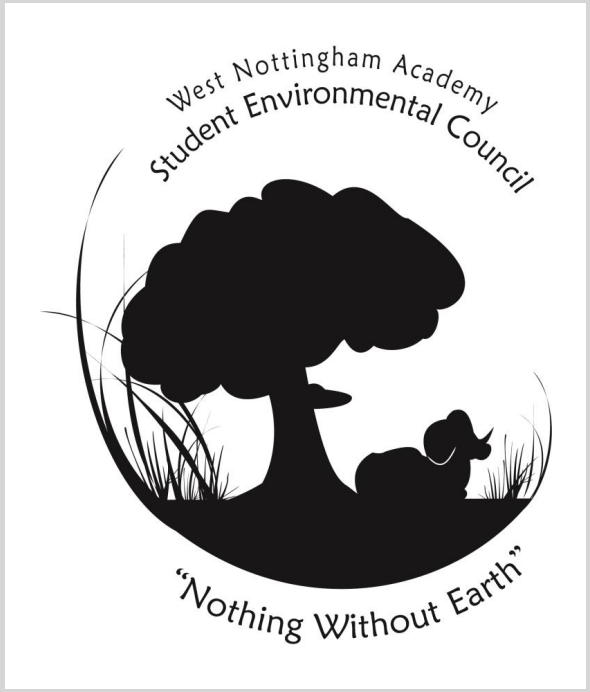
MAEOE
Maryland Association for Environmental & Outdoor Education

EXCELLENCE IN EDUCATION
WEST NOTTINGHAM ACADEMY
FOUNDED
NIHIL SINE LABORE
1744
17 44

West Nottingham Academy
Student Environmental Council
"Nothing Without Earth"

West Nottingham Academy Sustainability Program

- Environmental Literacy Across the Curriculum
- Environmentally Sound Physical Campus
- Community Embrace of Environmental Ethics on Campus and through Partnerships



The Efficacy of Community Partnerships

Kilby Farm: Outdoor Classroom and Neighbor


KILBY
CREAM


WEST
NOTTINGHAM
ACADEMY
Grades 9-12 Boarding & Day
www.wna.org
www.wna.org

Learning about compost

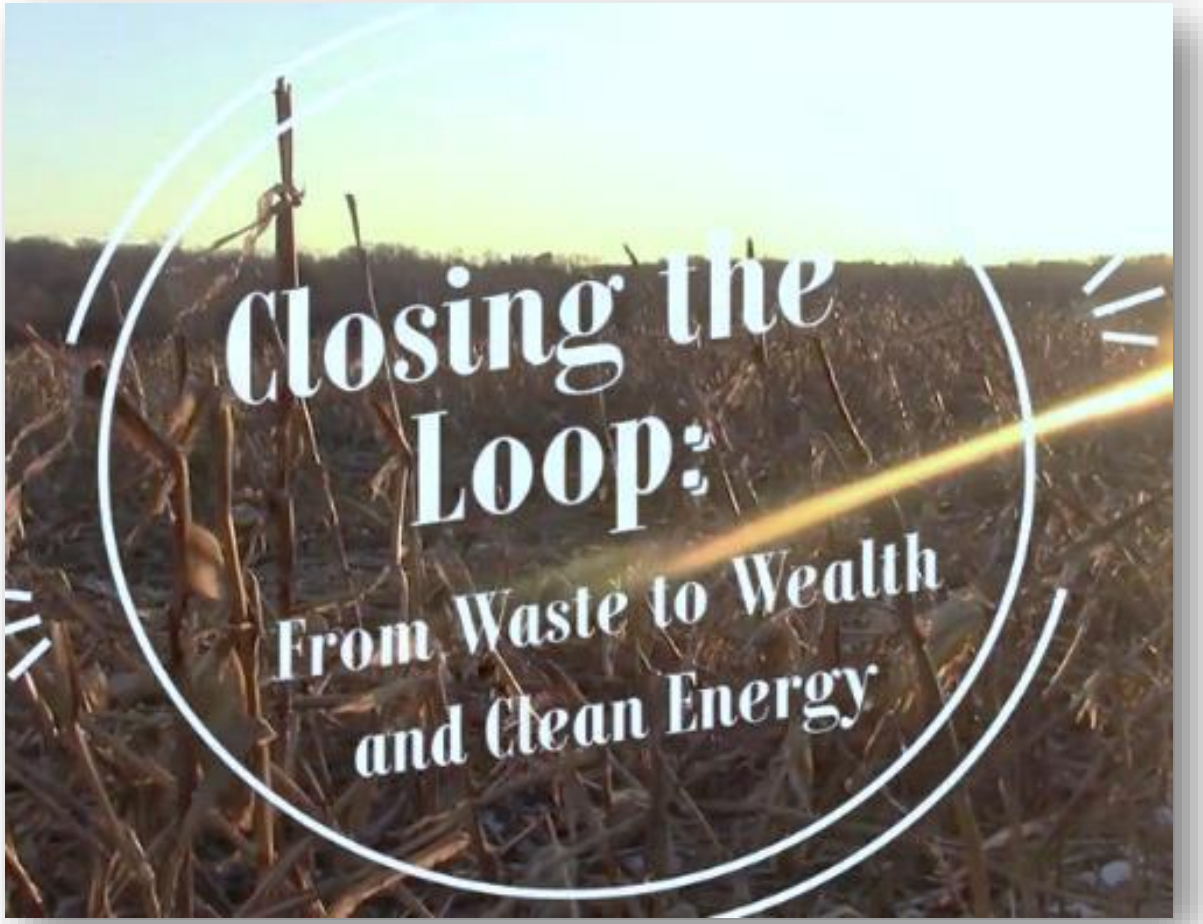
Methane Digester Tour

Understanding streambank restoration

How to run a business

How to run a farm

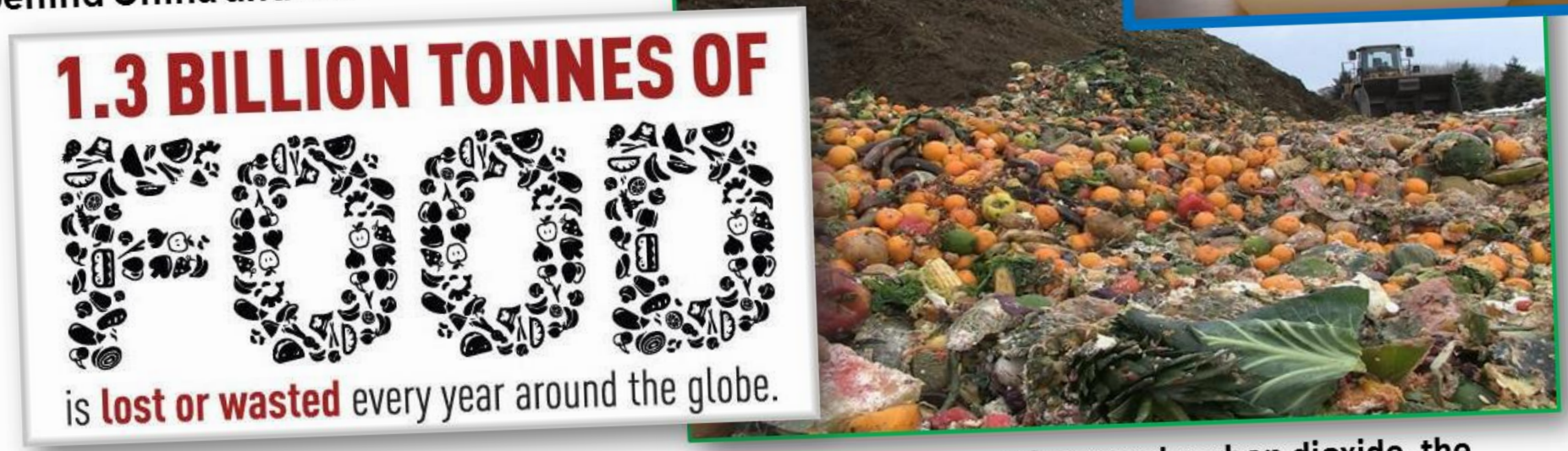
WNA, Mr. Kilby, and members of the American Dairy Association



For Sustainable Rural Communities

Food waste and methane

If food waste globally could be represented as its own country, it would be the third largest greenhouse gas emitter, behind China and the U.S.



Food waste in landfills decomposes and releases methane and carbon dioxide, the two most potent greenhouse gases that contribute to global warming.

Kilby Home Farm: Sustainability = Staying power and a state of mind.

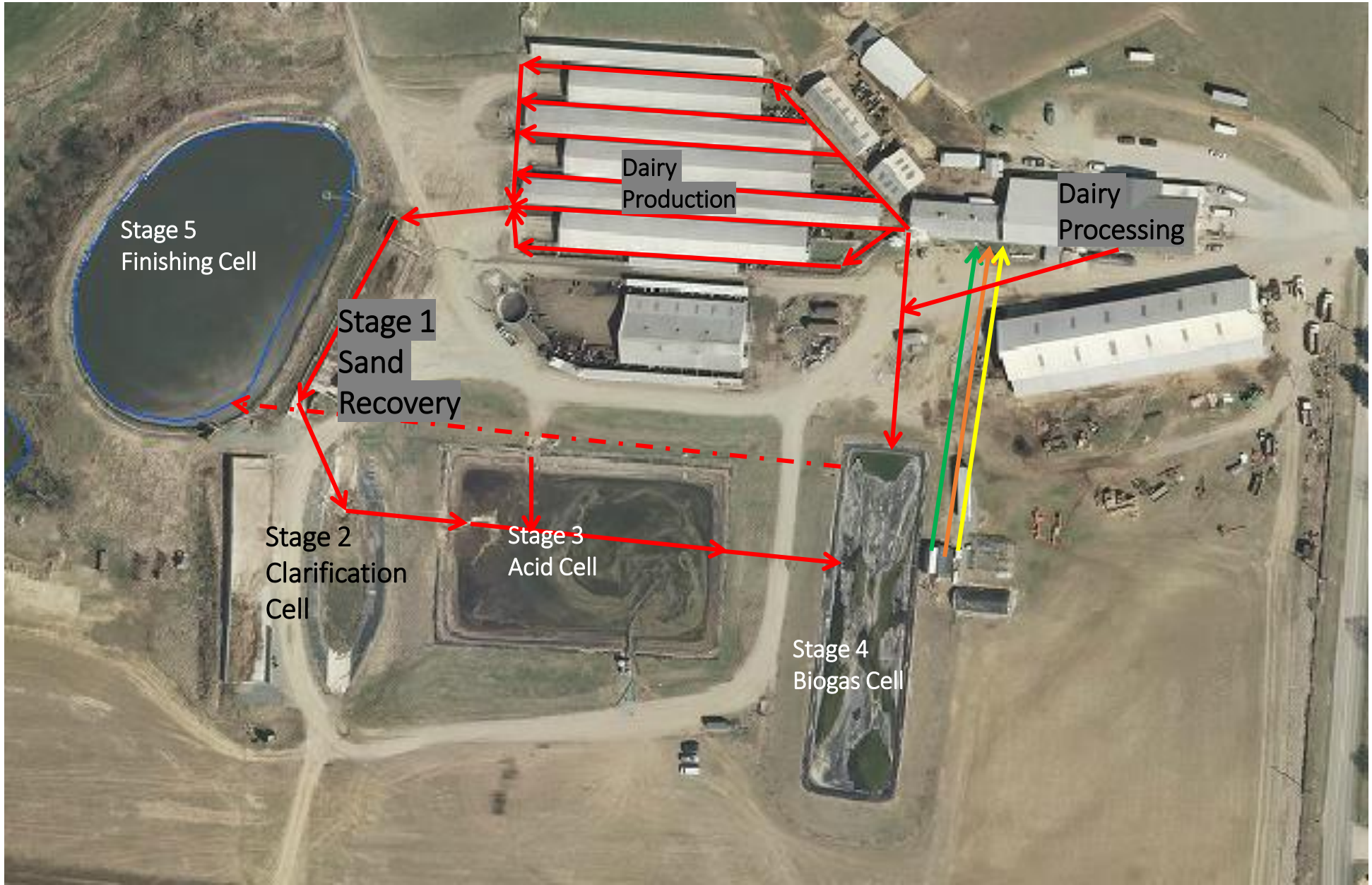
Bill and Phyllis Kilby retired from running the business in 2016. They now lease their farm to two young couples: Cliff and Andrea Sensenig and Ben and Liz Flayhart

Kilby Home Farm, Colora, MD

- 300 acres
- Farm 1000 acres
- Milk 500 cows (1000 head)
- Each cow produces 23,000 lbs per year
- Markets:
  - MD VA Co-op
  - Direct Milk Delivery to 800
  - Ice-cream

Kilby Dairy Operation

Kilby Methane Digester




Sand Bedding


Sand Bedding


Flushing the Lanes


Stage 1 – Sand Recovery


Stage 1 – Sand Recovery


Stage 3 – Acid Cell


Stage 4 – Biogas Cell


Stage 5 – Finishing Cell

Factors Influencing Us

- We began planning in 2007 - very positive, needed to update our 50 year old facility
- Environmental credit market growing, funds available for renewable energy
- Direct marketing of our dairy products, turning waste into energy
- CAFO - manure management EPA - proposed air quality regs
- Marketing our dairy products as “clean and green”

After 12 years – Things have changed for the better

- Flush system and sand bedding can be managed for digester use
- Excessive heat and corrosion caused problems with heat exchanger design
- Variation in gas quality
- Improved our manure management system
- Improved air quality - cleaner recycled flush water system
- Tipping fees and electric savings - positive bottom line
- Very positive image for our dairy products
- Digester technology has improved; this also means cost has increased

Future investments

- Cleaning and compression of gas for use in home delivery trucks
- Current farmstead brewery operating for the past year is included in the closed loop system

Direct Sales

With the Chesapeake Bay and 7 million people within a 50 mile radius

- Sustainability is meeting and exceeding environmental requirements
- Sustainability is lowering costs of production and distribution
- Sustainability is a positive image for marketing of our dairy products

Kilby Farm Food Waste Diversion Partnership with WNA: A Template Program

From Waste to Wealth and Clean Energy...

The Kilby Methane Digester

Student Environmental Council
"Nothing Without Earth"

KILBY Farm Fresh CREAM

1

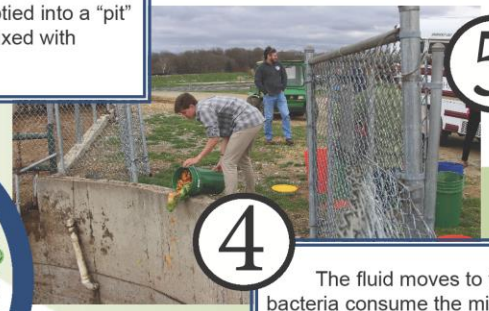
WNA's food waste is collected in colorful buckets at the back of our dining hall.

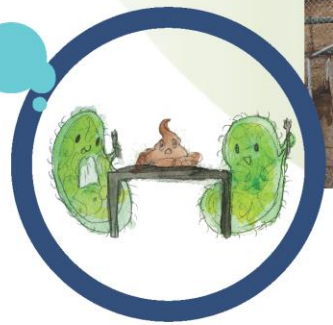
2

Every Saturday, a team of students and teachers deliver the buckets of food waste to Kilby Farm.

3

At the farm, our buckets are emptied into a "pit" where the food waste is mixed with animal manure.



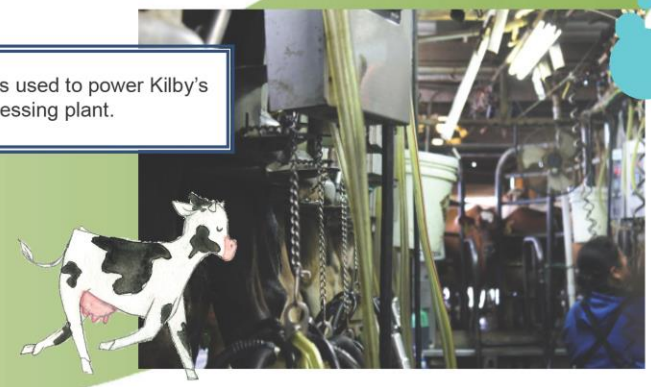


4

The fluid moves to the digester and bacteria consume the mix, producing compost for natural fertilizer and clean energy in the form of methane gas that does not leak into the atmosphere.

5

That methane gas is used to power Kilby's milk processing plant.



6

From the fresh Kilby milk, WNA gets. . .

7

Milk & Ice Cream!

Instead of going to a landfill and biodegrading into climate-change causing methane gas, our food waste is transformed into fresh local food that everyone can enjoy!

We, the WNA community, believe in practicing sustainability for ourselves and for future generations. Our closed-loop system allows us to sustain the Earth that sustains us.

Food waste diversion diverts almost seven tons of food waste annually from WNA's dining hall to the Kilby farm digester where it becomes compost and energy to run the farm. We remove methane from the atmosphere and save money in hauling food waste to the land fill. And....we are mitigating climate change in the bargain!

#RollRams
How it works:


ONLY FOOD IN THE COLORFUL BUCKETS PLUS
NO
Lay's
Classic


WARNING
AVISO


EMERGENCY EXIT
WEST NOTTINGHAM AC


WNA

- **WNA diverts almost 7 tons of food waste from Cecil County Landfill annually.**
- **Reducing our waste stream means reducing our on-campus dumpsters, saving us almost $12,000 per year.**

- **And . . .**

And we get **delicious** milk and ice cream!

On to the Future: Going to Annapolis

HB510

HB511

Thank you