

## 1. OVERALL PROJECT SUMMARY AND APPROACH

### a. Description of GHG Reduction Measures

**GHG Reduction Measure:** The Hudson Valley Regional Council (HVRC), as an individual applicant in partnership with municipalities across the Mid-Hudson Region of New York, is requesting support to reduce fugitive methane emissions from closed landfills in the Region through installations of biofilters. This grant will also support the future installation of solar and battery storage through the development of request for proposals (RFP) and the provision of technical assistance to municipalities to lease their land for community solar arrays. Finally, this grant will support the installation of native pollinator gardens and creation of long-term stewardship plans to improve regional biodiversity, decrease mowing needs, and engage the community to reclaim their landfill through ecological restoration. The project is titled Mid-Hudson Municipal Landfill Emissions Mitigation.

**Problem Statement:** The Mid-Hudson Region has dozens of small, closed municipally owned closed landfills as well as some larger county-owned closed landfills. Our Region is a hotbed of activity related to environmental activism and stopping climate change. Dozens of our local governments have completed greenhouse gas (GHG) emissions inventories and climate action plans, from the big cities to the tiniest villages and rural towns. HVRC staff has observed through our technical assistance to these municipalities that closed landfills are often the largest source of emissions for the government operations of many municipalities, as modeled using the EPA's LandGEM tool.

While conventional thinking about exponential decay of methane in landfills would indicate we do not need to worry about emissions from landfills closed 20 years ago, these landfills are in fact large emitters compared to other sources of government operations emissions like municipal fleets and buildings. Low level gas production may continue up to 100 years after landfill closure.<sup>1</sup> For instance, the Town of North East, a small, rural town of less than 3,000 residents, found its landfill to be more than 90% of its government operations emissions. The City of Beacon, a small city of 15,000 residents, found its landfill to be approximately 37% of the government operations emissions. The Town of Philipstown, a town of nearly 10,000 residents, found its landfill to be 92% of its government operations emissions. The Town of Amenia, a rural town of 4,000 residents, found its landfill to be 45% of its government operations emissions. These staggering percentages reflect the fact that these are legacy community emissions that the local governments are responsible for. These communities are included in the 14 municipalities with closed landfills participating in this project.

In addition to these modeled emissions, new research shows that, "point source emissions at landfills and large magnitude of aerial emissions rates point to potential gaps in landfill models" like LandGEM used to estimate the emissions reductions in this proposal.<sup>2</sup> There is potential for significantly higher emissions rates than those we have estimated here. Part of this project will be conducting on-the-ground monitoring to determine actual emissions from these landfills.

**Reduction Background Statement:** Adding biofilters to closed landfills is a low-cost method to remove methane from landfill gas (LFG). In this application, biofilters are being used with passive gas collection to capture escaping emissions at older landfills past peak gas production and at landfills where gas collection is no longer economically or technically feasible.<sup>3</sup> Most microbial methane uptake in landfills is accomplished by methanotrophs, microbes that can oxidize methane for energy uptake by producing

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<sup>1</sup> Huber-Humer et al., 2008.

<sup>2</sup> Cusworth et al., 2024

<sup>3</sup> Huber-Humer et al., 2008.

carbon dioxide and water. Methanotrophs are naturally occurring in methane-influenced ecosystems and soils. These microorganisms remove methane from landfill gas as the gas migrates through active and passive gas vents and into the biofilter.<sup>4</sup>

The literature documents that biofilters can remove methane from closed landfills at a rate of up to 90%.<sup>5</sup> Methane uptake rates can be affected by moisture content, temperature, and soil properties.<sup>6</sup> Research shows that high oxidation capacity is associated with coarse, porous soil rich in organic matter and has increased with more moisture.<sup>7</sup> The most effective media are wood chips, bark mulch, and compost.<sup>8</sup>

**Major Features, Tasks, Deliverables, Milestones, and Responsible Parties:**

Biofilters will be built at the gas vents on the closed landfills listed below. Initial monitoring will be conducted to determine the LFG flow rate and the concentration of methane being emitted from each gas vent. This will determine the number, location, and sizes of the biofilters for each landfill. These biofilters will consist of a combination of woody mulch and compost material. Participating municipalities with landfills are not sub-awardees, but they have submitted letters of commitment to this project. HVRC will work with them to manage design, installation, monitoring, and maintenance of biofilters on their landfills. HVRC will also work with NYS Department of Environmental Conservation (DEC) to ensure each landfill's site management plan is updated to meet DEC land-use change requirements. If the municipality has not yet explored the option of landfill solar or battery storage, HVRC will work with them to publish an RFP and select a vendor that will lease the land for installation of solar and/or battery storage. If baseline monitoring reveals that there is little to no methane being emitted from a municipal landfill, we will identify other landfills in the Region on which to implement the project.

Installation of biofilters will happen in phases, beginning with two landfills that will serve as pilot sites. Lessons learned from pilot landfills will be applied to the design and installation of biofilters at the rest of the landfills. Methane monitoring will occur monthly for the first two years after biofilter installation. After the first two years, monitoring will move to quarterly. All biofilters will be inspected during monthly monitoring and biofilter material will be added as necessary. Maintenance is not anticipated to be significant, save for external factors like flooding or animal interference. (Pilot sites are aligned with Phase 1 in the table below. Phase 2 in the below table relates to the balance of landfills.) Municipalities and County Governments that have submitted letters of commitment are:

1. City of Beacon (Dutchess County)
2. Dutchess County
3. Town of Amenia (Dutchess County)
4. Town of Bethel (Sullivan County)
5. Town of Cornwall (Orange County)
6. Town of Gardiner (Ulster County)
7. Town of Hurley (Ulster County)
8. Town of New Paltz (Ulster County)

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<sup>4</sup> Ibid.

<sup>5</sup> Duan et al., 2021; Gebert & Grongroft, 2005; Haubrichs & Widmann, 2006; Huber-Humer et al., 2008; Pecorini et al., 2020.

<sup>6</sup> Ibid.

<sup>7</sup> Haubrichs & Widmann, 2006; Pecorini et al., 2020.

<sup>8</sup> Huber-Humer et al., 2008.

9. Town of North East (Dutchess County)
10. Town of Philipstown (Putnam County)
11. Town of Rhinebeck (Dutchess County)
12. Town of Wallkill (Orange County)
13. Town of Woodstock (Ulster County)
14. Village of Mamaroneck (Westchester County)

The Workplan Table outlining the features and associated individual tasks, deliverables, milestones, and responsible parties for the project appears below. Combined, they ensure that every step in the Mid-Hudson Municipal Landfill Emissions Mitigation project will meet emissions reductions and ensure success of the GHG reduction measure. By monitoring methane emissions, installing biofilters, assisting municipalities in pursuing solar and/or battery storage on landfills, and ecologically restoring the landfills, this project will reduce emissions on these landfills.

WORKPLAN TABLE				
Feature	Task	Deliverable	Milestone	Responsible Party
1. Monitoring methane emissions from closed landfills.	1.1 Inventorying and identify vents producing the most methane.	1.1.1 Secure monitoring equipment and learn to use it.	Y1 Q1	HVRC
		1.1.2 Phase 1: Take baseline readings from first phase landfills.	Y1 Q2-Q3	Consultant Engineering Firm/HVRC
		1.1.3 Compare LandGEM estimates to baseline readings for first phase landfills.	Y1 Q2-Q3	HVRC
		1.1.4 Phase 2: Get baseline readings from all landfills.	Y1 Q2-Q3	Consultant Engineering Firm/HVRC
		1.1.5 Compare LandGEM estimates to baseline readings for all landfills.	Y2 Q2-Q3	HVRC
	1.2 Monitor emissions monthly.	1.2.1 Phase 1: Once biofilters installed, monitor emissions monthly at pilot landfills.	Y2 Q3 - Y5 Q4	HVRC
		1.2.2. Phase 2: Once biofilters installed, monitor emissions monthly at all landfills.	Y3 Q3 - Y5 Q4	HVRC
2. Installing biofilters to reduce methane emissions from closed landfills.	2.1 Secure land-use change approvals for all landfills.	2.1.1 Work with DEC to complete land-use change and site management plan updates for each landfill.	Y1 Q1-Q3	HVRC
	2.2 Hire engineering, construction, and data emissions expert consultants.	2.2.1 Draft RFP for consultant services following EPA and HVRC procurement standards.	Y1 Q3	HVRC
		2.2.2 Disseminate RFP.	Y1 Q4	HVRC
		2.2.3 Organize selection committee and review bids.	Y1 Q4	HVRC
		2.2.4 Select consultant, finalize contract that meets EPA and HVRC procurement standards.	Y1 Q4 - Y2 Q1	HVRC
	2.3 Construct biofilters.	2.3.1 Phase 1: Design biofilters based on baseline monitoring of pilot landfills.	Y2 Q2	Consultant Engineering Firm
		2.3.2 Phase 1: Install biofilters on pilot landfills.	Y2 Q2-Q3	Consultant Engineering Firm

		2.3.3. Phase 2: Design biofilters based on baseline monitoring of all landfills, adjusting as needed from lessons learned in pilot landfill projects.	Y3 Q2	Consultant Engineering Firm
		2.3.4 Phase 2: Install biofilters on all landfills, adjusting as needed from lessons learned in pilot landfill projects.	Y3 Q2-Q3	Consultant Engineering Firm
	2.4 Maintain biofilters.	2.4.1 All biofilters checked during monthly monitoring, biofilter material added if necessary.	Y3 Q4 - Y5 Q4	HVRC
3. Facilitating installation of solar and/or battery storage on closed landfills.	3.1 Determine feasibility of solar for landfills that do not yet have it but want it.	3.1.1 Draft RFP for feasibility analysis of solar/storage on landfills.	Y3 Q1	HVRC
		3.1.2 Publish RFP broadly to vendors.	Y3 Q2	HVRC/muni
		3.1.3 Organize selection committee and review bids.	Y3 Q2	HVRC/muni
		3.1.4 Select consultant, finalize contract that meets municipal goals and procurement standards.	Y3 Q2-Q3	Muni
4. Evaluating efficiency of emissions reduction.	4.1 Review data to ensure biofilters are working properly.	4.1.1 Data reviewed to ensure biofilters are working properly.	Y3 Q2-Q3	HVRC
		4.1.2 Data analyzed to understand methane reduction rate of biofilters at each landfill.	Y3 Q2-Q3	HVRC
		4.1.3 If needed, biofilters adjusted to work properly.	Y3 Q2-Q3	Consultant Engineering Firm
5. Supporting biodiversity and climate resilience on landfills.	5.1 Plant native plants on landfills.	5.1.1 Identify landfill conditions that will impact plant growth; develop long-term stewardship plan.	Y1 Q4	HVRC/Consultant
		5.1.2 Determine native plant seed mix appropriate for landfill planting.	Y1 Q4	HVRC/Consultant
		5.1.3 Plant seed mix.	Y2 Q2	HVRC/Consultant
		5.1.4 Determine native trees appropriate for landfill periphery planting.	Y1 Q4	HVRC/Consultant

		5.1.5 Host community event to plant trees.	Y3 Q2	HVRC/Consultant
		5.1.6 Monitor tree growth (only necessary in the first year).	Y2 Q2-Q3	HVRC/muni
		5.1.7 Mow to keep access paths intact.	Y2 Q3 - Y5 Q4	Muni
6. Sharing knowledge about reducing emissions and productive reuse of closed landfills.	6.1 Help residents in the community understand the impact of the project.	6.1.1 Create signage or municipal webpage for each project showing GHG reduction, energy / cost savings of implementing project.	Y2 Q1 - Y2 Q4	HVRC
		6.1.2 In collaboration with NJIT TAB, conduct community information sessions before / during / after project to help community understand impact of project on them.	Yearly, Q2	HVRC and NJITTAB
	6.2 Help expand use of biofilters, landfill solar and energy storage, and native plantings.	6.2.1 In collaboration with NJIT TAB, summarize lessons learned in conference and/or webinar series for the Region.	Q2, Y2-Y4	HVRC and NJITTAB
7. Reporting to EPA following reporting guidelines and timeframes.	7.1 Complete semi-annual reporting.	7.1.1 Work with municipalities to prepare semi-annual reports.	Yearly, Q3	HVRC
		7.1.2 Send EPA semi-annual reports.	Yearly, Q3	HVRC
	7.2 Complete semi-annual LI & DAC community benefits report.	7.2.1 Work with municipalities to prepare semi-annual benefits reports.	Y2 Q1	HVRC
		7.2.2 Send EPA semi-annual benefits reports. Only for 2nd semi-annual report.	Y2 Q1	HVRC
	7.3 Complete final report.	7.3.1 Work with municipalities to prepare final report.	Y5 Q3-Q4	HVRC
		7.3.2 Send EPA final report.	Y5 Q3-Q4	HVRC

Return to [Responsible Parties & Authority](#).

**Underlying Assumptions & Risks:** The risks associated with the Mid-Hudson Municipal Landfill Emissions Mitigation Project are typical of most construction projects. Risks include cost overruns due to increasing equipment prices or supply chain disruptions, schedule delays, quality control, contractual disputes, or natural or environmental concerns. In addition, there may be additional labor and materials costs uncovered in the RFP process, and the more detailed site review and project analysis. HVRC aims to proactively manage and mitigate risks through careful planning, contingency budgeting, and regular monitoring at each landfill. We have included contingencies in the budget and utilized higher-end estimates.

**CPRG Goals:** This project meets the CPRG implementation grant goals. This project is innovative, replicable, and can be scaled up. It achieves significant GHG reductions by 2030 and 2050. It is cost-effective and achieves substantial community benefits for communities with small, closed landfills.

**PCAP Alignment:** This project aligns with New York State’s PCAP Priority GHG Reduction Measure 3.8: Reduce Fugitive Methane and Co-Pollutant Emissions from Landfills. Landfills are the largest source of emissions in New York’s waste sector, accounting for 78% of emissions in this sector, largely from uncaptured methane.<sup>9</sup> Organic material in landfills generate methane, a greenhouse gas 28 times more potent than carbon dioxide over a 100-year period, and 84 times more potent over a 20-year period.<sup>10</sup> While many large municipal solid waste (MSW) landfills in New York have active gas collection systems in place to reduce methane emissions, most Mid-Hudson municipal landfills are too small to have feasible active gas collection. Therefore, in small municipal landfills with passive gas collection, much of this landfill gas is lost to the atmosphere.

The State’s PCAP measure details, “NYS DEC currently administers programs to manage landfill gas and landfill closures and has realized that the need exceeds available funding levels. This measure would allow NYS DEC to enhance landfill gas management by installing gas collection systems sooner after waste placement, installing specialty landfill gas collectors for difficult to access areas, or enhancing gas dewatering systems to increase collection efficiency. This measure could also include other CH<sub>4</sub> monitoring or CH<sub>4</sub> mitigation measures at landfills as appropriate.”<sup>11</sup> HVRC has been in communication with NYC DEC about our proposed Mid-Hudson Municipal Landfill Emissions Mitigation Project and DEC staff have helped us secure data regarding which landfills in the Mid-Hudson Region are relevant for our project. However, if the State uses CPRG funds on landfill methane mitigation projects, HVRC will ensure landfills supported through our CPRG project are not eligible for other CPRG project funds. We are not aware of an application from the State or other entity nearby for CPRG funds to be utilized at closed landfills to mitigate methane emissions.

#### **b. Demonstration of Funding Need**

HVRC’s research into potential funding sources to reduce GHG emissions from small, closed landfills revealed that funding generally does not apply to this project.

**Need for Funding:** Municipalities experience no financial benefit from or incentive to install biofilters on landfills. The Project landfills have been emitting methane since municipal solid waste was first deposited into them and will continue, with exponentially lower emissions, each year. Yet, these

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<sup>9</sup> New York State Department of Environmental Conservation, 2023. [2023 Statewide GHG Emissions Report](#). Albany, NY.

<sup>10</sup> CPRG [PCAP for New York State](#), 2024, page 29.

<sup>11</sup> Ibid.

emissions, despite getting smaller each year, continue to make up a large percentage of emissions compared to the rest of government operations even 20-30 years after the landfills have closed. Methane is a large source of emissions in NY State and the full extent of methane emissions are not known since they are not reported.<sup>12</sup> Per New York State's Methane Reduction Plan, "the total emissions from all waste are unknown and gas capture systems do not capture 100% of emissions. Additionally, not all inactive or closed landfills are capturing or destroying their methane emissions.... As landfills age the generation of methane declines but still contributes to overall emissions...Currently, capture systems are only required for large landfills (larger than 2.5 million tons capacity), but smaller landfills also emit methane." Although this type of project is low cost and high reward for lowering emissions, no financial incentive exists for a municipality to embark on this work other than an ethical commitment to lowering emissions. For small, cash-strapped municipalities, such projects cannot be a priority. Without strong co-benefits, installation of biofilters on closed landfills has not been a priority in New York or the Northeast. This project aims to change that, showing the power of a simple, inexpensive, and easily replicable solution.

**Availability of Other Funding:** New York State's Department of Environmental Conservation has a grant program for [Landfill Gas Collection and Treatment Systems](#). This grant program is designed for much larger landfills for the installation of landfill gas collection systems. It is not readily applicable to small municipal landfills that have been closed for a long time and were never a good match for traditional landfill gas collection and treatment systems. There is also a 50% match, which has historically presented a challenge to small municipalities.

The EPA also recently issued an RFA for research grants for [Understanding and Control of Municipal Solid Waste Landfill Air Emissions](#). The research results of this grant may be applicable to our project, but this project is strongly focused on implementation rather than research, and focuses on small, closed landfills, an under looked source of emissions.

**Other Funding:** HVRC and the municipalities have not applied for or secured any other federal or non-federal funding sources to implement this project. Both guidebooks for the Bipartisan Infrastructure Law and Inflation Reduction Act were reviewed and there are no sources of funds available at this time to implement this project.

### **c. Transformative Impact**

This project will have a transformative impact on GHG emissions reductions from small, closed landfills. By evaluating biofilter efficiency in reducing methane emissions at closed landfills in the Mid-Hudson Region, this project will establish best practices for design, implementation, and monitoring to make this project **replicable** at other municipality-owned closed landfills. To our knowledge, and based on numerous conversations with NYS DEC staff, this will be a **pioneering** effort since biofilters have not been implemented yet as a landfill methane mitigation technique in New York State. Biofilters have been implemented in Washington State and Maryland.

GHG reduction measures for landfills are often focused on landfill remediation after closure; closed landfills where active gas collection and flaring is not feasible are often overlooked. While most of the landfills participating in this project are past peak gas production, they are still emitting significant amounts of methane relative to the rest of government operations. These emissions are hard to abate. This project will reduce GHG emissions where reduction efforts are not being targeted. This project also

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<sup>12</sup> NYS DEC, 2017. [Methane Reduction Plan](#).



has the goal of showing the impact of this solution more broadly. We are partnering with New Jersey Institute of Technology's Technical Assistance for Brownfields Program (NJIT TAB) to showcase these projects throughout EPA Region 2. We have the goal of helping all 203 municipalities in HVRC's service area and beyond understand the importance and possibility of mitigating fugitive methane emissions from their municipal landfills. It would have been better to have completed these projects 20-30 years ago when the landfills were recently closed, but implementing the methane mitigation now is better than not doing it at all. The more landfills we can treat, the greater the emissions reductions.

**Market Transformation:** This project will have a market transformative impact that accelerates the deployment and adoption of biofilters for landfill emission reduction given its low-cost nature. The landfills that are part of this project can serve as demonstration sites to support the adoption of biofilters at landfills throughout the Region and State.

## 2. IMPACT OF GHG REDUCTION MEASURES

HVRC utilized the EPA's LandGEM tool to calculate methane emissions rates (metric tons) and total waste in place (tons) for the years the landfill was in operation. This data was inputted into ICLEI's ClearPath Tool to calculate total emissions in metric tons of carbon dioxide equivalent (MTCO<sub>2</sub>e) for each landfill. The Global Warming Potential values from the 2013 IPCC AR5 Fifth Assessment Report were used to estimate GHG emissions reductions.<sup>13</sup> (LandGEM is used to estimate emission rates for total landfill gas, methane, carbon dioxide, nonmethane organic compounds, and individual air pollutants from municipal solid waste (MSW) landfills. ClearPath is an online application for the calculation, tracking and management of greenhouse gas emissions at the government operations and community scales.) Baseline emissions address methane exclusively in MTCO<sub>2</sub>e because methane makes up the majority of GHG emissions from landfills.

The narrative portions of Sections 2.a. Magnitude of GHG Reductions from 2025 through 2030 and 2.b. Magnitude of GHG Reductions from 2025 through 2050 reference the below table. The table does not include any emissions reductions from potential future solar or battery storage facilities, any additional biofilters installed on other landfills as an indirect result of this project, or any carbon sequestered because of the ecological restoration of the land.

Landfills	Baseline 2025- 2030	Biofilters Installed 2025- 2030	Reductions 2025-2030	Baseline 2025- 2050	Biofilters Installed 2025-2050	Reductions 2025-2050
City of Beacon	8,008	801	7,207	22,484	2,248	20,236
Dutchess County	18,480	1,848	16,632	51,828	5,183	46,645
Town of Amenia	7,448	745	6,703	20,888	2,089	18,799
Town of Bethel	2,800	280	2,520	7,812	781	7,031
Town of Cornwall	7,448	745	6,703	20,916	2,092	18,824
Town of Gardiner	5,796	580	5,216	16,212	1,621	14,591
Town of Hurley	14,980	1,498	13,482	41,944	4,194	37,750
Town of New Paltz	14,560	1,456	13,104	40,880	4,088	36,792
Town of Northeast	4,788	479	4,309	13,496	1,350	12,146

<sup>13</sup> IPCC Fifth Assessment Report (AR5). [Global Warming Potential Values.](#)

<b>Town of Philipstown</b>	24,528	2,453	<b>22,075</b>	68,824	6,882	<b>61,942</b>
<b>Town of Rhinebeck</b>	12,348	1,235	<b>11,113</b>	34,636	3,464	<b>31,172</b>
<b>Town of Wallkill</b>	40,908	4,091	<b>36,817</b>	114,296	11,430	<b>102,866</b>
<b>Town of Woodstock</b>	15,204	1,520	<b>13,684</b>	42,729	4,273	<b>38,456</b>
<b>Village of Mamaroneck</b>	8,344	834	<b>7,510</b>	23,520	2,352	<b>21,168</b>
<b>Total (MTCO2e)</b>	<b>185,640</b>	<b>18,564</b>	<b>167,076</b>	<b>520,465</b>	<b>52,047</b>	<b>468,419</b>

**a. Magnitude of GHG Reductions from 2025 through 2030**

The cumulative emissions from 2025-2030 without emissions reduction measures for 14 participating landfills equal 185,640 MTCO2e. With biofilters in place to mitigate methane emissions, cumulative emission reductions from 2025-2030 equal 167,076 MTCO2e, or a 90% reduction from the baseline. Once biofilters are installed, they will be permanent fixtures at each landfill, therefore this measure will result in a permanent reduction in cumulative GHG emissions.

**b. Magnitude of GHG Reductions from 2025 through 2050**

The cumulative emissions from 2025-2050 without emissions reduction measures for 14 participating landfills equal 520,465 MTCO2e. With biofilters in place to mitigate methane emissions, cumulative emission reductions from 2025-2050 equal 468,419 MTCO2e, or a 90% reduction from the baseline. Once biofilters are installed, they will be permanent fixtures at each landfill, therefore this measure will result in a permanent reduction in cumulative GHG emissions.

**c. Cost Effectiveness of GHG Reductions**

**Cost effectiveness of GHG reductions** =  $(\$3,059,400) / (167,076) = \$18/\text{MTCO}_2\text{e}$ . This project has a direct GHG reduction cost of \$18 per MTCO2e reduced for the 2025-2030 period. This only includes the expected reductions from installing biofilters on the 14 landfills that have submitted letters of commitment. This cost effectiveness calculation is based on industry-standard models for the calculation of the GHG reductions as well as sound cost estimates and budgeting, as explained in the budget narrative, resulting in a reasonable cost per MTCO2e reduced.

**d. Documentation of GHG Reduction Assumptions**

Please see the technical appendix for an explanation of the methodology, assumptions, and data elements used to calculate GHG emissions. The GHG emission reduction calculation spreadsheet includes calculations for anticipated emission reductions for each participating landfill.

### 3. Environmental Results:

The Mid-Hudson Municipal Landfill Emissions Mitigation Project meets Goal 1: Tackle the Climate Crisis, Objective 1.1: Reduce Emissions that cause Climate Change of EPA's Fiscal Year 2022-2026 Strategic Plan.

- a. **Outcomes and Outputs:** The expected outcomes, outputs, timeline, and performance measures for the Mid-Hudson Municipal Landfill Emissions Mitigation Project are listed below.

OUTCOMES, OUTPUTS, & PERFORMANCE MEASURES TABLE			
Outcomes	Outputs / Activities	Timeline	Performance Measures
Methane emissions at each landfill determined.	Baseline methane readings taken.	Y1 Q2-Q3	Pre-installation monitoring reports prepared for 14 municipal landfills.
	Monthly methane monitoring readings taken.	Y2-Y5	Post-installation monitoring reports prepared annually for 14 municipal landfills.
Reduced methane emissions from closed landfills.	Develop RFP for engineering, construction, and data emissions consultants on project.	Y1 Q4	RFP distributed.
	Select consultant(s), finalize contract that meets HVRC goals and procurement.	Y1 Q2-Q3	Contract for consultants signed.
	Design biofilters based on baseline monitoring.	Y2 Q2	Site-specific biofilter design for 14 municipal landfills prepared.
	Install biofilters on landfills.	Y2 Q2-Q3	Biofilters installed at 14 municipal landfills.
	Evaluate efficiency of emissions reductions.	Y3	Methane reduction rate calculated for each landfill.
Facilitated renewable energy installations on closed municipal landfills.	Draft RFP for feasibility analysis of solar and battery storage on landfills.	Y3 Q2	Publish municipal RFPs (up to 5 solar and 7 battery storage based on our initial assessment.)
	Select consultant, finalize contract that meets municipal goals and procurement.	Y4	Up to 5 Solar feasibility studies completed.
Improved biodiversity and habitat for pollinators.	Identify landfill conditions that will impact plant growth.	Y1 Q4 - Y2 Q2	Long-term stewardship plan created for 14 landfills.
	Determine native plant seed mix appropriate for landfill planting.	Y2 Q2	Minimum 5% of available acreage planted with pollinator-friendly native plants.
	Determine native trees to plant around the periphery of each landfill.	Y3 Q2	Up to 10 native trees planted at each of 14 landfills.
	Host community event to plant trees.	Y3	14 community planting events.

Increased community understanding of benefits of biofilters' GHG-emissions reductions.	Create signage to educate community on project.	Y5	14 signs placed on municipal property in location visible to members of the public (town hall/community center, etc.).
	Conduct community information sessions to share status, challenges, and lessons learned, and respond to questions.	Y2 Q1-Q4	28 info sessions conducted (2 per landfill community).
	Create subpage on municipal website for each landfill to show GHG reduction, energy savings of the project.	Y2	14 webpages created for landfill project on municipal websites.
Increased understanding of biofilter methane solution regionally.	Project completion webinar (and/or conference) reporting on scope of work completed, project accomplishments, and projected GHG emissions reductions.	Y5	Minimum 50 participants from EPA Region 2.
EPA regularly informed of project and benefits to low-income and disadvantaged communities.	Semi-annual progress reports prepared.	twice yearly	9 semi-annual progress reports.
	Final report prepared.	Y5	1 final report.

**CAP and/or HAP emissions:** Landfills can emit toxic gases into the air even after they are closed.<sup>14</sup> This project will result in improved air quality around the landfills through installation of biofilters and may also improve the air quality of nearby communities. Biofilters have been shown to remove some HAPs, odors, VOCs.<sup>15</sup> While one of the 14 landfills is located within a Disadvantaged Community according to EPA's criteria, six more are located within five miles of a Disadvantaged Community.

#### **b. Performance Measures and Plan**

**Performance Measures and Plan:** The plan for tracking and measuring progress toward achieving the expected outputs and outcomes was established in the Outcomes, Outputs, & Performance Measures Table in Section 3.a. The effectiveness of the biofilters will be evaluated based on methane emission reduction rates calculated through regular monitoring throughout the project term. The results of the monitoring will be disclosed via municipal webpages and community information sessions. The project also includes starting the process of landfill solar installations for municipalities that have not yet explored it as an option, installation of native pollinator gardens on the landfills to help increase biodiversity, and creation of long-term stewardship plans to engage the community in restoring the ecosystem.

<sup>14</sup> <https://oehha.ca.gov/calenviroscreen/indicator/solid-waste-sites-and-facilities>

<sup>15</sup> Pecorini et al., 2020; Rossi et al. Sheoran et al, 2022.

**Tracking and Measuring Progress on Outcomes and Outputs:** The tasks and deliverables in the [Workplan Table](#) (section 1a.) associated with each project outcome and output in the Outcomes, Outputs, and Performance Measures Table will be tracked using an Excel tracking sheet based on identified performance measures. Baseline monitoring of emissions and monitoring after the biofilters have been implemented is built into the workplan to quantify and disclose the actual GHG emissions reductions. We plan to create a public web dashboard of emissions changes over time from the biofilters to showcase the effectiveness of this project.

### **c. Responsible Parties & Authorities**

The [Workplan Table](#) in section 1a. identifies the responsible parties for each deliverable necessary for successful implementation of the GHG reduction measure, Mid-Hudson Municipal Landfill Emissions Mitigation Project. The Workplan Table also details the Milestones for each deliverable and the Outcomes, Outputs, & Performance Measures Table details the timeline for completing specific outputs. Additional information regarding the coordination between responsible parties as well as the current authority to carry out the Project appears below.

- **HVRC:** This is an individual application with HVRC, a regional council of governments comprised of multiple municipalities, as the lead applicant. The 14 participants were offered the opportunity to participate as sub-awardees, but all decided that administratively it made more sense for HVRC to manage the project. HVRC will manage the project on behalf of the 14 municipalities and as such will have complete oversight and responsibility for ensuring full project implementation. HVRC will also be responsible for completion and submission of the required reporting, which appears as #7 in the [Workplan Table](#). This lead applicant role is noted in the Workplan Table where HVRC appears. The interested municipalities have provided HVRC the authority to implement the Project on their landfills by way of signed letters of commitment. If the grant is awarded, HVRC will further affirm that authority through a memorandum of understanding (MOU) that will be entered into between HVRC and the participating municipalities.
- **Municipalities:** Interested municipalities have signed a letter of commitment to participate. As can be seen from the [Workplan Table](#), the participating municipalities will be responsible for deliverables where they hold control, such as publishing the solar and/or battery storage RFP broadly to vendors, in partnership with HVRC, maintaining the landfill long-term stewardship plans, and helping residents in the community understand the impact of the Project. Municipalities will further affirm their responsibility and authority to complete these deliverables through the above-referenced MOU.
- **Project Consultants:** Consultant authority to conduct onsite work at Project landfills will be established post-RFP via the MOU. The MOU will give HVRC and any consultants brought on by HVRC for the implementation of the Project the authority to access and conduct work on the site. Consultants will be responsible for meeting municipal insurance requirements.
  - **Engineering Firm:** HVRC plans to contract with an engineering firm to design and construct the biofilters, with the monitoring conducted by HVRC staff. We have seen wildly varying estimates from methane emissions testing, resulting in the determination that in-house methane testing must be under our control, ensuring consistency in the process and resulting data. Our methane testing will be guided by NYS DEC staff as well as methane engineering experts. This joint role is noted in the Workplan Table where Consulting Engineering Firm/HVRC appears. The deliverables associated with Task 2.3 Construct biofilters will be the sole responsibility of the Firm given the required expertise.

- Data Emissions Consultant: The Data Emissions Consultant will be responsible for analyzing data from monitoring events, consulting on methods for emissions calculations and troubleshooting any issues that arise with data or data collection.
- Ecological Restoration Consultant: HVRC plans to contract with an ecological restoration firm to evaluate existing conditions and create long-term stewardship plans at each landfill site. This consultant will also be responsible for determining and planting native plant seed mix and native trees appropriate for landfill planting.
- NJIT-TAB: As detailed further in the community benefits section, New Jersey Institute of Technology's Technical Assistance for Brownfields Program will be assisting with community engagement and outreach to spread the word about this project. This work will be completed at no cost to the Project due to NJIT-TAB's separate funding for this type of work. HVRC will enter into a simple agreement with NJIT-TAB for their contribution to this Project.

#### **Other Entities:**

- NYS DEC's Region 3 Landfill Team: Critical parties to this application are the NYS DEC's Region 3 landfill team from Division of Materials Management, Division of Environmental Remediation and Division of Air Resources. We have already been working with them closely in the development of this project and plan to continue that close relationship if awarded to ensure the landfill transition to biofilter and/or solar is smooth. HVRC will also work with them to ensure each landfill's site management plan is updated to meet DEC land-use change requirements.
- Additional Municipalities: The Mid-Hudson has dozens of additional landfills that, with robust outreach to the municipalities in which they are located, could become part of this project as well if current participating landfills are not producing the expected methane to warrant biofilter installation. Should this situation arise, we will recruit other municipalities to participate in the project to maximize GHG emissions reductions, following the authority measure noted in the Municipalities section above.

#### **4. LOW-INCOME AND DISADVANTAGED COMMUNITIES**

##### **a. Community Benefits**

One of the landfills committed to this application is located within a Disadvantaged Community according to EPA's IRA definition. Six of the 14 landfills are within close proximity (less than 5 miles) to a Disadvantaged Community. The spreadsheet attached includes the CEJST Census tract IDs or EPA's EJScreen Census block group IDs and name of the relevant jurisdiction (e.g., city, town, etc.) for areas that may be affected by the proposed GHG reduction measures. Each of these communities would benefit directly and indirectly from this project based on its potential vulnerability to climate impacts such as reduced risk of wildfires, drought, extreme weather events, and sea level rise. Many of our communities are located on or near the water, including the Hudson River, Wallkill River, and the Long Island Sound. Many face dangers from flooding.

In addition, these landfills have been either neglected or seen as detrimental to the community – some of them are New York State superfund sites or are leaching hazardous waste into the groundwater. This project provides opportunities to transform the landfills – they will no longer contribute to climate change and can start the transition to becoming a net positive for the surrounding community. This project will help bring attention to the landfill, restoring the ecosystem through the pollinator gardens installed on them, bringing attention to the innovative, unique, and natural mitigation of methane taking place there, and potentially bringing solar to the locations to save municipal tax dollars and reduce fossil fuel consumption.

**Negative Project Impacts:** There are very few negative potential impacts associated with this project. There is some potential for increased noise during the biofilter construction, but it would be short lived and not affect the surrounding communities. In addition, there is some resistance to solar arrays, even on brownfields. This could have a negative impact if the surrounding communities are not amenable to solar installations being put on the landfills.

**Direct & Indirect Benefits:** Landfills emit secondary emissions, including non-methane volatile organic compounds (VOCs) and inorganic compounds. VOCs are air pollutants that are potentially hazardous to the environment and human health. The main VOCs that can be found in landfill biogas are benzene, toluene, ethylbenzene, and xylene. These together form BTEX, and are individually and collectively human carcinogens, including at low concentrations.<sup>16</sup> Landfill gases can also lead to bad smells. Common reactions to the odor include nausea or headaches. Although landfill odors may not be associated with long-term adverse health effects or illness for most people, they can add daily disruption and stress, which can greatly impact quality of life. Residing near landfill sites is also less desirable and landfill sites have a negative impact on market value of properties closer to them.<sup>17</sup> Adding biofilters would not only have the direct benefit of removing methane and secondary emissions, but also the indirect benefit of reducing the socio-economic impacts.<sup>18</sup>

By adding native pollinators, we will restore the landfill biodiversity and local ecosystem and support the environment's climate resilience. We will also host planting events at each landfill to bring in the local community to help with the periphery planting stage of the project. Our relationships with many of these municipalities stem from our collaboration and technical assistance to their volunteer climate task forces. We know and work well with the volunteers in each of these communities as well as the elected officials and municipal staff. We will work with them to bring in the communities.

Adding solar to landfills also has direct benefits. Many landfill solar arrays in the Mid-Hudson Region are community solar arrays, providing a direct tangible economic benefit to the surrounding residents. Most solar developers are pursuing the Low-Income Communities Bonus Credit Program for community solar, ensuring that most sign-ups to the solar arrays are low-income or from a Disadvantaged Community. We expect any solar projects that move forward because of this project to meet these criteria.

Rural communities in the Mid-Hudson Region that are outside of CEJST Census tracts or EJ Screen Census blocks groups still face the threat of agriculture loss, high energy costs, and are vulnerable to the impacts of climate change. This project has the potential to not only reduce municipal GHG emissions, but to improve air quality, reduce the quantity of stormwater runoff, lower land surface temperatures, reduce the pressure on agricultural land's conversion to solar, and create biodiverse habitats.

**Plan to Report Benefits:** We plan to engage the surrounding communities from the very start of this project. We are collaborating with NJIT-TAB. They have strong experience doing community engagement around brownfields. They will work with us to ensure that the projects can be flexible to incorporate community feedback, understand the effects of this project on nearby communities and report back to EPA on the benefits or disbenefits to these communities in their own words, not just the GHG reductions we are expecting. The reporting of benefits and avoided disbenefits will be accomplished through the development and implementation of signage or project webpage content on

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<sup>16</sup> Lakhout & Alsulami, 2020.

<sup>17</sup> Danthurebandara, et al., 2012

<sup>18</sup> Pecorini et al., 2020.

municipal websites. HVRC will assess, quantify, and report benefits and avoided disbenefits to these (and all) communities, including co-pollutant impacts (e.g., CAP and HAP emission reductions), throughout the grant period. Working with New York's Co-pollutant Impact Benefits Analysis Based on Emissions and/or conducting our own analysis using methods in CPRG's Technical Reference Document, Benefits Analyses: Co-Pollutant Impacts, we will proportionally apply the changes estimated for GHGs to co-pollutants.

**Impact on Low-Income and Disadvantaged Communities:** The EPA EJScreen Tool was used to identify low-income and disadvantaged communities according to EPA's IRA definition. Because landfills can have downwind environmental impacts beyond the immediate area, census blocks in the surrounding vicinity that are reasonably expected to be impacted were also evaluated. An overview of the EPA EJScreen Tool results is provided below, with the detailed listing of Census Block IDs found in the required attachment titled Areas\_HVRC-Landfills.xlsx.

- Town of Amenia Landfill: The landfill is located in and is surrounded by one Justice40 census tract and four census blocks that meet the EPA IRA criteria. The entire Town is a Justice40 Community, and some portions also meet the 90% percentile for the supplemental indexes, the most notable being Superfund Proximity. Hazardous waste was found at this landfill and has been remediated by NYS DEC.<sup>19</sup> Primary contaminants of concern at this landfill were PCBs and heavy metals.<sup>20</sup>
- Town of Bethel Landfill: The landfill is nearby three Justice40 Disadvantaged census tracts and 14 EPA IRA census blocks, with the closest being 2.5-3 miles. The census tracts meet the disadvantaged criteria for energy burden, water and wastewater & workforce development, and transportation. Most of these census blocks meet the 90% percentile for one of the supplemental indexes, the most notable being Lead Paint and Hazardous Waste Proximity.
- City of Beacon: The landfill resides near a census block that meets the EPA IRA criteria (approximately 0.5 miles away). The census block is at the 92<sup>nd</sup> percentile for lead paint, 83<sup>rd</sup> percentile for superfund site proximity, 82<sup>nd</sup> percentile for hazardous waste proximity, and 89<sup>th</sup> percentile for underground storage tank proximity.
- Town of Gardiner: The landfill is near one Justice40 census tract and four EPA IRA census blocks, with the closest being 3-3.5 miles away. One of the census blocks is at the 92<sup>nd</sup> percentile for lead paint, 83<sup>rd</sup> percentile for superfund proximity, and 80<sup>th</sup> percentile for wastewater discharge. The landfill is also very close to the Walkkill River and poses potential water contaminant risk.
- Town of Hurley: The landfill is near the City of Kingston, which has six Justice40 census tracts and 18 EPA IRA census blocks (distance approximately 3-4 miles). Census blocks within this group are at the 85<sup>th</sup> percentile for diesel particulate matter, 93<sup>rd</sup> percentile for toxic releases to air, 96<sup>th</sup> percentile for traffic proximity, 98<sup>th</sup> percentile for lead paint, 86<sup>th</sup> percentile for superfund proximity, 97<sup>th</sup> percentile for underground storage tanks, and 86<sup>th</sup> percentile for wastewater discharge. It is also close to the Ashokan Reservoir, which serves as one of New York City's drinking water sources. Contaminants of concern at this landfill include perfluorochemicals (PFCs), which are considered forever chemicals.<sup>21</sup>
- Village of Mamaroneck: The landfill is nearby two census blocks (closest distance .75 miles) that are categorized as low-income and disadvantaged communities. These census blocks meet the 90% percentile for multiple supplemental indexes, the most notable being ozone, diesel particulate matter, air toxics cancer risk, traffic proximity, RMP facility proximity, and hazardous

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<sup>19</sup> NYSDEC, Environmental Site Remediation Database. Site Record: Amenia Town Landfill.

<sup>20</sup> Ibid.

<sup>21</sup> NYSDEC, Environmental Site Remediation Database. Site Record: Hurley Town Landfill.



waste proximity. Hazardous waste was found at this landfill and has been remediated by NYS DEC.<sup>22</sup> In addition to hazardous waste, pesticides, metals, and VOCs are other contaminants of concern.<sup>23</sup>

#### **b. Community Engagement**

**Input:** The idea for this application came from community activists. Although HVRC works most intensively with municipal officials and staff, we spend a significant amount of time interacting with municipal volunteers – we provide support to Climate Smart Task Force members in navigating State programs related to climate and clean energy goals. We have helped seven municipalities participating in this project conduct greenhouse gas inventories and climate action plans for their government operations and/or community. When the Town of North East’s GHG Inventory showed that its landfill made up 90% of its GHG emissions, they came to HVRC for assistance to understand that finding. We started incorporating more closed landfills into government operations GHG inventories and came to understand the impact these closed landfills have on the emissions of a community. For the Town of North East, this became a passion project – they hired an engineering firm to monitor the emissions, they reached out to multiple experts to help understand the readings. The release of the CPRG NOFO highlighted the importance of mitigating landfill emissions from small municipal closed landfills. This project would not have come about if not for the determination of community members. While the Town of North East is not designated as a Disadvantaged Community, when we modeled landfill emissions anywhere, we found similar results – a high percentage of government operations emissions come from closed landfills. We have a simple, low-cost way to mitigate these emissions and have found receptive audiences throughout the community groups, government officials, and municipal staff we have asked to participate in this project, including in Disadvantaged Communities.

**Meaningful Engagement:** We have built this project to ensure the broadest possible adoption of these technologies after the life of this grant. We are experts in working with volunteer environmental committees. All communities that work with us on a GHG Inventory or Climate Action Plan are advised on how to best reach the audiences affected by these plans. We have advised them on holding public meetings, conducting outreach related to GHG reduction measures, and provided them with materials and support to do that. Municipalities completing a climate action plan also complete a public engagement and outreach plan to solicit and incorporate feedback from residents and key stakeholders. They undergo a comprehensive approach to connect with targeted audiences, such as posting a draft of the plan on the municipal web site for comment, holding workshops, tabling at a community event, and/or soliciting feedback for the draft plan in a community-wide mailing, through social media and/or a flyer. HVRC will provide similar options for each municipality participating so they can select the outreach methods that work best for their community.

With the assistance of NJIT-TAB, experts on brownfield community outreach, the elected officials, community volunteers, and HVRC will ensure communities affected by this project are incorporated continuously throughout the project. As the TAB provider for New York, NJIT TAB understands the importance of redeveloping brownfields to reduce GHG emissions and adapt to climate change. The TAB team consists of planners, engineers, environmental scientists, and social scientists who help communities with brownfield projects.<sup>24</sup> This assistance includes community engagement activities,

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<sup>22</sup> NYSDEC, Environmental Site Remediation Database. Site Record: Mamaroneck Taylor’s Lane Composting.

<sup>23</sup> Ibid.

<sup>24</sup> NJIT. Technical Assistance to Brownfield (TAB) Communities. <https://www.njit.edu/tab/what-tab>

educational workshops, seminars, webinars, and boot camps on specific brownfield related topics, and more. Community events will be tailored to each unique community and their individual needs.

In most of the communities participating, HVRC is already in touch with volunteers serving the community through their Climate Smart Task Force and/or Conservation Advisory Committee as well as the elected officials in each municipality participating. Our strong partnerships with these groups will ensure that the project is visible to the community and that community feedback is incorporated into the project from the beginning.

**Inclusion of Various Perspectives:** HVRC's staff is bilingual. We will prioritize hiring staff for this project who can communicate in Spanish to ensure engagement with the Spanish-speaking populations near these landfills.

## **5. JOB QUALITY**

HVRC will be creating new jobs through this project if selected for funding. To our knowledge, biofilters have not been utilized to reduce emissions from closed landfills in New York. We will be publishing an RFP for design and construction of biofilters. All contractors that complete work at these landfills will follow site specific health and safety plans and will have taken the OSHA Health and Safety Training Course for Hazardous Waste Operations.

We will also be assisting municipalities in publishing their own RFPs for landfill solar arrays. In addition to ensuring these RFPs include the grant requirements, such as prevailing wage and Build America Buy America standards, HVRC will include language related to the eight Good Jobs Principles as a checklist in the RFP for potential vendors to affirm whether they do or do not meet the Principles. This will help to focus potential vendors' efforts on: 1) ensuring they actively recruit from underserved communities and do not discriminate based on criteria unrelated to job performance, 2) provide family-sustaining benefits, 3) practice Diversity, Equity, Inclusion, and Accessibility in the workplace, 4) are empowered to join unions, 5) have a safe, healthy and accessible workplace, 6) excellent organizational culture, 7) are paid a stable living wage, and 8) have equitable opportunities and tools to progress.

Particularly when contributing to the potential creation of an industry, in this case biofilters on landfills in New York, it is critical to ensure the industry generates high-quality jobs with a diverse, highly skilled workforce. HVRC understands this, as a longstanding recipient of Economic Development Administration Partnership Planning Assistance support. We are experts at ensuring proposals submitted to EDA from our region meet the EDA's Investment Priorities of Equity, Recovery and Resilience, Workforce Development, Manufacturing, Technology-Based Economic Development, Environmentally Sustainable Development, and Exports & Foreign Direct Investment. We anticipate this project to result in quality jobs that reduce emissions in our Region through a new methodology. Ensuring the clean energy economy creates good, family sustaining jobs is critical to meeting our climate goals. This project will aim to put forth best practices towards clean energy job creation.

## **6. PROGRAMMATIC CAPABILITY AND PAST PERFORMANCE**

### **a. Past Performance**

HVRC currently has six full-time employees and one part-time employee working on Federal and State funded programs such as economic development, water quality, clean energy, and climate action planning. Below are descriptions of four of those programs on which we are the direct recipient:

**Project Title:**

Hudson Valley Regional Council and EDD Comprehensive Economic Development Planning and Technical Assistance

**Assistance Agreement Number:** ED22PHI3020067

**Federal or Non-federal Funding Agency and Assistance Listing Number:** 11.302

**Agreement Description:** HVRC has received grant funding from the US Department of Commerce Economic Development Administration (EDA) to develop a Comprehensive Economic Development Strategy (CEDS) for the Region every five years, with annual updates in between. The staff at HVRC assist municipalities and eligible entities throughout the Region with the application process for EDA's various grant offerings.

**Funder Contact:** Lucas Martin, [LMartin2@eda.gov](mailto:LMartin2@eda.gov)

**Management of Agreement:** HVRC has received EDA funding for Comprehensive Economic Development Strategy for over a decade. HVRC has submitted acceptable interim reports under the current agreement and final reports under prior agreements. HVRC has completed the required deliverables on time as well as other agreement requirements: the EDD's 5-year CEDS and annual CEDS updates in a coordinated manner amongst all relevant stakeholders (local governments, private industry, organizations, and individuals). In addition, HVRC facilitates municipalities'/not-for-profits' applications to access Federal Investment Assistance both in relationship to the 5-year CEDS as well as other funding opportunities. HVRC's management of our EDA PPA grant ensures that our EDD meets the 2021 updated investment priorities of the US Economic Development Administration: greater equity by focusing on underserved populations and/or underserved communities; building economic resilience and recovery from economic shocks; workforce development that focused on education and skills training for well-paying, quality jobs; growing existing and new, innovative manufacturing; growing technology-based economic development; encouraging environmentally-sustainable development that helps address the climate crisis; and growing US exports and foreign direct investment.

**Project Title:** Hudson Valley Regional Council Special Initiative to address Severe Adverse Economic Impact due to the Covid-19 Pandemic

**Assistance Agreement Number:** ED20PHI3070083

**Federal or Non-federal Funding Agency and Assistance Listing Number:** 11.307

**Agreement Description:** With special project funding through the CARES Act, HVRC researched the impact of the COVID-19 pandemic on our regional economy and identified future measure to increase the Region's resilience to future potential adverse economic or environmental impacts.

**Funder Contact:** Lucas Martin, [LMartin2@eda.gov](mailto:LMartin2@eda.gov)

**Management of Agreement:** HVRC successfully created surveys and determined the impact of COVID-19 on municipalities and businesses throughout the Region, and reported back to EDA with the types of assistance needed for industries that were most severely impacted. Final technical reports were submitted by HVRC to the EDA at grant term completion as well as required interim and final reports on a timely basis.

**Project Title:** Clean Water Funding: Training & Technical Assistance (TA) for Small & Rural Municipalities in the Mid-Hudson Region, New York

**Assistance Agreement Number:** not available yet

**Federal or Non-federal Funding Agency and Assistance Listing Number:** 66.446

**Agreement Description:** HVRC has been awarded an EPA TA grant to ensure rural and disadvantaged municipalities in the seven-county Mid-Hudson Region of New York are able to take advantage of

planning, development, and acquisition of funding and financing for wastewater projects, through a regional needs assessment and cohort model approach to guidance on IUP development and submission, in addition to project planning and management, and capacity building technical assistance.

**Agreement Contact:** Winnie Zhao, [Zhao.Winnie@epa.gov](mailto:Zhao.Winnie@epa.gov)

**Management of Agreement:** HVRC is finalizing the contracting process. We have successfully completed the pre-award review process, and are putting final touches on the descriptive areas of the budget narrative. In doing so, we have gained a strong understanding of EPA contracting requirements.

**Project Title:** 604(b) Baseline Water Quality Planning Program

**Assistance Agreement Number:** DEC01-C00929GG-3350000

**Federal or Non-federal Funding Agency and Assistance Listing Number:** 66.454

**Agreement Description:** HVRC is the recipient of grant funding to assist with Water Quality Planning in the Region through the NYSDEC and the Federal Clean Water Act Program. HVRC receives ongoing 604b funding from NYS DEC to organize and sustain collaboration around water quality management; build local capacity for watershed management planning and source water protection project implementation; provide technical support for MS4 permit compliance to communities in their service areas; update watershed plans to nine-element standards; and provide technical assistance on water quality matters to Mid-Hudson municipalities as requested.

**Funder Contact:** Natalie Brown, [Natalie.browne@dec.ny.gov](mailto:Natalie.browne@dec.ny.gov)

**Management of Agreement:** The current grant period has brought success in completing a Drinking Water Source Protection Program (DWSP2) Plan in NYSDEC's first iteration of the draft framework. We provided input on how the program can be improved before it is finalized by conducting a beta test and documenting the challenges the community faced while following the draft framework. Other program accomplishments include active participation in watershed planning and water quality groups at the watershed and county levels, participating in climate action planning for water resources, and more. HVRC is currently in the contracting phase for the Fiscal Year 2025 contract and has met the quarterly reporting requirements of past grant agreements.

In addition to the above four grants where we hold the contract with the state or federal entity, we are also a sub-awardee on two state contracts that directly relate to this project: NYSEDA's Clean Energy Communities Program and DEC's Climate Smart Communities (CSC) Coordinator Program. In each of these programs we advise local governments on climate and clean energy topics, helping them earn state grants for their efforts. CSC Coordinators assist and support local governments in taking action to reduce greenhouse gas emissions and adapt to climate change through outreach, planning, education, and capacity building. In the past two years HVRC completed an update to the 2010 Community Greenhouse Gas Emissions Inventory (GHGI) for the Mid-Hudson Region, the only region in the state to have done so. It is now available regionwide for municipal preparation of their individual community GHGIs. HVRC also led three cohorts and has just begun a fourth cohort, with a total of 82 municipalities participating across the four cohorts (unique participation number is lower).

Finally, in the last few years we also successfully implemented three county-level Climate Action Planning Institute cohorts since 2018. HVRC developed and implemented this innovative approach to climate action planning under our original NYSEDA agreement, working with nine municipalities. For the current two cohorts, HVRC lead the application process with two counties to the NYS DEC CSC Grant Program, enabling HVRC to deliver this much needed programing to 18 additional local governments. We have a proven track record in shepherding groups of municipalities to create greenhouse gas

emissions inventories and climate action plans for their government operations. We have found this style of technical assistance to be especially effective for municipalities to learn not only from our experts, but from each other. Cohorts not only help us reach more municipalities faster but help build capacity in the Region so municipalities can more effectively serve their residents over time.

#### **b. Reporting Requirements**

HVRC has met the reporting and completion requirements, where applicable, on each of the grants listed above. We submitted acceptable interim and final reports for each grant project above. All that have been available for renewal have been re-awarded to us based in part on our past performance on the projects. This includes the EDA Partnership Planning Assistance Grant, DEC 604b Water Quality Planning Grant, and the NYSEDA Clean Energy Communities Program Grant. We pride ourselves on achieving the expected deliverables, outputs, and outcomes under our agreements with State and Federal agencies. In the rare instance in which we are encountering difficulty implementing the project, we provide transparency and keep an open line of communication with our funder.

#### **c. Staff Expertise**

**Hudson Valley Regional Council:** HVRC was established in 1978 as an organization of county governments comprising Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, and Westchester Counties. HVRC is one of ten regional councils in NYS enabled through General Municipal Law Articles 12-B and/or 5-G and is one of over 650 regional planning organizations in the United States. In addition to providing a regional perspective, HVRC offers planning, education & outreach, and advocacy for Mid-Hudson municipalities, specifically in the areas of economic development, environmental sustainability, materials management, clean energy, and water quality. We are a trusted and known entity relied upon to provide helpful technical assistance suited to our local governments' needs and goals. HVRC is considered a government entity by New York State. We have submitted a legal opinion and New York State Article 5-G under "Other Narrative Attachments" as documentation that New York State considers HVRC to be a public body created by and pursuant to state law accountable to municipal units of government.

**Staff:** In addition to the Project Program Manager and Project Coordinator who will be hired to implement the Project, the HVRC staff listed below bring the expertise and background to support the successful completion the Mid-Hudson Municipal Landfill Emissions Mitigation Project. Our reach and strong relationships within the Region extend beyond local governments to the many not-for-profit entities doing good work in the environmental arena. This experience enables us to bring in appropriate partners with the resources, capacity, and expertise to fulfill the requirements of this proposed Project.

**Carla Castillo, Executive Director.** Ms. Castillo has been with HVRC since 2016. In her current role, Ms. Castillo oversees staff's regional work with 202 municipalities in the seven-county Mid-Hudson Region. This includes HVRC's funded work through the US Department of Commerce Economic Development Administration, Northern Borders Regional Commission, NYSEDEC 604(b) Water Quality Program, NYSEDA Clean Energy Communities Program, NYSEDEC Climate Smart Communities Program, and NYSEDEC-funded Climate Action Planning Institutes in Dutchess and Westchester Counties. Ms. Castillo manages HVRC's \$1.2M budget and board relations with a 19-member board consisting of elected officials and non-government representatives. She has dedicated thousands of hours creating and maintain relationships with nearly all the municipalities within the Region, and her fluency in Spanish is useful for communicating with the large Spanish-speaking population of the Region. Ms. Castillo's brings

26 years of combined experience in project management and lending as well as community engagement and capacity building experience to this project. Ms. Castillo received a master's degree in City & Regional Planning and a Master of Science in International Development & Appropriate Technology from the University of Pennsylvania. She received a bachelor's degree in Latin American Studies from UCLA. Ms. Castillo chairs her local municipality's town-appointed environmental committee and sits on a number of regional and local boards.

**Eleanor Peck, Deputy Executive Director.** Ms. Peck has been with the organization since 2021 managing the Clean Energy Communities and Climate Smart Communities Program for the Mid-Hudson Region, providing support as a Clean Energy Communities Coordinator to communities working to reduce energy usage and greenhouse gas emissions through the implementation of cost-saving clean energy projects. Previously, Ms. Peck was the Climate Smart Coordinator in the City of Beacon, helping the City achieve NYS Climate Smart Communities Program Silver Certification. She has also worked for the Cary Institute of Ecosystem Studies in Millbrook, fundraising for the Institute's ecological science, as well as the Wildlife Conservation Society, fundraising for the Bronx Zoo and conservation projects around the globe. Ms. Peck received a master's degree in International Affairs from the New School for Social Research in New York City and her bachelor's degree from Roosevelt University in Chicago. She continues to volunteer in the City of Beacon as a member of the City's conservation advisory committee.

**Melanie Patapis, Climate Smart Communities Coordinator.** Ms. Patapis joined HVRC in July 2022. Ms. Patapis works on the NYS DEC Climate Smart Communities Coordinator Program, providing technical assistance and guidance as a Climate Smart Communities Coordinator to local governments completing greenhouse gas emissions inventories and climate action planning. Most recently she updated the 2010 Mid-Hudson Regional GHG Inventory, providing 2021 community-wide emissions estimates for all 203 municipalities in the Region. Previously, she was the Sustainability Coordinator at Greenburgh Nature Center, providing support for all sustainability programming and initiatives. While there she worked with the local community and school districts on garden and ecosystem projects. Ms. Patapis received her master's degree in Environmental Education at Bard College's Center for Environmental Policy and her bachelor's degree in Environmental Studies from Tulane University.

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