May 29, 2020
File No. 02219702.00

Mr. Tom Farrell, Manager (cover letter only)
Division of Solid Waste Enforcement
New Jersey Department of Environmental Protection
9 Ewing Street
Trenton, New Jersey 08625-0420

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: May 2020 Progress Report
Keegan Landfill
New Jersey Sports and Exposition Authority
EA ID#: NEA 190002-13317

Dear Mr. Farrell and Mr. Meyer:

On behalf of the New Jersey Sports and Exposition Authority (NJSEA), SCS Engineers (SCS) submits this monthly progress report as required by Paragraph 41 of the Compliance Schedule in the Administrative Consent Order (ACO), NEA19002-13317, executed on March 9, 2020 (2020 ACO) for the Keegan Landfill (Landfill). This report covers progress on items related to the 2020 ACO for the month of May.

In an effort to streamline reporting and ensure all information is distributed to all interested parties, this report is also submitted to satisfy the requirements of Condition 14 of the Sanitary Landfill Major Disruption Approval (Disruption Approval), issued on June 27, 2019 and the Modified Sanitary Landfill Major Disruption Approval (Modified Disruption Approval), issued on December 23, 2019.

With the expiration of the EIPT on May 14, 2020 and submittal of the surface emissions monitoring (SEM) report included as **Attachment 3** and the Construction Activities report (under separate cover), all conditions and requirements of the Disruption Approval have been satisfied and/or completed. Therefore, this report is the final monthly progress report related to the Disruption Approval and Modified Disruption Approval. As required by Paragraph 31 of the Compliance Schedule in the Administrative Consent Order (ACO), NEA19002-13317, executed on March 9, 2020 (2020 ACO), the gas collection and control system will continue to operate until the final air permit is issued by the New Jersey Department of Environmental Protection (Department) for operation of the final gas collection system.

COMPLIANCE MEASURES AND STATUS

The work progress, summary of problems, activities planned, and required and actual completion

dates for each ACO Condition is summarized in the table provided in Attachment 1. The work progress, summary of problems, activities planned, and required and actual completion dates for each Disruption Approval Condition is summarized in the table provided in Attachment 2. Further discussion of the difficulties encountered is provided below.

ACO Difficulties Encountered

A letter was submitted via electronic mail on March 18, 2020, related to potential difficulties in meeting ACO compliance deadlines due to COVID-19 related restrictions.

Disruption Permit Difficulties Encountered

The surveyor has provided the final as-built survey drawings and the Construction Quality Assurance Report will be submitted under separate cover. Therefore, all conditions of the Disruption Approval and Modified Disruption Approval have been satisfied.

EXPLANATION OF NON-COMPLIANCE

ACO Schedule

There were no periods of non-compliance with the ACO during the period of this progress report.

Disruption Permit

There were no periods of non-compliance with the ACO during the period of this progress report.

EVALUATION OF CORRECTIVE MEASURES IMPLEMENTED

ACO Schedule

There were no periods of non-compliance, therefore corrective measures have not been required.

Disruption Permit Conditions

There were no periods of non-compliance, therefore corrective measures have not been required.

RECORDED MONTHLY MEASUREMENTS FOR DISRUPTION PERMIT

Surface emissions monitoring (SEM) for methane and hydrogen sulfide is required to be conducted on a monthly basis upon completion of the construction of the gas collection and control system and through completion of the Environmental Improvement Pilot Test (EIPT). Results of the May SEM event are included in Attachment 3. A comparison of the May SEM data to the April SEM data is also included in Attachment 3.

A signed certification of information form is included in Attachment 4. The next progress report related to the 2020 ACO will be submitted on or before July 1, 2020.

Please call either of the undersigned with any questions or comments.

Sincerely,

Marcus Scrimgeour, PE
Project Manager
SCS Engineers

Lisa K. Wilkinson, PE
Project Director I
SCS Engineers

cc: R. Clark, NJDEP (electronic copy)
A. Fontana (electronic copy)
M. Gerchman (electronic copy)
S. Shah (electronic copy)
V. Prieto, NJSEA (electronic copy)
T. Marturano, NJSEA (electronic copy)
A. Levy, NJSEA (electronic copy)
C. Sanz, NJSEA (electronic copy)
J. Stewart, Lowenstein (electronic copy)
G. Castano (electronic copy)

Attachment 1

May 2020 Progress Report Summary
Keegan Landfill (NEA190002-13317)

No.	ACO Condition Description	B. Status of permitting, planning approvals and work progress	C. Difficulties Encountered	D. Activities Planned for next reporting period	E. Required and Actual Completion date
25	Complete installation of expanded gas collection system, second flare, and sulfur treatment system	Installation and startup of all components of the expanded gas collection system, second flare and sulfur treatment system have been completed	None	None; activity is complete	Required: 3/22/2020 Actual: 3/16/2020
26	Submission of any additional permits for construction and operation of a full, and permanent landfill-wide gas collection and management system	Preconstruction air permit application submitted on 12/17/2019. There are no additional Landfill Disruption Approvals, land use permits or air pollution control permits required.	None.	None; activity is complete	Required: 4/8/2020 Actual: 12/17/2019
27	Commence installation of final gas collection system upon receipt of permits.	Permit application under review by NJDEP; blower skid and enclosed flare stack have been delivered to site and are installed.	None.	None, activity is complete	Required: within 15 days of receipt of permits Actual: 3/20/2020
28	Begin operation of final gas collection system	see Condition 27 above.	None	See Condition 27 above	Required: within 180 days from commencement of installation, 9/16/2020 Actual: 3/16/2020
29	EIPT and final gas collection system shall not interfere with landfill cap and shall minimize impacts on wildlife. Permanent flare shall be enclosed and NJSEA shall consult with Fish and Wildlife	Landfill cap system under analysis and design. Permit application for enclosed flare submitted on December 17, 2019 including planned methods for wildlife protection; anti-perching devices installed on enclosed flare stack in 2 locations	None	Ongoing	Required: None Actual: None
30	Timely response to requests for information on permit applications or submittals	Submitted response to NJDEP request for information in February and May	None.	None, no outstanding information requests	Required: 20 days from request Actual:
31	Continued operation of gas collection system regardless of expired EIPT	Gas collection system will continue to operate.	None	Gas collection system will continue to operate.	Required: EIPT expires 5/14/2020 Actual: Continued system operation past 5/14/2020
32	Submit Title V Operating permit application as determined by USEPA.	USEPA has determined that Title V permit application is required; pre-application meeting held on April 27, 2020.	None	Prepare application within 60 days of pre-application meeting.	Required: USEPA Order requires appplication submittal within 60 days of pre-filing conference; June 26, 2020 Actual:
33	Maintain the grade and thickness of cover material and repair any damage on a daily basis to facilitate proper stormwater management	NJSEA receives and places soil materials for maintenance and landfill contouring on a daily basis.	None	Ongoing.	Required: Ongoing Actual: Ongoing

May 2020 Progress Report Summary
Keegan Landfill (NEA190002-13317)

No.	ACO Condition Description	B. Status of permitting, planning approvals and work progress	C. Difficulties Encountered	D. Activities Planned for next reporting period	E. Required and Actual Completion date
34	Vegetation that interferes with approved cap shall be removed in accordance with the approved closure and post-closure plan.	Design of final cap system is ongoing	None	Vegetation will be managed upon determination of final cap limits	Required: Ongoing Actual: Ongoing
35 a-r.	Prepare and submit landfill closure and post-closure plan.	Begin preparation of landfill closure and post-closure plan	Due to COVID-19 restrictions schedule for this item may be difficult to meet, letter sent on March 18, 2020	Continue with landfill closure and post-closure plan preparation	Required: 7/7/2020 Actual:
36	Begin implementation of Closure Plan upon approval by Department	Will commence upon Department approval Closure Plan	None	None.	Required: 30 days from approval of Closure Plan Actual:
37	Complete all Closure Plan requirements in accordance with schedule provided in approved Closure Plan	Will commence upon Department approval Closure Plan	None	None	Required: to be determined Actual:
38	Once Closure Plan requirements are completed, commence implementation of Post-Closure Care plan	Will commence upon completion of Closure Plan requirements	None	None	Required: to be determined Actual:
39	All State, Federal, and location permits must be obtained and complied	Will apply based requirements in Closure Plan	None	None	Required: to be determined Actual:
40	Additional actions will be taken to comply with all applicable State, Federal, and location permits, regulations, etc.	Will apply based requirements in Closure Plan	None	None	Required: to be determined Actual:
41	A progress report must be submitted the first of every month followng the exectution of this ACO	This report satisfies this requirement for May 2020.	None	Continue to submit monthly progress reports as required	Required: First of Month Actual: Ongoing
42	Ensure that the H2S concentration does not exceed 30 ppbv over any 30-minute period; prepare a revised monitoring action plan (MAP) for the stations on the northern boundary	There have been no hydrogen sulfide concentrations that exceed 30 ppb over any 30-minue period at the monitoring stations; revisions to Monitoring Action Plan submitted with PCP application on 12/17/2019, letter submitted to NJDEP on April 13, 2020 regarding revised MAP; revised MAP submitted on April 28, 2020	None	Respond to comments as necessary and attend site visit as requested by Bureau of Air Monitoring.	Required: Revised Monitoring Plan - 4/8/20; monitor relocation - 30 days from Monitoring Plan approval Actual: 12/17/2019, 4/13/2020 and 4/28/2020

Attachment 2

May 2020 Progress Report Summary
Keegan Landfill (Disruption Permit-13317 and Modified Disruption Permit)

No.	Permit Condition Description	B. Status of permitting, planning approvals and work progress	C. Difficulties Encountered	D. Activities Planned for next reporting period	E. Required and Actual Completion date
1	Approval limited to installation and operation of 28 vertical gas extraction wells, six horizontal collectors, skid-mounted blower/flare system, condensate management system. Modified Approval for six horizontal collectors, header, 2nd skid-mounted blower/flare and sulfur treatment system.	All work completed related to the Original Disruption Permit is completed. Modified Disruption Permit and new EIPT was issued on December 23, 2019. Construction commenced on January 15, 2020. All horizontal collectors, sulfur treatment system and 2nd temporary flare have been installed and are operational.	None	None	Required: Ongoing Actual: Complete
2	All odorous waste shall be loaded directly onto trucks and delivered to working face (at least 2x per day). Non-odorous waste may be placed on grade.	Condition has been complied with.	None	None; excavation and waste relocation activities are complete	Required: Ongoing during construction Actual: Complete
3	Immediate placement of 6 inches of soil over odorous waste at working face; non-odorous waste covered at end of work day, no boring or trench left open overnight	Condition has been complied with.	None	None; excavation and waste relocation activities are complete	Required: Ongoing during construction Actual: Complete
4	Dust Control measures shall be implemented.	Dust control measures have been implemented during construction activities.	None	None; disruption activities are complete	Required: Ongoing during construction Actual: Complete
5	Noise control measures shall be implemented.	Noise control measures have been implemented.	None	None; disruption activities are complete	Required: Ongoing during construction Actual: Complete
6	Comply with air emission standards during disruption activities. Comply with GCCS Construction Odor Control Plan.	Condition has been complied with.	None	None; excavation activities are complete	Required: Ongoing during construction Actual: Complete
7	Vectors shall be controlled by application of cover soil.	No vectors have been observed. Cover soil is applied.	None	None; excavation activities are complete	Required: Ongoing during construction Actual: Complete
8	Adequate water supply and adequate fire-fighting equipment shall be maintained at the facility.	Adequate water supply and fire-fighting equipment is readily available as appropriate.	None	None; field activities are complete	Required: Ongoing during construction Actual: Complete
9	Cease operations and contact Department should hazardous materials be encountered	No hazardous materials have been encountered during disruption activities.	None	None; excavation activities are complete	Required: Ongoing during construction Actual: Complete
10	Follow OSHA standards and HASP; perform on-site air monitoring	OSHA standards have been observed.	None	None; field activities are complete	Required: Ongoing during construction Actual: Complete
11	Allow Department Inspectors to enter and inspect the facility	Department Inspectors are allowed to enter and inspect the facility	None	None; disruption permit activites are complete	Required: Ongoing Actual: Complete

May 2020 Progress Report Summary
Keegan Landfill (Disruption Permit-13317 and Modified Disruption Permit)

No.	Permit Condition Description	B. Status of permitting, planning approvals and work progress	C. Difficulties Encountered	D. Activities Planned for next reporting period	E. Required and Actual Completion date
12	Notify Department 72-hours prior to initiation of disruption activities.	Department was notified on January 10, 2020 that construction activities would commence on January 15, 2020.	None	None; activity is complete	Required: 72-hours prior to start Actual: 1/10/2020
13	Install and operate GCCS by September 17, 2019 for the western portion under the Original Disruption Permit and within 60 days of the Modified Disruption Permit for the eastern portion.	Installation complete of work in Original Disruption Permit as described above in Item 1, operation of the GCCS commenced on September 5, 2019. All horizontal collectors, sulfur treatment system and 2nd temporary flare have been installed and are operational.	None.	Continue with operation of GCCS and treatment system as required by Paragraph 31 of the Compliance Schedule in the Administrative Consent Order (ACO), NEA19002-13317.	Required: West Side 9/17/2019; East Side 2/23/2020 (revised 3/22/2020) Actual: West Side Operation commenced 9/5/2019: East side, flare and sulfur treatment commenced 3/16/2020
14	Submit Monthly Progress Reports	This report satisfies this requirement for May 2020.	None	None, this report will serve as the final report as all Permit Conditions and activities have been satisfied and/or completed	Required: First of Month Actual: Final Report May 29, 2020
15	Submit a report of Construction Activities at completion of construction	Construction activities report submitted on May 28, 2020	None	None	Required: 30 days after completion Actual: Initial construction CQA Report 2/27/2020; Expansion CQA Report 5/28/2020
16	Certify Progress Reports by NJ licensed professional engineer	This report is certified by a NJPE	None	None; this is the final report	Required: Monthly Actual: Complete
20	Apply Neutraline or equivalent during disruption activities; data sheet shall be provided prior to use	Condition has been complied with.	None	None; activity is complete	Required: Ongoing during construction Actual: Complete
21	Through completion of EIPT, perform SEM for methane and H2S on a monthly basis along slopes and plateau area	Revised EIPT expires on 5/14/2020; SEM data for May 2020 is included in Attachment 3	None	None; activity is complete	Required: Monthly, through May 2020 Actual: Completed May 14, 2020
22	Within 90 days from issuance of Modified Disruption Permit, submit an application for construction and operation of a GCCS for entire landfill	Modified Disruption Permit was issued on December 23 and new EIPT was issued on December 23. Permit application submitted for permanent flare on December 17, 2019. Response to DEP comments submitted on 2/6/2020 and 5/14/2020	None	None; activity is complete	Required: 3/22/2020 Actual: Permit Application Submitted 12/17/19.

Note: Conditions 17, 18 and 19 are general conditions.

Attachment 3

May 26, 2020
File No. 02219702.00

Mr. Tom Marturano
New Jersey Sports and Exposition Authority
One DeKorte Park Plaza
Lyndhurst, New Jersey 07071

SUBJECT: May Surface Emissions Monitoring
Keegan Landfill

Dear Mr. Marturano:

SCS Engineers performed surface emissions monitoring (SEM) on the Keegan Landfill (Landfill) on May 14, 2020. Condition 21 of the Modified Sanitary Landfill Major Disruption Approval (Disruption Approval), issued on December 23, 2019, requires SEM for methane and hydrogen sulfide (H_2S) to be performed along the slopes and plateau area of the Landfill on a monthly basis upon completion of the construction of the landfill gas (LFG) collection and control system (GCCS) and through completion of the Environmental Improvement Pilot Test (EIPT).

The EIPT expired on May 14, 2020, therefore the May event is the final monthly SEM performed under the Disruption Approval. As required by Paragraph 31 of the Compliance Schedule in the Administrative Consent Order (ACO), NEA19002-13317, executed on March 9, 2020 (2020 ACO), the GCCS will continue to operate until the final air permit is issued by the Department.

This report presents the data of the May SEM event and includes a comparison of the May SEM event data to the April SEM event data. This 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 accepted primarily construction and demolition (C&D) waste. The Landfill is a single mound-type landfill, constructed atop a historical municipal solid waste (MSW) dump site. The Landfill began receiving C&D waste in 2009 and permanently ceased waste acceptance in June 2019. The entire Landfill footprint is surrounded by a bentonite-slurry cutoff wall, which includes a leachate collection system. Collected leachate is pretreated for H_2S 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 Landfill to the west, but then transitions to residential properties.

Prior SEM reports recommended improvements to daily and intermediate cover procedures, and installation of an active GCCS to address measured surface emissions of methane and H_2S. GCCS installation occurred between July and September 2019, and GCCS startup commenced on September 5, 2019. An expansion of the GCCS commenced in January 2020 and a second flare commenced operation on February 3, 2020. SEM was performed in September, October, November, December 2019, January, February, March, and April 2020 during GCCS operations.

MONITORING METHODOLOGY AND EQUIPMENT

Methodology

While the Landfill is not subject to the SEM requirements of 40 CFR 60: New Source Performance Standards (NSPS), Subpart WWW - Municipal Solid Waste (MSW) Landfills, methane SEM 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 SEM route consisting of a serpentine path over the entire Landfill, with monitoring points at 30-meter intervals (see SEM plan in **Attachment 1**). H_2S monitoring was performed at generally the same locations as the methane SEM, and in general accordance with 40 CFR 60.755 (c) and (d), and 40 CFR 60, Appendix A, except that a monitoring device specifically designed for H_2S detection (i.e., Jerome Model J605) was used.

SEM was conducted at all monitoring points with the tip of the instrument probe about five to ten centimeters (i.e., two to four inches) above the Landfill surface. The SEM events were conducted on days with typical meteorological conditions as defined in CFR 60.755(c)(3). Typical meteorological conditions exclude periods within 24 hours following a rain event greater than 0.25 inches total (per 24-hour period).

Basic meteorological conditions, including temperature, wind speed, rainfall, weather conditions and barometric pressure, were recorded at the start of the monitoring day and recorded on Calibration and Pertinent Data Forms, included in **Attachment 2**. Additional hourly weather data and rainfall conditions from Newark Airport are included in **Attachment 3.**

Monitoring Equipment and Calibration

SEM for methane was conducted using a Thermo-Scientific model TVA 1000 portable flame ionization detector (FID). Equipment type, serial number and pertinent equipment information are recorded on Calibration and Pertinent Data Forms for the FID (see **Attachment 2)**.

A Jerome Model 605 meter (H_2S meter) was utilized for monitoring H_2S. A Jerome Model J605 meter was used for H_2S monitoring in the November, December, January, March, and April SEM events and the 631 was used for the February 2020 and earlier 2019 events. The Jerome Model 631X has an upper detection limit of 50 ppm, while the Jerome Model J605 has an upper detection limit of 10 ppm. The equipment type, serial number and certification of calibration for the Jerome meter is provided in **Attachment 2**.

Wind speed and direction during surface emissions monitoring were measured at eight ambient air H_2S detection and anemometer stations positioned around the Landfill. This data is provided on a daily basis to NJSEA and NJDEP, and is not reproduced in this report.

Calibration

Prior to commencement of the SEM event, the FID was calibrated in accordance with the manufacturer's recommended procedures, 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 procedures for calibration precision and instrument response time checks (see further detail below) were performed prior to the SEM. A post-monitoring calibration precision check was also performed on the FID at the end of each day of the SEM event.

The gold film sensor of the H_2S meter is inherently stable and does not require frequent field calibration. The H_2S meter is factory-calibrated using laboratory equipment, including NIST traceable permeation tubes. In order to calibrate the H_2S meter, 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, which is included in factory calibration. The factory-calibration certificate for the H_2S meter is included in Attachment 2.

Calibration Precision Checks

After the initial calibration of the FID instrument each day, instrument precision was checked by running zero methane calibration gas through the instrument and then switching to the 500 ppm methane calibration gas and recording the reading. Calibration precision checks were 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 with corresponding requirements. Results of FID calibration precision checks are recorded on Calibration and Pertinent Data Forms, included in Attachment 2.

In accordance with the manufacturer's recommendations, the H_2S meter was regenerated and zero-adjusted prior to the start of each day of the SEM event and as needed during monitoring.

Instrument Response Time Checks

After the initial calibration of the FID instrument, instrument response time was checked by connecting the FID to the zero methane calibration gas and quickly switching to the 500 ppm calibration gas, and recording the time between switching gases until the instrument reads 90 percent of the calibration gas concentration. 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 average 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 with corresponding requirements. Results of instrument response checks are recorded on Calibration and Pertinent Data Forms, included in Attachment 2.

The H_2S meter was operated with a sampling time of 12 to 53 seconds. This is the manufacturer's recommended operating mode for samples with concentrations ranging between 0.003 and 10 ppm H_2S (full range) for an accuracy of +/- 0.003 ppm at 0.050 ppm.

MONITORING RESULTS

The May 2020 SEM data is provided in **Attachment 4**. A total of 257 points were monitored along the pathway identified on the drawing in **Attachment 1**. Portions of the Landfill surface were not monitored due to heavy equipment operation and dangerous conditions. The H_2S SEM began at approximately 08:30 and concluded at approximately 15:45 on May 14. The methane SEM commenced on May 14 at approximately 09:30 and concluded at approximately 14:00.

On May 14, winds were variable, ranging from 3 to 12 mph, with wind direction shifting from the south-southeast to the east.

We considered 100 ppm as the methane concentration threshold for further consideration regarding surface emissions. Surface methane concentrations greater than 100 ppm were detected at one (1) location (see blue-highlighted monitoring locations on Drawing 1 in **Attachment 5**). There were no readings above 500 ppm during this monitoring event (see green-highlighted monitoring locations on Drawing 1 in **Attachment 5**). The methane concentrations, by route, are summarized in Table 1 below.

We selected 30 ppb as the threshold for further consideration regarding H_2S surface emissions. H_2S concentrations greater than 30 ppb were detected at 4 locations. Of these, 2 locations had H_2S concentrations greater than 100 ppb. Orange-highlighted stations on the Drawing 6 in **Attachment 5** indicate those locations with H_2S concentrations less than 100 ppb but greater than 30 ppb, and red-highlighted stations are those locations with H_2S concentrations greater than 100 ppb. The H_2S concentrations, by route, are summarized in Table 1 below.

Table 1. May 2020 SEM Event Data Summary.

Measured Parameter	Route 1	Route 2
Average H_2S reading (ppm)	0.001	0.011
Average CH_4 reading (ppm)	2.2	5.0
# H_2S readings >0.030 ppm	0	2
# H_2S readings >0.100 ppm	0	1
% H_2S readings > 0.030 ppm	0%	2%
% H_2S readings >0.100 ppm	0%	1%
# CH_4 readings >100 ppm	0	0
# CH_4 readings >500 ppm	0	0
% CH_4 readings >100 ppm	0%	0%
% CH_4 readings >500 ppm	0%	0%

FINDINGS AND CONCLUSIONS

There was no consistent, significant correlation between surface methane concentrations greater than 100 ppm and surface H_2S concentrations greater than 30 ppb at discrete points in previous monthly events.

However, during this event and similar to the April event, concentrations measured on the western side of the landfill, where the collection system has been in operation for a longer period of time and significant quantities of soil materials have been placed, are lower than the eastern side. On the eastern side, elevated readings of H_2S were measured in the vicinity of EW19-01 and EW19-19.

Table 2 below compares the SEM data for Route 1 from April and May 2020. Additionally, a comparison of the April to May methane and H_2S concentrations are depicted in Drawings 3 and 4 in Attachment 6. There were no elevated H_2S or methane readings in May. The continued lack of elevated readings is likely due to the significant placement of soil cover on the western portion of the Landfill.

Table 2. Route 1 SEM Event Data Comparison.

Measured Parameter	April	May
# H_2S readings >0.030 ppm	0	0
# H_2S readings >0.100 ppm	0	0
% H_2S readings > 0.030 ppm	0%	0%
% H_2S readings >0.100 ppm	0%	0%
# CH_4 readings >100 ppm	0	0
# CH_4 readings >500 ppm	0	0
% CH_4 readings >100 ppm	0%	0%
% CH_4 readings >500 ppm	0%	0%

Table 3 below compares the SEM data from Route 2 in April and May 2020. The percentage of elevated H_2S and methane readings decreased slightly from April and May. The second flare and all collectors of the expanded GCCS were operational during the May 2020 SEM event and likely have an effect on the reduction in methane and H_2S readings from previous months' SEM events.

Table 3. Route 2 SEM Event Data Comparison

Measured Parameter	April	May
# H_2S readings >0.030 ppm	4	2
# H_2S readings >0.100 ppm	2	1
% H_2S readings > 0.030 ppm	4%	2%
% H_2S readings >0.100 ppm	2%	1%
# CH_4 readings >100 ppm	1	0
# CH_4 readings >500 ppm	0	0

Measured Parameter	April	May
% CH_4 readings >100 ppm	1%	0%
% CH_4 readings >500 ppm	0%	0%

RECOMMENDATIONS

The operation of the GCCS, beginning on September 5, 2019, resulted in a significant reduction in surface emissions in the areas of the Landfill influenced by the GCCS. With the operation of the second interim flare and the GCCS expansion, we have seen another reduction in the surface emissions in the areas of the Landfill influenced by the GCCS. We recommend the collection system continue to be operated and adjusted to maximize collection efficiency, minimize odors and minimize air intrusion into the system. We also recommend placement of additional cover soil in the vicinity of EW19-01 and EW19-19 to address potential emissions from these areas.

Please call to discuss any questions.

Sincerely,

Stephen Ritman
Staff Engineer
SCS Engineers

Lisa K. Wilkinson, PE
Project Director I
SCS Engineers

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

Attachment 1

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:

1. FEATURES DEPICTED BASED ON DRAWING ENTITLED 'EXISTING TOPOGRAPHY, KEEGAN LANDFILL' DATE OF AERIAL FLIGHT IS 03-18-19, PREPARED BY KUCERA INTERNATIONAL INC., DATED 3-18-19. (FILENAME: KEEGAN 2019.DWG)
2. 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.
3. COORDINATE AND ELEVATION DATA FOR MONITORING WELLS WERE PROVIDED BY NJSEA.

100 50 0 100 200
SCALE: 1"=100'

NO.	REVISION	DATE
A	ISSUED FOR CLIENT REVIEW	3/15/2019
B	ADD PATH 2	4/3/2019
C	SEM PATH 1 & 2 REVISED	9/23/2019
D	SEM PATH 1, 2, TOPO REVISED	10/17/2019
E	DCCS UPDATED	1/31/2020

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

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS, P.C.
4 CENTURY DRIVE SUITE 150 PARSIPPANY, NJ 07054
PH: (845) 357-1510 FAX: (845) 357-1049

PROJ. NO. 02219702.00 | DSN. BY: LKW | DWN. BY: SHY | CHK. BY: LKW | Q/A RVW BY: LKW | APP. BY: LKW

CADD FILE: MONITORING SP

DATE: 3/15/2019

SCALE: AS SHOWN

DRAWING NO. **1** of **1**

Attachment 2

INSTRUMENT CALIBRATION REPORT

Pine Environmental Services, LLC.

SCS Field Services (PA)

Instrument ID 34945693
Description Thermo TVA-1000
Calibrated 2/12/2020

Frequency 6 Months
Status Passed
Temp 74
Humidity 28

Manufacturer Thermofisher
Model Number TVA-1000
Serial Number 34945693
Location Harrisburg, PA
Customer Name Doug Cordisco

Calibration Specifications

Group # 1
Group Name PID
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
100.00 / 100.00	ppm	100.00	ppm	98.90	98.90	-1.10%	Pass

Group # 2
Group Name FID
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
100.00 / 100.00	ppm	100.00	ppm	101.00	101.00	1.00%	Pass

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

Test Instrument ID	Description	Manufacturer	Model Number	Serial Number / Lot Number	Last Cal Date	Next Cal Date / Expiration Date
NJ ISOBUTYLENE 03/23	ISOBUTYLENE 100PPM	Calgas	100 PPM	DBJ-248-100-12		3/12/2023
NJ-METHANE EBJ-150A-100-2	100 ppm Methane/ Air	GASCO	100 ppm Methane/ Air	EBJ-150A-100-2		4/3/2023

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Timothee Kouassi

Pine Environmental Services, LLC. hereby certifies that this instrument is calibrated and functions to meet the manufacturer's specifications using NIST traceable standards, or is derived from accepted values of physical constants.

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 # 2706696

This is to certify that the Jerome **J605-0001** Gold Film Hydrogen Sulfide Analyzer, Serial Number **60500522**, with Sensor Number **19-7-24-S2CS**, was calibrated with standard units traceable to NIST.

Calibration Status as Received: **New**

		Actual		Calibration Gas		Allowable Range		
Incoming:	Range 1		ppm H2S		ppm H2S	-		ppm H2S
Outgoing:	Range 1	0.494	ppm H2S	0.500	ppm H2S	0.475	- 0.525	ppm H2S
	RSD %	1.43				<3%		

Calibration Status as Left: **New**

Estimated Uncertainty of Calibration System: 2.4%

Calibration Date: 13-Feb-2020 Recalibration Date: 12-Feb-2021

Temperature °F: 70.30 % Relative Humidity: 28.40

Approved By: Jackie Kreitlow Date Approved: 13-Feb-2020
Title: Jackie Kreitlow - Quality Control

Equipment Used:

H2S Calibration Standard: CC-75664 **NIST#:** 1467976
Calibration Date: 25-Sep-2018 **Calibration Date Due:** 25-Sep-2021

Mass Flow Controller B: 124604 **NIST#:** 256148
Calibration Date: 13-Jan-2020 **Calibration Date Due:** 13-Jan-2021

Mass Flow Controller D: 124602 **NIST#:** 256155
Calibration Date: 13-Jan-2020 **Calibration Date Due:** 13-Jan-2021

Digital Multimeter: 74620534 **NIST#:** 7003135
Calibration Date: 16-Feb-2019 **Calibration Date Due:** 16-Feb-2020

Flowmeter: US04H25956 **NIST#:** 1813; 1817; 1796
Calibration Date: 12-Aug-2019 **Calibration Date Due:** 12-Aug-2020

Calibration Procedure Used: 730-0099

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.

SCS FIELD SERVICES

NSPS Surface Emissions Monitoring
Calibration and Pertinent Data Form

Date: 05/14/20 Site: Keegan Job Number: 02219702.00

Technician(s): Doug Cordisco

Weather Observations

Wind Speed: 3 MPH Wind Direction: NE Barometric Pressure: 30.32 "Hg

Air Temperature: 56 °F General Weather Conditions: Partly Cloudy

Calibration Information

Instrument Info Make/Model: TVA 1000 Serial No: 34945693

Cal Gas Info	Manufacturer	Lot #	Expiration Date	Concentration
Span Gas:	Pine Environmental	3J-X02AI99CP104282	11/21/2023	500 ppm
Zero Gas:	QED Landtec	4828301	10/1/2021	0 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	0.4	501	1
2	0.2	500	0
3	0.2	500	0
		Average Difference:	0

Calibration Precision = Average Difference / Cal. Gas Conc. X 100%

= 0 / 500 X 100%

= 0.07 %

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	501	451	11
2	500	450	10
3	~~500~~	450	8
		Average Response Time:	10

Background Concentration Checks

Upwind Location Description: NE of site on perimeter road Reading: 2.35 ppm

Downwind Location Description: SW of site on perimeter road Reading: 2.74 ppm

Average Background Reading: 2.55 ppm

Post-monitoring Calibration Precision Check

Zero Air Reading: 0.5 ppm Cal Gas Reading: 504 ppm

Notes/Comments:

Attachment 3

Search Locations Log in | Log...

Popular Cities (weather/us/ca/san-francisco/37.78,-122.42) (weather/us/ny/manhattan/40.75,-74.00) (weather/us/il/schiller-park/41.95,-87.88) (weather/us/ma/boston/42.36,-71.07) (weather/us/tx/houstc

40.69 °N, **74.18** °W

Newark, NJ Weather History

69° NEWARK LIBERTY INTERNATIONAL AIRPORT STATION (/WEATHER/US/NJ/NEWARK/KEWR?CM_VEN=LOCALWX_PWSDASH) | CHANGE

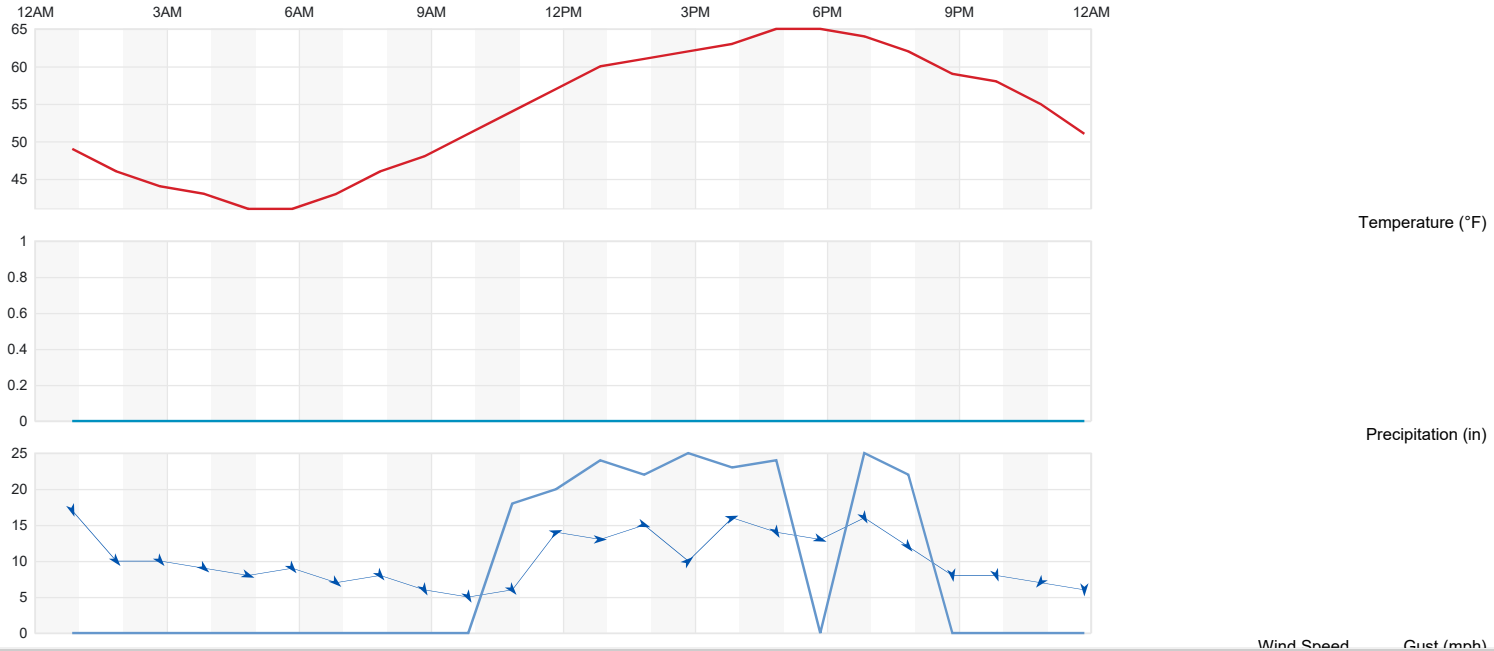
HISTORY (/HISTORY/DAILY/US/NJ/NEWARK/KEWR)

- TODAY (/WEATHER/US/NJ/NEWARK/KEWR)
- HOURLY (/HOURLY/US/NJ/NEWARK/KEWR)
- 10-DAY (/FORECAST/US/NJ/NEWARK/KEWR)
- CALENDAR (/CALENDAR/US/NJ/NEWARK/KEWR)
- HISTORY (/HISTORY/DAILY/US/NJ/NEWARK/KEWR)
- WUNDERMAP (/WUNDERMAP?LAT=40.69&LON=-74.18)

Daily Weekly

(/history/daily/us/nj/newark/KEWR/date/2020-5-13) 5-13) (/history/monthly/us/nj/newark/KEWR/date/2020-5)

May 13 2020 View



Summary

Temperature (° F)	Actual	Historic Avg.	Record
High Temp	65	71	92
Low Temp	41	52	37
Day Average Temp	53.67	62	-
Precipitation (Inches)	Actual	Historic Avg.	Record
Precipitation (past 24 hours from 04:51:00)	0.00	0.12	-
Dew Point (° F)	Actual	Historic Avg.	Record
Dew Point	23.04	-	-
High	29	-	-
Low	19	-	-
Average	23.04	-	-
Wind (MPH)	Actual	Historic Avg.	Record
Max Wind Speed	17	-	-
Visibility	10	-	-
Sea Level Pressure (Hg)	Actual	Historic Avg.	Record
Sea Level Pressure	30.31	-	-
Astronomy	Day Length	Rise	Set
Actual Time	14h 23m	5:42 AM	8:06 PM
Civil Twilight		5:11 AM	8:37 PM
Nautical Twilight		4:33 AM	9:15 PM
Astronomical Twilight		3:50 AM	9:58 PM
Moon: waning gibbous		1:34 AM	11:18 AM

Daily Observations

No Rainfall

12:51 AM	49 °F	26 °F	41 %	NNW	17 mph	0 mph	30.18 in	0.0 in	Fair
1:51 AM	46 °F	27 °F	47 %	NW	10 mph	0 mph	30.20 in	0.0 in	Fair
2:51 AM	44 °F	25 °F	47 %	NW	10 mph	0 mph	30.20 in	0.0 in	Fair
3:51 AM	43 °F	24 °F	47 %	NW	9 mph	0 mph	30.22 in	0.0 in	Fair
4:51 AM	41 °F	24 °F	51 %	WNW	8 mph	0 mph	30.24 in	0.0 in	Fair
5:51 AM	41 °F	24 °F	51 %	NW	9 mph	0 mph	30.26 in	0.0 in	Fair
6:51 AM	43 °F	24 °F	47 %	NW	7 mph	0 mph	30.29 in	0.0 in	Fair
7:51 AM	46 °F	24 °F	42 %	NW	8 mph	0 mph	30.30 in	0.0 in	Fair
8:51 AM	48 °F	22 °F	36 %	NNW	6 mph	0 mph	30.31 in	0.0 in	Fair
9:51 AM	51 °F	21 °F	31 %	NNW	5 mph	0 mph	30.30 in	0.0 in	Fair
10:51 AM	54 °F	23 °F	30 %	NW	6 mph	18 mph	30.30 in	0.0 in	Fair
11:51 AM	57 °F	22 °F	26 %	WSW	14 mph	20 mph	30.29 in	0.0 in	Fair
12:51 PM	60 °F	24 °F	25 %	W	13 mph	24 mph	30.26 in	0.0 in	Fair
1:51 PM	61 °F	23 °F	23 %	WNW	15 mph	22 mph	30.24 in	0.0 in	Fair
2:51 PM	62 °F	25 °F	24 %	SW	10 mph	25 mph	30.22 in	0.0 in	Fair
3:51 PM	63 °F	24 °F	23 %	WSW	16 mph	23 mph	30.20 in	0.0 in	Fair
4:51 PM	65 °F	20 °F	18 %	NNW	14 mph	24 mph	30.19 in	0.0 in	Fair
5:51 PM	65 °F	19 °F	17 %	WNW	13 mph	0 mph	30.20 in	0.0 in	Fair
6:51 PM	64 °F	20 °F	18 %	NNW	16 mph	25 mph	30.20 in	0.0 in	Fair
7:51 PM	62 °F	19 °F	19 %	NW	12 mph	22 mph	30.22 in	0.0 in	Fair
8:51 PM	59 °F	20 °F	22 %	N	8 mph	0 mph	30.24 in	0.0 in	Fair
9:51 PM	58 °F	21 °F	24 %	NNW	8 mph	0 mph	30.26 in	0.0 in	Fair
10:51 PM	55 °F	29 °F	37 %	NE	7 mph	0 mph	30.27 in	0.0 in	Fair
11:51 PM	51 °F	23 °F	33 %	N	6 mph	0 mph	30.28 in	0.0 in	Fair

Search Locations Log in (Beg...

Popular Cities (weather/us/ca/san-francisco/37.78,-122.42) (weather/us/ny/manhattan/40.75,-74.00) (weather/us/il/schiller-park/41.95,-87.88) (weather/us/ma/boston/42.36,-71.07) (weather/us/tx/houstc

40.69 °N, **74.18** °W

Newark, NJ Weather History

69° NEWARK LIBERTY INTERNATIONAL AIRPORT STATION (/WEATHER/US/NJ/NEWARK/KEWR?CM_VEN=LOCALWX_PWSDASH) | CHANGE

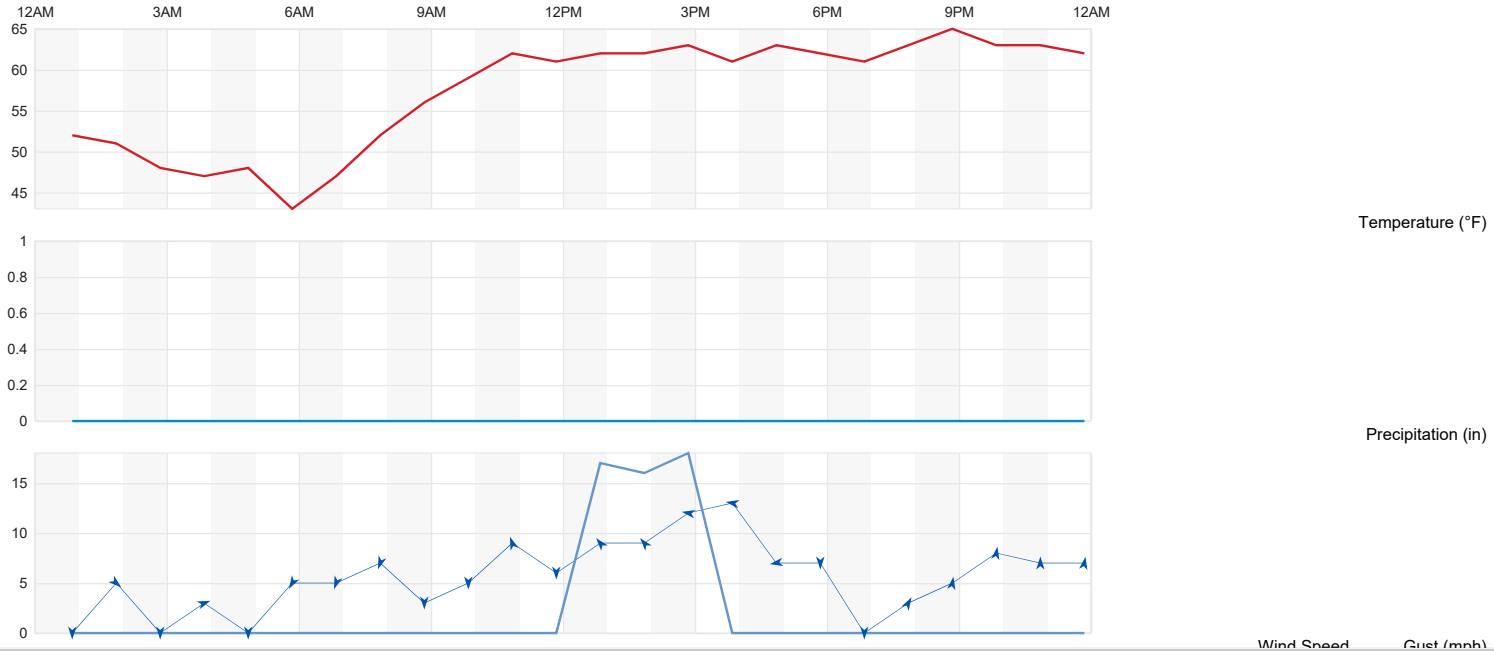
HISTORY (/HISTORY/DAILY/US/NJ/NEWARK/KEWR)

- TODAY (/WEATHER/US/NJ/NEWARK/KEWR)
- HOURLY (/HOURLY/US/NJ/NEWARK/KEWR)
- 10-DAY (/FORECAST/US/NJ/NEWARK/KEWR)
- CALENDAR (/CALENDAR/US/NJ/NEWARK/KEWR)
- HISTORY (/HISTORY/DAILY/US/NJ/NEWARK/KEWR)
- WUNDERMAP (/WUNDERMAP?LAT=40.69&LON=-74.18)

Daily Weekly

(/history/daily/us/nj/newark/KEWR/date/2020-5-14) 5-14) (/history/monthly/us/nj/newark/KEWR/date/2020-5)

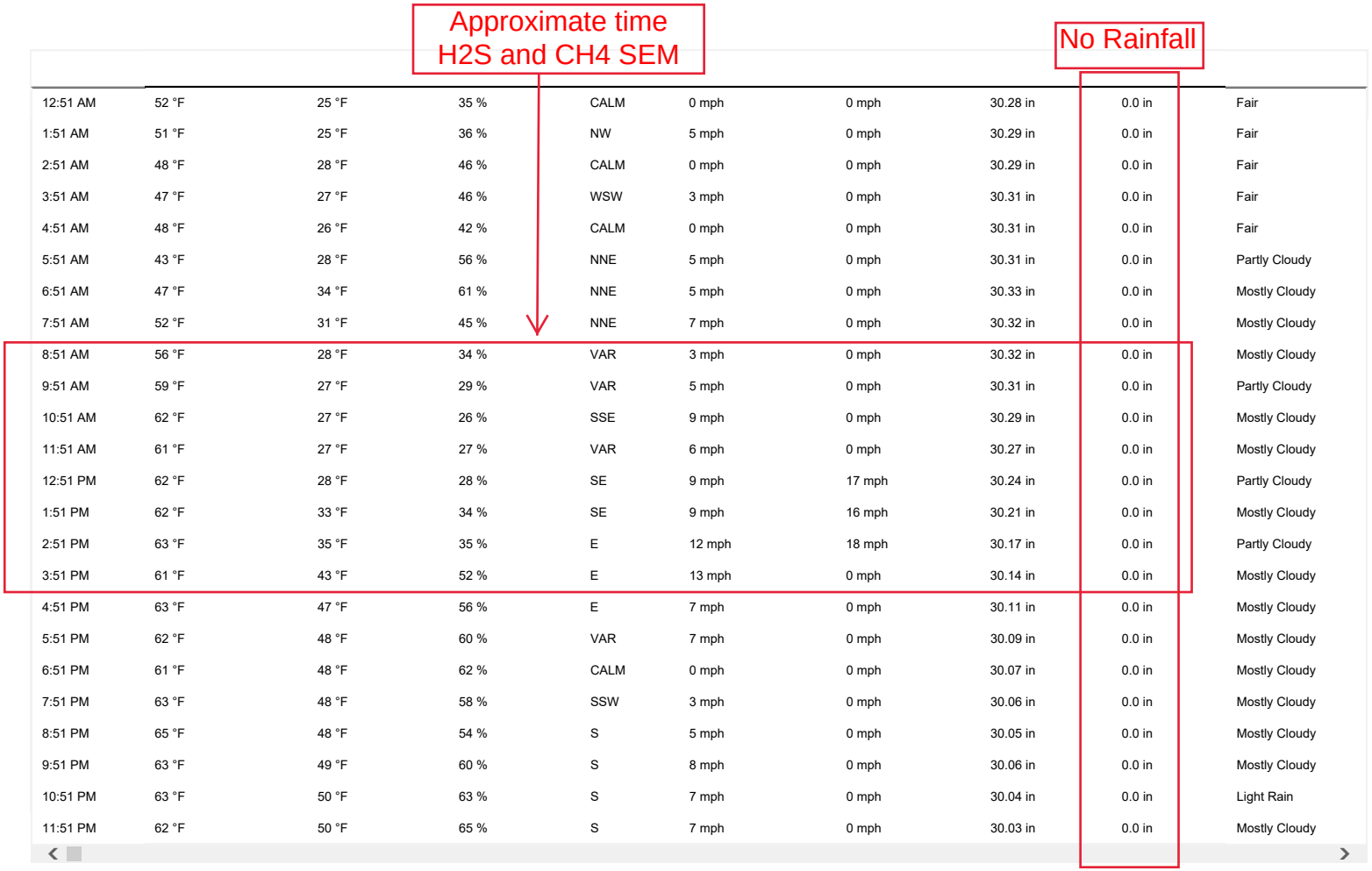
May 14 2020 View



Summary

Temperature (° F)	Actual	Historic Avg.	Record
High Temp	65	72	91
Low Temp	43	53	36
Day Average Temp	57.33	62	-
Precipitation (Inches)	Actual	Historic Avg.	Record
Precipitation (past 24 hours from 04:51:00)	0.00	0.12	-
Dew Point (° F)	Actual	Historic Avg.	Record
Dew Point	35.83	-	-
High	50	-	-
Low	25	-	-
Average	35.83	-	-
Wind (MPH)	Actual	Historic Avg.	Record
Max Wind Speed	13	-	-
Visibility	10	-	-
Sea Level Pressure (Hg)	Actual	Historic Avg.	Record
Sea Level Pressure	30.33	-	-
Astronomy	Day Length	Rise	Set
Actual Time	14h 25m	5:41 AM	8:07 PM
Civil Twilight		5:10 AM	8:38 PM
Nautical Twilight		4:32 AM	9:16 PM
Astronomical Twilight		3:49 AM	9:59 PM
Moon: waning gibbous		2:10 AM	12:19 PM

Daily Observations



12:51 AM	52 °F	25 °F	35 %	CALM	0 mph	0 mph	30.28 in	0.0 in	Fair
1:51 AM	51 °F	25 °F	36 %	NW	5 mph	0 mph	30.29 in	0.0 in	Fair
2:51 AM	48 °F	28 °F	46 %	CALM	0 mph	0 mph	30.29 in	0.0 in	Fair
3:51 AM	47 °F	27 °F	46 %	WSW	3 mph	0 mph	30.31 in	0.0 in	Fair
4:51 AM	48 °F	26 °F	42 %	CALM	0 mph	0 mph	30.31 in	0.0 in	Fair
5:51 AM	43 °F	28 °F	56 %	NNE	5 mph	0 mph	30.31 in	0.0 in	Partly Cloudy
6:51 AM	47 °F	34 °F	61 %	NNE	5 mph	0 mph	30.33 in	0.0 in	Mostly Cloudy
7:51 AM	52 °F	31 °F	45 %	NNE	7 mph	0 mph	30.32 in	0.0 in	Mostly Cloudy
8:51 AM	56 °F	28 °F	34 %	VAR	3 mph	0 mph	30.32 in	0.0 in	Mostly Cloudy
9:51 AM	59 °F	27 °F	29 %	VAR	5 mph	0 mph	30.31 in	0.0 in	Partly Cloudy
10:51 AM	62 °F	27 °F	26 %	SSE	9 mph	0 mph	30.29 in	0.0 in	Mostly Cloudy
11:51 AM	61 °F	27 °F	27 %	VAR	6 mph	0 mph	30.27 in	0.0 in	Mostly Cloudy
12:51 PM	62 °F	28 °F	28 %	SE	9 mph	17 mph	30.24 in	0.0 in	Partly Cloudy
1:51 PM	62 °F	33 °F	34 %	SE	9 mph	16 mph	30.21 in	0.0 in	Mostly Cloudy
2:51 PM	63 °F	35 °F	35 %	E	12 mph	18 mph	30.17 in	0.0 in	Partly Cloudy
3:51 PM	61 °F	43 °F	52 %	E	13 mph	0 mph	30.14 in	0.0 in	Mostly Cloudy
4:51 PM	63 °F	47 °F	56 %	E	7 mph	0 mph	30.11 in	0.0 in	Mostly Cloudy
5:51 PM	62 °F	48 °F	60 %	VAR	7 mph	0 mph	30.09 in	0.0 in	Mostly Cloudy
6:51 PM	61 °F	48 °F	62 %	CALM	0 mph	0 mph	30.07 in	0.0 in	Mostly Cloudy
7:51 PM	63 °F	48 °F	58 %	SSW	3 mph	0 mph	30.06 in	0.0 in	Mostly Cloudy
8:51 PM	65 °F	48 °F	54 %	S	5 mph	0 mph	30.05 in	0.0 in	Mostly Cloudy
9:51 PM	63 °F	49 °F	60 %	S	8 mph	0 mph	30.06 in	0.0 in	Mostly Cloudy
10:51 PM	63 °F	50 °F	63 %	S	7 mph	0 mph	30.04 in	0.0 in	Light Rain
11:51 PM	62 °F	50 °F	65 %	S	7 mph	0 mph	30.03 in	0.0 in	Mostly Cloudy

Attachment 4

Surface Emission Monitoring Results
May 14, 2020 Event-Route 1
Keegan Landfill

Monitoring Location (x100')	H2S MEASUREMENT TIME	H2S Concentration (ppm) [1]	CH4 MEASUREMENT TIME	CH4 Concentration (ppm) [2]	Comments
0	8:33:57	0	9:28:50	3.89	
1	8:35:50	0	9:30:28	2.14	
2	8:37:14	0	9:31:07	2.54	
3	8:38:42	0	9:31:30	2.54	
4	8:39:58	0	9:31:53	2.24	
5	8:41:15	0	9:32:18	3.39	
6	8:42:41	0.00303	9:33:12	1.99	
7	8:43:56	0	9:33:32	2.08	
8	8:45:10	0.00346	9:34:11	2.1	
9	8:46:28	0.00327	9:34:41	2.23	
10	8:47:42	0.00348	9:35:12	2.17	
11	8:49:07	0.00394	9:35:39	2.17	
12	8:50:36	0.00361	9:36:07	3.6	
13	8:52:11	0.00348	9:45:30	2.02	
14	8:53:43	0.0033	9:46:23	2.08	
15	8:55:15	0.00365	9:46:48	2.06	
16	8:56:36	0.00393	9:47:18	1.95	
17	8:57:59	0.00339	9:47:56	2.15	
18	8:59:35	0.00376	9:48:27	3.13	
19	9:01:01	0.00375	9:49:00	3.15	
20	9:02:22	0.00363	9:49:30	3.2	
21	9:04:07	0.0038	9:50:30	2.33	
22	9:05:33	0.00372	9:50:58	2.36	
23	9:06:52	0.00382	9:51:40	2.12	
24	9:08:14	0.00383	9:51:58	2.93	
25	9:09:29	0.00373	9:52:35	2.57	
26	9:11:03	0.0037	9:53:01	3.03	
27	9:12:16	0.00374	9:53:26	2.17	
28	9:13:34	0.00375	9:53:53	1.91	
29	9:15:08	0.00393	9:54:16	2.05	
30	9:16:43	0.00348	9:54:32	2.12	
31	9:18:16	0.00382	9:54:54	1.96	
32	9:19:49	0.00372	9:55:06	2.05	
33	9:21:32	0.00383	9:55:34	1.97	
34	9:22:52	0.0037	9:55:48	2.08	
35	9:24:12	0.00365	9:56:12	2.12	
36	9:25:33	0.0035	9:56:34	2.27	
37	9:26:54	0.00361	9:57:07	2.61	
38	9:28:25	0.00365	9:57:33	2.88	
39	9:29:44	0.00359	9:57:49	2.34	
40	9:31:05	0.0034	9:58:06	3.75	
41	9:32:49	0.00305	9:58:33	6.61	
42	9:34:20	0.00317	9:59:03	5.06	
43	9:35:40	0.00404	9:59:49	4.79	
44	9:37:00	0.00346	10:00:42	11.2	
45	9:38:20	0	10:01:05	9.14	
46	9:40:56	0.00333	10:01:31	1.93	
47	9:42:34	0.00317	10:01:49	1.87	
48	9:44:15	0	10:02:13	1.85	
49	9:45:44	0	10:02:27	1.85	
50	9:47:41	0	10:02:42	1.81	
51	9:49:23	0	10:04:01	1.88	
52	9:50:47	0	10:04:45	2.02	
53	9:52:13	0	10:05:03	1.94	
54	9:53:40	0	10:05:18	1.93	

Surface Emission Monitoring Results
May 14, 2020 Event-Route 1
Keegan Landfill

Monitoring Location (x100')	H2S MEASUREMENT TIME	H2S Concentration (ppm) [1]	CH4 MEASUREMENT TIME	CH4 Concentration (ppm) [2]	Comments
55	9:55:07	0	10:05:40	1.94	
56	9:56:29	0	10:06:35	1.96	
57	9:58:22	0	10:07:17	1.77	
58	9:59:46	0	10:07:45	1.85	
59	10:01:01	0	10:08:11	1.78	
60	10:02:19	0	10:08:45	1.95	
61	10:03:37	0	10:09:10	1.63	
62	10:05:04	0	10:09:33	1.61	
63	10:06:27	0	10:09:56	1.6	
64	10:07:47	0	10:10:20	1.86	
65	10:09:12	0	10:10:44	2.44	
66	10:10:30	0	10:11:07	1.86	
67	10:11:53	0	10:11:28	1.26	
68	10:13:11	0	10:11:56	1.76	
69	10:14:32	0	10:12:22	1.72	
70	10:15:56	0	10:12:58	1.82	
71	10:17:26	0	10:13:22	1.69	
72	10:18:54	0	10:13:47	1.72	
73	10:21:02	0	10:14:02	1.75	
74	10:22:54	0	10:14:30	1.99	
75	10:24:09	0	10:15:01	1.98	
76	10:25:25	0	10:15:20	1.85	
77	10:26:41	0	10:15:32	1.94	
78	10:27:57	0	10:16:01	1.77	
79	10:29:14	0	10:16:25	1.76	
80	10:30:33	0	10:16:58	1.78	
81	10:32:06	0	10:17:25	1.96	
82	10:34:02	0	10:17:53	2.06	
83	10:35:24	0	10:18:32	1.68	
84	10:36:43	0	10:18:58	1.64	
85	10:38:08	0.00334	10:19:22	1.65	
86	10:39:26	0	10:19:51	1.73	
87	10:40:52	0.00389	10:20:16	1.63	
88	10:42:21	0	10:20:43	1.82	
89	10:43:37	0.00342	10:21:09	1.83	
90	10:45:03	0	10:21:37	2.12	
91	10:46:19	0.00317	10:22:02	2.03	
92	10:47:34	0	10:22:29	1.79	
93	10:48:51	0	10:22:53	1.75	
94	10:50:11	0	10:23:13	1.85	
95	10:51:28	0	10:23:37	1.87	
96	10:52:52	0	10:24:03	2.02	
97	10:54:17	0	10:24:32	1.86	
98	10:55:40	0	10:24:55	2.11	
99	10:56:59	0	10:25:17	2.08	
100	10:58:16	0	10:25:44	1.92	
101	10:59:40	0.00361	10:26:07	1.71	
102	11:00:59	0	10:26:36	2.3	
103	11:02:11	0	10:27:04	1.93	
104	11:03:28	0	10:27:47	1.99	
105	11:04:49	0	10:28:13	1.6	
106	11:06:10	0	10:28:50	2.01	
107	11:07:31	0	10:29:10	1.6	
108	11:08:54	0	10:29:39	1.66	
109	11:10:12	0	10:30:03	1.82	

Surface Emission Monitoring Results
May 14, 2020 Event-Route 1
Keegan Landfill

Monitoring Location (x100')	H2S MEASUREMENT TIME	H2S Concentration (ppm) [1]	CH4 MEASUREMENT TIME	CH4 Concentration (ppm) [2]	Comments
110	11:11:33	0	10:30:28	1.79	
111	11:12:51	0	10:30:55	1.86	
112	11:14:14	0	10:31:19	1.62	
113	11:15:32	0	10:31:48	1.84	
114	11:16:52	0	10:32:11	1.91	
115	11:18:08	0	10:32:27	1.82	
116	11:19:23	0	10:32:54	1.74	
117	11:20:39	0	10:33:23	1.8	
118	11:21:54	0	10:33:43	1.64	
119	11:23:19	0	10:34:07	1.85	
120	11:24:40	0	10:34:33	1.8	
121	11:25:58	0	10:34:54	1.83	
122	11:27:17	0	10:35:17	1.77	
123	11:28:32	0	10:35:45	1.85	
124	11:29:49	0	10:36:07	1.76	
125	11:31:08	0	10:36:32	1.7	
126	11:32:26	0	10:36:58	1.94	
127	11:33:47	0	10:37:25	1.94	
128	11:35:09	0	10:37:54	1.95	
129	11:36:35	0	10:38:14	2.17	
130	11:37:57	0	10:38:45	2.16	
131	11:39:15	0	10:39:06	1.96	
132	11:40:44	0	10:40:03	1.69	
133	11:42:03	0	10:40:25	1.85	
134	11:43:30	0	10:40:54	1.83	
135	11:44:44	0	10:41:20	1.81	
136	11:46:05	0	10:42:33	1.77	
137	11:47:24	0	10:43:06	1.68	
138	11:48:43	0	10:43:41	1.49	
139	11:50:00	0	10:43:58	1.79	
140	11:51:21	0	10:44:23	1.87	
141	11:52:43	0	10:44:43	1.8	
142	11:53:56	0			
Minimum		**0.0**		**1.3**	
Maximum		**0.004**		**11**	
Average		**0.001**		**2.2**	

Legend	Legend	
H2S>0.030 ppm	H2S>0.030 ppm	0.035
H2S>0.1 ppm	H2S>0.1 ppm	0.12
	Methane > 100 ppm	101
	Methane > 500 ppm	501

Notes:
(1) H2S monitoring performed on 5/14/2020 from 8:30 to 15:45
(2) CH4 monitoring performed on 5/14/2020 from 9:30 to 14:00
(3) H2S meter regeneration at 12:08

Surface Emission Monitoring Results
May 14, 2020 Event-Route 2
Keegan Landfill

Monitoring Location (x100')	H2S MEASUREMENT TIME	H2S Concentration (ppm) [1]	CH4 MEASUREMENT TIME	CH4 Concentration (ppm) [2]	Comments
0	13:01:35	0	12:57:54	2.62	
1	13:03:03	0	12:59:11	1.74	
2	13:04:41	0	13:00:06	2.07	
3	13:05:59	0	13:00:56	1.49	
4	13:07:20	0	13:01:26	1.49	
5	13:08:41	0	13:01:45	1.47	
6	13:10:01	0	13:02:04	1.48	
7	13:11:21	0	13:02:28	1.45	
8	13:12:40	0	13:03:13	1.82	
9	13:14:00	0	13:03:38	1.54	
10	13:15:27	0	13:04:05	1.62	
11	13:16:48	0	13:04:30	3.33	
12	13:18:05	0	13:04:49	4.46	
13	13:19:21	0	13:05:13	2.99	
14	13:20:40	0	13:05:36	7.06	
15	13:22:01	0	13:05:55	4.93	
16	13:23:23	0	13:06:10	19.6	
17	13:24:53	0	13:06:29	8.9	
18	13:26:13	0	13:06:50	2.47	
19	13:27:26	0	13:07:16	4.69	
20	13:28:43	0	13:07:38	8.99	
21	13:30:11	0	13:08:04	2.55	
22	13:31:34	0	13:08:22	2.44	
23	13:32:58	0	13:08:42	1.89	
24	13:34:37	0	13:09:03	1.91	
25	13:36:13	0	13:09:36	1.96	
26					No readings due to dirt piles
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37	13:37:37	0	13:10:35	2.25	
38	13:38:54	0	13:11:06	4.18	
39					No readings due to truck traffic and large dirt piles
40					
41					
42					
43					
44					
45					
46					
47					
48					
49	13:40:07	0	13:12:08	12.55	
50	13:41:27	0	13:12:36	2.27	
51	13:42:50	0	13:13:02	2.18	

Surface Emission Monitoring Results
May 14, 2020 Event-Route 2
Keegan Landfill

Monitoring Location (x100')	H2S MEASUREMENT TIME	H2S Concentration (ppm) [1]	CH4 MEASUREMENT TIME	CH4 Concentration (ppm) [2]	Comments
52	13:44:10	0	13:13:27	9.28	
53	13:45:36	0	13:13:50	56.68	
54	13:47:00	0	13:14:34	7.52	
55	13:48:18	0	13:14:57	1.99	
56	13:49:36	0	13:15:21	1.45	
57	13:50:55	0	13:16:14	2.27	
58	13:52:13	0	13:16:40	2.93	
59	13:53:31	0	13:17:07	9.71	
60	13:54:50	0	13:17:30	1.29	
61	13:56:12	0	13:17:49	1.68	
62	13:57:32	0	13:18:00	1.98	
63	13:58:55	0.01713	13:18:23	51.73	
64	14:00:46	0.01044	13:18:56	24.51	
65	14:02:05	0	13:19:27	10.45	
66	14:03:21	0	13:20:00	1.71	
67	14:04:38	0	13:21:09	1.9	
68	14:05:54	0	13:21:30	2.16	
69	14:07:13	0.00612	13:21:56	11.04	
70	14:08:30	0	13:22:20	2.42	
71	14:12:41	0	13:22:51	1.47	
72	14:14:01	0	13:23:14	1.48	
73	14:15:23	0	13:23:47	1.57	
74	14:16:40	0	13:24:09	3.34	
75	14:18:06	0.003	13:24:34	1.55	
76	14:19:29	0	13:24:55	6.65	
77	14:21:01	0	13:25:24	2.7	
78	14:22:24	0	13:25:56	4.11	
79	14:24:06	0	13:26:21	1.97	
80	14:25:29	0	13:26:46	4.38	
81	14:27:02	0	13:27:10	4.91	
82	14:28:23	0	13:27:40	3.41	
83	14:29:43	0	13:27:56	2.23	
84	14:31:17	0.00303	13:28:15	1.57	
85	14:32:39	0	13:28:44	5.57	
86	14:34:03	0	13:29:06	6.46	
87	14:35:08	1.05	13:29:24	20.22	
88	14:36:56	0.00399	13:29:50	2.68	
89	14:38:14	0.00393	13:30:40	17.08	
90	14:39:35	0.01076	13:31:07	12.51	
91	14:40:54	0.00304	13:31:33	5.05	
92	14:42:14	0	13:31:58	22.59	
93	14:43:34	0	13:32:23	10.32	
94	14:44:56	0.00322	13:32:47	3.53	
95	14:46:23	0.01043	13:33:13	4.92	
96	14:47:50	0.03022	13:33:31	4.25	
97	14:49:04	0.02399	13:34:06	6.16	
98	14:51:08	0.00478	13:34:34	8.85	
99	14:52:49	0.00579	13:34:58	3.97	
100	14:54:26	0.00324	13:35:24	1.66	
101	14:55:53	0	13:35:50	2.18	
102	14:57:22	0	13:36:15	2.23	
103	14:58:52	0	13:37:10	1.65	

Surface Emission Monitoring Results
May 14, 2020 Event-Route 2
Keegan Landfill

Monitoring Location (x100')	H2S MEASUREMENT TIME	H2S Concentration (ppm) [1]	CH4 MEASUREMENT TIME	CH4 Concentration (ppm) [2]	Comments
104	15:00:34	0	13:37:43	1.46	
105	15:02:02	0.00315	13:38:21	3.27	
106	15:03:21	0.00305	13:39:06	3.59	
107	15:05:28	0	13:39:32	2.99	
108	15:07:04	0.00311	13:39:57	2.95	
109	15:08:36	0.00308	13:40:19	3.04	
110	15:10:24	0	13:40:47	3.15	
111	15:11:54	0	13:41:17	4.25	
112	15:13:18	0	13:41:43	3.15	
113	15:14:50	0	13:42:15	1.48	
114	15:16:32	0	13:42:40	2.06	
115	15:18:06	0	13:43:05	1.76	
116	15:19:50	0	13:43:30	2.28	
117	15:21:14	0	13:43:55	1.24	
118	15:22:38	0	13:44:20	1.48	
119	15:23:53	0.00303	13:44:45	1.5	
120	15:25:10	0.003	13:45:14	1.82	
121	15:26:46	0.00312	13:45:44	1.29	
122	15:28:12	0.00309	13:46:14	1.21	
123	15:30:02	0.0032	13:46:45	1.43	
124	15:31:24	0.00301	13:47:13	1.24	
125	15:32:48	0	13:47:40	1.43	
126	15:34:11	0	13:48:08	1.49	
127	15:35:33	0	13:48:33	1.49	
128	15:36:56	0	13:49:04	1.57	
129	15:38:24	0	13:49:43	1.34	
130	15:39:45	0	13:50:11	1.47	
131	15:41:05	0	13:50:40	1.31	
132	15:42:48	0	13:51:04	1.22	
133	15:44:05	0	13:51:41	1.11	
134					
Minimum		**0.00**		**1.1**	
Maximum		**1.05**		**56.7**	
Average		**0.011**		**5.0**	

Legend	Legend	
H2S>0.030 ppm	H2S>0.030 ppm	0.035
H2S>0.1 ppm	H2S>0.1 ppm	0.12

Methane > 100 ppm	101
Methane > 500 ppm	501

Notes:
(1) H2S monitoring performed on 5/14/2020 from 8:30 to 15:45
(2) CH4 monitoring performed on 5/14/2020 from 9:30 to 14:00
(3) H2S meter regeneration at 12:08

Attachment 5

CH₄ Concentrations (ppm)

- <100
- 100-500
- >500

Notes:
1. Aerial Imagery from Google Satellite Imagery (2018)
2. Exterior label denotes Monitoring Location.
3. Interior label denotes CH₄ concentration.

Keegan Landfill

May 2020 SEM Event

CH₄ Concentrations

SCS ENGINEERS

SCALE: 0 150 300 450 600 ft

File No. 02219702.00

May 2020

H_2S Concentrations (ppm)

- <0.030
- 0.030-0.100
- >0.100

Notes:
1. Aerial Imagery from Google Satellite Imagery (2018)
2. Exterior label denotes Monitoring Location.
3. Interior label denotes H_2S concentration.

Keegan Landfill

May 2020 SEM Event

H_2S Concentrations

SCS ENGINEERS

SCALE: 0 150 300 450 600 ft

File No. 02219702.00

May 2020

Attachment 6

April 2020

May 2020

CH_4 Concentrations (ppm)

- <100
- 100-500
- >500

Notes:
1. Aerial Imagery from Google Satellite Imagery (2018)
2. Exterior label denotes Monitoring Location.
3. Interior label denotes H_2S concentration.

Keegan Landfill

April / May 2020

CH_4 Concentrations

SCS ENGINEERS

SCALE: 0 150 300 450 600 ft

File No. 02219702.00

May 2020

April 2020

May 2020

H_2S Concentrations (ppm)

- <0.030
- 0.030-0.100
- >0.100

Notes:
1. Aerial Imagery from Google Satellite Imagery (2018)
2. Exterior label denotes Monitoring Location.
3. Interior label denotes H_2S concentration.

Keegan Landfill

April / May 2020

H_2S Concentrations

SCS ENGINEERS

SCALE: 0 150 300 450 600 ft

File No. 02219702.00

Mat 2020

Attachment 4

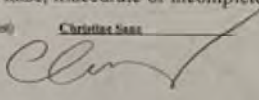
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
CERTIFICATION OF INFORMATION

Facility ID: Kenyon Landfill, NEA190001-13317; SW Facility ID No. 133871
COMPANY: New Jersey Sports & Exposition Authority

1. Responsible Official - This first tier of this certification is to be signed by the responsible official as defined at N.J.A.C 7:27-1.4

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attached documents and, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil and criminal penalties, including the possibility of fine or imprisonment or both, for submitting false, inaccurate or incomplete information."

Name (type or print): Christine Sanz — Title: Senior Vice President/Chief Operating Officer

Signature:  Date: 5/13/2020

2. Individual(s) with direct knowledge of and responsibility for the information contained in the certified document (N.J.A.C. 7:27-1.39(a)1)

A. "I certify under penalty of law that I believe the information provided in this document is true, accurate and complete. I am aware that there are significant civil and criminal penalties, including the possibility of fine or imprisonment or both, for submitting false, inaccurate or incomplete information."

Name (type or print): Lisa K. Wilkinson — Title: SCS Engineers Project Director
(Consultant)

Signature: _____ Date: 5/28/2020

3. Individual(s) with direct knowledge of and responsibility for the information contained in the certified document (N.J.A.C. 7:27-1.39(a)1)

A. "I certify under penalty of law that I believe the information provided in this document is true, accurate and complete. I am aware that there are significant civil and criminal penalties, including the possibility of fine or imprisonment or both, for submitting false, inaccurate or incomplete information."

Name (type or print): Marcus M. Sorlingsvear, PE — Title: SCS Engineers Project Manager
(Consultant)

Signature: _____ Date: 5/28/2020

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
CERTIFICATION OF INFORMATION

Facility ID **Keegan Landfill, NEA190001-13317; SW Facility ID No. 133571**
COMPANY **New Jersey Sports & Exposition Authority**

1. Responsible Official - This first tier of this certification is to be signed by the responsible official as defined at N.J.A.C 7:27-1.4

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attached documents and, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil and criminal penalties, including the possibility of fine or imprisonment or both, for submitting false, inaccurate or incomplete information."

Name (type or print) **Christine Sanz** Title **Senior Vice President/Chief Operating Officer**

Signature _____ Date _____

2. Individual(s) with direct knowledge of and responsibility for the information contained in the certified document (N.J.A.C. 7:27-1.39(a)1)

A. "I certify under penalty of law that I believe the information provided in this document is true, accurate and complete. I am aware that there are significant civil and criminal penalties, including the possibility of fine or imprisonment or both, for submitting false, inaccurate or incomplete information."

Name (type or print) **Lisa K. Wilkinson** Title **SCS Engineers Project Director (Consultant)**

Signature _____ Date 5/28/2020

3. Individual(s) with direct knowledge of and responsibility for the information contained in the certified document (N.J.A.C. 7:27-1.39(a)1)

A. "I certify under penalty of law that I believe the information provided in this document is true, accurate and complete. I am aware that there are significant civil and criminal penalties, including the possibility of fine or imprisonment or both, for submitting false, inaccurate or incomplete information."

Name (type or print) **Marcus M. Scrimgeour, PE** Title **SCS Engineers Project Manager (Consultant)**

Signature _____ Date 5/28/2020