

Urban Soil Health Remediation at be.wild.er farm



Establishing the First Urban Soil Health Remediation Project

be.wild.er farm, established in 2016 north of Pittsburgh, grows mixed vegetables and sells through Community Supported Agriculture (CSA), restaurants, and farmers markets. In 2021, farm owner, Megan Gallagher, purchased additional land adjacent to her home in Wilkinsburg, Pennsylvania, with the goal of expanding operations. The planned expansion prompted Gallagher to reach out to Allegheny County Conservation District (ACCD) for technical assistance to assess soil lead (Pb) levels at the new urban site.

Creating a Remediation Recipe

ACCD's heavy metal micro-mapping revealed elevated soil lead levels across the newly acquired site. Rather than relying on "cap and build" mitigation, Gallagher was committed to restoring the soil for agricultural use. Working alongside ACCD and project partners, she played an essential role in developing the remediation "recipe" that successfully reduced lead concentrations, establishing be.wild.er farm as the first Urban Soil Health Remediation (USHR) project.



**Allegheny County
Conservation District™**
Trusted Soil & Water Conservation Partner

Project Snapshot

Landowner: Megan Gallagher
Project Date: 2023- 2025
Project Partners: Pasa Sustainable Agriculture, Chatham University

Site Overview

- **Area:** 8,400 sq ft
- **Site Use:** Urban farm business, mixed vegetable
- **Site History:** Residential (2012 demo)
- **Site Access:** Farmer owned

Lead Levels

- **Starting Site Pb Average:**
520.10 ppm
- **Final Site Pb Average:**
384.70 ppm

Lessons Learned



Double Dig Process

Wood chips were inoculated with soil pro-biotic and spread at a depth of 6 inches. The contractor removed debris from demolition, incorporated wood chips, and deep tilled with a backhoe, moving backwards across the site to prevent re-compaction.



Cover Cropping

Soil was amended with compost and bio-char before seeding sorghum sudangrass and broom corn cover crops. These crops were selected due to high biomass residue, ability to thrive without irrigation, and potential for non-edible cash crop harvest.



Non-Edible Cash Crop

Both cover crops thrived in the current soil conditions, despite concerns that wood chips might lock up essential nitrogen. Broom corn tassels were harvested and traded at a value of \$170.

Digging Into Results

Using USHR protocol, soil lead concentration *decreased* overall. **The site average soil lead content decreased by 135.40 ppm;** from medium risk to low risk. 84% of samples decreased in soil lead concentration. More than half of those samples decreasing by 100 parts per million (ppm) or more. Laboratory testing showed increased soil pH and sufficient phosphate content, which means that lead bio-availability was reduced.

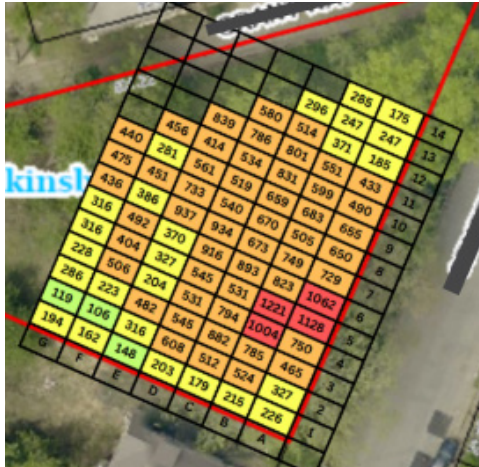


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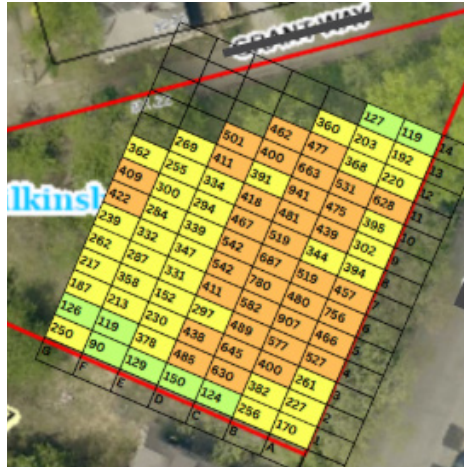
to learn about ACCD's Community Agriculture & Urban Soils Program, find resources, and request assistance online.

Connect with be.wild.er

bewilderfarm.com
bewilderfarm@gmail.com



BEFORE: In 2023, sampling and analysis using a pXRF shows average soil lead of **520.1 ppm, medium risk.** Four samples exceed 1000 ppm Pb. Lab results show soil pH of 6.7 and phosphate content of 179 lb/acre.



AFTER: In 2025, sampling and analysis using a pXRF shows average soil lead of **384.7 ppm, low risk.** No samples exceed 1000 ppm Pb. Lab results include increased soil pH of 7.2 and increased phosphate content of 252 lb/acre.

Site Maps

- Very Low Risk: 0- 150 ppm Pb
- Low Risk: 151- 400 ppm Pb
- Medium Risk: 401- 1000 ppm Pb
- High Risk: 1000+ ppm Pb

Project Budget

- Soil amendments: \$4,807
- Equipment and labor: \$6,773
- Cover crop: \$120
- Laboratory fees: \$370
- Excludes farmer stipend



With ACCD's support, we not only made a significant improvement to the soil health at our site, but also collaborated with other sites to determine whether the methods we used were replicable and effective. This type of practical, collaborative research is much needed in urban agriculture and being able to participate in it is deeply fulfilling."

Megan Gallagher

be.wild.er farm owner



This project was generously supported by the following funders:

- PA Department of Agriculture's Urban Ag Infrastructure Grant - awarded to be.wilder farm.
- USDA's National Institute of Food & Agriculture Northeast Sustainable Agriculture Research & Education (SARE) Partnership Grant (ONE24-448)

Photos courtesy of Ezra Jones Photography and be.wilder farm.

Urban Soil Health Remediation at Rebecca Ave. Community Garden



Fruitful Connections

Rebecca Ave. Community Garden is a small mixed vegetable and herb garden managed by neighbors and garden steward Jess Runco.

Expanding Community Food Access

In 2024 the garden partnered with Tree Pittsburgh's Giving Grove Program to establish a community orchard, expanding opportunities for fresh food production and community engagement. As planning began, Runco recognized the importance of understanding the site's soil conditions before planting edible crops and fruit trees.

Launching Soil Remediation Efforts

To assess soil health and safety, Runco contacted Allegheny County Conservation District (ACCD) for soil analysis. Testing revealed elevated levels of lead in portions of the site. With support from ACCD, the garden became part of the Urban Soil Health Remediation (USHR) initiative.



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Project Snapshot

Land Steward: Jess Runco

Project Date: 2024-2026

Project Partners: Pasa Sustainable Agriculture, Chatham University, Tree Pittsburgh

Site Overview

- **Area:** 2,200 sq ft
- **Site Use:** Community garden
- **Site History:** Residential (2018 demo)
- **Site Access:** Lease from private landowner

Lead Levels

- **Starting Site Pb Average:** 844.67 ppm
- **Final Site Pb Average:** 497.95 ppm

Lessons Learned



Rubble Removal

This site had significant rubble to remove and haul away. The sidewalk and foundation left behind from demolition align with historic maps. In the future, ACCD will suggest farming outside the concrete footprint.



Lowering Costs

Rebecca Ave. Community Garden is volunteer-run and had to rent a tiller for seedbed preparation. Costs can be lowered through programs like tool lending libraries, preventing farmers from needing to rent equipment.



Beauty & Biomass

Volunteers at Rebecca Ave. Community Garden grew flowers as the non-edible cash crop. Beautification was prioritized over revenue. After harvest and before frost, the remaining biomass was incorporated as green manure.

Digging Into Results

Using USHR, soil lead concentration *decreased* overall at Rebecca Ave. Community Garden. **The site average soil lead content decreased by 346.71 ppm;** from medium risk to low risk. 76% of samples decreased in soil lead concentration. 71% of those samples decreasing by 100 parts per million (ppm) or more. Laboratory testing showed an increased soil pH and sufficient phosphate content, which means that lead bio-availability has been reduced.



Scan the code

to learn about ACCD's Community Agriculture & Urban Soils Program, find resources, and request assistance online.

Connect to Touch of Green

touchofgreenpgh.com
jess@touchofgreenpgh.com



BEFORE: In 2024 sampling and analysis using a pXRF shows average lead of **844.67 ppm**, medium risk. Nine samples exceed 1000 ppm Pb. Lab results show soil pH of 7.2 and deficient phosphate content of 69 lb/acre.



AFTER: In 2026 sampling and analysis using a pXRF shows average lead of **497.95 ppm**, considered medium risk with just 1 sample exceeding 1000 ppm Pb. Lab results include increased soil pH of 7.3 and phosphate content of 133 lb/acre.

Site Maps

-  Very Low Risk: 0- 150 ppm Pb
-  Low Risk: 151- 400 ppm Pb
-  Medium Risk: 401- 1000 ppm Pb
-  High Risk: 1000+ ppm Pb

Project Budget

- Soil amendments: \$264
- Equipment and Labor: \$3,285
- Cover crop: \$98
- Laboratory fees: \$370
- Excludes farmer stipend



Without support from ACCD, we wouldn't have been able to move ahead with the community orchard. Now our neighbors can safely enjoy this space and the fruit for years to come. It's been a big learning opportunity for everyone who uses the garden."

Jess Runco

Community Garden Steward



This project was generously supported by the following funders:

- National Association of Conservation District's Urban & Community Conservation Grant
- USDA's National Institute of Food & Agriculture Northeast Sustainable Agriculture Research & Education (SARE) Partnership Grant (ONE24-448)

Photos courtesy of Ezra Jones Photography and Touch of Green..

Urban Soil Health Remediation at Soil Sisters Plant Nursery



Growing Impact

Soil Sisters Plant Nursery (SSPN) was established in 2020 and is co-owned by sisters Raynise and TaRay Kelly. The nursery grows heirloom vegetable, herb, and annual flower seedlings.

With support from the Hilltop Alliance, a local community development corporation, Raynise and TaRay started to expand their operation to a vacant lot across the street in 2022.

Preparing for Remediation

SSPN requested that Allegheny County Conservation District (ACCD) screen the vacant lot for lead before acquiring the lease. The vacant lot was owned by the Urban Redevelopment Authority (URA) and had to be dispossessed through Pittsburgh's Land Bank; this took over 3 years. It is essential to acquire long-term, secure site access prior to implementing Urban Soil Health Remediation (USHR) protocols.



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Project Snapshot

Land Steward: Raynise Kelly

Project Date: 2023-2026

Project Partners: Pasa Sustainable Agriculture, Chatham University

Site Overview

- **Area:** 4,200 sq ft
- **Site Use:** Community farm
- **Site History:** Residential (2005 demo)
- **Site Access:** Farmer owned

Lead Levels

- **Starting Site Pb Average:** 324.95 ppm
- **Final Site Pb Average:** 285.31 ppm

Lessons Learned



Flawed Fill

During land acquisition, significant grading and leveling were completed at the site. New fill was introduced and incorporated into existing soil. The site had to be screened again before USHR to confirm that the new fill did not introduce contamination.



Double Dig Process

This site had significant rubble. 4th River Workers Guild developed a strategy to trench the site with steep slopes, remove large debris, and allow debris < 6 inches to fall below plow line. This accomplished goals and reduced labor costs.



Late-Seeded Cover Crop

Broomcorn, which is drought tolerant and deer resistant, was selected as a non-edible cover crop. Despite a late planting and drought conditions, broomcorn produced a large amount of residual biomass. This was incorporated as a green manure.

Digging Into Results

Using USHR, soil lead concentration *decreased* overall at Soil Sisters Urban Farm. **The site average soil lead content decreased by 39.64 ppm;** lowering associated risk of soil lead exposure. 67% of samples decreased in soil lead concentration. 31% of those samples decreasing by 100 parts per million (ppm) or more. Lab testing also shows an increased soil pH and sufficient phosphate content, which means that lead bio-availability has been reduced.



Scan the code

to learn about ACCD's Community Agriculture & Urban Soils Program, find resources, and request assistance online.

Connect to Soil Sisters Plant Nursery

soilsistersplantnursery.com
soilsisters835@gmail.com



BEFORE: In 2024 sampling and analysis using a pXRF shows an average site soil lead of **324.95 ppm**, medium risk. Laboratory soil test results show soil pH of 7.4 and excessive phosphate content of 571 lb/acre.



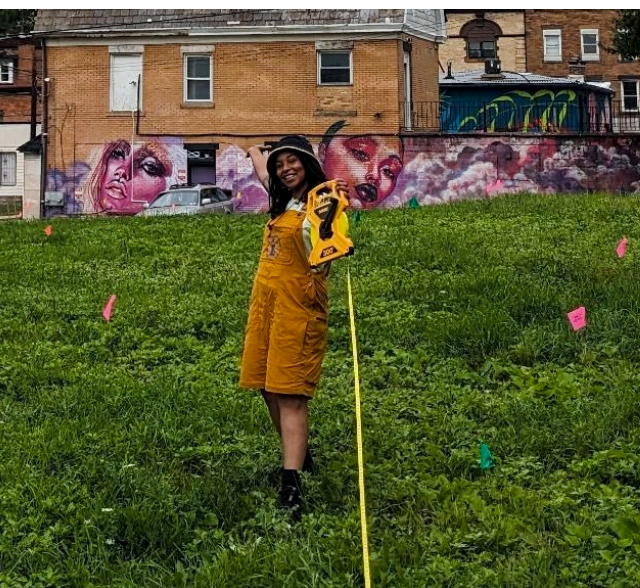
AFTER: In 2026 sampling and analysis using a pXRF shows an average site soil lead average of **285.31 ppm**, considered medium risk. Lab results include increased soil pH of 7.9 and sufficient phosphate content of 247 lb/acre.

Site Maps

- Very Low Risk: 0- 150 ppm Pb
- Low Risk: 151- 400 ppm Pb
- Medium Risk: 401- 1000 ppm Pb
- High Risk: 1000+ ppm Pb

Project Budget

- Soil amendments: \$4,500
- Equipment and Labor: \$5,898
- Cover crop: \$65
- Laboratory fees: \$370
- Excludes farmer stipend



"We're grateful for the guidance and resources provided by ACCD to make this project a reality. Using this farm as an educational, hands-on learning space is essential to our vision, and we feel better inviting the community here knowing that we invested in healthier soil."

Raynise Kelly

Soil Sisters Co-owner

- National Association of Conservation District's Urban & Community Conservation Grant
- USDA's National Institute of Food & Agriculture Northeast Sustainable Agriculture Research & Education (SARE) Partnership Grant (ONE24-448)