

Sunshine Canyon Landfill Local Enforcement Agency

Overview of Landfill Odor Issue

May 2024



April 2023

SUNSHINE CANYON LANDFILL



SCL-LEA



LOCAL ENFORCEMENT AGENCY

RAINFALL DATA FOR SANTA CLARITA AREA

LA County (Santa Clarita)					
Month	Rainfall For Month		Month	Rainfall For Month	
	Measured for Month			Measured for Month	Monthly Normal [†]
Nov-22	3.85		Nov-23	0.69	0.60
Dec-22	7.60		Dec-23	3.36	1.96
Jan-23	18.44		Jan-24	0.91	2.61
Feb-23	9.73		Feb-24	7.00	2.24
Mar-23	14.71		Mar-24	2.94	2.08
Apr-23	0.21		Apr-24	0.65	0.59
	54.54			15.55	10.08

**Public Works (October to Present:
 Newhall: 23.4 inches
 Brown's Canyon: 30.8 inches**

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Sunshine Canyon Landfill, Facility ID No. 49111

Odor Complaints Reported to South Coast AQMD Alleging SCL; and Notices of Violation (NOV) Summary from 2009 through April 2024

Public Nuisance: South Coast AQMD Rule 402; Calif. H&S 41700

		Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec	Total NOVs	Total Complaints
2015	Complaints	260	119	297	60	12	41	23	126	337	370	85	65		1795
	NOVs	5	3	7	2	0	0	0	2	11	7	2	0	39	
2016	Complaints	100	188	185	181	30	74	52	85	206	193	206	59		1559
	NOVs	2	4	6	5	0	1	1	1	2	4	4	1	31	
2017	Complaints	200	254	274	116	19	10	14	30	44	27	22	18		1028
	NOVs	6	7	6	1	0	0	0	0	0	0	0	0	20	
2018	Complaints	32	18	21	9	5	9	16	6	33	21	2	36		208
	NOVs	0	0	0	0	0	0	0	0	0	0	0	1	1	
2019	Complaints	17	17	76	12	2	5	7	7	95	82	14	16		350
	NOVs	0	1	1	0	0	0	0	0	1	2	0	0	5	
2020	Complaints	29	17	12	33	98	20	23	82	105	121	18	22		580
	NOVs	0	0	0	0	2	1	0	1	3	4	0	1	12	
2021	Complaints	7	10	3	22	4	31	27	71	55	74	59	83		446
	NOVs	0	0	0	1	0	0	0	2	1	2	0	0	6	
2022	Complaints	158	84	58	38	17	40	12	40	85	64	25	32		653
	NOVs	5	1	0	1	0	2	0	0	2	1	0	0	12	
2023	Complaints	226	191	146	185	32	22	34	264	148	230	130	113		1721
	NOVs	6	7	5	11	1	0	1	9	4	6	7	4	61	
2024	Complaints	204	474	272	266										1216
	NOVs	9	17	9	6									41	

Wet Season

Importance of Wet Weather Preparation Measures that Impact Generation of Odors

Hurricane Hillary

Total R402 NOVs Issued to Date	
Total Complaints *	16,175
Total R402 NOVs Issued **	352

* Includes 6,619 Complaints from 2009 through 2014

** Includes 124 NOVs from 2009 through 2014

*** Includes eight NOVs from 2011 through 2014

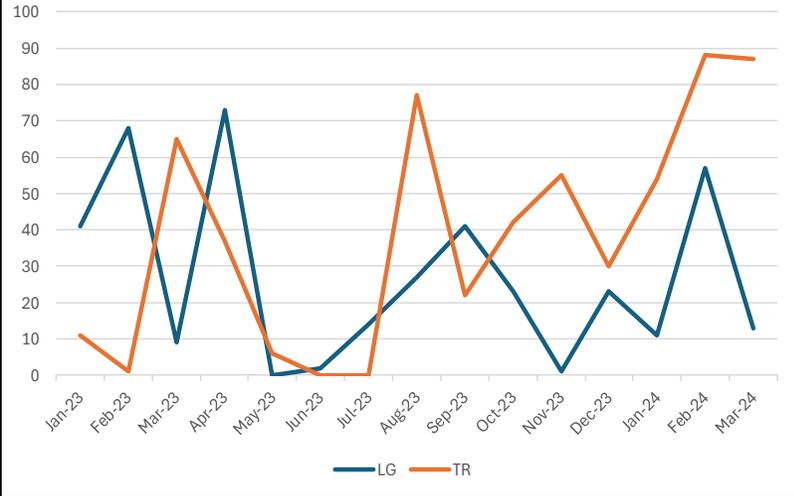
First Quarter 2024 Odor Complaints

Number of Complaints During Times LF Open / Closed		
Description	LF Closed	LF Open
Total Complaints (1st Quarter 2024)	362	586
Percent of Total Complaints	38%	62%
Landfill Hours (per Week)	92	76
Percent of Total Landfill Hours	55%	45%

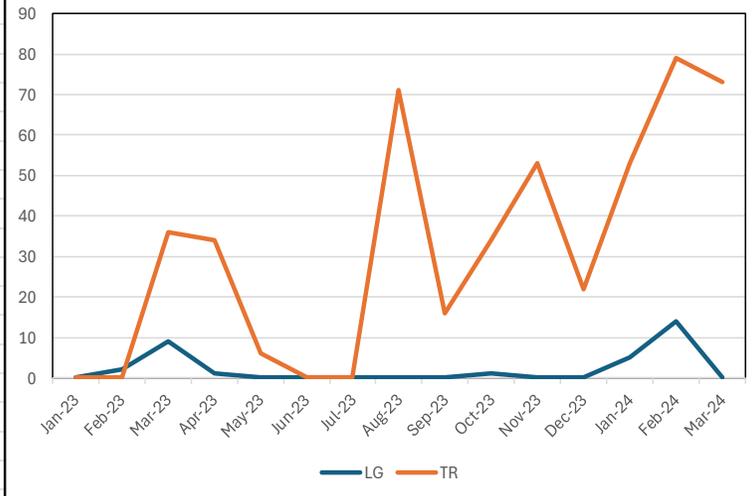
Type of Odor During Open / Closed Hours by Month (January 2023 to March 2024)

Month total	LG	TR	None	NFR	Other		While open	LG	TR	None	NFR	Other		While closed	LG	TR	None	NFR	Other
Jan-23	41	11	21	23	3		Jan-23	0	0	0	0		Jan-23	41	11	21	23	3	
Feb-23	68	1	20	26	1		Feb-23	2	0	0	0		Feb-23	66	1	20	26	1	
Mar-23	9	65	47	25			Mar-23	9	36	37	11		Mar-23	0	29	10	14	0	
Apr-23	73	37	46	26	2		Apr-23	1	34	44	9	2		Apr-23	72	3	2	17	0
May-23	0	6	13	11	2		May-23	0	6	13	3			May-23	0	0	0	8	2
Jun-23	2	0	1	20			Jun-23	0	0	1	7			Jun-23	2	0	0	13	0
Jul-23	14	0	9	11			Jul-23	0	0	5	7			Jul-23	14	0	4	4	0
Aug-23	27	77	67	93			Aug-23	0	71	57	47			Aug-23	27	6	10	46	0
Sep-23	41	22	55	29			Sep-23	0	16	41	9			Sep-23	41	6	14	20	0
Oct-23	23	42	114	51			Oct-23	1	34	90	26			Oct-23	22	8	24	25	0
Nov-23	1	55	36	38			Nov-23	0	53	30	29			Nov-23	1	2	6	9	0
Dec-23	23	30	36	24			Dec-23	0	22	26	13			Dec-23	23	8	10	11	0
Jan-24	11	54	69	70			Jan-24	5	53	67	38			Jan-24	6	1	2	32	0
Feb-24	57	88	91	237			Feb-24	14	79	66	82			Feb-24	43	9	25	155	0
Mar-24	13	87	75	96			Mar-24	0	73	45	61			Mar-24	13	14	30	35	0

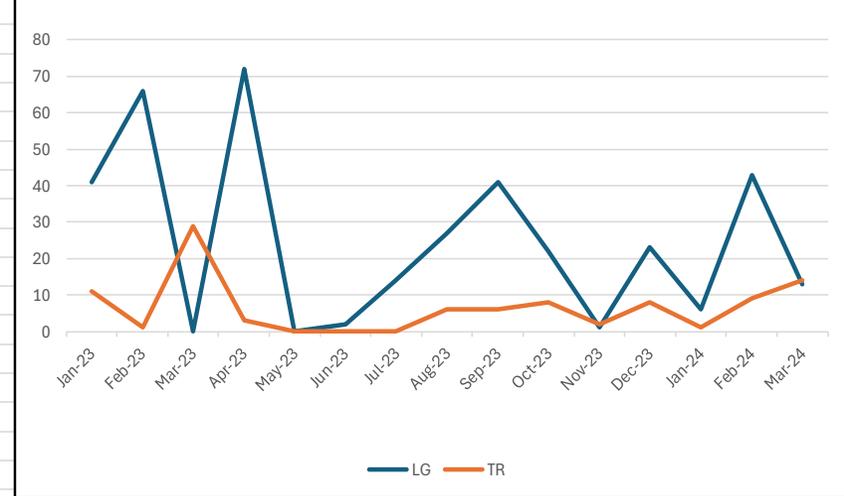
Odor complaint counts total



Odor complaints while open



Odor complaints while closed



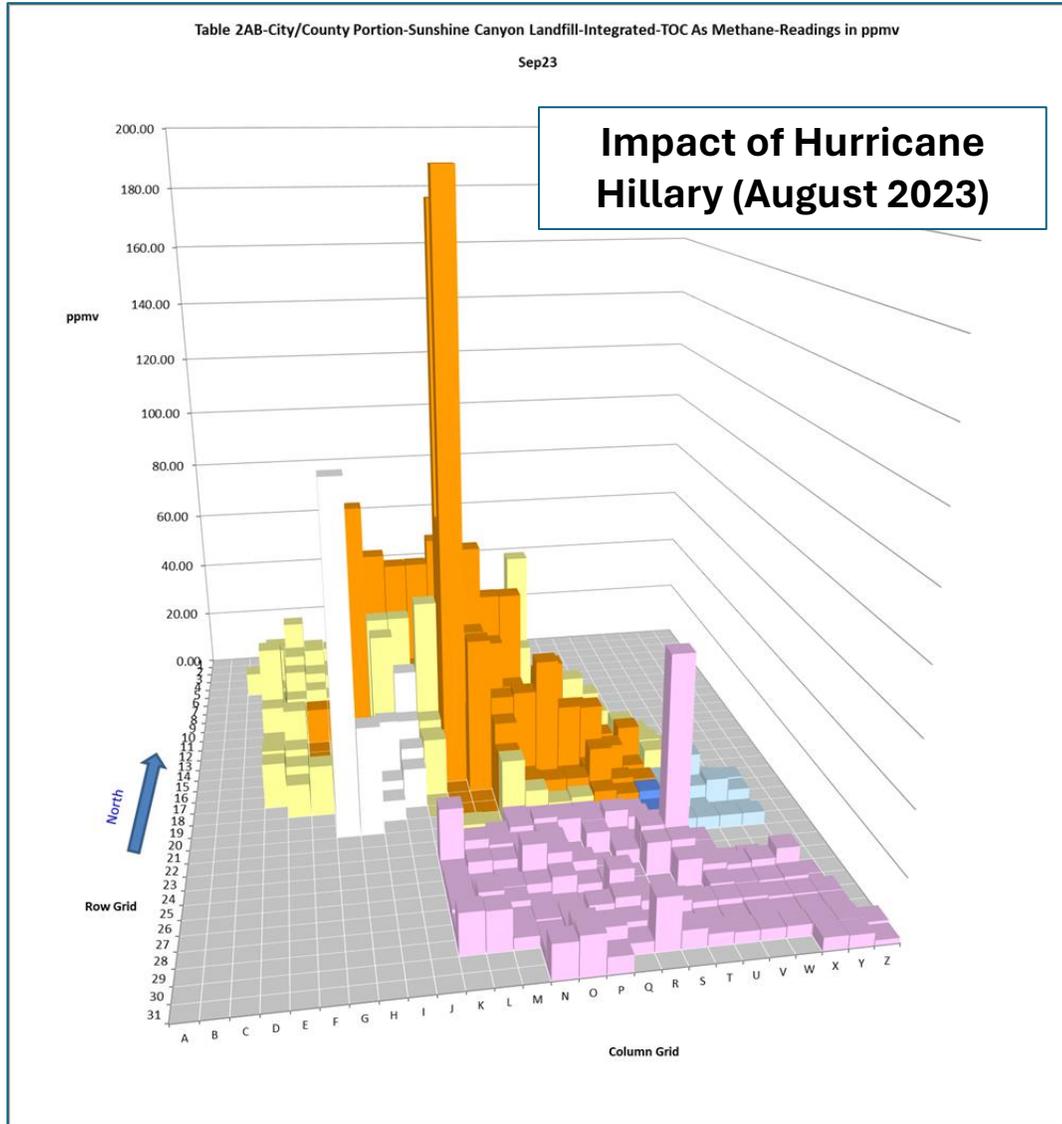
SCL LEA Collaboration with Republic Services

- Proactive Request by Republic Services of SCL LEA (2023)
 - Additional SCL LEA Recommended Mitigation Measures
- Collaborate and Support SCAQMD and Republic Services to develop potential additional recommendations for odor mitigation measures
 - Develop monitoring and evaluation protocols for assessing impact of recommended mitigation measures
- SCL LEA Approached Separately by Other Entities/Agencies
 - Complementary suite of best management practices

Update on Odor Mitigation Measures

- Primary Focus: Fresh Trash (and Landfill Gas Odors)
 - Past (2011-2018) focus was primarily on “landfill gas” odors and on the improvement of the overall landfill gas collection system
 - First quarter 2023 focus is on fresh trash odors (abnormal rainfall)
 - Current focus also on impact of inclement weather on landfill odors
 - Preventative measures to address fresh trash odors
 - Preventative measures on mitigating generation of landfill gas odors
- Developing Science-Based Mitigation Measures
 - Updating SCL LEA Data Mining / Analysis (Developing “Actionable Data”)
 - SCL LEA analysis of Appropriate Best Management Practices (BMP)
 - Combination of Complementary Suite of Best management Practices

Sharing SCL LEA Data Mining/Analytics with Republic, SCAQMD, County DPW, and County Public Health



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z		
1																												
2																												
3				19.84	18.59	17.59				15.37	14.6	13.32																
4			17.87	20.5	11.78	11.46	14.37	10.54	10.15	12.54	16.23	15.47	15.63	16.37														
5			7.3	8.55	11.91	22.38	6.33	7.91	9.73	4.31	3.93	3.23	21.28	12.85														
6				39.95	5.78	21.36	7	6.8	5.62	4.67	3.8	5.68	7.07	5.94	7.8													
7				85.55	23.69	19.99	4.51	4.43	3.42	3.6	4.13	3.13	2.43	2.16	4.03													
8				11.58	18.72	13.71	14.18	12.68	13.66	13.98	14.21	16.36	8.93	6.59	7.99	3.58												
9				41.87	39.27	22.67	11.13	13.22	14.49	15.96	16.87	25.21	20.07	24.6	15.23	35.93												
10				24.43	22.09	50.27	7.82	6.72	6.08	23.82	13.67	30.3	11.53	44.61	18.7	55.76	38.1											
11				15.43	18.19	38.27	27.81	5.49	9.26	8.93	11.73	21.95	111.11	59.71	55.77	26.75	13.91	7.37										
12				54.42	32.34	20.18	21.16	21.56	16.99	10.99	20.44	15.01	36.66	79.02	40.48	13.34	10.09	8.13	4.36									
13				9.85	18.02	20.27	18.2	33.87	28.83	21.61	25.95	54.23	63.97	67.53	45.22	51.81	31.44	13.08	6.76	12.85								
14				12.2	21.26	12.32	16.95	22.78	65.82	134.71	173.62	113.72	55.64	152.66	56.87	5.99	7.03	9.93	7.81	4.76	3.91							
15				15.53	24.08	15.28	26.83	23.4	Active	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	
16				31.57	25.96	Active	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	
17				26.6	33.87	Active	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	
18					13.86	Active	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	
19						Active	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	
20						Active	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	Tractive	
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Selecting Priority Grids for Cover Enhancements

December 2023 Integrated-TOC As Methane-Readings in ppmv

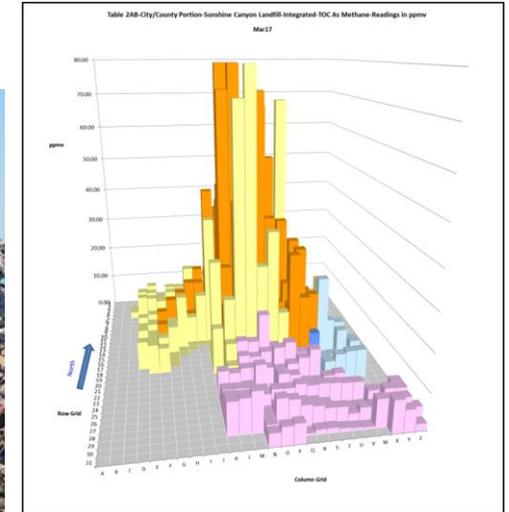
“Fresh Trash” Odors and Landfill Gas Odors Mitigation

- 2016 Abatement Order (Focus: LFG Odors)
 - Primary Focus on Improving LFG System Collection Efficiency
 - Enhance Daily Cover and Intermediate Cover
 - Minimize Legacy Damage
 - Dispersing/Diluting (Lowering Concentration of Odorous Compounds)
- 2024 Odor Mitigation Focus (Fresh Trash and LFG Odors)
 - Use of Odor Neutralizer in Foam-Based Application of Working Face
 - Redirection / Restricting Movement of Air Flow (Berm)
 - Reduce / Prevent Odiferous Loads
 - Reduce Disposal of Organics (Implementation of SB 1383)

SCL LEA Recommended Potential Short Term Mitigation Measures

- Fresh Trash Odor (In addition to ongoing existing measures)

- Use of Foam Sprayer
 - Water sprays are “thin”
 - Use of “foam” to create “isolating layer” of foam
 - Can test with high-pressure sprayer to test soap foam
- Use of Compost as ADC (Biofiltration Effect)
 - Effective to reduce H₂S emissions
- Special Scheduling for Odiferous Loads



- Enhanced Intermediate Cover Approach

- Extra Application of Low Permeability Compacted Soil
- Use of Compost as Alternative Intermediate Cover (AIC)
- Utilization of Vegetative Cover (Biofiltration Effect)
- Application of PosiShell
- Increase Monitoring (LIDAR Scanning, Tracked Robot, etc.)
 - Focus on evening/early morning odors for detection of point sources of LFG emissions



Enhanced Daily Cover: EnviroCover + Compacted Soil Layer (During Ongoing Daily Operations)



**Truck with Foaming
Odor Neutralizer Spray**

Misting Fans

Soil on EnviroCover

EnviroCover

March 2024

Working Face Water Truck Fitted with Foaming Agent



**55 Gallon Barrel with
Foaming Agent**

Enhanced Daily Cover: EnviroCover + Compacted Soil Layer (During Ongoing Daily Operations)



EnviroCover

Misting Fans

**Stockpile of Peel-Back
Soil over Previous
Day's EnviroCover**

May 16, 2024 (Thursday)

Enhanced Daily Cover: EnviroCover + Compacted Soil Layer (During Weekend Closing Time)



Weekend Compacted
Soil over EnviroCover

EnviroCover

May 18, 2024 (Saturday)

EQUIVALENT DARCY'S LAW FLOW RATE FOR POLYETHYLENE CALCULATED FROM GAS TRANSMISSION DATA

Methane Gas Loss Through Polyethylene Film
(Matrecon Laboratories, Oakland, Calif., 1991, ASTM E96)

1.25 mil, permeation = 6.1 scm/acre/day

5 mil, permeation = 3.3 scm/acre/day

vs.

Soil/Green Waste Covers >> 1,000 scm/acre/day

Methane Gas Loss Through Daily Cover Soil

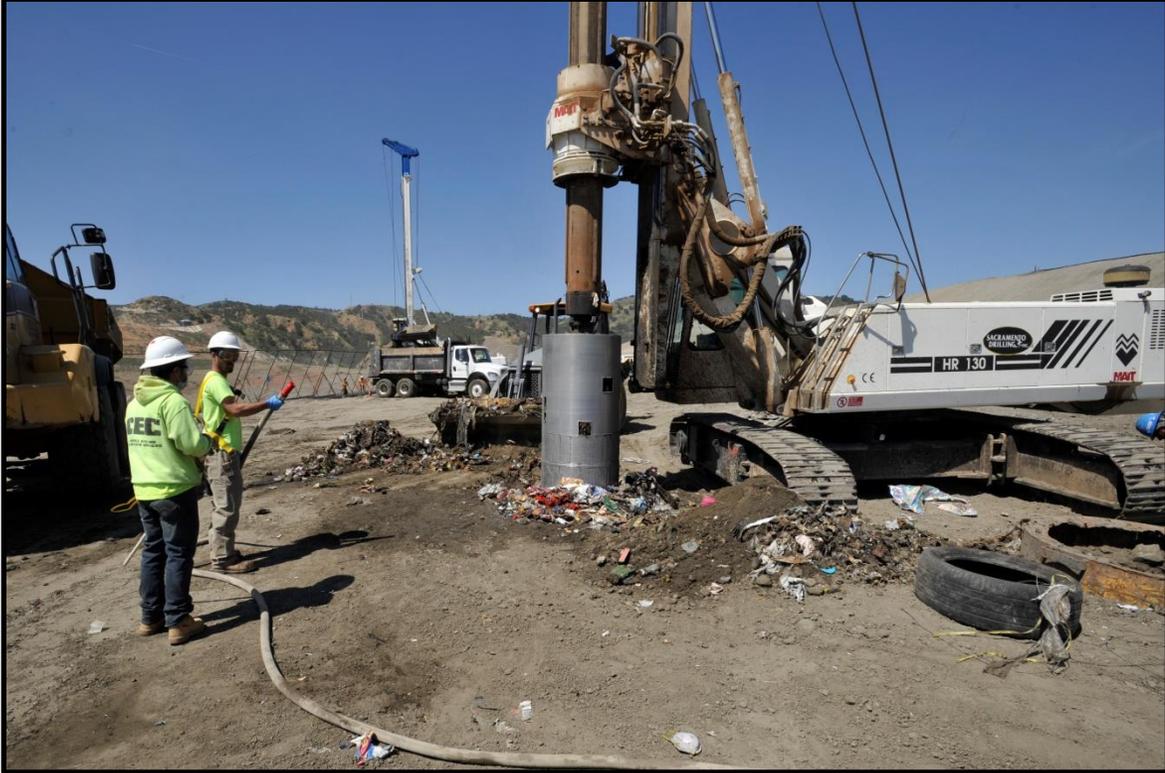
<u>Soil Conditions</u>	<u>Flow Through (1,000 m² Area) Soil</u>
kw=10-8 m/sec, compacted clay over firm subgrade	117 m ³ /day
kw=10-6 m/sec, typical clayey soil compacted over poor subgrade (such as landfill waste)	11,700 m ³ /day
kw=10-5 m/sec, typical sandy/clayey soil over poor subgrade	117,000 m ³ /day

Methane Gas Loss Through Polyethylene Film (1,000 m² Area)

(From Matrecon Laboratories, Oakland, Calif., 1991)

2mil, permeation = 92 cm ³ /100 in ² /day =	1.4 m ³ /day
3mil, permeation = 73 cm ³ /100 in ² /day =	1.1 m ³ /day
5mil, permeation = 49 cm ³ /100 in ² /day =	0.76 m ³ /day

Inspection of LFG Drilling Materials from EnviroCover ADC vs. 9" Compacted Soil Locations

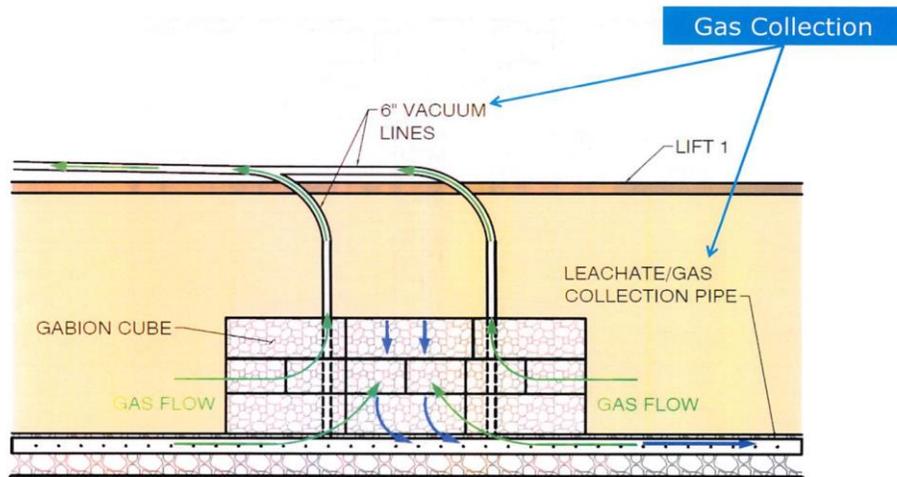
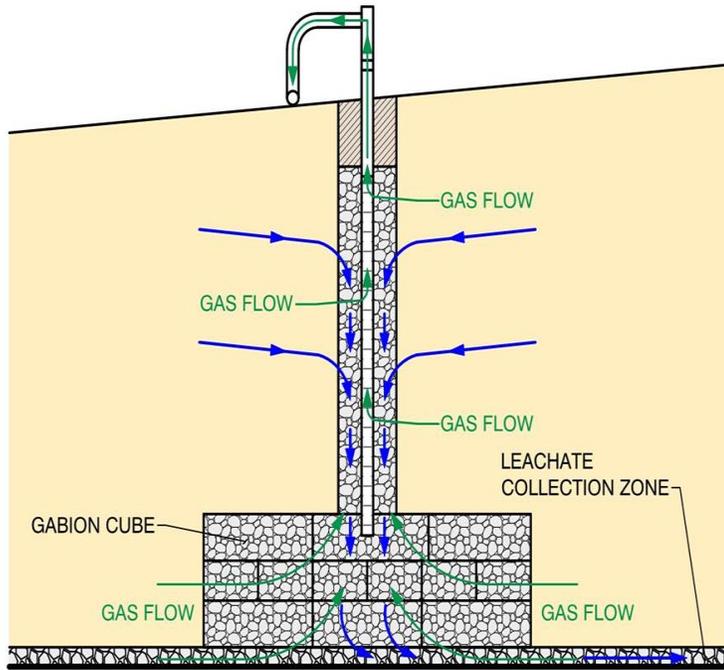


LFG Well
Drilling



Temperature
Reading

New Cell CC5A Development with Gabion Cubes and Horizontal LFG Collection (May 2024)



SCL LEA Recommended Potential Additional Mitigation Measures

- Enhance Wet Weather Preparation Plan to Implement Preventative Measures that Impact Generation of Odor
 - Erosion Control
 - Grading Improvements
- Construction of Berm to Incorporate Mitigation Measures
 - Landscaping (Visual and Odor Barrier)
 - Misting and or Waterless Vapor System on Berm
- Use of Alternative Daily Cover on Weekends
 - Pilot Program Proposed by LA County Public Works

Wet Weather: Preventing/Minimizing Slope Erosion

(Scheduled Implementation for Wet Weather 2024)

- Review/Revise Cell Design to Decrease Slope
- Utilize Grading Techniques
 - Contour Grading / Slope Rounding
 - Terrace Farming
- Slope Surface Preparation
 - Grooving / Tracking (Surface Roughening)
 - Wattles (already being implemented)
 - Use of Straw Erosion Control Blanket
 - Use of Other Synthetic Erosion Control Fabric / Blanket
 - Utilize More Non-Erosive Materials for Slope Cover
 - Put in Vegetative Cover
 - Mulch, Compost
 - Chemical Stabilization
 - Additional Temporary Supplemental Cover (e.g., PosiShell, etc.)



Closeup View of Wet Weather Preparation (2023)

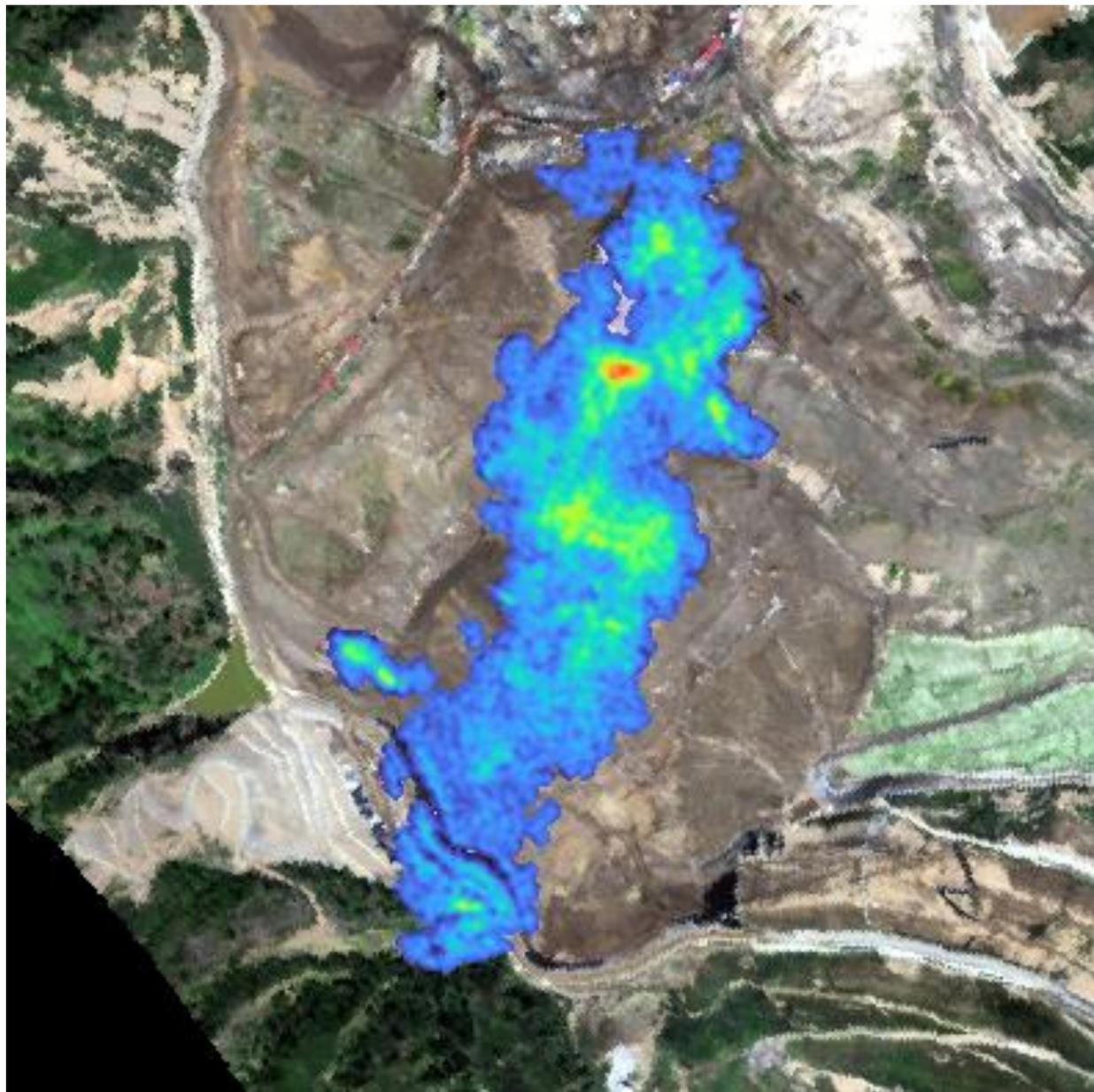
Runoff Sheeting Ongoing Working Face Runoff Sheeting Straw Waddles Runoff Sheeting Straw Waddles
Fans/Misters for Control of Working Face Odors



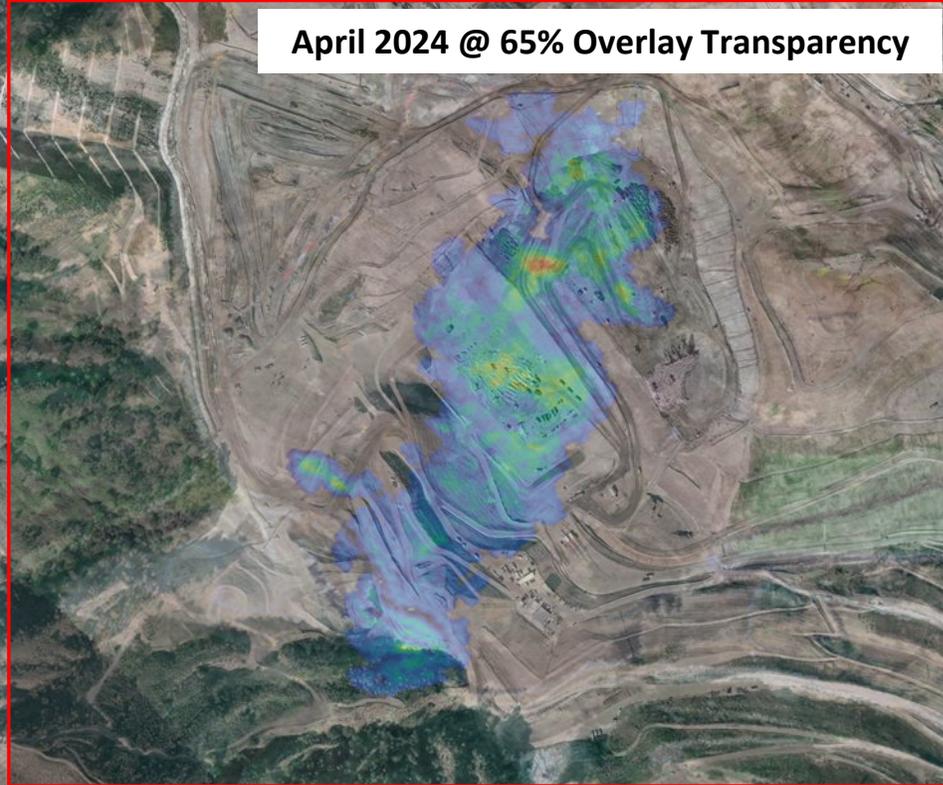
Entrance Berm to be Landscaped (With Added Odor Neutralizer Misting Systems)



Carbon Mapper / NASA / JPL April 16 – 17, 2024 SCL Flyover



April 2024 @ 65% Overlay Transparency



**Continued SCL LEA
Collaboration with
Carbon Mapper / NASA**

**Additional Flyovers
Scheduled for June 2024**



May 2024 Panorama Picture



**Expanded Vapor System
for Odor Control on City
South (Observation Deck)**

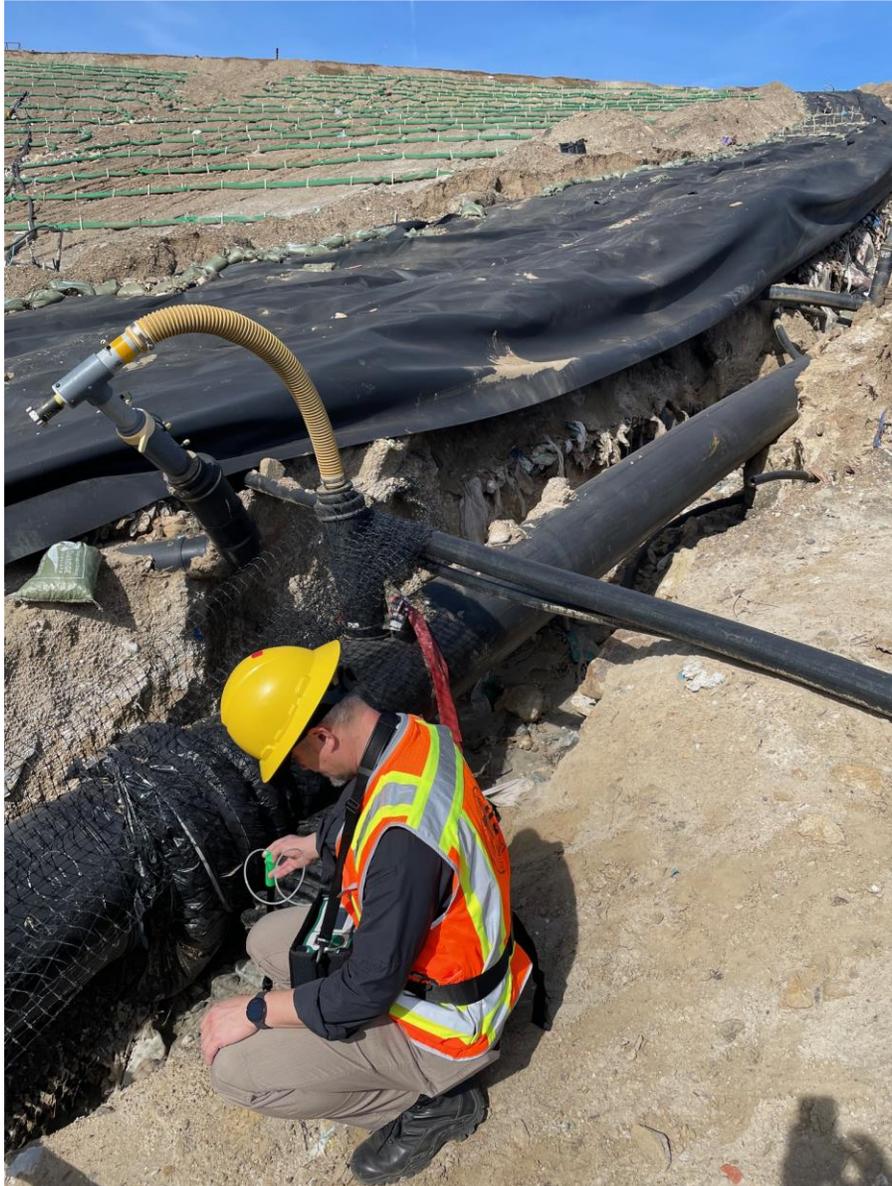
Innovative Pilot Program: Collaboration on Surface Emissions Data Collection Rover

- **SCL LEA Recommending Addition Methane Monitoring**
 - Real Time Data for Optimizing Mitigation Measures
- **NASA Developed Technology for Commercialization**
 - Provide REAL TIME data for “Preventative Measures”
 - EPA Approved use of drones (December 2022)
 - Go to Places where not safe for humans
 - Can Monitor at Night (Drones and Humans Cannot)
 - Half of Odors Occur when Landfill Closed
- **SCL LEA Determine “Performance Equivalency”**



Independent SCL LEA Emissions Monitoring Utilizing LIDAR

(Light Detection and Ranging, Remote Sensing with Pulsed Laser)



Collaboration with SCAQMD and LA County Public Works / Public Health

- Collaborate with Los Angeles County Public Works and SCAQMD
 - Discuss potential factors and causes of increase in odor complaints during first quarter and in third quarter
 - Address rise in odor complaints following August Hurricane Hillary and first quarter 2024 wet weather
- SCL LEA Provided In-Depth Briefing to Public Works, Public Health and SCAQMD
 - SCL LEA Provided Detailed Technical and Regulatory/Legal Briefing
 - Provided Access to SCL LEA Data Mining/Analysis
 - Provided SCL LEA Analytical Tools and Reference Materials
 - Provided Updates on Data Mining Analysis
- Provided Overview of SCL LEA's Additional Recommended Mitigation Measures
 - Systems Engineering Holistic Approach
 - Science-Based Recommendations that are Legally and Technically Defensible
 - Complementary Suite of Best Management Practices



Sunshine Canyon Landfill Local Enforcement Agency

Questions...?

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November 2022