	odors
142	14:27:05	20.7	0.019	SSW	5.7	odors
143	14:29:48	20.7	0.045	SSW	12.3	odors
144	14:31:46	11.4	0.13	SSW	10.2	odors
145	14:33:12	27.8	0.012	SSW	11.7	odors
146	14:34:24	12.8	0.112	SSW	11.0	odors
147	14:36:03	52.3	0.067	SSW	9.7	odors
148	14:37:39	35.8	0.006	SSW	5.5	odors
149	14:39:11	4.2	0.17	SSW	8.1	odors
150	14:40:14	13.5	0.13	SSW	4.7	odors
151	14:41:29	21.2	0.008	SSW	4.9	odors
152	14:42:37	4.1	0.12	SSW	7.7	odors
153	14:44:08	14	1.05	SSW	8.0	odors
154	14:44:31	26.2	0.029	SSW	7.2	odors
155	14:45:47	276	0.026	SSW	5.7	odors
156	14:46:52	73.4	0.3	SSW	10.3	odors
157	14:48:18	23.8	0.21	SSW	9.4	odors
158	14:48:56	12.2	0.004	SSW	8.0	odors
159	14:50:03	31.9	1.36	SSW	5.7	odors
160	14:51:11	3.8	0.2	SSW	7.4	odors
161	14:52:40	2.1	0.078	SSW	11.4	odors

Monitoring Station (x100')	TIME	CH4 Concentration (ppm)	H2S Concentration (ppm)	Wind Direction	Wind Speed (mph)	Comments
<b>Landfill Side Slopes</b>						
162	14:54:20	42.4	0.004	SSW	9.9	
163	14:56:18	26.1	0.005	SSW	3.4	
164	14:58:10	37.7	0.004	SSW	2.1	
165	15:00:06	0.2	0.003	SSW	4.9	
166	15:04:46	9.9	0.002	SSW	2.6	
167	15:05:46	11.2	0.002	SSW	7.4	
168	15:44:04	13.8	0.002	SSW	5.7	
169	15:44:43	24	0.032	SSW	9.2	odors
170	15:45:32	6.1	0.003	SSW	9.7	
171	15:46:38	18.7	0.002	SSW	8.6	
172	15:47:32	0.9	0.004	SSW	6.9	
173	15:48:35	10	0.001	SSW	7.2	
174	15:49:32	2.8	0.024	SSW	7.4	odors
175	15:50:36	241	0.052	SSW	8.2	odors
176	15:52:03	10	0.41	SSW	10.0	odors
177	15:52:50	5.4	0.19	SSW	7.6	odors
178	15:53:36	6.4	0.27	SSW	6.8	odors
179	15:55:48	19.8	0.13	SSW	2.7	odors
180	15:56:29	33.8	0.11	SSW	4.3	odors
181	15:59:26	17.2	0.012	SSW	8.5	odors
182	16:00:24	37.1	0.029	SSW	5.7	odors
183	16:01:42	19.4	0.007	SSW	8.0	
184	16:02:44	19.2	0.005	SSW	2.3	
185	16:03:43	14.2	0.005	S	7.9	
186	16:04:46	163	0.006	S	5.7	
187	16:05:06	92.6	0.003	S	8.0	
188	16:05:55	7.8	0.005	S	7.4	
189	16:07:11	6.6	0.01	S	6.7	
190	16:08:16	3.8	0.028	SSW	4.6	
191	16:09:04	4.7	0.017	SSW	4.6	
192	16:09:52	1.5	0.002	SSW	4.0	
193	16:11:02	5	0.005	SSW	2.9	
194	16:11:53	1.4	0.007	SSW	3.2	
195	16:13:06	10.6	0.015	SSW	4.7	
196	16:13:49	3.7	0.011	SSW	3.8	
197	16:15:45	2.7	0.004	S	1.2	
198	16:17:24	11.9	0.008	S	2.4	
199	16:18:25	3.2	0.005	S	4.4	
200	16:19:15	56.8	0.005	S	4.8	
201	16:20:09	37.1	0.006	S	3.4	
202	16:21:11	17.4	0.004	S	4.5	
203	16:22:30	13.1	0.006	S	3.3	
204	16:23:18	4.1	0.004	S	1.3	
205	16:24:05	1.2	0.005	S	5.8	
206	16:25:09	0.7	0.005	S	4.1	
207	16:26:23	5.1	0.004	S	4.0	
208	16:28:01	3.2	0.004	S	4.6	
209	16:28:41	0.3	0.005	S	3.4	
210	16:29:26	0	0.003	S	6.1	
211	16:30:09	0.6	0.003	S	4.6	
212	16:31:07	3.6	0.005	S	6.0	
213	16:31:52	13.8	0.004	S	8.2	
214	16:33:28	0.1	0.006	S	7.7	
215	16:34:27	-0.4	0.005	S	4.2	
216	16:35:34	14.1	0.005	S	4.0	

Monitoring Station (x100')	TIME	CH4 Concentration (ppm)	H2S Concentration (ppm)	Wind Direction	Wind Speed (mph)	Comments
217	16:36:34	0.2	0.005	S	4.7	
218	16:37:39	-0.3	0.005	S	5.9	
	Minimum	-0.40	0.001		0	
	Maximum	340	1.360		12.3	
	Average				6.0	
	Methane > 100 ppm	163				
	H2S>0.030 ppm		0.052			
	H2S>0.1		0.41			

# Precipitation April 12 - 13, 2019



[source:https://www.wunderground.com/history/daily/us/nj/newark/KEWR/date/2019-4-13](https://www.wunderground.com/history/daily/us/nj/newark/KEWR/date/2019-4-13)

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Rensselaer, NY (weather/us/ny/rensselaer/42.38,-74.21)

Elev 0 40.69 °N, 74.18 °W

# Newark Liberty International Airport, New Jersey ★ 🏠

☀️ **61° NEWARK LIBERTY INTERNATIONAL AIRPORT STATION** (/HISTORY/DAILY/US/NJ/NEWARK/KEWR/DATE/2019-4-15?CM\_VEN=LOCALWX\_PWSDASH) | CHANGE ▾

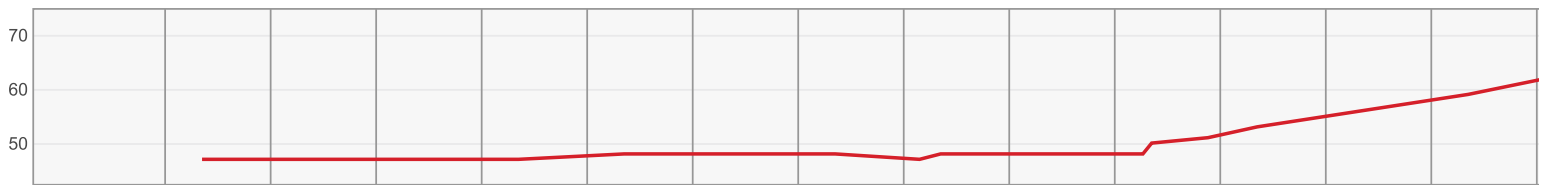
HISTORY (/HISTORY/DAILY/US/NJ/NEWARK/KEWR/DATE/2019-4-15)

- [TODAY \(/WEATHER/US/NJ/NEWARK/40.73,-74.17\)](#)
- [HOURLY \(/HOURLY/US/NJ/NEWARK/40.73,-74.17\)](#)
- [10-DAY \(/FORECAST/US/NJ/NEWARK/40.73,-74.17\)](#)
- [CALENDAR \(/CALENDAR/US/NJ/NEWARK/KEWR/DATE/2019-4\)](#)
- [HISTORY \(/HISTORY/DAILY/US/NJ/NEWARK/KEWR/DATE/2019-4-15\)](#)
- [WUNDERMAP \(/WUNDERMAP?LAT=40.69&LON=-74.18\)](#)

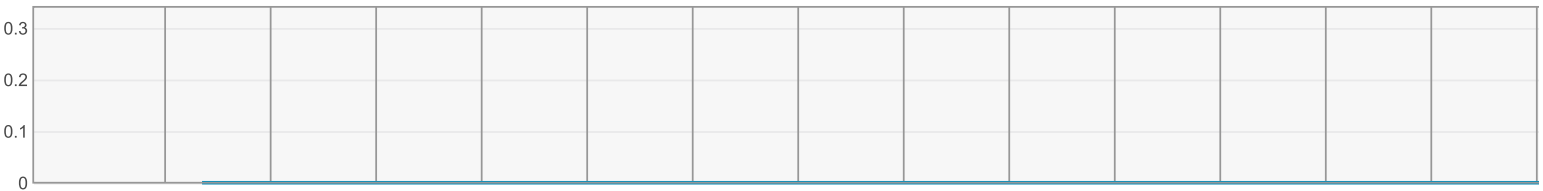
Daily Weekly Monthly

April 12 2019 View

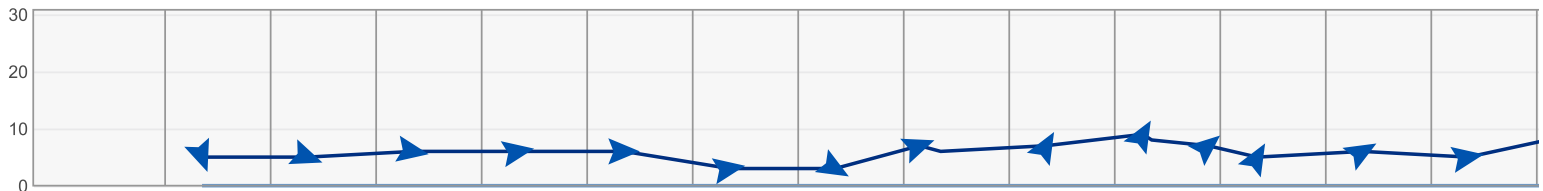
8 PM 9 PM 10 PM 11 PM 12 AM 1 AM 2 AM 3 AM 4 AM 5 AM 6 AM 7 AM 8 AM 9 AM



Temperature



Precipitation



Wind Wind Direction Gust

# Summary

April 12, 2019

RAINFALL FOR  
APRIL 12

Temperature (° F)	Actual	Historic Avg.	Record	▲
High Temp	70	61	90	
Low Temp	46	43	27	
Day Average Temp	58	52	-	
Precipitation (Inches)	Actual	Historic Avg.	Record	▲
Precipitation	0.57	0.15	2.5	
Month to Date	1.02	1.77	-	
Year to Date	12.9	12.37	-	
Degree Days (° F)	Actual	Historic Avg.	Record	▲
Heating Degree Days	7	14	-	
HDD Month to Date	171	187	-	
HDD Since July 1	4469	4531	-	
Cooling Degree Days	0	0	-	
CDD Month to Date	1	0	-	
CDD Year to Date	1	1	-	
Growing Degree Days	8	-	-	
Dew Point (° F)	Actual	Historic Avg.	Record	▲
Dew Point	45	-	-	
High	59	-	-	
Low	23	-	-	
Average	45	-	-	
Wind (MPH)	Actual	Historic Avg.	Record	▲
Max Wind Speed	22	-	-	
Visibility	10	-	-	
Sea Level Pressure (Hg)	Actual	Historic Avg.	Record	▲
Sea Level Pressure	30.29	-	-	

Temperature (° F)	Actual	Historic Avg.	Record	▲
<b>Astronomy</b>	Day Length	Rise	Set	▲
Actual Time	13h 9m	6:24 AM	7:33 PM	
Civil Twilight		5:55 AM	8:01 PM	
Nautical Twilight		5:22 AM	8:34 PM	
Astronomical Twilight		4:47 AM	9:10 PM	
Moon: waxing half first qtr		11:44 AM	2:01 AM	

# Daily Observations

Start April 12, 2019

April 11, 2019



Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Precip Accum	Condition
8:51 PM	47 ° F	30 ° F	52 %	SSE	5 mph	0 mph	30.3 in	0.0 in	0.0 in	Cloudy
9:51 PM	47 ° F	31 ° F	54 %	ESE	5 mph	0 mph	30.3 in	0.0 in	0.0 in	Cloudy
10:51 PM	47 ° F	31 ° F	54 %	E	6 mph	0 mph	30.2 in	0.0 in	0.0 in	Cloudy
11:51 PM	47 ° F	26 ° F	44 %	E	6 mph	0 mph	30.2 in	0.0 in	0.0 in	Cloudy
12:51 AM	48 ° F	23 ° F	37 %	E	6 mph	0 mph	30.2 in	0.0 in	0.0 in	Cloudy
1:51 AM	48 ° F	25 ° F	41 %	E	3 mph	0 mph	30.2 in	0.0 in	0.0 in	Cloudy
2:51 AM	48 ° F	35 ° F	61 %	ESE	3 mph	0 mph	30.2 in	0.0 in	0.0 in	Cloudy
3:39 AM	47 ° F	38 ° F	71 %	ENE	7 mph	0 mph	30.3 in	0.0 in	0.0 in	Cloudy
3:51 AM	48 ° F	38 ° F	68 %	NE	6 mph	0 mph	30.3 in	0.0 in	0.0 in	Cloudy
4:51 AM	48 ° F	41 ° F	77 %	NNE	7 mph	0 mph	30.3 in	0.0 in	0.0 in	Cloudy
5:46 AM	48 ° F	43 ° F	82 %	NNE	9 mph	0 mph	30.3 in	0.0 in	0.0 in	Cloudy
5:51 AM	50 ° F	42 ° F	74 %	NNE	8 mph	0 mph	30.3 in	0.0 in	0.0 in	Cloudy
6:23 AM	51 ° F	42 ° F	71 %	NE	7 mph	0 mph	30.3 in	0.0 in	0.0 in	Cloudy
6:51 AM	53 ° F	43 ° F	69 %	NNE	5 mph	0 mph	30.3 in	0.0 in	0.0 in	Mostly Cloudy
7:51 AM	56 ° F	43 ° F	62 %	ENE	6 mph	0 mph	30.2 in	0.0 in	0.0 in	Mostly Cloudy
8:51 AM	59 ° F	45 ° F	60 %	E	5 mph	0 mph	30.2 in	0.0 in	0.0 in	Mostly Cloudy
9:51 AM	63 ° F	47 ° F	56 %	E	9 mph	0 mph	30.2 in	0.0 in	0.0 in	Mostly Cloudy
10:51 AM	63 ° F	49 ° F	60 %	ENE	6 mph	0 mph	30.1 in	0.0 in	0.0 in	Mostly Cloudy
11:51 AM	64 ° F	52 ° F	65 %	VAR	5 mph	0 mph	30.1 in	0.0 in	0.0 in	Mostly Cloudy
12:51 PM	68 ° F	53 ° F	59 %	S	5 mph	0 mph	30.1 in	0.0 in	0.0 in	Light Rain
1:51 PM	66 ° F	56 ° F	70 %	S	13 mph	0 mph	30.1 in	0.0 in	0.0 in	Cloudy
2:51 PM	65 ° F	57 ° F	75 %	S	16 mph	28 mph	30.1 in	0.0 in	0.0 in	Light Rain
3:51 PM	62 ° F	58 ° F	86 %	S	12 mph	22 mph	30.1 in	0.0 in	0.0 in	Light Rain
4:51 PM	61 ° F	58 ° F	90 %	S	10 mph	0 mph	30.1 in	0.1 in	0.0 in	Rain
5:09 PM	61 ° F	59 ° F	93 %	S	10 mph	0 mph	30.1 in	0.0 in	0.0 in	Light Rain
5:51 PM	62 ° F	59 ° F	90 %	SW	8 mph	0 mph	30.1 in	0.0 in	0.0 in	Light Rain
6:20 PM	61 ° F	59 ° F	93 %	SSW	8 mph	0 mph	30.1 in	0.3 in	0.0 in	Rain
6:51 PM	61 ° F	59 ° F	93 %	S	7 mph	0 mph	30.1 in	0.3 in	0.0 in	Light Rain
7:51 PM	61 ° F	59 ° F	93 %	S	12 mph	0 mph	30.1 in	0.1 in	0.0 in	Rain

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Elev 0 40.69 °N, 74.18 °W

# Newark Liberty International Airport, New Jersey ★ 🏠

☀️ **61° NEWARK LIBERTY INTERNATIONAL AIRPORT STATION** (/HISTORY/DAILY/US/NJ/NEWARK/KEWR/DATE/2019-4-15?CM\_VEN=LOCALWX\_PWSDASH) | CHANGE ▾

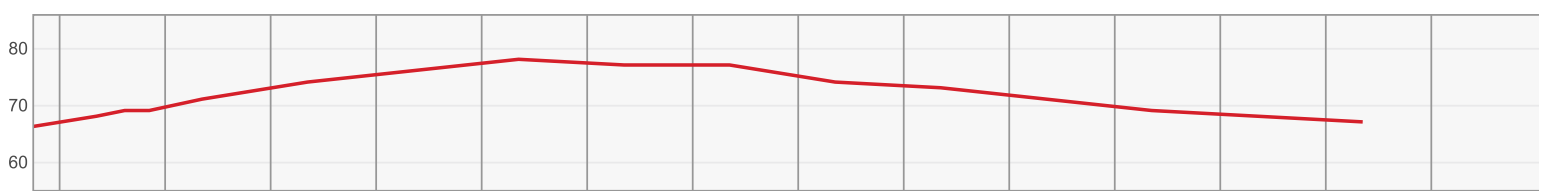
HISTORY (/HISTORY/DAILY/US/NJ/NEWARK/KEWR/DATE/2019-4-15)

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- [HOURLY \(/HOURLY/US/NJ/NEWARK/40.73,-74.17\)](#)
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- [WUNDERMAP \(/WUNDERMAP?LAT=40.69&LON=-74.18\)](#)

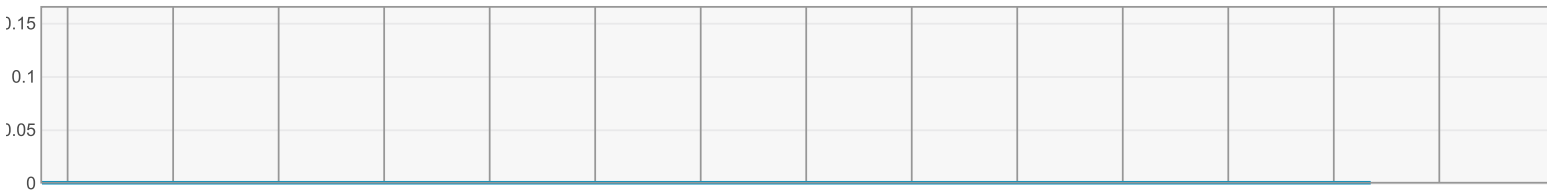
Daily Weekly Monthly

April 13 2019 View

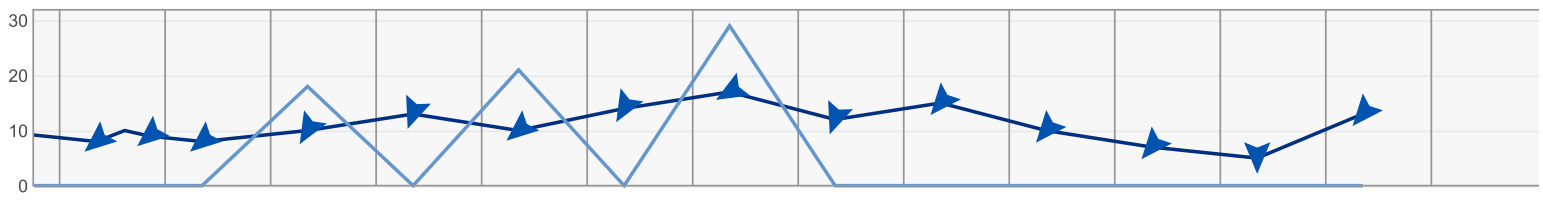
8 AM 9 AM 10 AM 11 AM 12 PM 1 PM 2 PM 3 PM 4 PM 5 PM 6 PM 7 PM 8 PM



Temperature



Precipitation



Wind Wind Direction Gust



# Summary

April 13, 2019

RAINFALL FOR  
APRIL 13

Temperature (° F)	Actual	Historic Avg.	Record	▲
High Temp	79	61	86	
Low Temp	61	43	26	
Day Average Temp	70	52	-	
Precipitation (Inches)	Actual	Historic Avg.	Record	▲
Precipitation	0.17	0.15	1.05	
Month to Date	1.19	1.92	-	
Year to Date	13.07	12.52	-	
Degree Days (° F)	Actual	Historic Avg.	Record	▲
Heating Degree Days	0	13	-	
HDD Month to Date	171	200	-	
HDD Since July 1	4469	4544	-	
Cooling Degree Days	5	0	-	
CDD Month to Date	6	0	-	
CDD Year to Date	6	1	-	
Growing Degree Days	20	-	-	
Dew Point (° F)	Actual	Historic Avg.	Record	▲
Dew Point	58	-	-	
High	61	-	-	
Low	44	-	-	
Average	58	-	-	
Wind (MPH)	Actual	Historic Avg.	Record	▲
Max Wind Speed	21	-	-	
Visibility	10	-	-	
Sea Level Pressure (Hg)	Actual	Historic Avg.	Record	▲
Sea Level Pressure	30.09	-	-	

Temperature (° F)	Actual	Historic Avg.	Record	▲
<b>Astronomy</b>	Day Length	Rise	Set	▲
Actual Time	13h 11m	6:22 AM	7:34 PM	
Civil Twilight		5:54 AM	8:02 PM	
Nautical Twilight		5:20 AM	8:36 PM	
Astronomical Twilight		4:45 AM	9:11 PM	
Moon: waxing gibbous		12:49 PM	2:55 AM	

# Daily Observations

Start April 13, 2019

Period SEM was performed

April 12, 2019

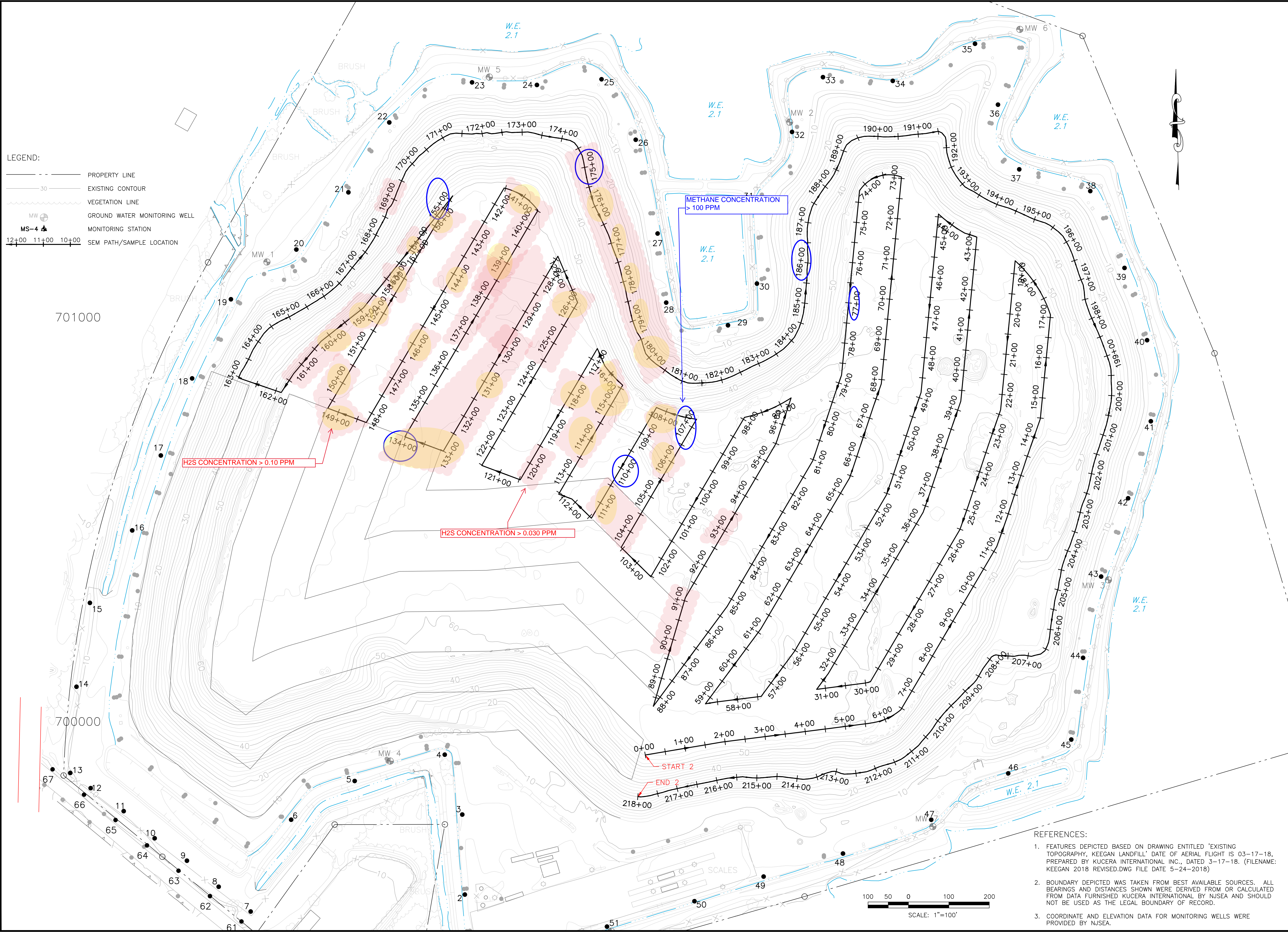
Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Precip Accum	Condition
8:51 PM	62 ° F	59 ° F	90 %	S	13 mph	0 mph	30.1 in	0.1 in	0.0 in	Light Rain
9:51 PM	62 ° F	59 ° F	90 %	S	14 mph	0 mph	30.1 in	0.0 in	0.0 in	Light Rain
10:51 PM	62 ° F	58 ° F	86 %	S	15 mph	0 mph	30.0 in	0.0 in	0.0 in	Cloudy
11:40 PM	62 ° F	58 ° F	86 %	S	15 mph	0 mph	30.0 in	0.0 in	0.0 in	Cloudy
11:51 PM	62 ° F	58 ° F	86 %	S	15 mph	24 mph	30.0 in	0.0 in	0.0 in	Cloudy
12:51 AM	62 ° F	58 ° F	86 %	S	20 mph	0 mph	30.0 in	0.0 in	0.0 in	Cloudy
1:28 AM	61 ° F	59 ° F	93 %	SW	13 mph	0 mph	30.0 in	0.0 in	0.0 in	Rain
1:51 AM	61 ° F	60 ° F	97 %	WSW	7 mph	0 mph	30.0 in	0.1 in	0.0 in	Heavy Rain
2:51 AM	61 ° F	60 ° F	97 %	S	5 mph	0 mph	30.0 in	0.0 in	0.0 in	Light Rain
3:40 AM	62 ° F	60 ° F	93 %	SW	13 mph	0 mph	30.1 in	0.0 in	0.0 in	Light Rain
3:51 AM	62 ° F	60 ° F	93 %	SW	15 mph	0 mph	30.1 in	0.0 in	0.7 in	Cloudy
4:36 AM	63 ° F	61 ° F	93 %	SSW	10 mph	0 mph	30.1 in	0.0 in	0.0 in	Cloudy
4:51 AM	63 ° F	60 ° F	90 %	S	8 mph	0 mph	30.1 in	0.0 in	0.0 in	Cloudy
5:51 AM	64 ° F	61 ° F	90 %	SW	9 mph	0 mph	30.1 in	0.0 in	0.0 in	Cloudy
6:35 AM	64 ° F	61 ° F	90 %	WSW	13 mph	0 mph	30.1 in	0.0 in	0.0 in	Cloudy
6:51 AM	65 ° F	61 ° F	87 %	SW	10 mph	0 mph	30.1 in	0.0 in	0.0 in	Cloudy
7:51 AM	68 ° F	61 ° F	78 %	SW	8 mph	0 mph	30.1 in	0.0 in	0.0 in	Mostly Cloudy
8:07 AM	69 ° F	61 ° F	75 %	SW	10 mph	0 mph	30.0 in	0.0 in	0.0 in	Mostly Cloudy
8:21 AM	69 ° F	60 ° F	73 %	SW	9 mph	0 mph	30.0 in	0.0 in	0.0 in	Mostly Cloudy
8:51 AM	71 ° F	59 ° F	66 %	SW	8 mph	0 mph	30.0 in	0.0 in	0.0 in	Mostly Cloudy
9:51 AM	74 ° F	56 ° F	53 %	SSW	10 mph	18 mph	30.0 in	0.0 in	0.0 in	Mostly Cloudy
10:51 AM	76 ° F	54 ° F	46 %	SSW	13 mph	0 mph	30.0 in	0.0 in	0.0 in	Partly Cloudy
11:51 AM	78 ° F	52 ° F	40 %	SW	10 mph	21 mph	30.0 in	0.0 in	0.0 in	Mostly Cloudy
12:51 PM	77 ° F	51 ° F	40 %	SSW	14 mph	0 mph	30.0 in	0.0 in	0.0 in	Mostly Cloudy
1:51 PM	77 ° F	44 ° F	31 %	WSW	17 mph	29 mph	30.0 in	0.0 in	0.0 in	Cloudy
2:51 PM	74 ° F	54 ° F	50 %	SSW	12 mph	0 mph	29.9 in	0.0 in	0.0 in	Cloudy
3:51 PM	73 ° F	55 ° F	53 %	SW	15 mph	0 mph	30.0 in	0.0 in	0.0 in	Cloudy
4:51 PM	71 ° F	56 ° F	59 %	SW	10 mph	0 mph	30.0 in	0.0 in	0.0 in	Cloudy
5:51 PM	69 ° F	57 ° F	65 %	SW	7 mph	0 mph	30.0 in	0.0 in	0.0 in	Mostly Cloudy
6:51 PM	68 ° F	57 ° F	68 %	S	5 mph	0 mph	29.9 in	0.0 in	0.0 in	Mostly Cloudy

## Attachment 4

I:\PROJECTS\02219702\00\DRAWINGS\MONITORING\_SP.DWG layout: SEM plotted on: 4/3/2019 3:37 PM Yevchuk, Sharon

**LEGEND:**

- PROPERTY LINE
- 30 --- EXISTING CONTOUR
- VEGETATION LINE
- MW ⊕ GROUND WATER MONITORING WELL
- MS-4 ▲ MONITORING STATION
- 12+00 11+00 10+00 SEM PATH/SAMPLE LOCATION

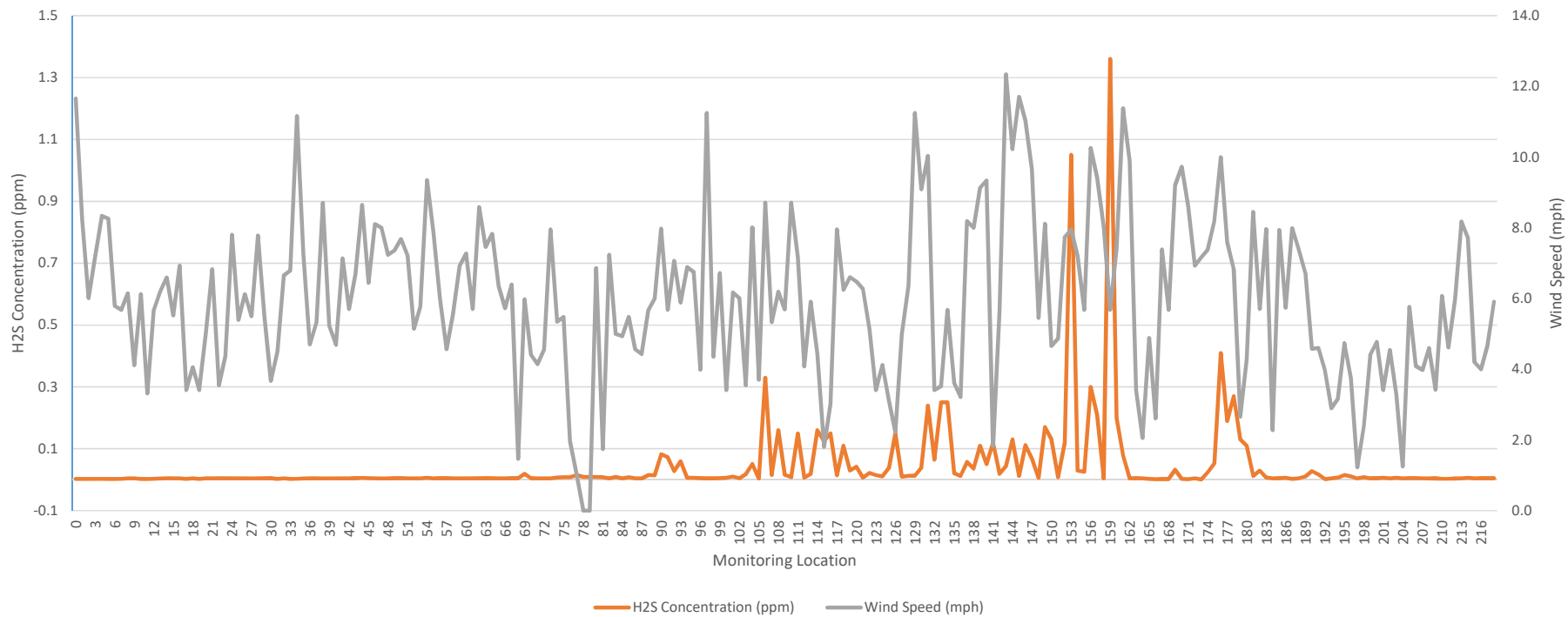


- REFERENCES:**
- FEATURES DEPICTED BASED ON DRAWING ENTITLED 'EXISTING TOPOGRAPHY, KEEGAN LANDFILL' DATE OF AERIAL FLIGHT IS 03-17-18, PREPARED BY KUCERA INTERNATIONAL INC., DATED 3-17-18. (FILENAME: KEEGAN 2018 REVISED.DWG FILE DATE 5-24-2018)
  - BOUNDARY DEPICTED WAS TAKEN FROM BEST AVAILABLE SOURCES. ALL BEARINGS AND DISTANCES SHOWN WERE DERIVED FROM OR CALCULATED FROM DATA FURNISHED KUCERA INTERNATIONAL BY NJSEA AND SHOULD NOT BE USED AS THE LEGAL BOUNDARY OF RECORD.
  - COORDINATE AND ELEVATION DATA FOR MONITORING WELLS WERE PROVIDED BY NJSEA.

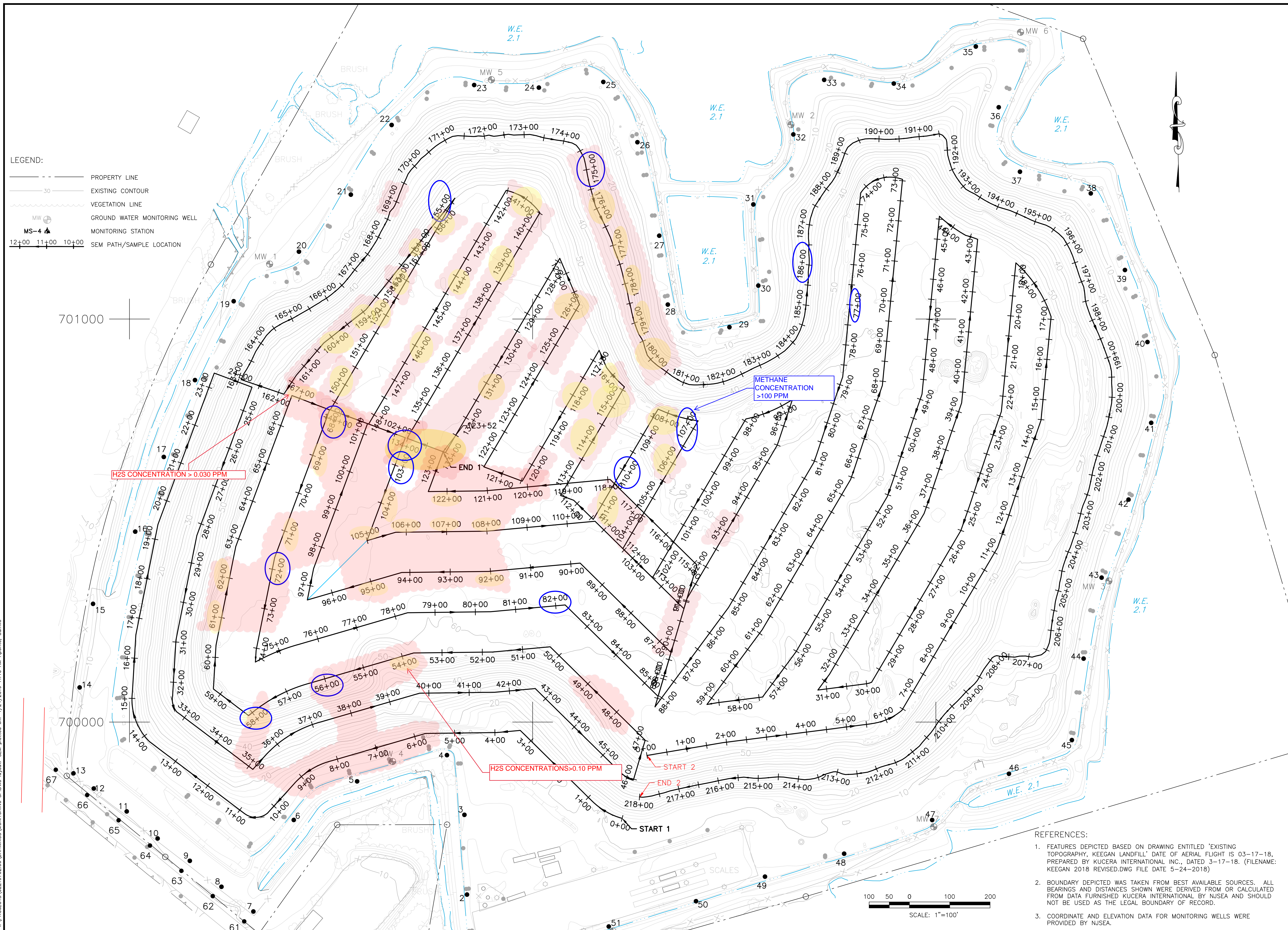
NO.		REVISION	DATE
1	ISSUED FOR CLIENT REVIEW		3/15/2019
2	ADD PATH 2		4/3/2019
SHEET TITLE		SEM SITE PLAN	
PROJECT TITLE		MONITORING SUPPORT KEEGAN LANDFILL	
CLIENT			
NEW JERSEY SPORTS & EXHIBITION AUTHORITY 1 DE KORTE PARK PLAZA, POB 640 LYNDHURST, NJ 07071			
CADD FILE:		MONITORING SP	
DATE:		3/15/2019	
SCALE:		AS SHOWN	
DRAWING NO.		1 of 1	

## Attachment 5

### Keegan Landfill H2S Concentration and Wind Speed



## Attachment 6



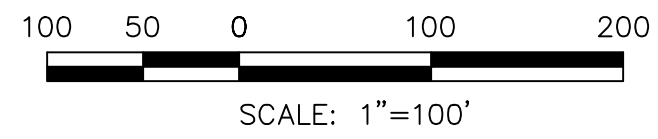
- LEGEND:
- PROPERTY LINE
  - 30' EXISTING CONTOUR
  - VEGETATION LINE
  - MW ⊕ GROUND WATER MONITORING WELL
  - MS-4 ▲ MONITORING STATION
  - 12+00 11+00 10+00 SEM PATH/SAMPLE LOCATION

701000

700000

I:\PROJECTS\02219702\00\DRAWINGS\MONITORING.SP.DWG layout: SEM plotted on: 4/24/2019 11:10 AM Agents, Corinne

- REFERENCES:
- FEATURES DEPICTED BASED ON DRAWING ENTITLED 'EXISTING TOPOGRAPHY, KEEGAN LANDFILL' DATE OF AERIAL FLIGHT IS 03-17-18, PREPARED BY KUCERA INTERNATIONAL INC., DATED 3-17-18. (FILENAME: KEEGAN 2018 REVISED.DWG FILE DATE 5-24-2018)
  - BOUNDARY DEPICTED WAS TAKEN FROM BEST AVAILABLE SOURCES. ALL BEARINGS AND DISTANCES SHOWN WERE DERIVED FROM OR CALCULATED FROM DATA FURNISHED KUCERA INTERNATIONAL BY NJSEA AND SHOULD NOT BE USED AS THE LEGAL BOUNDARY OF RECORD.
  - COORDINATE AND ELEVATION DATA FOR MONITORING WELLS WERE PROVIDED BY NJSEA.



NO.		REVISION	DATE
1	ISSUED FOR CLIENT REVIEW		3/15/2019
2	ADD PATH 2		4/3/2019
SHEET TITLE		SEM SITE PLAN	
PROJECT TITLE		MONITORING SUPPORT KEEGAN LANDFILL	
CLIENT			
<b>SCS ENGINEERS</b> STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC. 4 EXECUTIVE BLDG. SUITE 303, SUFFERN, NY 10901 PH. (845) 357-1510 FAX. (845) 357-1049 E-MAIL: SCS@SCSENG.COM WWW: WWW.SCS-ENG.COM			
CADD FILE:			
MONITORING.SP			
DATE:			
3/15/2019			
SCALE:			
AS SHOWN			
DRAWING NO.			
1 of 1			