

Hudson Valley Regional Council
CPRG Landfill Biofilters Project

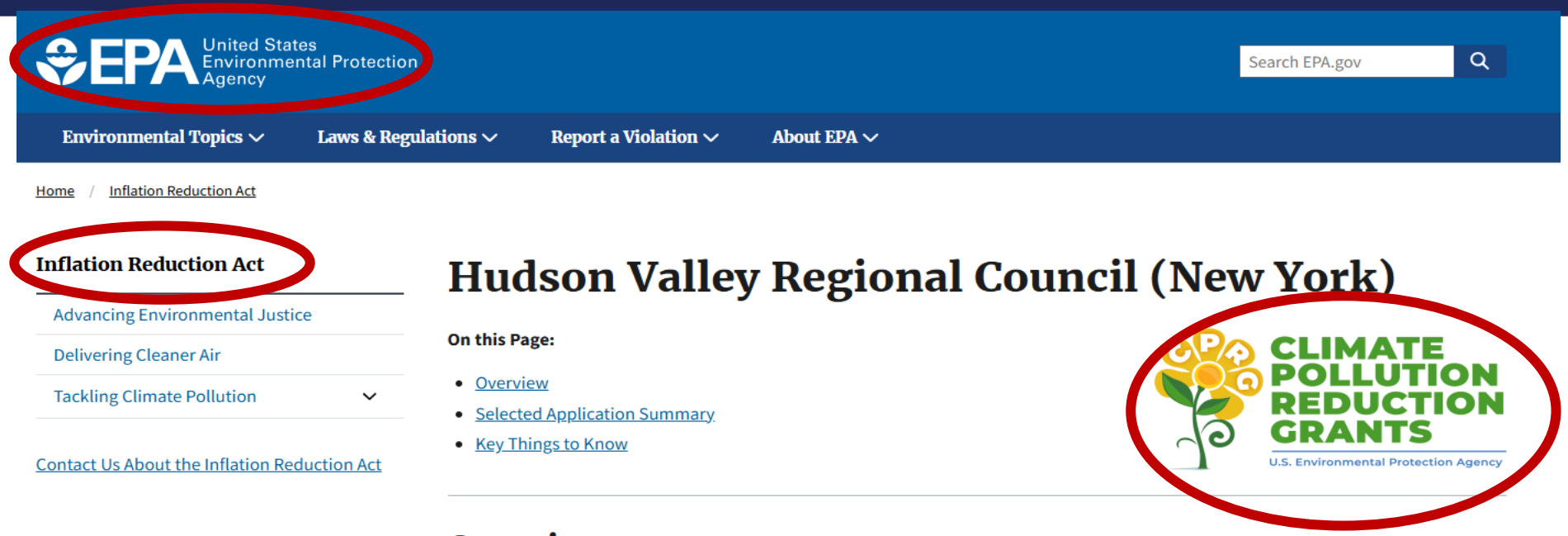
Status Updates | October 16, 2026

Dr. Sehrish Asghar
Principal Environmental Scientist/
Manager

Today's Agenda

- Project Background
- Project Progress and updates
- Baseline Data And Vents Selection Strategy
- What baseline monitoring can and cannot show
- Challenges and solutions adopted
- Next Steps (Biofilter Design and operational Plan RFP)
- Municipal responsibilities and near-term actions
- Discussion and municipal feedback

HVRC's Mid-Hudson Landfill Biofilters Project



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Why Biofilter?
Why Methane Biofilter for Municipal Landfills?

- **Uses natural microbial treatment —** methanotrophs in compost-based media break down methane without combustion or heavy machinery.
- **Controls landfill gas and odors —** helps reduce methane, VOCs, hydrogen sulfide, ammonia, and nuisance odors.
- **Provides a low-maintenance long-term solution —** especially useful as landfill gas generation declines after closure.
- **Reduces municipal emissions** — converts methane into less harmful byproducts and supports climate mitigation.
- **Aligns with NYS climate programs** — supports CLCPA goals, Climate Smart Communities points, and potential carbon credit pathways.
- **Repositions landfills as community climate assets** — creates opportunities for solar, battery storage, pollinator habitat, and a positive public narrative.

How a Methane Biofilter Works?

1 **Gas enters the system**

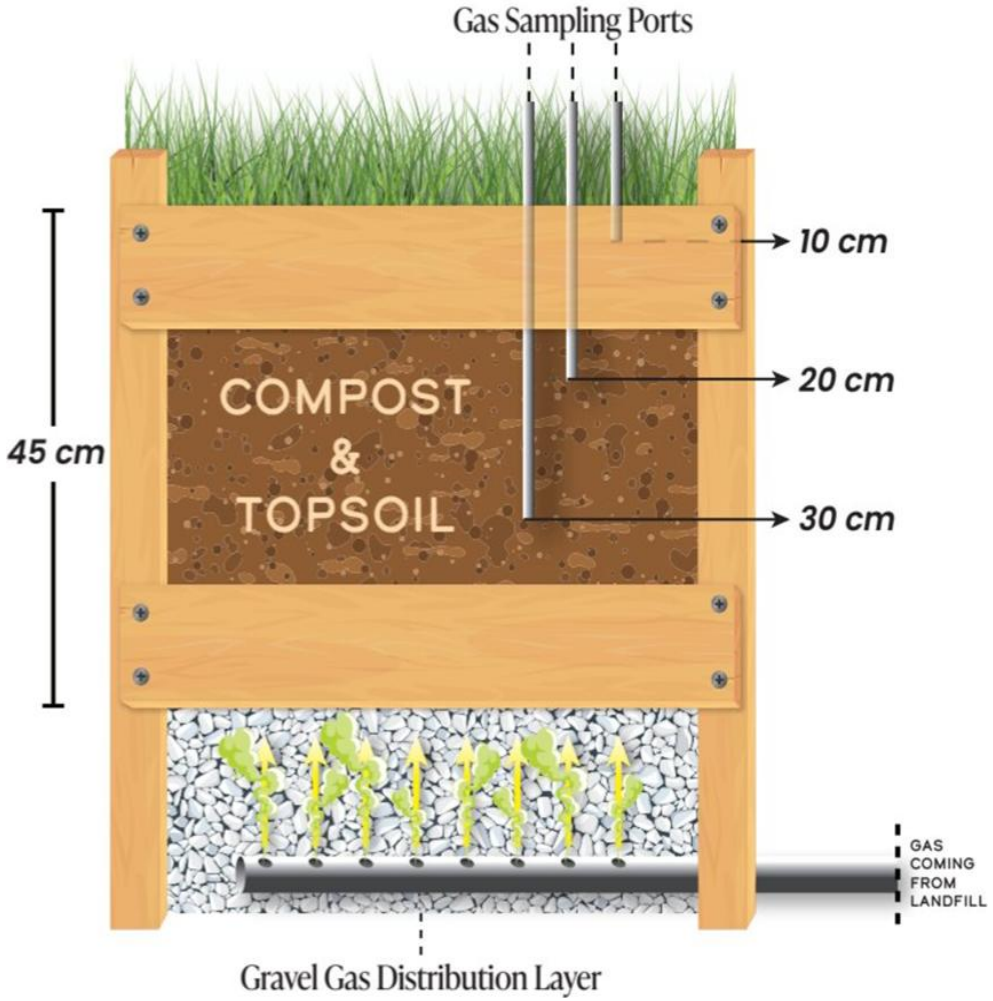
Methane-rich landfill gas enters the biofilter through a porous layer, such as gravel.

2 **Gas moves through the biofilter media**

The gas passes through compost, soil, or engineered organic media where methanotrophic bacteria oxidize methane.

3 **Treated gas exits the biofilter**

The gas exits the biofilter after methane and other contaminants are reduced.



Key Factors

- H_2O **Humidity or moisture content**
- °C **Temperature**
- O_2 **Oxygen levels / Oxidation**

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Takeaway: Biofilters create the right conditions for methane-eating bacteria to naturally reduce landfill gas emissions.

Biofilter Solutions







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Biofilter Design Examples



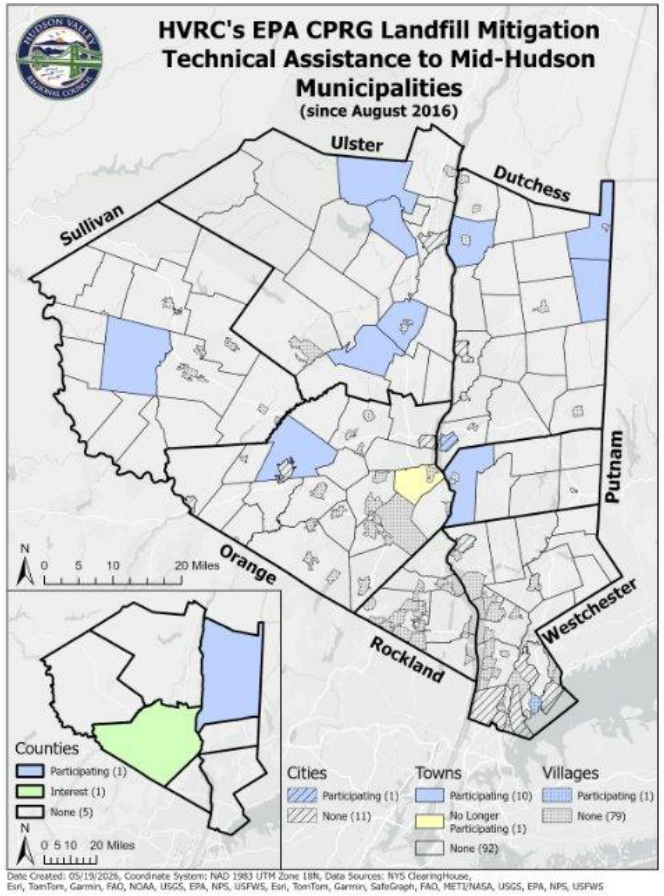






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Landfill Biofilters Project Participants and vents on Sites



Landfill site	Vents as of 2026
Amenia	2
Dutchess County	59
Woodstock	63
Beacon	33
North East	13
Gardiner	26
Wallkill	16
Hurley	8
Mamaroneck	8
Bethel	34
Rhinebeck	42
New Paltz	11
Philipstown	21
Total	**335**

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Project Progress and Updates

HVRC Landfill Biofilters Team - Updates

Former HVRC Project Support



Eleanor Peck

Transitioned from HVRC

Former Deputy Director
Project stewardship



Mary Lambert

Transitioned from HVRC

Former Climate Action Planning Manager
Project management

Current HVRC Project Team



Dr. Sehrish Asghar

Expanded Role as of March 2026

Principal Environmental Scientist / Manager
Project management



Kathleen (Katie) Hall

Started in August 2026

Environmental Scientist
Field Activities and Data Management

Technical Support / Consultants



Peter Bannister & Team

GeoSyntec / B&B Engineers & Geologists
Quality assurance and technical support

TBD – 2026

Biofilters Design / Implementation Consultant
Design and implementation

TBD – 2027-2028

Pollinators Consultant
Pollinator plantings design and implementation

Landfill Biofilters Project Phases

Phase 1: Pre-Implementation Landfill Review and Analysis

- ✓ Post-closure monitoring / site management plans reviewed for participating landfills
- ✓ EPA approved Quality Assurance and Data Management Plan
- ✓ 13 out 13 participating municipalities signed MOUs.

Phase 2: Biofilter Design and Implementation

- **Take baseline landfill gas measurements (including LFG concentration, flow rate)**
- **Design, build and install biofilters**

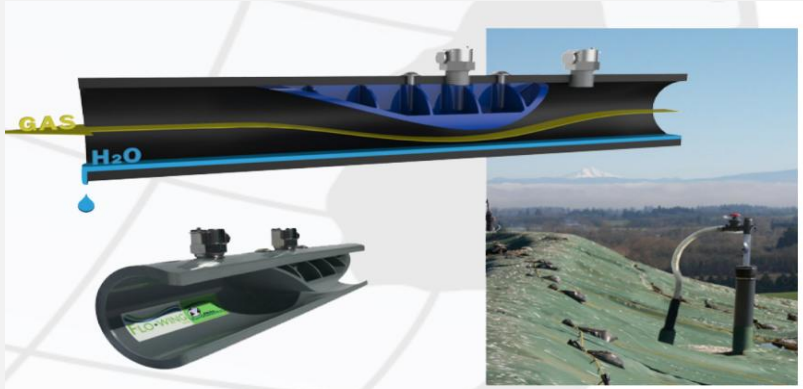
Phase 3: Post-Implementation Landfill Monitoring

- Measure landfill gas post-implementation
- Plant native pollinators along perimeter of landfills
- Assist with solar citing reviews and battery storage planning



Landfill Visits and Equipment for Baseline LFG monitoring





Parameter	What it indicates
CH_4, CO_2, O_2 and balance gas	Landfill-gas composition
Differential pressure (ΔP)	Direction and strength of gas movement
Estimated gas flow	Volume of gas moving through the vent
Temperature and barometric pressure	Conditions affecting measurements
Vent condition and field notes	Access, safety and data-quality context

Landfill Visits and Baseline LFG monitoring







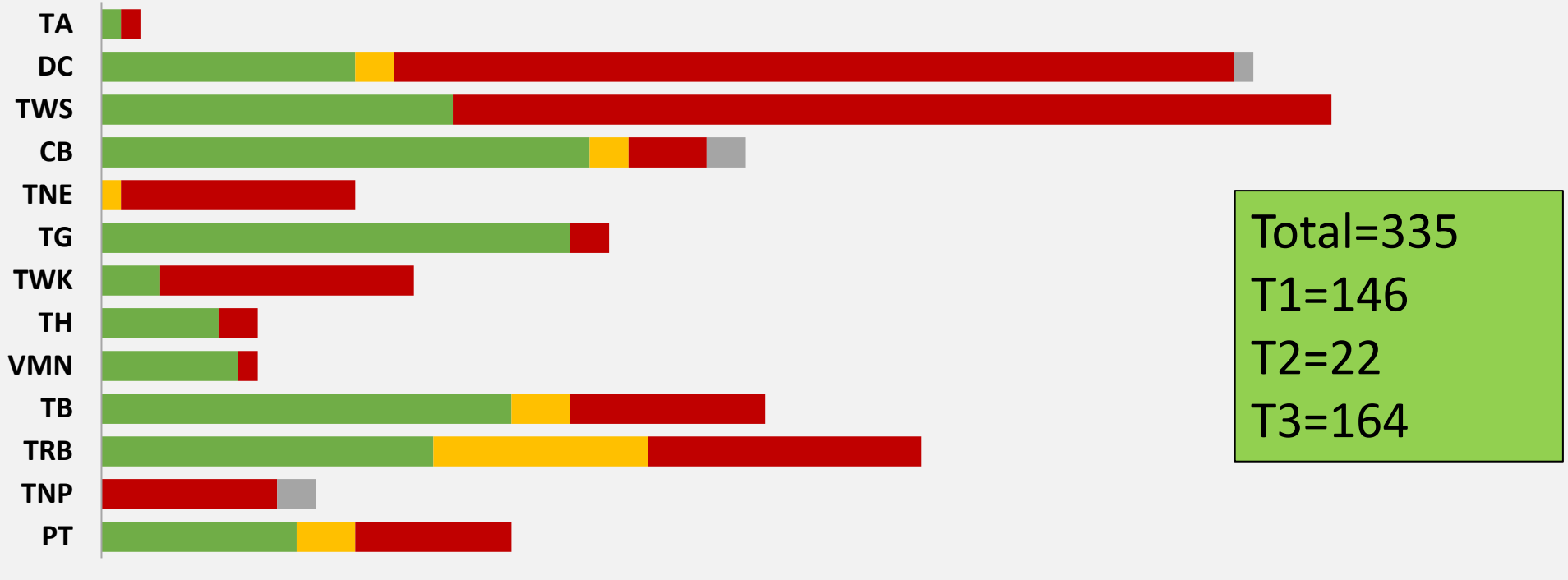

- 13 landfill sites visited: access authorized, methane vent count, structure, condition, topography, physical structures, and environmental factors. Baseline monitoring continued on al sites.
- 3 landfills already have solar arrays (Beacon, Bethel and Wallkill)
- Landfills range in size from roughly 5-30 acres (smallest: Town of Mamaroneck, largest: Dutchess County)
- Vents range from 2-10 feet high with differing vent styles and quality.

Three Tiers Vent Classification



- Use methane concentration as an initial screen, not a final ranking.
- Confirm measurable outward flow and repeat behavior across monitoring rounds.
- Review data quality, uncertainty, weather, and vent condition together.
- Screen locations for cap protection, access, safety, drainage, and infrastructure conflicts.
- The design consultant will recommend candidate vents; no vent is selected

LFG Vent Tier classifications based on methane (till July 2026)



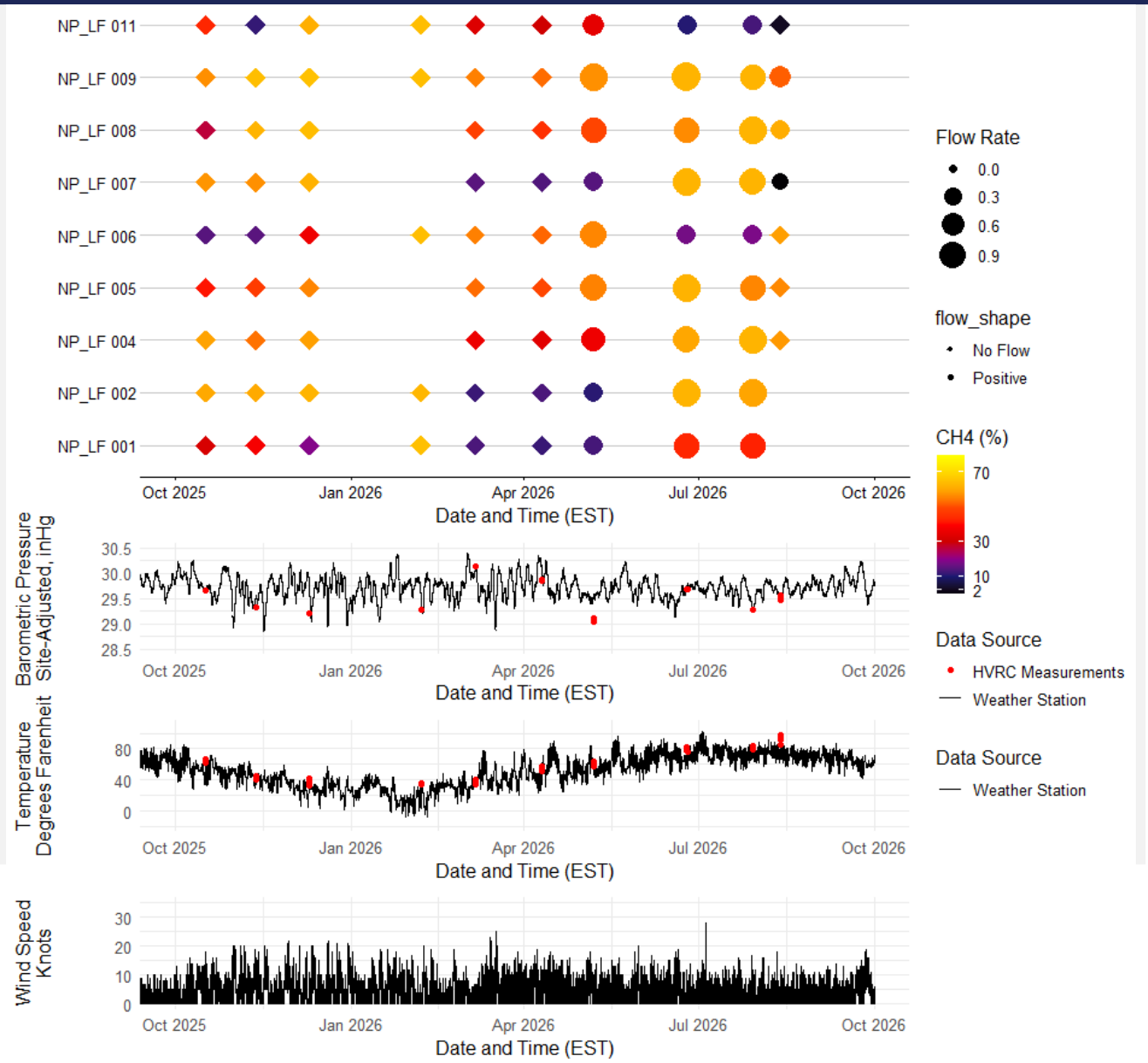
Total=335
T1=146
T2=22
T3=164

	PT	TNP	TRB	TB	VMN	TH	TWK	TG	TNE	CB	TWS	DC	TA
Tier 1	10	0	17	21	7	6	3	24	0	25	18	13	1
Tier 2	3	0	11	3	0	0	0	0	1	2	0	2	0
Tier 3	8	9	14	10	1	2	13	2	12	4	45	43	1
No numeric result	0	2	0	0	0	0	0	0	0	2	0	1	0

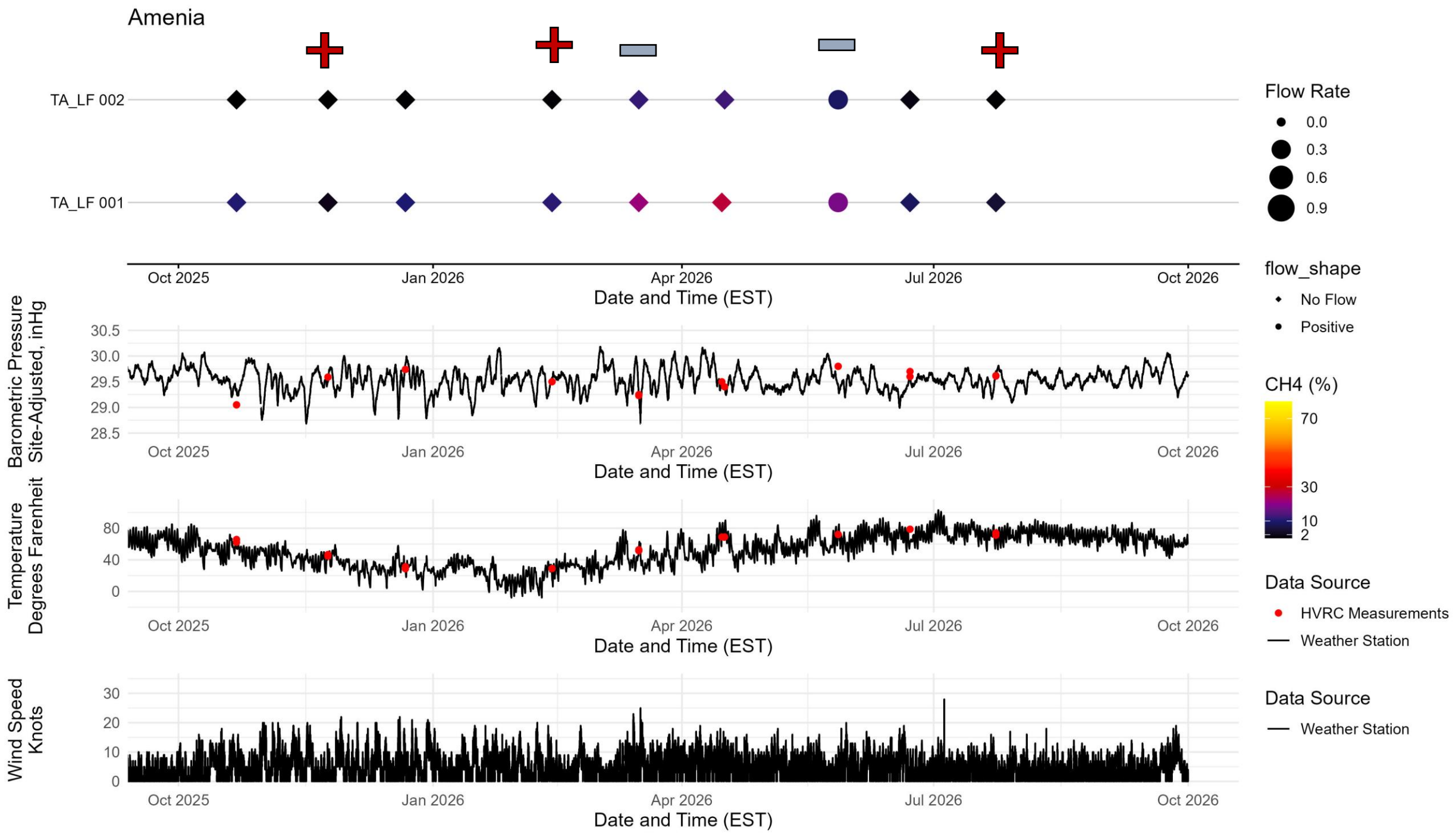
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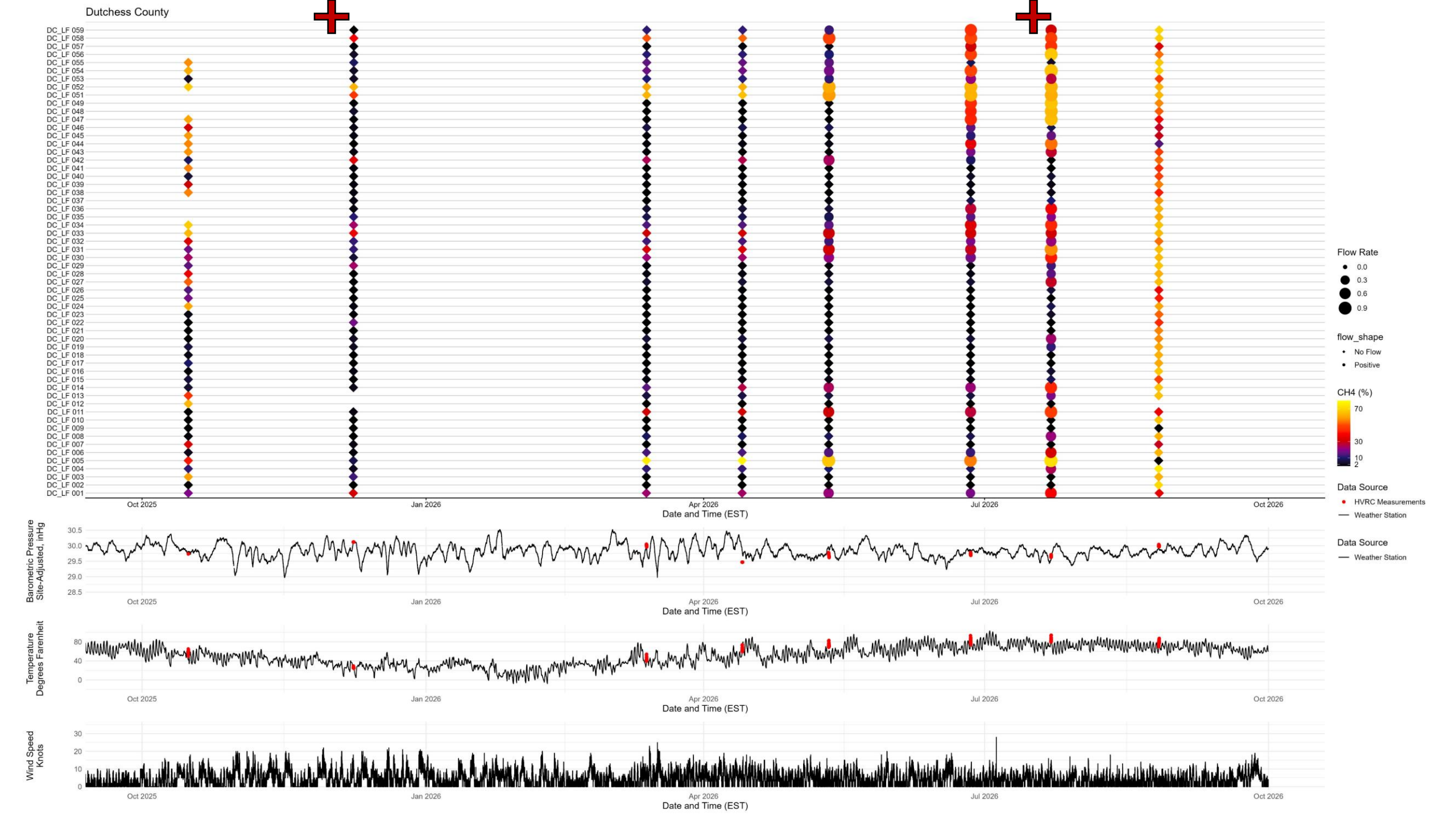
Next step: Upscaling Vent Emissions

- How can we upscale emissions from these once a month snapshots?
- Can we upscale empirically with a limited dataset or is a more process-based model required?
- Could we reasonably supplement sampling to make an empirical upscaling estimate?

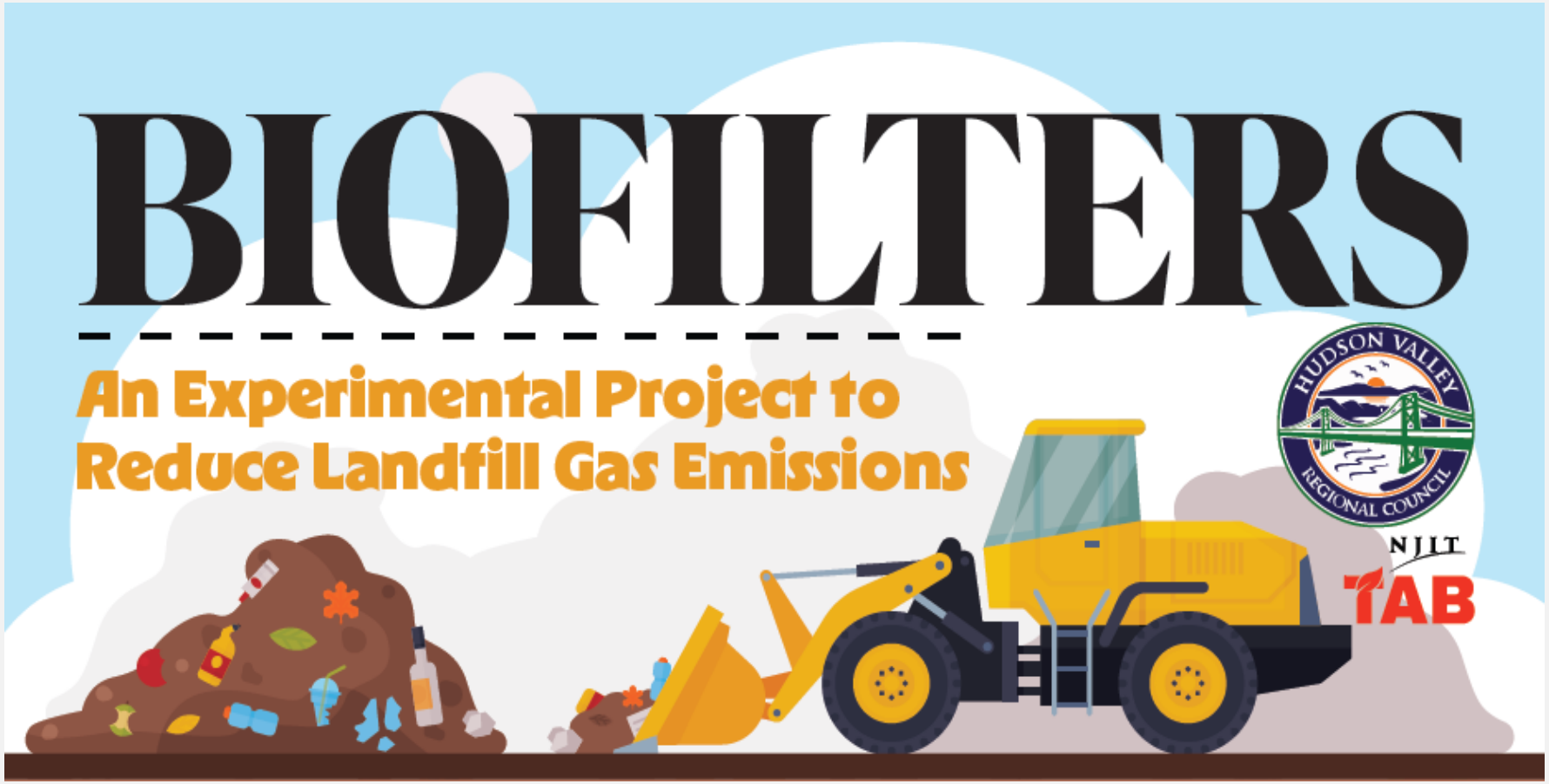


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Amenia
TA_LF 002
TA_LF 001
Oct 2025
Jan 2026
Apr 2026
Jul 2026
Oct 2026
Date and Time (EST)
Flow Rate
0.0
0.3
0.6
0.9
flow_shape
No Flow
Positive
Barometric Pressure
Site-Adjusted, inHg
30.5
30.0
29.5
29.0
28.5
CH4 (%)
70
30
10
2
Temperature
Degrees Farenheit
80
40
0
Data Source
HVRC Measurements
Weather Station
Wind Speed
Knots
30
20
10
0
Data Source
Weather Station


Dutchess County
DC_LF 059
DC_LF 058
DC_LF 057
DC_LF 056
DC_LF 055
DC_LF 054
DC_LF 053
DC_LF 052
DC_LF 051
DC_LF 049
DC_LF 048
DC_LF 047
DC_LF 046
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DC_LF 013
DC_LF 012
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DC_LF 010
DC_LF 009
DC_LF 008
DC_LF 007
DC_LF 006
DC_LF 005
DC_LF 004
DC_LF 003
DC_LF 002
DC_LF 001
Oct 2025
Jan 2026
Apr 2026
Jul 2026
Oct 2026
Date and Time (EST)
Flow Rate
0.0
0.3
0.6
0.9
flow_shape
No Flow
Positive
CH4 (%)
70
30
10
2
Data Source
HVRC Measurements
Weather Station
Barometric Pressure Site-Adjusted, inHg
30.5
30.0
29.5
29.0
28.5
Data Source
Weather Station
Temperature Degrees Farenheit
80
40
0
Wind Speed Knots
30
20
10
0

Education and Outreach



Education and Outreach

+ A Call to Action +

The USEPA estimates that over 50% of typical household garbage can be composted instead of thrown into the landfill—those are your food scraps, yard waste, and paper products. Composting is a different breakdown process that releases fewer greenhouse gases. Composting also decreases pollution, improves air quality, and enriches our soil.

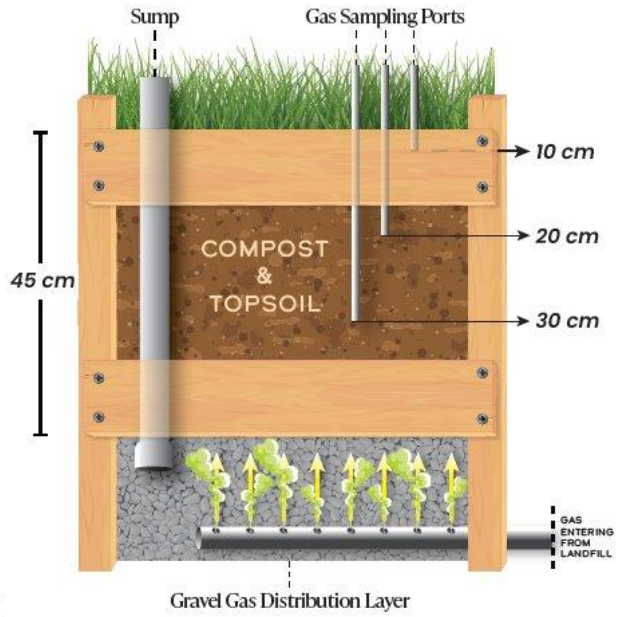
At times, this rubric comprises four principles, each beginning with the letter 'R,' starting with '**Refuse**.' So, you should not only use less but also refuse unnecessary purchases.

See here: https://bit.ly/4rs-refuse-reuse-reduce-recycle



An Experimental Solution

HVRC received a $3 million grant from the US Environmental Protection Agency's (USEPA) Climate Pollution Reduction Grant Program to implement a sustainable, low-maintenance solution for landfill methane: biofilters. This engineered system relies on naturally occurring microorganisms to break down methane. Landfill gas is vented through packed beds that resemble raised flower beds, filled with porous materials like wood chips or compost.



As the methane flows through the bed, molecules diffuse into a moist biofilm where the microorganisms consume and oxidize the methane. This low-tech, sustainable approach will be implemented—along with robust monitoring and data collection—at 14 closed landfills across the Hudson Valley through 2029.

Education and Outreach

The Closed Landfills Are Still Breathing. Here is What We Do About It.

A Local Answer to a Long-Term Problem: Methane Meets Microbes

By Dr. Sehrish Asghar, Environmental Scientist, HVRC Mid-Hudson Landfill Biofilters Project | March 2026

Methane. From Flaming Seeps to Measurements in Flight: Katie's journey to HVRC

By **HVRC** | August 31, 2026

Phase 2 Work Completed (Winter/Spring /summer 26)

- Equipment procurement completed: Tested and procured methane monitoring equipment (GEM 5000) and calibration gases.
- Baseline monitoring underway: Began vent-based baseline methane monitoring across participating sites.
- Collected available historical data from participating municipalities and consultants.
- Vent selection methodology finalized: Using a three-tier methane screening strategy to prioritize vents for monitoring and potential biofilter placement.
- **Next milestone: RFP for biofilter design is planned to be released in October 2026.**

HVRC Responsibilities

- Manage contractual grant requirements as determined by the US EPA, including honoring any and all contractual agreements entered into with consultants under contract with HVRC for implementation of the Project.
- Measure on a monthly basis the methane and other landfill gas concentrations and velocity flowing from municipal landfill, utilizing equipment and methods approved by NYS DEC and US EPA.
- Calculate landfill gas emissions from municipal landfill.
- Sub-contract with consultants to design and build Project biofilters.
- Work with NYS DEC to ensure biofilters are approved for use on municipal landfill.
- Manage the solar feasibility and battery storage report deliverables, where applicable.
- Manage the planting of native pollinators, where applicable.
- Restore the landfill vents to their original function at the conclusion of the Project, if the Municipality chooses to discontinue use of the biofilters.

Municipal Responsibilities

- Provide site access.
- Allow the installation of biofilters on the closed landfill.
  - Site plan or schematic officially approved by the Municipality.
  - All biofilter designs shall be reviewed and certified by a New York State-licensed engineer. **(HVRC to take lead)**
  - All biofilter designs shall be submitted to NYS DEC prior to implementation. **(HVRC to take lead)**
- Authorize HVRC staff and/or its designated consultants to perform reasonable. modifications to existing LFG venting infrastructure as necessary.

Municipal Responsibilities

- Assist in the planning and promotion of at least one public education event.
- Maintain biofilters Post-Project (optional).
  - Periodic replenishment (approximately every five years) of organic biofilter media (e.g., mulch or compost).
  - Routine repair or replacement of structural elements.

Optional Municipal Responsibilities

- Agree to a solar feasibility study completed for landfill.
- Agree to allow native pollinator plantings installed on the perimeter of landfill -- outside of the capped area.

Next Steps

Next Steps for HVRC – Phases 1 & 2

- Present to or update municipal legislatures on the landfill biofilters project.
- Continue baseline methane emissions monitoring.
- Determine the surface emission reading from whole LFs surfaces and account those into the overall emissions LFs
- Submit year-2 semi annual report to EPA.
- Issue RFP and select respondent for design of biofilters.

Next Steps for Municipality – Phases 1 & 2

- Present project updates to the local governing board.
  NOTE: HVRC can present on your behalf, virtually or in person.
- Provide relevant landfill research, records, and consultant data to HVRC.
- Continue authorizing HVRC access to the landfill.
- Maintain mowing for safe, unrestricted site access.
- Plow landfill access roads and monitoring areas during winter.

Thank you for your partnership and support!

Scan QR code to Learn More About HVRC's Mid-Hudson Landfill Biofilters Project!

or contact

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phone: (845) 595-8684

