

**IRVINGTON LANDFILL, TUCSON, ARIZONA**  
**2019 ANNUAL ENVIRONMENTAL REPORT**  
**AQUIFER PROTECTION PERMIT NO. 50044800.00**

Prepared for:

Arizona Department of Environmental Quality  
Solid Waste Plan Review Unit  
1110 West Washington Street  
Phoenix, Arizona 85007

January 2, 2020

Prepared by:

City of Tucson  
Environmental & General Services Department  
P.O. Box 27210  
Tucson, Arizona 85726-7210



Environmental &  
General Services  
Department

## Table of Contents

<b><u>Section</u></b>	<b><u>Page</u></b>
1.0 INTRODUCTION.....	1
2.0 GROUNDWATER MONITORING.....	1
3.0 METHANE GAS MONITORING PROBE RESULTS .....	1
4.0 DEEP SOIL VAPOR MONITORING.....	2
5.0 SITE INSPECTIONS.....	2
6.0 SUMMARY OF ACTIVITIES.....	3

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## **Figures**

Figure 1            Location Map  
Figure 2            Site Map

## **Appendices**

Appendix A        Field Data Sheets for Methane Gas Probes  
Appendix B        Landfill Site Inspection Reports

## Acronyms

Alert Level	AL
Aquifer Protection Permit	APP
Aquifer Quality Limit	AQL
Aquifer Water Quality Standards	AWQS
Arizona Department of Environmental Quality	ADEQ
Below Ground Surface	bgs
Carbon Dioxide	CO <sub>2</sub>
City of Tucson-Environmental & General Services Department	COT-EGSD
Feet	ft
Feet Above Mean Sea Level	ft amsl
Groundwater Protection Level	GPL
Non Detect	ND
Methane	CH <sub>4</sub>
Milligrams per Liter	mg/l
Nephelometric Turbidity Unit	NTU
Oxygen	O <sub>2</sub>
Quality Assurance/Quality Control	QA/QC
Reportable Detection Level	RDL
Volatile Organic Compounds	VOC
Water Table Elevation	WTE
Total Suspended Solids	TSS
Tetrachloroethene	PCE
Trichloroethene	TCE
cis-1,2-Dichloroethene	cis-1,2-DCE
Vinyl Chloride	VC
Trichlorofluoromethane	TCFM
Dichlorodifluoromethane	DCFM

## 1.0 INTRODUCTION

The City of Tucson - Environmental & General Services Department (COT-EGSD) has prepared this report to document groundwater, methane gas, soil vapor monitoring, and site inspections completed at the closed Irvington Landfill during 2019. Environmental sampling and analysis and site inspections are required by Aquifer Protection Permit (APP) 50044800.00, approved by the Arizona Department of Environmental Quality (ADEQ) on May 28, 2009.

The Irvington Landfill is located on the east side of the City of Tucson at 10000 East Irvington Road, near the intersection of East Irvington Road and South Houghton Road. The location of the Irvington Landfill is shown on **Figure 1**. The Irvington Landfill was operated as a municipal waste landfill by the City of Tucson from 1978 to 1988.

## 2.0 GROUNDWATER MONITORING

In March 2014, ADEQ<sup>1</sup> approved a reduction in the frequency of post-closure groundwater monitoring at the Irvington Landfill from an annual basis to a biennial basis (one sampling event every two years). The most recent annual groundwater sampling event at the Irvington Landfill was conducted by COT-EGSD in 2018. Accordingly, the next annual groundwater sampling event at the Irvington Landfill will be conducted by COT-EGSD in 2020.

## 3.0 METHANE GAS MONITORING PROBE RESULTS

There are 14 methane gas monitoring probes, designated as probes IRV-1 through IRV-14, located around the perimeter of the Irvington Landfill. Each probe is constructed to allow for a soil vapor (methane gas) sample to be collected at depths of 10 feet and 25 feet below ground surface. The gas monitoring probe locations are shown on **Figure 2**.

COT-EGSD monitored methane gas probes IRV-1 through IRV-14 on a quarterly basis in February, May, September, and November 2019 for the presence of methane gas in the vapor of shallow subsurface soils. Methane gas concentrations in the perimeter landfill gas probes were below the equipment detection limit at each probe location during the four sampling events in 2019. The measurement range for each methane measurement is 0% to 100% and the accuracy for each measurement is  $\pm 0.3\%$ . **Appendix A** contains the quarterly soil vapor (methane gas) field monitoring summary sheets for 2019.

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<sup>1</sup> ADEQ, RE: Irvington Landfill, Aquifer Protection Permit (APP) No. 50044800.00, 2013 Annual Report for Groundwater and Methane Monitoring, Landfill Inspections, March 27, 2014

## 4.0 DEEP SOIL VAPOR MONITORING

COT-EGSD had been monitoring volatile organic compounds (VOCs) on a voluntarily basis at deep nested soil vapor probe R-101A to assess deep vadose zone conditions at the Irvington Landfill site. The purpose of this analysis was to assess possible impacts to groundwater from vapor phase VOCs migrating from the waste at the Irvington Landfill site. There are no regulatory standards for this monitoring data and analysis of the soil vapor for VOCs is not a requirement of the APP. HARGIS + Associates, Inc. developed Groundwater Protection Limits (GPLs) for VOCs for the Irvington Landfill site in 2008<sup>2</sup>. The GPLs establish the minimum soil vapor concentrations that will not cause an exceedance of the aquifer water quality standards (AWQS) in the groundwater at the site.

Historical analytical data, since 2002, obtained by COT-EGSD was evaluated to assess possible impacts to groundwater from vapor phase VOCs potentially migrating from the waste at the Irvington Landfill site. Evaluation of the data identified VOCs in concentrations significantly less than the GPLs, suggesting the potential for soil vapors to impact groundwater quality was unlikely. Therefore, COT-EGSD decided to discontinue the deep soil vapor monitoring at probe R-101A. The results of the historical soil vapor evaluation were provided in the 2016 Annual Environmental Report. COT-EGSD<sup>3</sup> also notified ADEQ of its intention to permanently discontinue the voluntary vapor monitoring.

## 5.0 SITE INSPECTIONS

Irvington Landfill site inspections are required on a quarterly basis and under qualifying weather conditions as specified in the APP. Site inspections were conducted by COT-EGSD's Engineering Manager and by Engineering and Environmental Consultants, Inc. (EEC), on behalf of COT-EGSD, in 2019. A copy of each inspection report is provided in **Appendix B**.

The following landfill site inspections were conducted in 2019:

- February 14, 2019: 1<sup>st</sup> quarterly 2019 event.
- May 15, 2019: 2<sup>nd</sup> quarterly 2019 event.
- July 31, 2019: Rainfall inspection event.
- August 13, 2019: 3<sup>rd</sup> quarterly 2019 event.
- September 26, 2019: Rainfall inspection event.
- November 13, 2019: Wind inspection event.
- November 20, 2019: Rainfall inspection event.

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<sup>2</sup> EEC and Hargis + Associates, Inc., *Soil Vapor Assessment at Los Reales, Prudence, Vincent Mullins, Irvington, Cottonwood, and Ryan Landfills*, April 10, 2008

<sup>3</sup> COT-EGSD, *Irvington Landfill, Tucson, Arizona, 2016 Annual Environmental Report, Aquifer Protection Permit 50044800.00*, January 24, 2017

- November 28-29, 2019: Rainfall inspection event.
- December 8, 2019: Rainfall inspection event.
- December 18, 2019: Wind inspection event.

The following items were noted as discrepancies during 2019:

- Fencing: Concrete footers of several fence poles along the southern and eastern perimeter fence are exposed and being undermined by runoff.
- Inspection roads: Erosion rills observed along the southern and western inspection road. South perimeter road impassible (erosion and wash). Minor erosional rills on west perimeter road.
- Stormwater controls: Sediment accumulating in top section of the basin drainage channel.

COT-EGSD will evaluate the discrepancies and determine appropriate timing of repairs and maintenance to the facility in 2020.

## **6.0 SUMMARY OF ACTIVITIES**

Activities conducted in 2019 at the Irvington Landfill site include:

- Methane gas was not detected in any of the perimeter landfill gas probes during quarterly monitoring conducted in 2019. Methane gas monitoring at the gas probes will continue on a quarterly basis in 2020.
- As required by the APP, site inspections were performed to evaluate the integrity of the final cover layer, access road conditions, drainage systems, vegetation, and security conditions. No critical environmental issues were identified at the Irvington Landfill during the site inspections.
- The landfill met all the requirements and conditions of the APP.

# **FIGURES**










Figure 1  
Location Map  
Irvington Landfill



**Legend**

-  Perimeter Landfill Gas Probe
-  Soil Vapor Monitor Well
-  Groundwater Monitor Well
-  Natural Drainage Areas (Washes)
-  Landfill Boundary

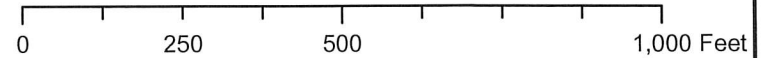
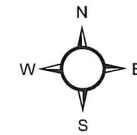


Figure 2  
Site Map Irvington Landfill  
Tucson, Az

# **Appendix A**

## **Field Data Sheets for Methane Gas Probes**



Engineering and Environmental Consultants, Inc.

555 E. River Road, Suite 301 | Tucson, Arizona 85704 | P: 520.321.4625

April 17, 2019

Mr. Thomas Ryan, P.E.  
Ms. Lori Ehman  
City of Tucson  
Environmental & General Services Department  
4004 S. Park Avenue, Bldg. 2  
Tucson, Arizona 85714

**Re: Summary of First Quarterly Landfill Gas Monitoring at Irvington Landfill**

Dear Mr. Ryan and Ms. Ehman:

EEC is pleased to submit the data package for the quarterly landfill gas monitoring at the Irvington Landfill. The monitoring was performed on February 28, 2019 to satisfy the requirement for the first quarter 2019 monitoring. EEC arrived on site at 1245 and was off site at 1630.

No methane was detected in any probe monitored. Where appropriate, EEC remarked probe nomenclature and lubed sticky padlocks. The following additional items were noted:

- No locks were observed on wells IR-006, IR-007, IR-008, IR-009, IR-0010, IR-0011, IR-0012, IR-0013, or IR-0014, however these wells are located within the fenced area of the landfill.

Let us know if you have any questions or concerns.

Sincerely,

**Engineering and Environmental Consultants, Inc.**

A handwritten signature in blue ink that reads "Chad S. Hancock".

Chad S. Hancock  
Field Services Manager

A handwritten signature in blue ink that reads "Kevin A. Pierce".

Kevin A. Pierce  
Senior Environmental Manager

Irvington Landfill  
Methane Monitoring  
Wells (all, Quarterly)

Device ID	Date/Time	CH4 %	CO2 %	O2 %	Balance %	Baro. Press. inches Hg	Rel. Press. inches H2O
IR000110	2/28/2019 13:04	0	0.8	19.7	79.5	27.26	0
IR000125	2/28/2019 13:07	0	1.2	19.2	79.6	27.26	0.01
IR000210	2/28/2019 13:13	0	1.2	19.5	79.3	27.26	0.01
IR000225	2/28/2019 13:17	0	1	19.7	79.3	27.27	0
IR000310	2/28/2019 13:30	0	1.2	19.3	79.5	27.27	0
IR000325	2/28/2019 13:34	0	2.1	18.7	79.2	27.26	0.02
IR000410	2/28/2019 13:40	0	1.6	19.4	79	27.27	0
IR000425	2/28/2019 13:43	0	2.9	18.3	78.8	27.26	0
IR000510	2/28/2019 13:51	0	2.8	18.3	78.9	27.26	0.01
IR000525	2/28/2019 13:55	0	4	17.2	78.8	27.26	0.01
IR000610	2/28/2019 14:01	0	1.2	19.8	79	27.25	0.01
IR000625	2/28/2019 14:05	0	2	19.2	78.8	27.26	-0.01
IR000710	2/28/2019 14:09	0	0.7	20.6	78.7	27.25	0
IR000725	2/28/2019 14:12	0	0.7	20.7	78.6	27.25	0
IR000810	2/28/2019 14:19	0	0.7	20.7	78.6	27.25	0
IR000825	2/28/2019 14:23	0	0.9	20.1	79	27.26	-0.01
IR000910	2/28/2019 14:27	0	1	20.6	78.4	27.24	-0.01
IR000925	2/28/2019 14:31	0	1.8	19.9	78.3	27.24	0.01
IR001010	2/28/2019 14:52	0	1.5	20.3	78.2	27.24	0.01
IR001025	2/28/2019 14:56	0	2.7	19.1	78.2	27.22	-0.01
IR001110	2/28/2019 15:02	0	0.5	21.1	78.4	27.22	0
IR001125	2/28/2019 15:06	0	1.1	20.6	78.3	27.21	0.02
IR001210	2/28/2019 15:23	0	0.7	21.2	78.1	27.21	0
IR001225	2/28/2019 15:27	0	1.7	20.5	77.8	27.21	0.02
IR001310	2/28/2019 15:47	0	0.4	21.8	77.8	27.21	0
IR001325	2/28/2019 15:50	0	0.8	21.3	77.9	27.17	0.01
IR001410	2/28/2019 15:56	0	0.3	21.8	77.9	27.2	0
IR001425	2/28/2019 15:59	0	0.4	21.8	77.8	27.19	0

Note:

GEM5000 ID: G505889

Monitored by: K. Pierce (EEC)

GEM5000 was calibrated using 15% methane (see K.P. calibration sheet for this date).

Pressure readings were taken with a Dywer Model 476A digital manometer.

Accuracy of the machine is +/-0.3% at methane concentrations of less than <5.0%.



CITY OF  
TUCSON

METHANE MONITORING FIELD FORM

IRVINGTON

GEM ID: 6505889

Inspector Name: Pierre

Analyzer ID: Dwyer 476H

Date: 2/28/19

Weather Condition: Clear ~72°

Barometric Pressure: 27.28"

Probe ID	Pressure (H <sub>2</sub> O) Reading	Methane (CH <sub>4</sub> ) Reading	Purge Times (seconds)	Notes	Probe ID	Pressure (H <sub>2</sub> O) Reading	Methane (CH <sub>4</sub> ) Reading	Purge Times (seconds)	Notes
IR000110	Ø	Ø %	47 (1WV)		IR001310	Ø	Ø %	47 (1WV)	
IR000125	Ø	Ø %	116 (1WV)		IR001325	Ø	Ø %	116 (1WV)	
IR000210	Ø	Ø %	47 (1WV)		IR001410	Ø	Ø %	47 (1WV)	
IR000225	Ø	Ø %	116 (1WV)		IR001425	Ø	Ø %	116 (1WV)	
IR000310	Ø	Ø %	47 (1WV)		NOTES: Probes will be purged a minimum of 1 well volume (1WV) to a maximum of 3 well volumes (3WV). - 10 on site ~ 1245 - no locks on probe wells, 6, 7, 8, 9, 10, 11 (60ft), 12, 13, 14 - off site 1630				
IR000325	Ø	Ø %	116 (1WV)						
IR000410	-0.07	Ø %	47 (1WV)						
IR000425	-0.08	Ø %	116 (1WV)						
IR000510	Ø	Ø %	47 (1WV)						
IR000525	Ø	Ø %	116 (1WV)						
IR000610	Ø	Ø %	47 (1WV)						
IR000625	Ø	Ø %	116 (1WV)						
IR000710	Ø	Ø %	47 (1WV)						
IR000725	Ø	Ø %	116 (1WV)						
IR000810	Ø	Ø %	47 (1WV)						
IR000825	Ø	Ø %	116 (1WV)						
IR000910	+0.10	Ø %	47 (1WV)						
IR000925	Ø	Ø %	116 (1WV)						
IR001010	Ø	Ø %	47 (1WV)						
IR001025	Ø	Ø %	116 (1WV)						
IR001110	Ø	Ø %	47 (1WV)						
IR001125	Ø	Ø %	116 (1WV)						
IR001210	Ø	Ø %	47 (1WV)						
IR001225	Ø	Ø %	116 (1WV)						



**LANDTEC CALIBRATION FORM**

DATE: 2/28/14 TIME: 0720 Inspector's Name: Pierce

MACHINE TYPE: GEM2000  OTHER  TYPE: GEM 5000 MACHINE ID: 6505889

**SITE INFO & STORAGE:**

File: S:\GA90\DATA \_\_\_\_\_ .xls File S:\GA90\DATA \_\_\_\_\_ .xls  
 File: S:\GA90\DATA \_\_\_\_\_ .xls File S:\GA90\DATA \_\_\_\_\_ .xls

**Methane Calibration Gas Used:**

15.0%	50.0%	(circula one)	MANUFACTUER	LOT #
15.0%CH4/15.0%CO2/0.0% O2			LANDTEC or CALGAZ	738866
50.0%CH4/35.0%CO2/0.0% O2			LANDTEC or CALGAZ	
		1%O2/96%N2	LANDTEC or CALGAZ	4736299

RESET TO FACTORY SETTINGS? YES  NO

CALIBRATION GAS	CALIBRATION READINGS	RANGES
<b>Zero Methane(CH<sub>4</sub>)</b> <i>(Not connected to calibration gas)</i>	Initial CH <sub>4</sub> Zero Reading <u>0</u> % Final CH <sub>4</sub> Zeroed-Out Reading <u>0</u> %	<b>CH<sub>4</sub> ranges: 15% and 50%</b> 15% = min-14.0%—max-16.0% 50% = min-48.8%—max-51.2%
<b>Span Methane(CH<sub>4</sub>)</b> <i>(Connect to calibration gas)</i>	Initial CH <sub>4</sub> Reading <u>15.7</u> % Final Calibrated CH <sub>4</sub> Reading <u>15.8</u> %	In range? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
<b>Span Carbon Dioxide (CO<sub>2</sub>)</b> <i>(Stay connected to calibration gas)</i>	Initial CO <sub>2</sub> Reading <u>15.4</u> % Final Calibrated CO <sub>2</sub> Reading <u>15.8</u> %	<b>CO<sub>2</sub> ranges: 15% and 35%</b> 15% = min-14.0%—max-16.0% 35% = min-34.2%—max-35.8%
<b>Zero Oxygen (O<sub>2</sub>)</b> <i>(Stay connected to calibration gas)</i>	Initial O <sub>2</sub> Reading <u>0.1</u> % Final Calibrated O <sub>2</sub> Reading <u>0</u> %	<b>Zeroed O<sub>2</sub> range: 0.0%</b> min-0.0%—max-0.2%
<b>Span Oxygen (O<sub>2</sub>)</b> <i>(Disconnect from calibration gas)</i>	Oxygen Ambient Air only <u>20.8</u> % Initial O <sub>2</sub> Reading <u>20.2</u> % Final Calibrated O <sub>2</sub> Reading <u>20.9</u> %	<b>O<sub>2</sub> range: 20.8%</b> min-19.8%—max-21.8%
<b>Calibration Check</b> <i>(Check ranges)</i>	Methane (CH <sub>4</sub> ) Reading <u>15</u> % <i>(Read methane gas)</i>	Oxygen (O <sub>2</sub> ) Reading <u>20.8</u> % <i>(Read ambient air)</i>

Calibration Complete? Yes  NO  If no, Why? \_\_\_\_\_

Inspector Signature: [Signature]

# CERTIFICATION OF CALIBRATION

ISSUED BY: QED Environmental Systems, Inc. Services Facility

Date Of Calibration: January 18, 2019

Certificate Number: G505889\_10/35684



PJLA  
Calibration

No. 66916

Page 1 of 2

Approved By Signatory

*Kyle Racine*  
Kyle Racine  
Laboratory Inspection



QED Environmental Systems, Inc. Services Facility,  
2355 Bishop Circle West, Dexter, MI 48130  
www.qedenv.com

**Customer:** Geotech Environmental Equipment Inc

2650 E 40th Ave  
Denver, CO 80205  
USA

**Description:** Gas Analyser

**Model:** GEM5000

**Serial Number:** G505889

## Accredited Results:

Methane (CH <sub>4</sub> )		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.9	0.42
15.0	14.9	0.66
50.0	49.6	1.03

Carbon Dioxide (CO <sub>2</sub> )		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.8	0.43
15.0	14.7	0.71
50.0	49.7	1.19

Oxygen (O <sub>2</sub> )		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
20.7	20.7	0.25

Gas cylinders are traceable and details can be provided if requested.

CH<sub>4</sub>, CO<sub>2</sub> readings recorded at:

32.2 °C/89.9 °F

Barometric Pressure: 29.15 "Hg

O<sub>2</sub> readings recorded at:

22.6 °C/72.7 °F

Method of Test: The analyzer is calibrated in a temperature controlled chamber using reference gases. All analyzers are calibrated in accordance with our procedure ISP-17 using high purity grade gas.

All calibrations are performed in accordance with ISO 17025 at LANDTEC, an ISO 17025:2005 – accredited service facility through PJLA.

The calibration results published in this certificate were obtained using equipment capable of producing results that are traceable through NIST to the International System of Units (SI). Certification only applies to results shown. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.



# CERTIFICATION OF CALIBRATION

PJLA ACCREDITED CALIBRATION LABORATORY NO. 66916

Certificate Number  
G505889\_10/35684

Page 2 of 2

*The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with NIST requirements.*

## Non Accredited results:

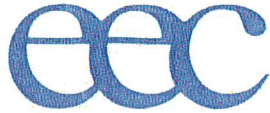
Pressure Transducers (inches of water column)					
Transducer	Certified (Low)	Reading (Low)	Certified (High)	Reading (High)	Accuracy
Static	0"	0"	40"	40.10"	2.0"
Differential	0"	0"	4"	4.02"	0.7"

Barometer (mbar)	
Reference	Instrument Reading
0987 mbar / 29.15 "Hg	0990 mbar / 29.22 "Hg

Additional Gas Cells		
Gas	Certified Gas (ppm)	Instrument Reading (ppm)
CO	501	507
H2S	249.5	250

As received gas check readings are only recorded if the instrument is received in a working condition. Where the instrument is received damaged no reading can be taken.

End of Certificate



Engineering and Environmental Consultants, Inc.

555 E. River Road, Suite 301 | Tucson, Arizona 85704 | P: 520.321.4625

July 9, 2019

Mr. Thomas Ryan, P.E.  
Ms. Lori Ehman  
City of Tucson  
Environmental & General Services Department  
4004 S. Park Avenue, Bldg. 2  
Tucson, Arizona 85714

**Re: Summary of Second Quarter 2019 Landfill Gas Monitoring at Irvington Landfill**

Dear Mr. Ryan and Ms. Ehman:

EEC is pleased to submit the data package for the quarterly landfill gas monitoring at the Irvington Landfill. The monitoring was performed on May 23, 2019 to satisfy the requirement for the second quarter 2019 monitoring.

No methane was detected in any probe monitored. Where appropriate, EEC remarked probe nomenclature and lubed sticky padlocks. No additional items were noted.

Let us know if you have any questions or concerns.

Sincerely,

**Engineering and Environmental Consultants, Inc.**

A handwritten signature in blue ink that reads "Chad S. Hancock".

Chad S. Hancock  
Field Services Manager

A handwritten signature in blue ink that reads "Kevin A. Pierce".

Kevin A. Pierce  
Senior Environmental Manager

Irvington Landfill  
Methane Monitoring  
Wells (all, quarterly)

Device ID	Date/Time	CH4	CO2	O2	Balance	Baro. Press.	Rel. Press.
		%	%	%	%	inches Hg	inches H2O
IR000110	5/23/2019 7:20	0	0.5	20.3	79.2	27.09	0
IR000125	5/23/2019 7:23	0	1.2	19	79.8	27.09	0
IR000210	5/23/2019 7:31	0	0.3	20.2	79.5	27.1	0
IR000225	5/23/2019 7:34	0	0.4	20.1	79.5	27.08	0
IR000310	5/23/2019 7:39	0	1.7	18.8	79.5	27.1	0
IR000325	5/23/2019 7:42	0	2.3	17.9	79.8	27.11	0
IR001010	5/23/2019 7:49	0	1.7	18.9	79.4	27.09	0
IR001025	5/23/2019 7:53	0	1.4	19	79.6	27.1	0
IR001110	5/23/2019 8:03	0	0.2	20.4	79.4	27.08	0
IR001125	5/23/2019 8:07	0	0.1	20.5	79.4	27.1	-0.12
IR000410	5/23/2019 9:55	0	2.7	18.7	78.6	27.15	0
IR000425	5/23/2019 9:58	0	3	17.9	79.1	27.14	0
IR000510	5/23/2019 10:05	0	3.1	18.2	78.7	27.15	0
IR000525	5/23/2019 10:08	0	3.1	17.9	79	27.14	0
IR000610	5/23/2019 10:16	0	1.2	19.6	79.2	27.15	0
IR000625	5/23/2019 10:19	0	1.9	18.4	79.7	27.15	0
IR000710	5/23/2019 10:23	0	0.3	20.2	79.5	27.16	0
IR000725	5/23/2019 10:26	0	0.1	20.4	79.5	27.13	0
IR000810	5/23/2019 10:30	0	0.8	19.5	79.7	27.13	0
IR000825	5/23/2019 10:33	0	0.9	18.6	80.5	27.15	0
IR000910	5/23/2019 10:37	0	0.6	19.8	79.6	27.15	0
IR000925	5/23/2019 10:40	0	1.5	18.5	80	27.16	0
IR001210	5/23/2019 10:54	0	0.5	20.6	78.9	27.17	0
IR001225	5/23/2019 10:57	0	0	21.2	78.8	27.13	0
IR001310	5/23/2019 11:04	0	0.5	20.7	78.8	27.18	0
IR001325	5/23/2019 11:08	0	0.4	20.4	79.2	27.15	0
IR001410	5/23/2019 11:13	0	0.4	20.6	79	27.16	0
IR001425	5/23/2019 11:21	0	0.3	20.6	79.1	27.14	0
Note:							
GEM5000 ID: G505889		Monitored by: K. Pierce (EEC)					
GEM5000 was calibrated using 15% methane (see K.P. calibration sheet for this date).							
Pressure readings were taken with a Dywer Model 476A digital manometer.							
Accuracy of the machine is +/-0.3% at methane concentrations of less than <5.0%.							



# CITY OF TUCSON

## METHANE MONITORING FIELD FORM

IRVINGTON

Well ID: G50588A

Inspector Name: Pierce

Manometer ID: Dwyer 4760

Date: 5/23/19

Weather Condition: Clear ~ 65°

Barometric Pressure: 27.15"

Probe ID	Pressure (H <sub>2</sub> O) Reading	Methane (CH <sub>4</sub> ) Reading	Purge Times (seconds)	Notes	Probe ID	Pressure (H <sub>2</sub> O) Reading	Methane (CH <sub>4</sub> ) Reading	Purge Times (seconds)	Notes
IR000110	0	0 %	47 (1WV)		IR001310	0	0 %	47 (1WV)	
IR000125	0	0 %	116 (1WV)		IR001325	0	0 %	116 (1WV)	
IR000210	0	0 %	47 (1WV)		IR001410	0	0 %	47 (1WV)	
IR000225	0	0 %	116 (1WV)		IR001425	0	0 %	116 (1WV)	
IR000310	0	0 %	47 (1WV)		NOTES: Probes will be purged a minimum of 1 well volume (1WV) to a maximum of 3 well volumes (3WV). Purge times are based on a GEM 5000 instrument. - on site @ 0700 - off site ~ 0820 (restart VML) - on site @ 0950 - off site @ ~ 1200				
IR000325	0	0 %	116 (1WV)						
IR000410	0	0 %	47 (1WV)						
IR000425	0	0 %	116 (1WV)						
IR000510	0	0 %	47 (1WV)						
IR000525	0	0 %	116 (1WV)						
IR000610	0	0 %	47 (1WV)						
IR000625	0	0 %	116 (1WV)						
IR000710	0	0 %	47 (1WV)						
IR000725	0	0 %	116 (1WV)						
IR000810	0	0 %	47 (1WV)						
IR000825	0	0 %	116 (1WV)						
IR000910	0	0 %	47 (1WV)						
IR000925	0	0 %	116 (1WV)						
IR001010	0	0 %	47 (1WV)						
IR001025	0	0 %	116 (1WV)						
IR001110	0	0 %	47 (1WV)						
IR001125	-0.12	0 %	116 (1WV)						
IR001210	0	0 %	47 (1WV)						
IR001225	0	0 %	116 (1WV)						



**LANDTEC CALIBRATION FORM**

DATE: 5/23/16 TIME: 0700 Inspector's Name: Pierce

MACHINE TYPE: GEM2000  OTHER:  TYPE: GEM 500 MACHINE ID: G505889

**SITE INFO & STORAGE:**

File: S:\GA90\DATA\_\_\_\_\_ .xls  
 File: S:\GA90\DATA\_\_\_\_\_ .xls

File: S:\GA90\DATA\_\_\_\_\_ .xls  
 File: S:\GA90\DATA\_\_\_\_\_ .xls

**Methane Calibration Gas Used:**

<input checked="" type="checkbox"/> 15.0% <input type="checkbox"/> 50.0% (circle one)	MANUFACTURER	LOT #
15.0%CH4/15.0%CO2/0.0% O2 :	LANDTEC or CALGAZ	1089600
50.0%CH4/35.0%CO2/0.0% O2:	LANDTEC or CALGAZ	
4%O2/96%N2:	LANDTEC or CALGAZ	

RESET TO FACTORY SETTINGS? YES  NO

CALIBRATION GAS	CALIBRATION READINGS	RANGES
<b>Zero Methane(CH<sub>4</sub>)</b> <i>(Not connected to calibration gas)</i>	Initial CH <sub>4</sub> Zero Reading: <u>0</u> % Final CH <sub>4</sub> Zeroed-Out Reading: <u>0</u> %	<b>CH<sub>4</sub> ranges: 15% and 50%</b> 15% = min-14.0%–max-16.0% 50% = min-48.8%–max-51.2%
<b>Span Methane(CH<sub>4</sub>)</b> <i>(Connect to calibration gas)</i>	Initial CH <sub>4</sub> Reading: <u>14.8</u> % Final Calibrated CH <sub>4</sub> Reading: <u>15.0</u> %	In range? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
<b>Span Carbon Dioxide (CO<sub>2</sub>)</b> <i>(Stay connected to calibration gas)</i>	Initial CO <sub>2</sub> Reading: <u>14.7</u> % Final Calibrated CO <sub>2</sub> Reading: <u>15.0</u> %	<b>CO<sub>2</sub> ranges: 15% and 35%</b> 15% = min-14.0%–max-16.0% 35% = min-34.2%–max-35.8%
<b>Zero Oxygen (O<sub>2</sub>)</b> <i>(Stay connected to calibration gas)</i>	Initial O <sub>2</sub> Reading: <u>0.1</u> % Final Calibrated O <sub>2</sub> Reading: <u>0</u> %	<b>Zeroed O<sub>2</sub> range: 0.0%</b> min-0.0%–max-0.2%
<b>Span Oxygen (O<sub>2</sub>)</b> <i>(Disconnect from calibration gas)</i>	Oxygen Ambient Air only: <u>20.8</u> % Initial O <sub>2</sub> Reading: <u>20.4</u> % Final Calibrated O <sub>2</sub> Reading: <u>20.9</u> %	<b>O<sub>2</sub> range: 20.8%</b> min-19.8%–max-21.8%
<b>Calibration Check</b> <i>(Check ranges)</i>	Methane (CH <sub>4</sub> ) Reading: <u>15.0</u> % (Read methane gas) Oxygen (O <sub>2</sub> ) Reading: <u>20.9</u> % (Read ambient air)	

Calibration Complete? Yes  NO  If no, Why? \_\_\_\_\_

Inspector Signature: [Signature]

# CERTIFICATION OF CALIBRATION

ISSUED BY: QED Environmental Systems, Inc. Services Facility

Date Of Calibration: January 18, 2019

Certificate Number: G505889\_10/35684



PJLA  
Calibration

No. 66916

Page 1 of 2

Approved By Signatory

*Kyle Racine*  
Kyle Racine  
Laboratory Inspection



QED Environmental Systems, Inc. Services Facility,  
2355 Bishop Circle West, Dexter, MI 48130  
www.qedenv.com

**Customer:** *Geotech Environmental Equipment Inc*

2650 E 40th Ave  
Denver, CO 80205  
USA

**Description:** Gas Analyser

**Model:** GEM5000

**Serial Number:** G505889

## Accredited Results:

Methane (CH <sub>4</sub> )		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.9	0.42
15.0	14.9	0.66
50.0	49.6	1.03

Carbon Dioxide (CO <sub>2</sub> )		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.8	0.43
15.0	14.7	0.71
50.0	49.7	1.19

Oxygen (O <sub>2</sub> )		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
20.7	20.7	0.25

Gas cylinders are traceable and details can be provided if requested.

CH<sub>4</sub>, CO<sub>2</sub> readings recorded at: 32.2 °C/89.9 °F

Barometric Pressure: 29.15 "Hg

O<sub>2</sub> readings recorded at: 22.6 °C/72.7 °F

Method of Test: The analyzer is calibrated in a temperature controlled chamber using reference gases. All analyzers are calibrated in accordance with our procedure ISP-17 using high purity grade gas.

All calibrations are performed in accordance with ISO 17025 at LANDTEC, an ISO 17025:2005 – accredited service facility through PJLA.

The calibration results published in this certificate were obtained using equipment capable of producing results that are traceable through NIST to the International system of Units (SI). Certification only applies to results shown. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Calibration Instance: 101 IGC Instance: N/A

LP015LNANIS

# CERTIFICATION OF CALIBRATION

PJLA ACCREDITED CALIBRATION LABORATORY NO. 66916

Certificate Number  
G505889\_10/35684

Page 2 of 2

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with NIST requirements.

## Non Accredited results:

Pressure Transducers (inches of water column)					
Transducer	Certified (Low)	Reading (Low)	Certified (High)	Reading (High)	Accuracy
Static	0"	0"	40"	40.10"	2.0"
Differential	0"	0"	4"	4.02"	0.7"

Barometer (mbar)	
Reference	Instrument Reading
0987 mbar / 29.15 "Hg	0990 mbar / 29.22 "Hg

Additional Gas Cells		
Gas	Certified Gas (ppm)	Instrument Reading (ppm)
CO	501	507
H2S	249.5	250

As received gas check readings are only recorded if the instrument is received in a working condition. Where the instrument is received damaged no reading can be taken.

End of Certificate

Calibration Instance: 101 IGC Instance: N/A

LP015LNANIST-1.1

**WWW.LANDTECNA.COM**

QED Instrument Services Facility - 2355 Bishop Circle West, Dexter, MI. 48130



Engineering and Environmental Consultants, Inc.

555 E. River Road, Suite 301 | Tucson, Arizona 85704 | P: 520.321.4625

October 3, 2019

Mr. Thomas Ryan, P.E.  
Ms. Lori Ehman  
City of Tucson  
Environmental & General Services Department  
4004 S. Park Avenue, Bldg. 2  
Tucson, Arizona 85714

**Re: Summary of Third Quarter 2019 Landfill Gas Monitoring at Irvington Landfill**

Dear Mr. Ryan and Ms. Ehman:

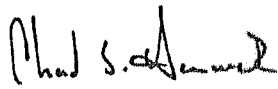
EEC is pleased to submit the data package for the quarterly landfill gas monitoring at the Irvington Landfill. The monitoring was performed on September 6, 2019 to satisfy the requirement for the third quarter 2019 monitoring.

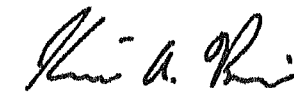
No methane was detected in any probe monitored. Where appropriate, EEC remarked probe nomenclature and lubed sticky padlocks. No unexpected items or problems were noted.

Let us know if you have any questions or concerns.

Sincerely,

**Engineering and Environmental Consultants, Inc.**

  
Chad S. Hancock  
Field Services Manager

  
Kevin A. Pierce  
Senior Environmental Manager



Irvington Landfill  
Methane Monitoring  
Wells (all, quarterly)

Device ID	Date/Time	CH4 %	CO2 %	O2 %	Balance %	Baro. Press. inches Hg	Rel. Press. inches H2O
IR000110	9/6/2019 6:30	0	0.7	20.4	78.9	27.22	0
IR000125	9/6/2019 6:33	0	1.2	19.2	79.6	27.19	0
IR001010	9/6/2019 6:41	0	1.1	19.9	79	27.21	0
IR001025	9/6/2019 6:45	0	0.8	19.8	79.4	27.2	0
IR001110	9/6/2019 6:50	0	0.8	20.1	79.1	27.21	0
IR001125	9/6/2019 6:54	0	0.3	20.3	79.4	27.18	0
IR000210	9/6/2019 6:59	0	0.3	20.6	79.1	27.21	0
IR000225	9/6/2019 7:03	0	0.7	20.1	79.2	27.2	0
IR000310	9/6/2019 7:18	0	1.7	19.3	79	27.2	0
IR000325	9/6/2019 7:23	0	3.2	17.6	79.2	27.2	0
IR000410	9/6/2019 7:29	0	2.4	18.6	79	27.24	0
IR000425	9/6/2019 7:33	0	4.3	16.6	79.1	27.23	0
IR000510	9/6/2019 7:39	0	3.1	18.1	78.8	27.24	0
IR000525	9/6/2019 7:42	0	4	17	79	27.2	0
IR000610	9/6/2019 7:47	0	1.3	19.5	79.2	27.24	0
IR000625	9/6/2019 7:51	0	2.1	18.5	79.4	27.24	0
IR000710	9/6/2019 8:01	0	0.5	20.4	79.1	27.24	0
IR000725	9/6/2019 8:04	0	0.1	20.7	79.2	27.23	0
IR000810	9/6/2019 8:09	0	0.6	20.3	79.1	27.24	0
IR000825	9/6/2019 8:13	0	0.9	19.3	79.8	27.24	0
IR000910	9/6/2019 8:19	0	0.8	20.1	79.1	27.2	0
IR000925	9/6/2019 8:23	0	1.8	18.8	79.4	27.2	0
IR001410	9/6/2019 8:35	0	0.4	20.5	79.1	27.24	0
IR001425	9/6/2019 8:38	0	0.1	21	78.9	27.2	0
IR001310	9/6/2019 8:42	0	0.4	20.6	79	27.18	0
IR001325	9/6/2019 8:45	0	0.2	20.5	79.3	27.21	0
IR001210	9/6/2019 8:55	0	0.6	20.5	78.9	27.22	0
IR001225	9/6/2019 8:59	0	0.9	20.1	79	27.22	0
Note:							
GEM5000 ID: G505889		Monitored by: K. Pierce (EEC)					
GEM5000 was calibrated using 15% methane (see K.P. calibration sheet for this date).							
Pressure readings were taken with a Dywider Model 476A digital manometer.							
Accuracy of the machine is +/-0.3% at methane concentrations of less than <5.0%.							



CITY OF  
TUCSON

METHANE MONITORING FIELD FORM  
IRVINGTON

GEM ID: 6505889

Inspector Name: Pierce

Manometer ID: Dwyer 476 A

Date: 9 / 6 / 19

Weather Condition: Partly Cloudy 80°

Barometric Pressure: 27.22"

Probe ID	Pressure (H <sub>2</sub> O) Reading	Methane (CH <sub>4</sub> ) Reading	Purge Times (seconds)	Notes	Probe ID	Pressure (H <sub>2</sub> O) Reading	Methane (CH <sub>4</sub> ) Reading	Purge Times (seconds)	Notes
IR000110	Ø	Ø %	47 (1WV)		IR001310	Ø	Ø %	47 (1WV)	
IR000125	Ø	Ø %	116 (1WV)		IR001325	Ø	Ø %	116 (1WV)	
IR000210	Ø	Ø %	47 (1WV)		IR001410	Ø	Ø %	47 (1WV)	
IR000225	Ø	Ø %	116 (1WV)		IR001425	Ø	Ø %	116 (1WV)	
IR000310	Ø	Ø %	47 (1WV)		NOTES: Probes will be purged a minimum of 1 well volume (1WV) to a maximum of 3 well volumes (3WV). Purge times are based on a GEM 5000 instrument.  - on site 0600 - off site 0915				
IR000325	Ø	Ø %	116 (1WV)						
IR000410	Ø	Ø %	47 (1WV)						
IR000425	Ø	Ø %	116 (1WV)						
IR000510	Ø	Ø %	47 (1WV)						
IR000525	Ø	Ø %	116 (1WV)						
IR000610	Ø	Ø %	47 (1WV)						
IR000625	Ø	Ø %	116 (1WV)						
IR000710	Ø	Ø %	47 (1WV)						
IR000725	Ø	Ø %	116 (1WV)						
IR000810	Ø	Ø %	47 (1WV)						
IR000825	Ø	Ø %	116 (1WV)						
IR000910	Ø	Ø %	47 (1WV)						
IR000925	Ø	Ø %	116 (1WV)						
IR001010	Ø	Ø %	47 (1WV)						
IR001025	Ø	Ø %	116 (1WV)						
IR001110	Ø	Ø %	47 (1WV)						
IR001125	Ø	Ø %	116 (1WV)						
IR001210	Ø	Ø %	47 (1WV)						
IR001225	Ø	Ø %	116 (1WV)						



**LANDTEC CALIBRATION FORM**

DATE: 9/6/19 TIME: 0600 Inspector's Name: Pierce

MACHINE TYPE: GEM2000  OTHER  TYPE: GEM5000 MACHINE ID: 6505889

**SITE INFO & STORAGE:**

File: S:\GA90\DATA\_\_\_\_\_ .xls File: S:\GA90\DATA\_\_\_\_\_ .xls  
File: S:\GA90\DATA\_\_\_\_\_ .xls File: S:\GA90\DATA\_\_\_\_\_ .xls

**Methane Calibration Gas Used:**

<input checked="" type="checkbox"/> 5.0% <input type="checkbox"/> 50.0% (circle one)	MANUFACTURER	LOT #
15.0%CH4/15.0%CO2/0.0% O2	LANDTEC or CALGAZ	1022080
50.0%CH4/35.0%CO2/0.0% O2	LANDTEC or CALGAZ	
4%O2/96%N2	LANDTEC or CALGAZ	

RESET TO FACTORY SETTINGS? YES  NO

CALIBRATION GAS	CALIBRATION READINGS		RANGES	
<b>Zero Methane(CH<sub>4</sub>)</b> <i>(Not connected to calibration gas)</i>	Initial CH <sub>4</sub> Zero Reading	<u>0.2</u> %	<b>CH<sub>4</sub> ranges: 15% and 50%</b> 15% = min-14.0%--max-16.0% 50% = min-48.8%--max-51.2%	
	Final CH <sub>4</sub> Zeroed-Out Reading	<u>0</u> %		
<b>Span Methane(CH<sub>4</sub>)</b> <i>(Connect to calibration gas)</i>	Initial CH <sub>4</sub> Reading	<u>14.6</u> %	<b>In range? YES <input checked="" type="checkbox"/></b> NO <input type="checkbox"/>	
	Final Calibrated CH <sub>4</sub> Reading	<u>18.0</u> %		
<b>Span Carbon Dioxide (CO<sub>2</sub>)</b> <i>(Stay connected to calibration gas)</i>	Initial CO <sub>2</sub> Reading	<u>14.7</u> %	<b>CO<sub>2</sub> ranges: 15% and 35%</b> 15% = min-14.0%--max-16.0% 35% = min-34.2%--max-35.8%	
	Final Calibrated CO <sub>2</sub> Reading	<u>18.0</u> %		
<b>Zero Oxygen (O<sub>2</sub>)</b> <i>(Stay connected to calibration gas)</i>	Initial O <sub>2</sub> Reading	<u>0.3</u> %	<b>Zeroed O<sub>2</sub> range: 0.0%</b> min-0.0%--max-0.2%	
	Final Calibrated O <sub>2</sub> Reading	<u>0</u> %		
<b>Span Oxygen (O<sub>2</sub>)</b> <i>(Disconnect from calibration gas)</i>	Oxygen Ambient Air only	<u>20.8</u> %	<b>O<sub>2</sub> range: 20.8%</b> min-19.8%--max-21.8%	
	Initial O <sub>2</sub> Reading	<u>20.4</u> %		
	Final Calibrated O <sub>2</sub> Reading	<u>20.8</u> %		
<b>Calibration Check</b> <i>(Check ranges)</i>	Methane (CH <sub>4</sub> ) Reading	<u>18.0</u> % <i>(Read methane gas)</i>	Oxygen (O <sub>2</sub> ) Reading	<u>20.8</u> % <i>(Read ambient air)</i>

Calibration Complete? Yes  NO  If no, Why? \_\_\_\_\_

Inspector Signature: [Signature]

# CERTIFICATION OF CALIBRATION

ISSUED BY: QED Environmental Systems, Inc. Services Facility

Date Of Calibration: January 18, 2019

Certificate Number: G505889\_10/35684



No. 66916

Page 1 of 2



QED Environmental Systems, Inc. Services Facility,  
2355 Bishop Circle West, Dexter, MI 48130  
www.qedenv.com

Approved By Signatory

*Kyle Racine*  
Kyle Racine  
Laboratory Inspection

**Customer:** Geotech Environmental Equipment Inc

2650 E 40th Ave  
Denver, CO 80205  
USA

**Description:** Gas Analyser

**Model:** GEM5000

**Serial Number:** G505889

## Accredited Results:

Methane (CH <sub>4</sub> )		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.9	0.42
15.0	14.9	0.66
50.0	49.6	1.03

Carbon Dioxide (CO <sub>2</sub> )		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.8	0.43
15.0	14.7	0.71
50.0	49.7	1.19

Oxygen (O <sub>2</sub> )		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
20.7	20.7	0.25

Gas cylinders are traceable and details can be provided if requested.

CH<sub>4</sub>, CO<sub>2</sub> readings recorded at: 32.2 °C / 89.9 °F

Barometric Pressure: 29.15 "Hg

O<sub>2</sub> readings recorded at: 22.6 °C / 72.7 °F

Method of Test: The analyzer is calibrated in a temperature controlled chamber using reference gases. All analyzers are calibrated in accordance with our procedure ISP-17 using high purity grade gas.

All calibrations are performed in accordance with ISO 17025 at LANDTEC, an ISO 17025:2005 -- accredited service facility through PJLA.

The calibration results published in this certificate were obtained using equipment capable of producing results that are traceable through NIST to the International System of Units (SI). Certification only applies to results shown. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

# CERTIFICATION OF CALIBRATION

PJLA ACCREDITED CALIBRATION LABORATORY NO. 66916

Certificate Number  
G505889\_10/35684

Page 2 of 2

*The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with NIST requirements.*

## Non Accredited results:

Pressure Transducers (inches of water column)					
Transducer	Certified (Low)	Reading (Low)	Certified (High)	Reading (High)	Accuracy
Static	0"	0"	40"	40.10"	2.0"
Differential	0"	0"	4"	4.02"	0.7"

Barometer (mbar)	
Reference	Instrument Reading
0987 mbar / 29.15 "Hg	0990 mbar / 29.22 "Hg

Additional Gas Cells		
Gas	Certified Gas (ppm)	Instrument Reading (ppm)
CO	501	507
H2S	249.5	250

As received gas check readings are only recorded if the instrument is received in a working condition. Where the instrument is received damaged no reading can be taken.

End of Certificate

Calibration Instance: 1101 IGC Instance: N/A

1P0151NANIST-111

**WWW.LANDTECNA.COM**

QED Instrument Services Facility - 2353 Bishop Circle West, Dexter, MI. 48130



Engineering and Environmental Consultants, Inc.

555 E. River Road, Suite 301 | Tucson, Arizona 85704 | P: 520.321.4625

December 16, 2019

Ms. Lori Ehman  
City of Tucson  
Environmental & General Services Department  
4004 S. Park Avenue, Bldg. 2  
Tucson, Arizona 85714

**Re: Summary of Fourth Quarter 2019 Landfill Gas Monitoring at Irvington Landfill**

Dear Ms. Ehman:

EEC is pleased to submit the data package for the quarterly landfill gas monitoring at the Irvington Landfill. The monitoring was performed on November 21, 2019 to satisfy the requirement for the fourth quarter 2019 monitoring.

No methane was detected in any probe monitored. Where appropriate, EEC remarked probe nomenclature and lubed sticky padlocks. No unexpected items or problems were noted.

Let us know if you have any questions or concerns.

Sincerely,

**Engineering and Environmental Consultants, Inc.**

A handwritten signature in black ink, appearing to read 'Chad S. Hancock'.

Chad S. Hancock  
Field Services Manager

A handwritten signature in black ink, appearing to read 'Kevin A. Pierce'.

Kevin A. Pierce  
Senior Environmental Manager

Irvington Landfill  
Methane Monitoring  
Wells (all, quarterly)

Device ID	Date/Time	CH4	CO2	O2	Balance	Baro. Press.	Rel. Press.
		%	%	%	%	inches Hg	inches H2O
IR000110	11/21/2019 9:37	0	0.3	20.3	79.4	27.04	0
IR000125	11/21/2019 9:41	0	1.3	19	79.7	27.04	0
IR000210	11/21/2019 9:47	0	0.2	20.4	79.4	27.07	0
IR000225	11/21/2019 9:50	0	0.6	20.1	79.3	27.05	0
IR001010	11/21/2019 9:54	0	1.4	19.4	79.2	27.07	0
IR001025	11/21/2019 9:59	0	1.5	19.1	79.4	27.02	0
IR001110	11/21/2019 10:03	0	0.7	20	79.3	27.06	0
IR001125	11/21/2019 10:08	0	0.3	20.4	79.3	27.03	0
IR000310	11/21/2019 10:20	0	1.4	19.4	79.2	27.06	0
IR000325	11/21/2019 10:23	0	3	17.9	79.1	27.06	0
IR000410	11/21/2019 10:28	0	2	18.8	79.2	27.08	0
IR000425	11/21/2019 10:32	0	4.1	16.9	79	27.08	0
IR000510	11/21/2019 10:37	0	2.9	18.2	78.9	27.08	0
IR000525	11/21/2019 10:40	0	3.4	17.5	79.1	27.06	0
IR000610	11/21/2019 10:45	0	1.1	19.8	79.1	27.09	0
IR000625	11/21/2019 10:48	0	2.1	18.9	79	27.06	0
IR000710	11/21/2019 10:53	0	0.4	20.7	78.9	27.07	0
IR000725	11/21/2019 10:56	0	0.1	21.1	78.8	27.07	0
IR000810	11/21/2019 11:00	0	0.6	20.1	79.3	27.04	0
IR000825	11/21/2019 11:03	0	1	19.2	79.8	27.04	0
IR000910	11/21/2019 11:06	0	0.7	20	79.3	27.07	0
IR000925	11/21/2019 11:09	0	1.9	18.9	79.2	27.04	0
IR001410	11/21/2019 11:23	0	0.4	20.4	79.2	27.02	0
IR001425*	11/21/2019 11:27	N/A	N/A	N/A	N/A	N/A	0
IR001310	11/21/2019 11:34	0	0.5	20.2	79.3	27.03	0
IR001325	11/21/2019 11:37	0	0.9	19.6	79.5	27.05	0
IR001210	11/21/2019 11:53	0	0.5	20.3	79.2	27.06	0
IR001225	11/21/2019 11:58	0	0.9	19.6	79.5	27.06	0

Note:

GEM5000 ID: G505889

Monitored by: K. Pierce (EEC)

GEM5000 was calibrated using 15% methane (see K.P. calibration sheet for this date).

Pressure readings were taken with a Dywer Model 476A digital manometer.

Accuracy of the machine is +/-0.3% at methane concentrations of less than <5.0%.

\*The instrument appears to have malfunctioned while saving the reading at IR001425, the field sheet indicates 0% CH4.



CITY OF  
TUCSON

METHANE MONITORING FIELD FORM  
IRVINGTON

GEM ID: G505889

Inspector Name: Pierce

Manometer ID: Dwyer 476A

Date: 11 / 21 / 19

Weather Condition: Cloudy 51°

Barometric Pressure: 27.04"

Probe ID	Pressure (H <sub>2</sub> O) Reading	Methane (CH <sub>4</sub> ) Reading	Purge Times (seconds)	Notes	Probe ID	Pressure (H <sub>2</sub> O) Reading	Methane (CH <sub>4</sub> ) Reading	Purge Times (seconds)	Notes
IR000110	0	0 %	47 (1WV)		IR001310	0	0 %	47 (1WV)	
IR000125	0	0 %	116 (1WV)		IR001325	0	0 %	116 (1WV)	
IR000210	0	0 %	47 (1WV)		IR001410	0	0 %	47 (1WV)	
IR000225	0	0 %	116 (1WV)		IR001425	0	0 %	116 (1WV)	
IR000310	0	0 %	47 (1WV)		NOTES: Probes will be purged a minimum of 1 well volume (1WV) to a maximum of 3 well volumes (3WV). Purge times are based on a GEM 5000 instrument.  on site 0930 off site 1230				
IR000325	0	0 %	116 (1WV)						
IR000410	0	0 %	47 (1WV)						
IR000425	0	0 %	116 (1WV)						
IR000510	0	0 %	47 (1WV)						
IR000525	0	0 %	116 (1WV)						
IR000610	0	0 %	47 (1WV)						
IR000625	0	0 %	116 (1WV)						
IR000710	0	0 %	47 (1WV)						
IR000725	0	0 %	116 (1WV)						
IR000810	0	0 %	47 (1WV)						
IR000825	0	0 %	116 (1WV)						
IR000910	0	0 %	47 (1WV)						
IR000925	0	0 %	116 (1WV)						
IR001010	0	0 %	47 (1WV)						
IR001025	0	0 %	116 (1WV)						
IR001110	0	0 %	47 (1WV)						
IR001125	0	0 %	116 (1WV)						
IR001210	0	0 %	47 (1WV)						
IR001225	0	0 %	116 (1WV)						





CITY OF TUCSON ENVIRONMENTAL SERVICES LANDTEC CALIBRATION FORM

DATE: 11/21/19 TIME: 0820 Inspector's Name: Pierce

MACHINE TYPE: GEM2000 OTHER: TYPE: GEM5000 MACHINE ID: 6505889

SITE INFO & STORAGE:

File: S:\GA90\DATA.xls File: S:\GA90\DATA.xls
File: S:\GA90\DATA.xls File: S:\GA90\DATA.xls

Methane Calibration Gas Used:

Table with columns: (circle one) 15.0% 50.0%, MANUFACTURER, LOT #. Rows include 15.0% CH4/15.0% CO2/0.0% O2 and 50.0% CH4/35.0% CO2/0.0% O2.

RESET TO FACTORY SETTINGS? YES [X] NO [ ]

Main calibration data table with columns: CALIBRATION GAS, CALIBRATION READINGS, RANGES. Rows include Zero Methane, Span Methane, Span Carbon Dioxide, Zero Oxygen, Span Oxygen, and Calibration Check.

# CERTIFICATION OF CALIBRATION

ISSUED BY: QED Environmental Systems, Inc. Services Facility

Date Of Calibration: January 18, 2019

Certificate Number: G505889\_10/35684



No. 66916

Page 1 of 2



QED Environmental Systems, Inc. Services Facility,  
2355 Bishop Circle West, Dexter, MI 48130  
www.qedenv.com

Approved By Signatory

*Kyle Racine*  
Kyle Racine  
Laboratory Inspection

**Customer:** *Geotech Environmental Equipment, Inc*  
2650 E 40th Ave  
Denver, CO 80205  
USA

**Description:** Gas Analyser

**Model:** GEM5000

**Serial Number:** G505889

**Accredited Results:**

Methane (CH <sub>4</sub> )		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.9	0.42
15.0	14.9	0.66
50.0	49.6	1.03

Carbon Dioxide (CO <sub>2</sub> )		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.8	0.43
15.0	14.7	0.71
50.0	49.7	1.19

Oxygen (O <sub>2</sub> )		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
20.7	20.7	0.25

Gas cylinders are traceable and details can be provided if requested.

CH<sub>4</sub>, CO<sub>2</sub> readings recorded at: 32.2 °C/89.9 °F Barometric Pressure: 29.15 "Hg

O<sub>2</sub> readings recorded at: 22.6 °C/72.7 °F

Method of Test: The analyzer is calibrated in a temperature controlled chamber using reference gases. All analyzers are calibrated in accordance with our procedure ISP-17 using high purity grade gas.

All calibrations are performed in accordance with ISO 17025 at LANDTEC, an ISO 17025:2005 – accredited service facility through PJLA.

The calibration results published in this certificate were obtained using equipment capable of producing results that are traceable through NIST to the International System of Units (SI). Certification only applies to results shown. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

# CERTIFICATION OF CALIBRATION

PILA ACCREDITED CALIBRATION LABORATORY NO. 66916

Certificate Number  
G505889\_10/35684

Page 2 of 2

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with NIST requirements.

## Non Accredited results:

Pressure Transducers (inches of water column)					
Transducer	Certified (Low)	Reading (Low)	Certified (High)	Reading (High)	Accuracy
Static	0"	0"	40"	40.10"	2.0"
Differential	0"	0"	4"	4.02"	0.7"

Barometer (mbar)	
Reference	Instrument Reading
0987 mbar / 29.15 "Hg	0990 mbar / 29.22 "Hg

Additional Gas Cells		
Gas	Certified Gas (ppm)	Instrument Reading (ppm)
CO	501	507
H2S	249.5	250

As received gas check readings are only recorded if the instrument is received in a working condition. Where the instrument is received damaged no reading can be taken.

End of Certificate

Calibration Instance: 101 ICG Reference: N/A

LF0131NANIST-1.1

[WWW.LANDTECNA.COM](http://WWW.LANDTECNA.COM)

QED Instrument Services Facility - 2355 Bishop Circle West, Dexter, MI. 48130

## **Appendix B**

### **Landfill Site Inspection Reports**

**CITY OF TUCSON ENVIRONMENTAL SERVICES  
 QUARTERLY CLOSED LANDFILL INSPECTION REPORT  
 IRVINGTON LANDFILL**

INSPECTION ITEM	DISCREPANCY	CORRECTIVE ACTION
<b>Perimeter Security Fence and Gate</b> (holes, structure issues)	The concrete footers of several fence poles along the southern and eastern perimeter fence are exposed and being undermined by runoff.	Fill and compact soil around the fence pole footers.
<b>Inspection Roads</b> (washouts, obstructions, potholes)	Erosion rills observed along the southern and western inspection road.	Fill and compact the erosion area.
<b>Storm Water Controls</b> (berms, let downs, spillways)	Sediment accumulating in top section of the basin drainage channel.	Remove sediment to allow flow of stormwater to continue into channel and onto basin.
<b>Storm Water Retention Basins</b> (washouts, excessive silt in, holding water)	No discrepancies observed	Not Applicable
<b>Landfill Earthen Cap</b> (washouts, trash showing, debris and trash)	No discrepancies observed	Not Applicable
<b>Landfill Gas Extraction System Wellfield</b> (piping, wells, vaults, washouts)	No gas extraction system on-site.	Not Applicable
<b>Landfill Gas Extraction System Compound</b> (fencing, blower equipment, flare, carbon canisters)	No gas extraction system on-site.	Not Applicable
<b>Landfill Gas Monitoring Wells</b> (including bollards, vaults, locks)	No discrepancies observed	Not Applicable
<b>Groundwater Monitoring Wells</b> (including bollards, vaults, locks)	No discrepancies observed	Not Applicable
<b>Remediation Equipment</b> (compound fence, erosions, leaks)	No remediation equipment on-site	Not Applicable
<b>Illegal Dumping</b> (including overgrown vegetation, homeless camps, vectors)	No illegal dumping observed	Not Applicable
<b>Neighboring Land Uses</b> (changing adjacent land uses that will or currently are impacting the landfill site)	No new land uses observed	Not Applicable
<b>INSPECTOR SIGNATURE</b>  Thomas Ryan, EGSD Engineering Manager		<b>Date: Feb. 14, 2019</b>  <b>Quarter: 1</b>

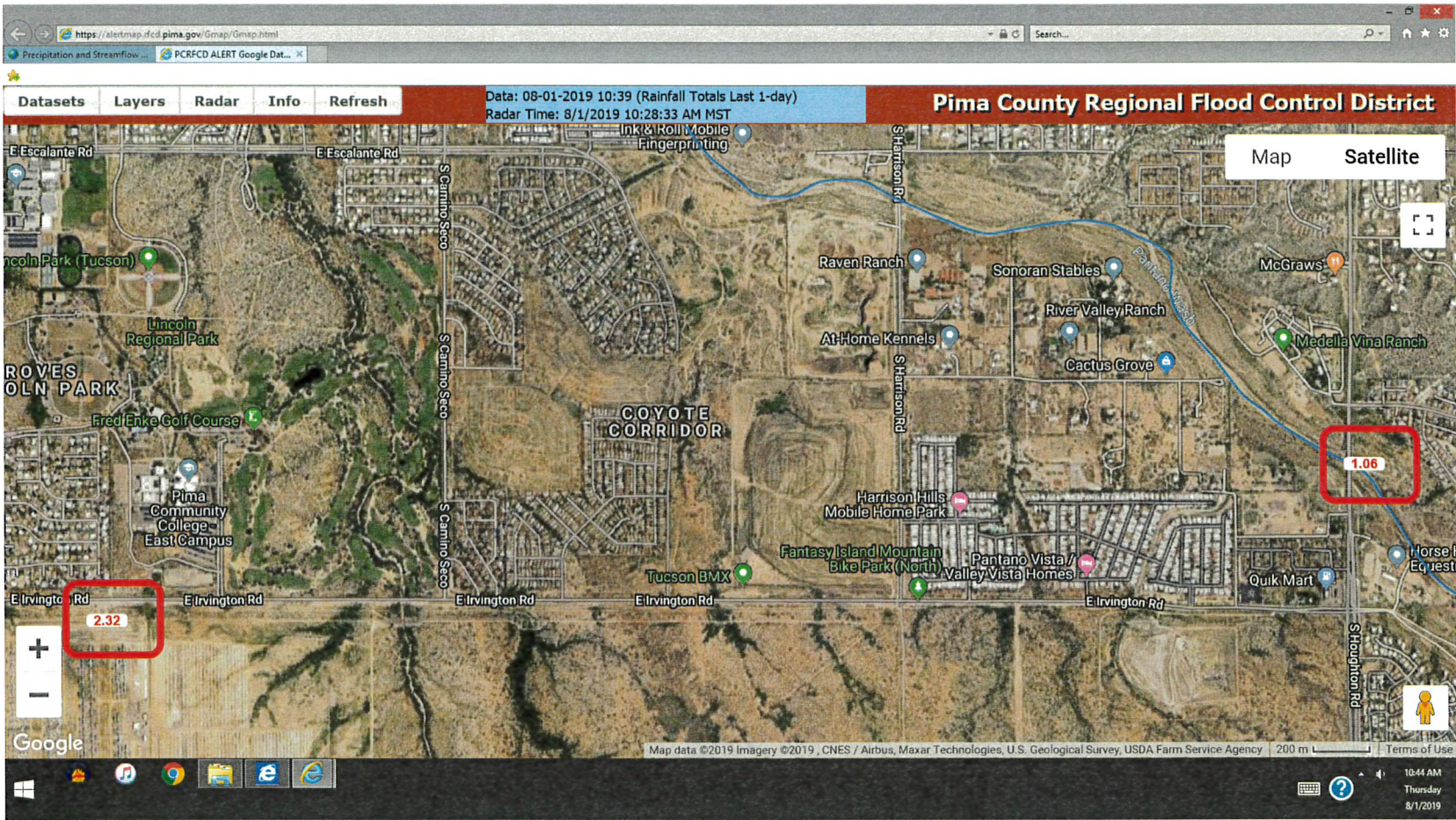
**CITY OF TUCSON ENVIRONMENTAL SERVICES  
 QUARTERLY CLOSED LANDFILL INSPECTION REPORT  
 IRVINGTON LANDFILL**

INSPECTION ITEM	DISCREPANCY	CORRECTIVE ACTION
<b>Perimeter Security Fence and Gate</b> (holes, structure issues)	The concrete footers of several fence poles along the southern and eastern perimeter fence are exposed and being undermined by runoff.	Fill and compact soil around the fence pole footers.
<b>Inspection Roads</b> (washouts, obstructions, potholes)	Erosion rills observed along the southern and western inspection road.	Fill and compact the erosion area.
<b>Storm Water Controls</b> (berms, let downs, spillways)	Sediment accumulating in top section of the basin drainage channel.	Remove sediment to allow flow of stormwater to continue into channel and onto basin.
<b>Storm Water Retention Basins</b> (washouts, excessive silt in, holding water)	No discrepancies observed	Not Applicable
<b>Landfill Earthen Cap</b> (washouts, trash showing, debris and trash)	No discrepancies observed	Not Applicable
<b>Landfill Gas Extraction System Wellfield</b> (piping, wells, vaults, washouts)	No gas extraction system on-site.	Not Applicable
<b>Landfill Gas Extraction System Compound</b> (fencing, blower equipment, flare, carbon canisters)	No gas extraction system on-site.	Not Applicable
<b>Landfill Gas Monitoring Wells</b> (including bollards, vaults, locks)	No discrepancies observed	Not Applicable
<b>Groundwater Monitoring Wells</b> (including bollards, vaults, locks)	No discrepancies observed	Not Applicable
<b>Remediation Equipment</b> (compound fence, erosions, leaks)	No remediation equipment on-site	Not Applicable
<b>Illegal Dumping</b> (including overgrown vegetation, homeless camps, vectors)	No illegal dumping observed	Not Applicable
<b>Neighboring Land Uses</b> (changing adjacent land uses that will or currently are impacting the landfill site)	No new land uses observed	Not Applicable
<b>INSPECTOR SIGNATURE</b>  Thomas Ryan, EGSD Engineering Manager		<b>Date: May 15, 2019</b>  <b>Quarter: 2</b>

**CITY OF TUCSON ENVIRONMENTAL SERVICES  
WEATHER EVENT INSPECTION REPORT  
IRVINGTON LANDFILL**

INSPECTION ITEM	DISCREPANCY	CORRECTIVE ACTION
<b>Perimeter Security Fence and Gate</b> (holes, structure issues)	No discrepancy	
<b>Inspection Roads</b> (washouts, obstructions, potholes)	South perimeter road impassible (erosion and wash). Minor erosional rills on west perimeter road	Re-evaluate after conclusion of Monsoon season.
<b>Storm Water Controls</b> (berms, let downs, spillways)	No discrepancy	
<b>Storm Water Retention Basins</b> (washouts, excessive silt in, holding water)	No discrepancy	
<b>Landfill Earthen Cap</b> (washouts, trash showing, debris and trash)	No discrepancy	
<b>Landfill Gas Extraction System Wellfield</b> (piping, wells, vaults, washouts)	None	
<b>Landfill Gas Extraction System Compound</b> (fencing, blower equipment, flare, carbon canisters)	None	
<b>Landfill Gas Monitoring Wells</b> (including bollards, vaults, locks)	No discrepancy	
<b>Groundwater Monitoring Wells</b> (including bollards, vaults, locks)	No discrepancy	
<b>Remediation Equipment</b> (compound fence, erosions, leaks)	None	
<b>Illegal Dumping</b> (including overgrown vegetation, homeless camps, vectors)	None	
<b>Neighboring Land Uses</b> (changing adjacent land uses that will or currently are impacting the landfill site)	No changes or impacts	
<b>INSPECTOR SIGNATURE</b> Kevin Pierce, EEC	<b>EVENT TYPE</b> Rainfall (1.06")	<b>DATE</b> 7/31/19

# 7/31/19 Rainfall Harrison and Irvington Landfills





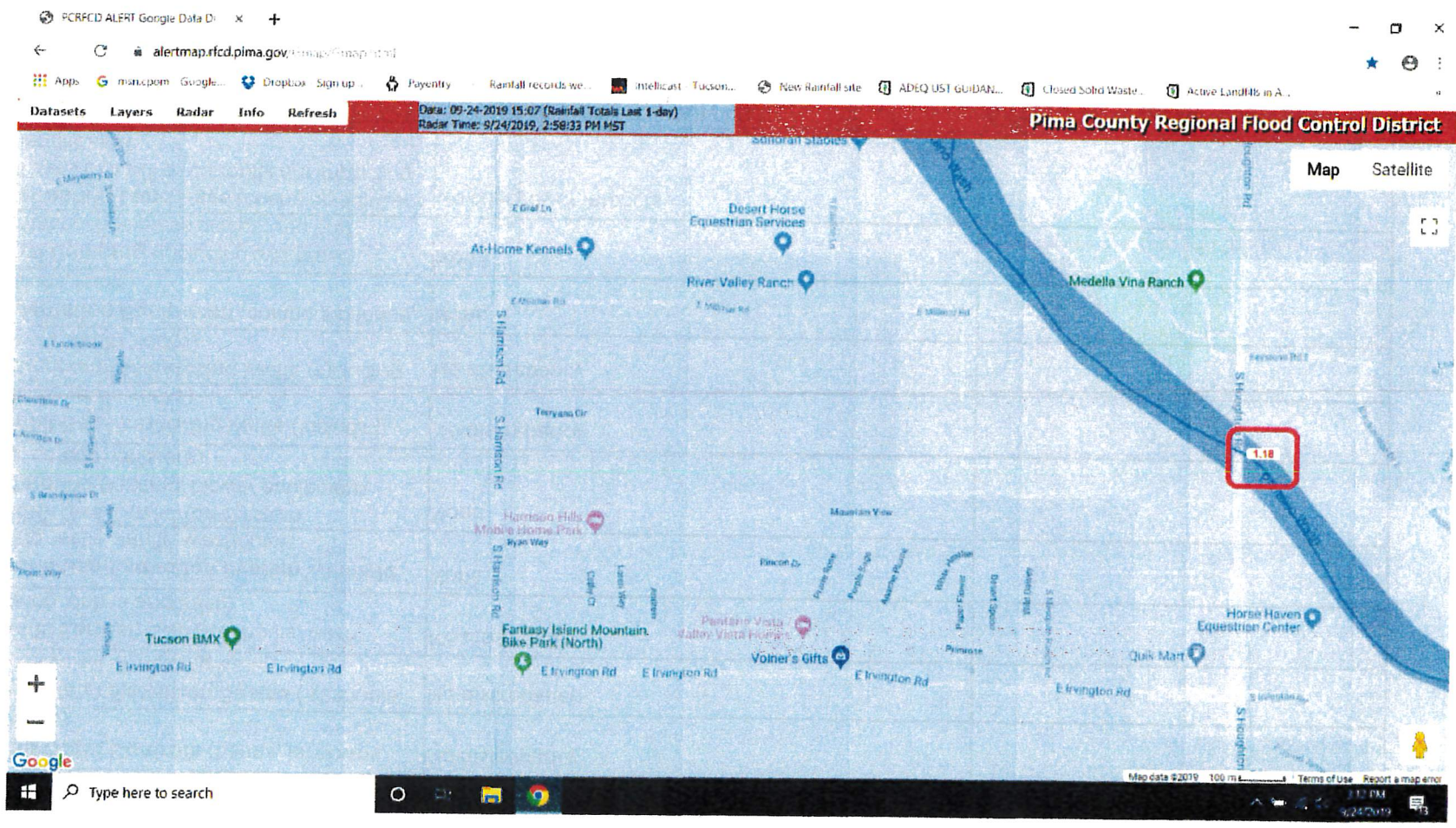
**CITY OF TUCSON ENVIRONMENTAL SERVICES  
 QUARTERLY CLOSED LANDFILL INSPECTION REPORT  
 IRVINGTON LANDFILL**

INSPECTION ITEM	DISCREPANCY	CORRECTIVE ACTION
<b>Perimeter Security Fence and Gate</b> (holes, structure issues)	No Discrepancy	None needed
<b>Inspection Roads</b> (washouts, obstructions, potholes)	Major erosion on south perimeter road. Minor erosional rills on west perimeter road.	Identify corrective action after conclusion of monsoon season
<b>Storm Water Controls</b> (berms, let downs, spillways)	No Discrepancy	None needed
<b>Storm Water Retention Basins</b> (washouts, excessive silt in, holding water)	No Discrepancy	None needed
<b>Landfill Earthen Cap</b> (washouts, trash showing, debris and trash)	No Discrepancy	None needed
<b>Landfill Gas Extraction System Wellfield</b> (piping, wells, vaults, washouts)	None	None needed
<b>Landfill Gas Extraction System Compound</b> (fencing, blower equipment, flare, carbon canisters)	None	None needed
<b>Landfill Gas Monitoring Wells</b> (including bollards, vaults, locks)	No Discrepancy	None needed
<b>Groundwater Monitoring Wells</b> (including bollards, vaults, locks)	No Discrepancy	None needed
<b>Remediation Equipment</b> (compound fence, erosions, leaks)	None	None needed
<b>Illegal Dumping</b> (including overgrown vegetation, homeless camps, vectors)	None	None needed
<b>Neighboring Land Uses</b> (changing adjacent land uses that will or currently are impacting the landfill site)	No Changes or Impacts	None needed
<b>INSPECTOR SIGNATURE</b>  Thomas Ryan, EGSD Engineering Manager	<b>Date:</b> August 13, 2019	
	Third Quarter Inspection	

**CITY OF TUCSON ENVIRONMENTAL SERVICES  
WEATHER EVENT INSPECTION REPORT  
IRVINGTON LANDFILL**

INSPECTION ITEM	DISCREPANCY	CORRECTIVE ACTION
Perimeter Security Fence and Gate (holes, structure issues)	No discrepancy	
Inspection Roads (washouts, obstructions, potholes)	South perimeter road impassible (erosion and wash). <u>Minor erosional rills on west perimeter road</u>	Re-evaluate after conclusion of Monsoon season.
Storm Water Controls (berms, let downs, spillways)	No discrepancy	
Storm Water Retention Basins (washouts, excessive silt in, holding water)	No discrepancy	
Landfill Earthen Cap (washouts, trash showing, debris and trash)	No discrepancy	
Landfill Gas Extraction System Wellfield (piping, wells, vaults, washouts)	None	
Landfill Gas Extraction System Compound (fencing, blower equipment, flare, carbon canisters)	None	
Landfill Gas Monitoring Wells (including bollards, vaults, locks)	No discrepancy	
Groundwater Monitoring Wells (including bollards, vaults, locks)	No discrepancy	
Remediation Equipment (compound fence, erosions, leaks)	None	
Illegal Dumping (including overgrown vegetation, homeless camps, vectors)	None	
Neighboring Land Uses (changing adjacent land uses that will or currently are impacting the landfill site)	No changes or impacts	
INSPECTOR SIGNATURE Kevin Pierce, EEC	EVENT TYPE Rainfall (1.81")	DATE: 9/26/19 (Event 9/24 & 25/19)

# 9/24/19 Rainfall Event Irvington Landfill



**CITY OF TUCSON ENVIRONMENTAL SERVICES  
WEATHER EVENT INSPECTION REPORT  
IRVINGTON LANDFILL**

INSPECTION ITEM	DISCREPANCY	CORRECTIVE ACTION
<b>Perimeter Security Fence and Gate</b> (holes, structure issues)	No discrepancy	
<b>Inspection Roads</b> (washouts, obstructions, potholes)	South perimeter road impassible (erosion and wash). Minor erosional rills on west perimeter road	Monitor and assess during annual inspection
<b>Storm Water Controls</b> (berms, let downs, spillways)	No discrepancy	
<b>Storm Water Retention Basins</b> (washouts, excessive silt in, holding water)	No discrepancy	
<b>Landfill Earthen Cap</b> (washouts, trash showing, debris and trash)	No discrepancy	
<b>Landfill Gas Extraction System Wellfield</b> (piping, wells, vaults, washouts)	None	
<b>Landfill Gas Extraction System Compound</b> (fencing, blower equipment, flare, carbon canisters)	None	
<b>Landfill Gas Monitoring Wells</b> (including bollards, vaults, locks)	No discrepancy	
<b>Groundwater Monitoring Wells</b> (including bollards, vaults, locks)	No discrepancy	
<b>Remediation Equipment</b> (compound fence, erosions, leaks)	None	
<b>Illegal Dumping</b> (including overgrown vegetation, homeless camps, vectors)	None	
<b>Neighboring Land Uses</b> (changing adjacent land uses that will or currently are impacting the landfill site)	No changes or impacts	
<b>INSPECTOR SIGNATURE</b> Kevin Pierce, EEC	<b>EVENT TYPE</b> Wind	<b>DATE:</b> 11-13-19 (Event 11-12-19)

# Tucson, AZ

Tucson International

© 2:11 PM MST on November 12, 2019 (GMT -0700)

## Weather History for KTUS - November, 2019

November

12

2019

### View

Tuesday, November 12, 2019

<b>Daily</b>	Weekly	Monthly	Custom
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	Actual	Average	Record
Temperature			
Mean Temperature	64 °F	61 °F	
Max Temperature	73 °F	75 °F	90 °F (1999)
Min Temperature	55 °F	47 °F	25 °F (1898)
Degree Days			
Heating Degree Days	2	5	
Month to date heating degree days		43	
Since 1 July heating degree days		67	
Cooling Degree Days	0	1	
Month to date cooling degree days		21	
Year to date cooling degree days		3140	
Growing Degree Days	14 (Base 50)		
Moisture			

<b>Nov. 12, 2019</b>	<b>Rise</b>	<b>Set</b>
<u>Civil Twilight</u>	6:24 AM MST	5:51 PM MST
<u>Nautical Twilight</u>	5:54 AM MST	6:20 PM MST
<u>Astronomical Twilight</u>	5:25 AM MST	6:49 PM MST
<b>Moon</b>	5:53 PM MST	6:47 AM MST
<u>Length of Visible Light</u>	11h 27m	
<u>Length of Day</u>	10h 35m	

**Full, 100% of the Moon is illuminated**

Today	Nov 19	Nov 26	Dec 3	Dec 11
Full	Last Quarter	New	First Quarter	Full

### Hourly Weather History & Observations

Time (MST)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
12:53 AM	61.0 °F	41.0 °F	48%	30.02 in	10.0 mi	SE	4.6 mph	-	N/A		Mostly Cloudy
METAR KTUS 120753Z 14004KT 10SM FEW090 BKN120 16/05 A3012 RMK AO2 SLP165 T01610050											
1:53 AM	59.0 °F	42.1 °F	53%	30.03 in	10.0 mi	SE	5.8 mph	-	N/A		Clear
METAR KTUS 120853Z 14005KT 10SM CLR 15/06 A3012 RMK AO2 SLP167 T01500056 51006											
2:53 AM	55.9 °F	42.1 °F	60%	30.02 in	10.0 mi	SW	5.8 mph	-	N/A		Clear
METAR KTUS 120953Z 23005KT 10SM CLR 13/06 A3011 RMK AO2 SLP165 T01330056											
3:53 AM	63.0 °F	46.0 °F	54%	30.01 in	10.0 mi	ESE	10.4 mph	-	N/A		Clear
METAR KTUS 121053Z 11009KT 10SM CLR 17/08 A3012 RMK AO2 SLP163 T01720078											
4:53 AM	63.0 °F	44.1 °F	50%	30.03 in	10.0 mi	ESE	16.1 mph	-	N/A		Clear
METAR KTUS 121153Z 11014KT 10SM CLR 17/07 A3013 RMK AO2 SLP169 T01720067 10172 20128 53004											
5:53 AM	60.1 °F	41.0 °F	49%	30.06 in	10.0 mi	ESE	13.8 mph	20.7 mph	N/A		Clear
METAR KTUS 121253Z 12012G18KT 10SM CLR 16/05 A3016 RMK AO2 SLP179 T01560050											
6:53 AM	60.1 °F	39.9 °F	47%	30.09 in	10.0 mi	SE	12.7 mph	-	N/A		Clear

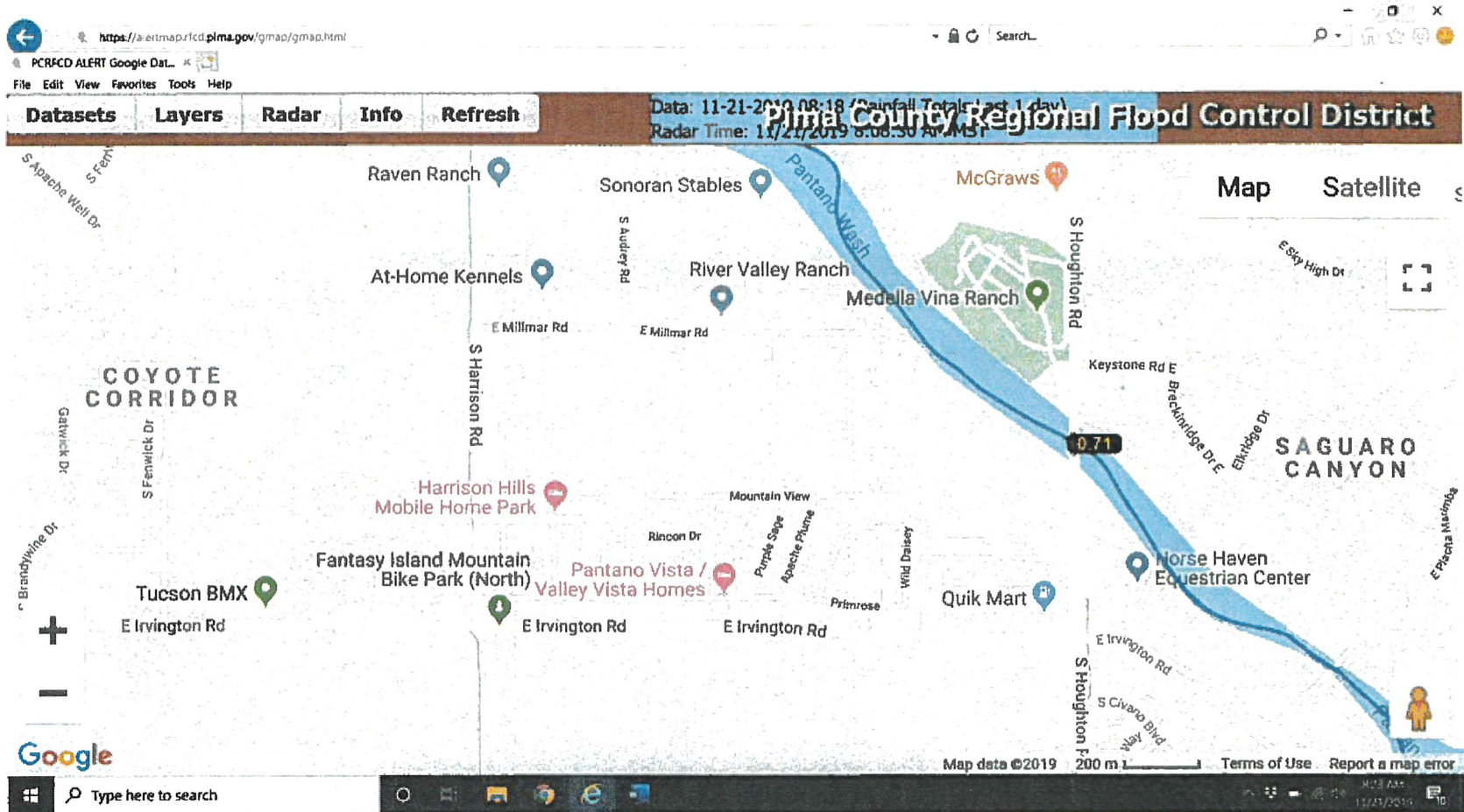
Time (MST)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Gust Speed	Precip	Events	Conditions
	METAR KTUS 121353Z 13011KT 10SM CLR 16/04 A3018 RMK AO2 SLP188 T01560044										
7:53 AM	60.1 °F	39.0 °F	46%	30.11 in	10.0 mi	ESE	20.7 mph	-	N/A		Clear
	METAR KTUS 121453Z 12018KT 10SM CLR 16/04 A3019 RMK AO2 SLP194 T01560039 51017										
8:53 AM	62.1 °F	37.0 °F	39%	30.12 in	10.0 mi	SE	23.0 mph	35.7 mph	N/A		Clear
	METAR KTUS 121553Z 13020G31KT 10SM CLR 17/03 A3020 RMK AO2 PK WND 13031/1547 SLP198 T01670028										
9:53 AM	64.9 °F	37.9 °F	37%	30.10 in	10.0 mi	ESE	23.0 mph	35.7 mph	N/A		Clear
	METAR KTUS 121653Z 12020G31KT 10SM CLR 18/03 A3019 RMK AO2 PK WND 13035/1618 SLP193 T01830033										
10:53 AM	66.9 °F	37.9 °F	34%	30.08 in	10.0 mi	ESE	29.9 mph	43.7 mph	N/A		Clear
	METAR KTUS 121753Z 12026G38KT 10SM CLR 19/03 A3017 RMK AO2 PK WND 12038/1752 SLP186 T01940033 10194 20150 58007										
11:53 AM	70.0 °F	37.0 °F	30%	30.06 in	10.0 mi	SE	28.8 mph	38.0 mph	N/A		Clear
	METAR KTUS 121853Z 13025G33KT 10SM CLR 21/03 A3016 RMK AO2 PK WND 12034/1842 SLP180 T02110028										
12:53 PM	72.0 °F	37.0 °F	28%	30.03 in	10.0 mi	ESE	26.5 mph	36.8 mph	N/A		Clear
	METAR KTUS 121953Z 12023G32KT 10SM CLR 22/03 A3013 RMK AO2 PK WND 13036/1904 SLP169 T02220028										
1:53 PM	73.0 °F	36.0 °F	26%	30.01 in	10.0 mi	ESE	18.4 mph	29.9 mph	N/A		Clear
	METAR KTUS 122053Z 12016G26KT 10SM CLR 23/02 A3010 RMK AO2 PK WND 12032/1955 SLP161 T02280022 58022										

**CITY OF TUCSON ENVIRONMENTAL SERVICES  
WEATHER EVENT INSPECTION REPORT  
IRVINGTON LANDFILL**

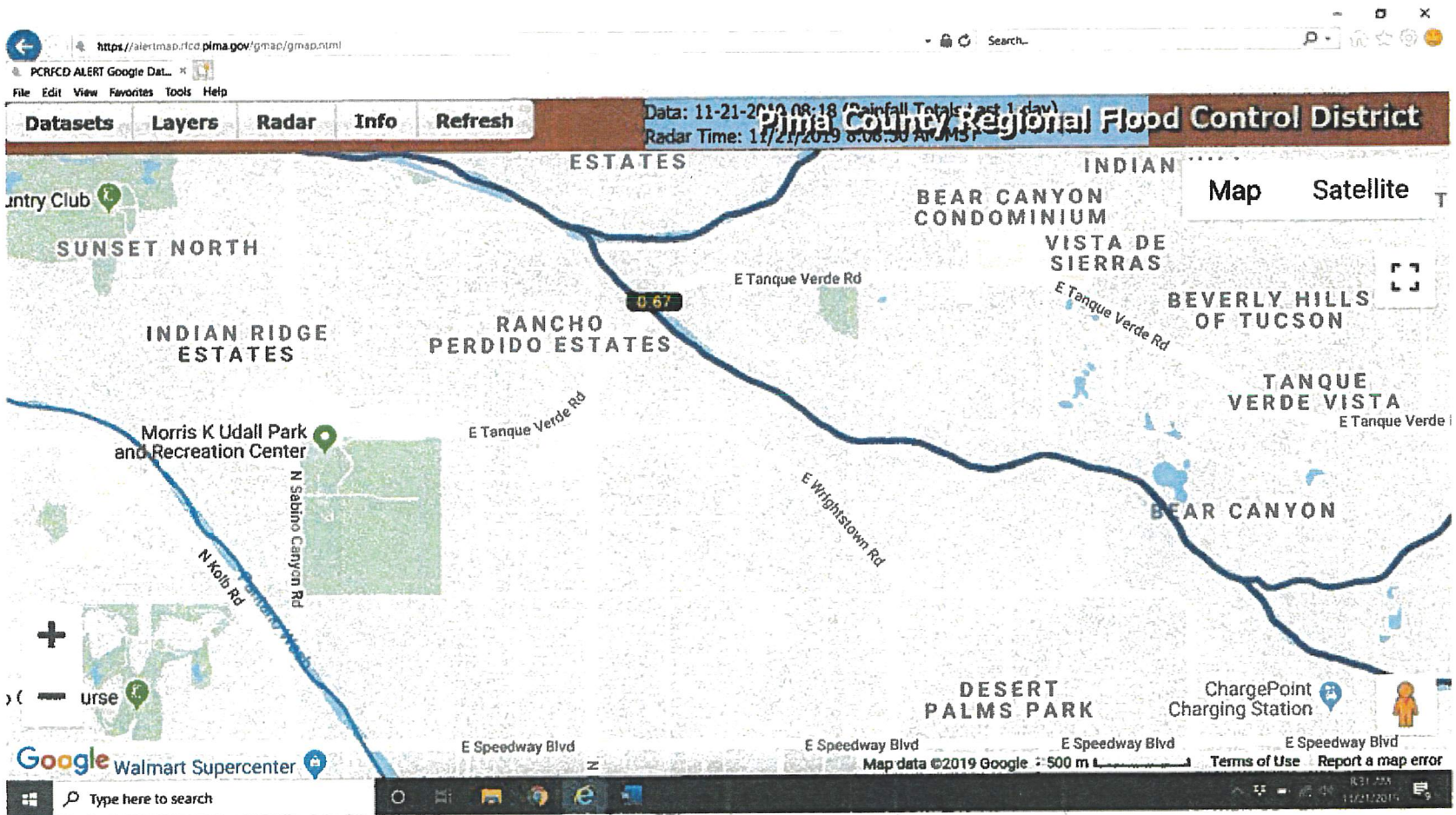
INSPECTION ITEM	DISCREPANCY	CORRECTIVE ACTION
<b>Perimeter Security Fence and Gate</b> (holes, structure issues)	No discrepancy	
<b>Inspection Roads</b> (washouts, obstructions, potholes)	South perimeter road impassible (erosion and wash). Minor erosional rills on west perimeter road	Re-evaluate after conclusion of Monsoon season.
<b>Storm Water Controls</b> (berms, let downs, spillways)	No discrepancy	
<b>Storm Water Retention Basins</b> (washouts, excessive silt in, holding water)	No discrepancy	
<b>Landfill Earthen Cap</b> (washouts, trash showing, debris and trash)	No discrepancy	
<b>Landfill Gas Extraction System Wellfield</b> (piping, wells, vaults, washouts)	None	
<b>Landfill Gas Extraction System Compound</b> (fencing, blower equipment, flare, carbon canisters)	None	
<b>Landfill Gas Monitoring Wells</b> (including bollards, vaults, locks)	No discrepancy	
<b>Groundwater Monitoring Wells</b> (including bollards, vaults, locks)	No discrepancy	
<b>Remediation Equipment</b> (compound fence, erosions, leaks)	None	
<b>Illegal Dumping</b> (including overgrown vegetation, homeless camps, vectors)	None	
<b>Neighboring Land Uses</b> (changing adjacent land uses that will or currently are impacting the landfill site)	No changes or impacts	
<b>INSPECTOR SIGNATURE</b> Kevin Pierce, EEC	<b>EVENT TYPE:</b> Rainfall (0.71")	<b>DATE:</b> 11/20/19



# Harrison/Irvington Rain Event 24 hours 11/20/19 8AM to 11/21/19 8AM



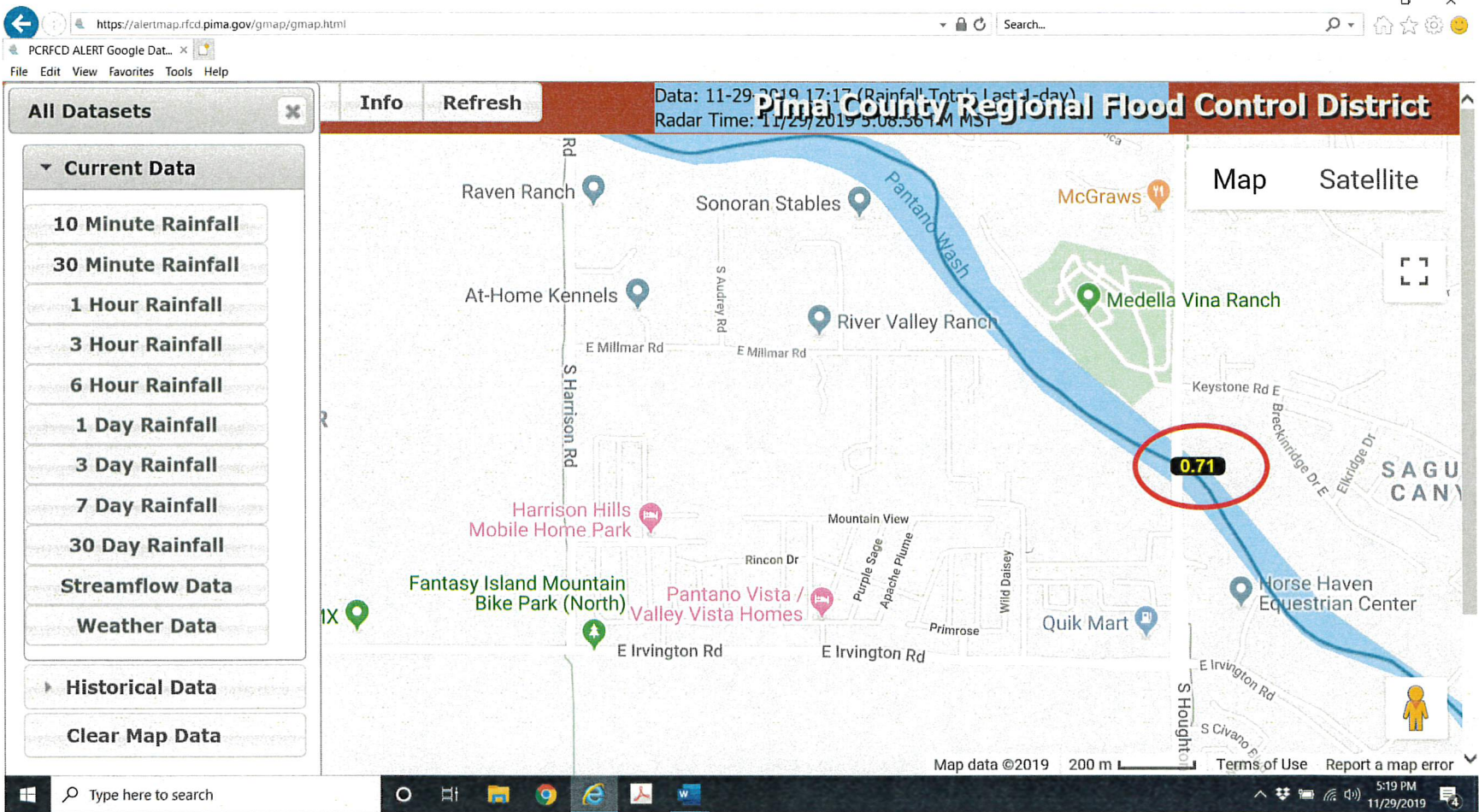
Mullins Rain Event 24hrs printed 11-21-19 8AM



**CITY OF TUCSON ENVIRONMENTAL SERVICES  
WEATHER EVENT INSPECTION REPORT  
IRVINGTON LANDFILL**

INSPECTION ITEM	DISCREPANCY	CORRECTIVE ACTION
<b>Perimeter Security Fence and Gate</b> (holes, structure issues)	No discrepancy	
<b>Inspection Roads</b> (washouts, obstructions, potholes)	South perimeter road impassible (erosion and wash). Increasing erosional rills on west perimeter road	Re-evaluate after conclusion of Monsoon season.
<b>Storm Water Controls</b> (berms, let downs, spillways)	No discrepancy	
<b>Storm Water Retention Basins</b> (washouts, excessive silt in, holding water)	No discrepancy	
<b>Landfill Earthen Cap</b> (washouts, trash showing, debris and trash)	No discrepancy	
<b>Landfill Gas Extraction System Wellfield</b> (piping, wells, vaults, washouts)	None	
<b>Landfill Gas Extraction System Compound</b> (fencing, blower equipment, flare, carbon canisters)	None	
<b>Landfill Gas Monitoring Wells</b> (including bollards, vaults, locks)	No discrepancy	
<b>Groundwater Monitoring Wells</b> (including bollards, vaults, locks)	No discrepancy	
<b>Remediation Equipment</b> (compound fence, erosions, leaks)	None	
<b>Illegal Dumping</b> (including overgrown vegetation, homeless camps, vectors)	None	
<b>Neighboring Land Uses</b> (changing adjacent land uses that will or currently are impacting the landfill site)	No changes or impacts	
<b>INSPECTOR SIGNATURE</b> Kevin Pierce, EEC	<b>EVENT TYPE: Rainfall (0.71")</b>	<b>DATE: 11/28 &amp; 29/19</b>

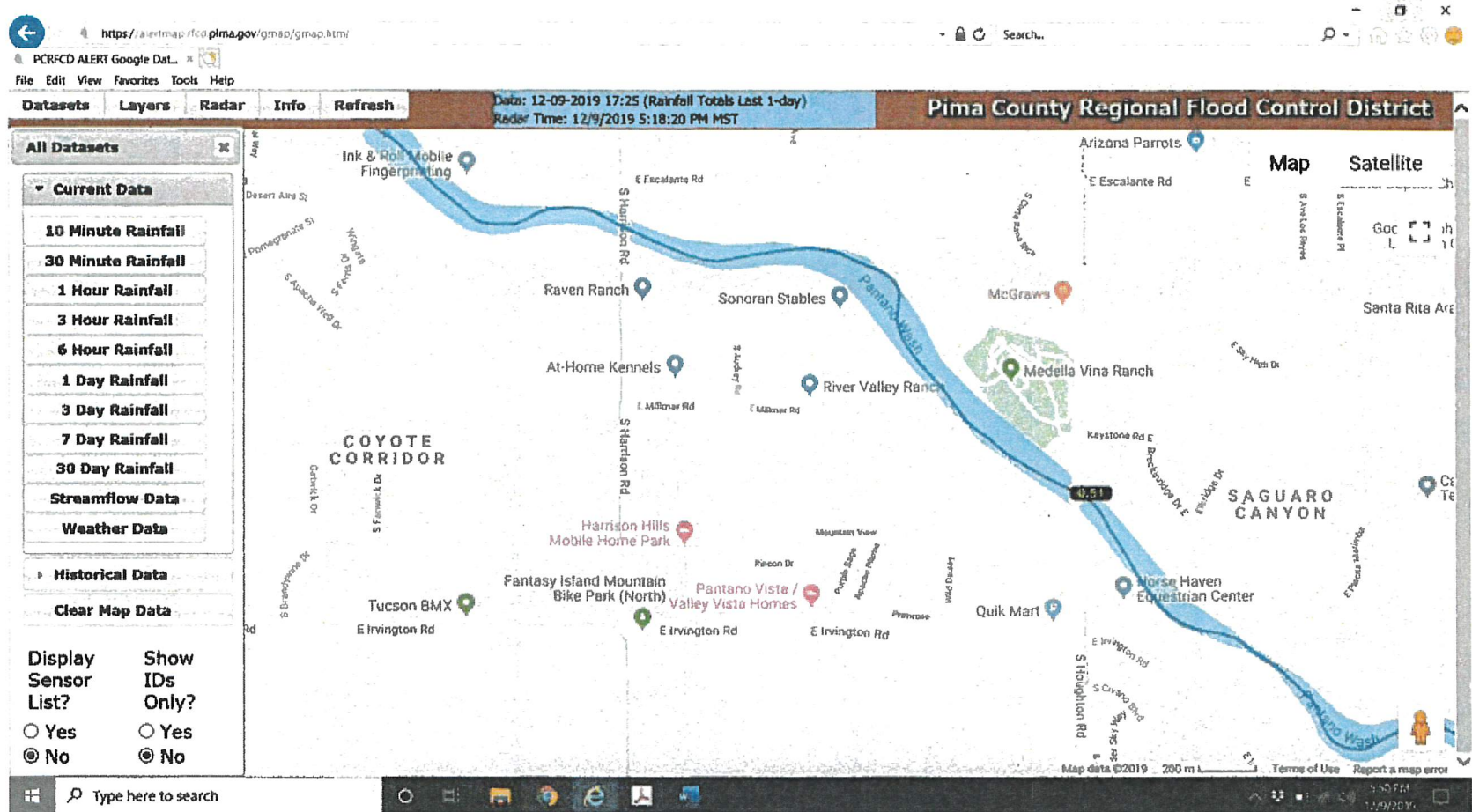
Rainfall Event 11-28 & 29 Harrison and Irvington Last 24 hours printed 11-29-19 @5:21 PM



**CITY OF TUCSON ENVIRONMENTAL SERVICES  
WEATHER EVENT INSPECTION REPORT  
IRVINGTON LANDFILL**

INSPECTION ITEM	DISCREPANCY	CORRECTIVE ACTION
<b>Perimeter Security Fence and Gate</b> (holes, structure issues)	No discrepancy	
<b>Inspection Roads</b> (washouts, obstructions, potholes)	South perimeter road impassible (erosion and wash). Minor erosional rills on west perimeter road	Re-evaluate after conclusion of Monsoon season.
<b>Storm Water Controls</b> (berms, let downs, spillways)	No discrepancy	
<b>Storm Water Retention Basins</b> (washouts, excessive silt in, holding water)	No discrepancy	
<b>Landfill Earthen Cap</b> (washouts, trash showing, debris and trash)	No discrepancy	
<b>Landfill Gas Extraction System Wellfield</b> (piping, wells, vaults, washouts)	None	
<b>Landfill Gas Extraction System Compound</b> (fencing, blower equipment, flare, carbon canisters)	None	
<b>Landfill Gas Monitoring Wells</b> (including bollards, vaults, locks)	No discrepancy	
<b>Groundwater Monitoring Wells</b> (including bollards, vaults, locks)	No discrepancy	
<b>Remediation Equipment</b> (compound fence, erosions, leaks)	None	
<b>Illegal Dumping</b> (including overgrown vegetation, homeless camps, vectors)	None	
<b>Neighboring Land Uses</b> (changing adjacent land uses that will or currently are impacting the landfill site)	No changes or impacts	
<b>INSPECTOR SIGNATURE</b> Kevin Pierce, EEC	<b>EVENT TYPE</b> Rainfall (0.51")	<b>DATE:</b> 12/8/19

# Rain Event 12-8-19 Harrison and ILF



# 12-8-19 Rain Event Mullins

Browser address bar: <https://alertmap.pima.gov/gmap/gmap.html>

Page Title: Pima County Regional Flood Control District

Map Data: 12-09-2019 17:25 (Rainfall Totals Last 1-day)  
Radar Time: 12/9/2019 5:18:20 PM MST

Map Controls: Map, Satellite

**All Datasets**

- Current Data
  - 10 Minute Rainfall
  - 30 Minute Rainfall
  - 1 Hour Rainfall
  - 3 Hour Rainfall
  - 6 Hour Rainfall
  - 1 Day Rainfall
  - 3 Day Rainfall
  - 7 Day Rainfall
  - 30 Day Rainfall
  - Streamflow Data
  - Weather Data
- Historical Data
- Clear Map Data

Display Sensor List?  Yes  No

Show IDs Only?  Yes  No

# Rain Event 12-8-19 Harrison and Irvington





**CITY OF TUCSON ENVIRONMENTAL SERVICES  
WEATHER EVENT INSPECTION REPORT  
IRVINGTON LANDFILL**

INSPECTION ITEM	DISCREPANCY	CORRECTIVE ACTION
<b>Perimeter Security Fence and Gate</b> (holes, structure issues)	No discrepancy	
<b>Inspection Roads</b> (washouts, obstructions, potholes)	South perimeter road impassible (erosion and wash). Increasing rills on west perimeter road	Re-evaluate after conclusion of Monsoon season.
<b>Storm Water Controls</b> (berms, let downs, spillways)	No discrepancy	
<b>Storm Water Retention Basins</b> (washouts, excessive silt in, holding water)	No discrepancy	
<b>Landfill Earthen Cap</b> (washouts, trash showing, debris and trash)	No discrepancy	
<b>Landfill Gas Extraction System Wellfield</b> (piping, wells, vaults, washouts)	None	
<b>Landfill Gas Extraction System Compound</b> (fencing, blower equipment, flare, carbon canisters)	None	
<b>Landfill Gas Monitoring Wells</b> (including bollards, vaults, locks)	No discrepancy	
<b>Groundwater Monitoring Wells</b> (including bollards, vaults, locks)	No discrepancy	
<b>Remediation Equipment</b> (compound fence, erosions, leaks)	None	
<b>Illegal Dumping</b> (including overgrown vegetation, homeless camps, vectors)	None	
<b>Neighboring Land Uses</b> (changing adjacent land uses that will or currently are impacting the landfill site)	No changes or impacts	
<b>INSPECTOR SIGNATURE</b> Kevin Pierce, EEC	<b>EVENT TYPE:</b> Wind	<b>DATE:</b> 12/18/19

Search Locations

Log in / ..



Popular Cities

San Francisco, CA ▲  
54 °F Rain

Manhattan, NY ▲  
35 °F Mostly Cloudy

Schiller Park, IL  
18 °F Fair

Boston, MA ▲  
35 °F Cloudy

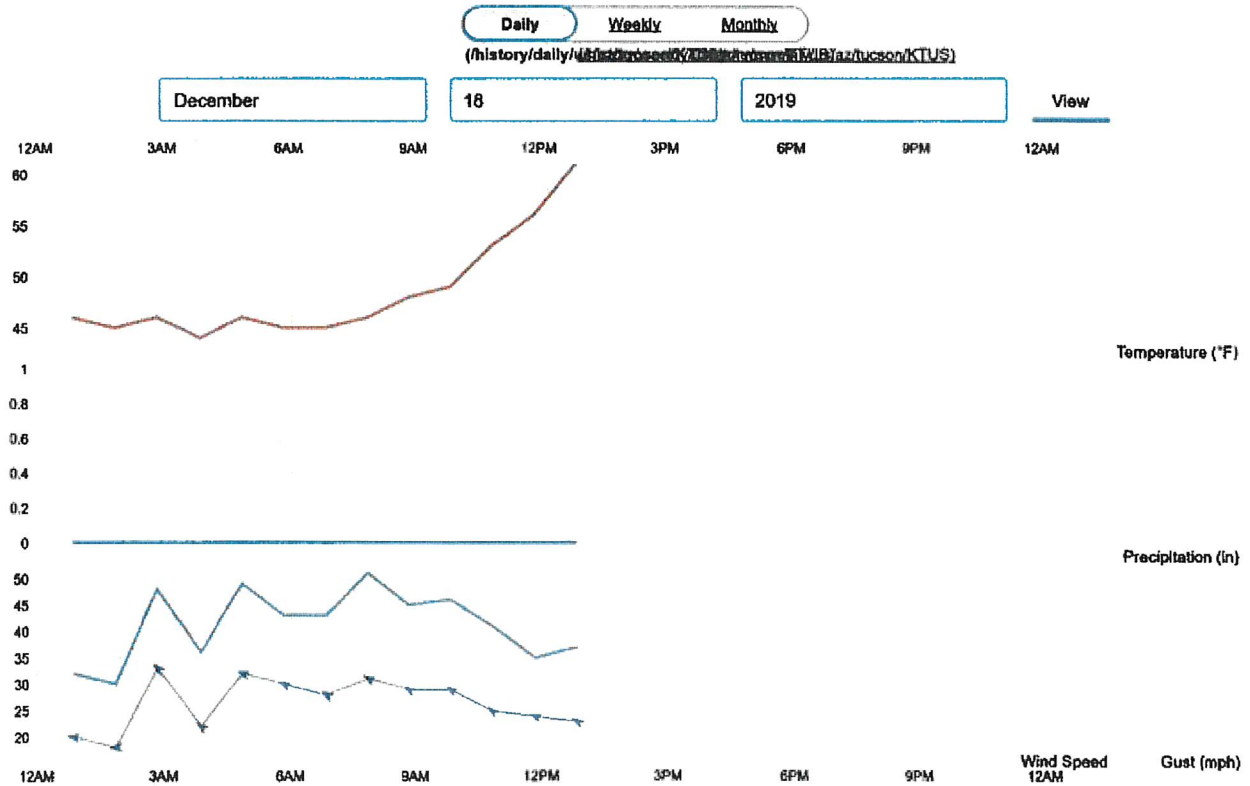
32.12 °N, 110.94 °W

## Tucson, AZ Weather History ★ 🏠

61° TUCSON INTERNATIONAL AIRPORT STATION (WEATHER/US/AZ/TUCSON/KTUS?CM\_VEN=LOCALWX\_PWSDASH) | CHANGE ▾

HISTORY (/HISTORY/DAILY/US/AZ/TUCSON/KTUS)

- [TODAY \(/WEATHER/US/AZ/TUCSON/KTUS\)](#)
- [HOURLY \(/HOURLY/US/AZ/TUCSON/KTUS\)](#)
- [10-DAY \(/FORECAST/US/AZ/TUCSON/KTUS\)](#)
- [CALENDAR \(/CALENDAR/US/AZ/TUCSON/KTUS\)](#)
- [HISTORY \(/HISTORY/DAILY/US/AZ/TUCSON/KTUS\)](#)
- [WUNDERMAP \(/WUNDERMAP?LAT=32.12&LON=-110.94\)](#)



## Summary

Temperature (° F)	Actual	Historic Avg.	Record	▲
High Temp	61	64	80	
Low Temp	44	39	23	
Day Average Temp	48.48	51	-	
Precipitation (Inches)	Actual	Historic Avg.	Record	▲
Precipitation (past 24 hours from 07:53:00)	0.00	0.03	-	

