A Sustainable Landfill Cover
The Hamm Landfill Story

Charlie Sedlock
Director
Hamm Waste Services
609 Perry Place
Perry, Kansas 66073
Direct: 785.597.5111
charlie.sedlock@nrhamm.com

Michael S. Kukuk, P.G.
Principal
Blackstone Environmental, Inc.
9153 West 133rd Street
Overland Park, Kansas 66213
Direct: 913.956.6220
mkukuk@blackstone-env.com
Hamm Operations
Hamm SLF Succession: Mining
Hamm SLF Succession: Cell Construction
Hamm SLF Succession: Landfill and Capping
Cap/Slope Failures
Cap/Slope Failures
Cap/Slope Failures
Sustainable Cap
A Glimpse Into The Future

Source: Groundswell, MOMA
Another Glimpse
Closure Concept/Goals

• Create an adaptive reuse of a closed landfill that transforms how Kansans use and view landfills

• Restore Kansas savanna conditions, wildlife, and cultivate a sustainable landfill cap, and

• Create a 600 acre green space asset in Kansas through sound innovative engineering and environmental design.

• Create the landscape and framework for future activities such as hiking/biking and increase the quality of life and recreational opportunities in northeast Kansas.

• Safely and conservatively provide for closure and post closure of facility
Vegetation in Kansas

Küchler’s Map of The Potential Vegetation of Kansas - Generalized

- Floodplain Vegetation
- Mixed Prairie
- Sand and Sandsage Prairie
- Cross Timbers
- Shortgrass Prairie
- Tallgrass Prairie
- Oak-Hickory Forest
- Mixed Tallgrass/Oak-Hickory Forest

Courtesy University of Kansas Applied Remote Sensing (KACS) Program

HAMM
Landfill Aerial
Current Forested Areas
Wildlife Movement
Diagram referenced from the “Conservation Research Institute”
Root Systems

Big bluestem (Andropogon gerardii) roots from a section of soil 24 inches wide, 30 inches deep, and 3 inches thick.
Why Use **ET-Tree** Covers?

- Save ~$35-50k/acre Over Sub D Caps
- Lower O & M Costs
- Minimizes Long Term Integrity Issues vs Sub D
- Natural, Sustainable, Ecosystem Based
- Improved Wildlife Habitat
- Simpler Solution
New Projects and ET Cover
This Is Not Your Fathers Landfill: Trees, Soils and Grasses as Cover Components
Cover Designs for Wetter Climates (>20 inches off ppt)

• ET-Tree cap option (Poplar, Cottonwood, Willow and native hardwoods)

• Birds and wind will disperse seeds for “volunteer” trees. Birds as Landscape Architects!

• 5-25 gallons/tree/day during growing season
Constructing A Seed Bed
Soil Cover Combinations

1.0 feet of Clay Topsoil over 4.5 feet of Snyderville Shale

CLAY TOPSOIL

SNYDERVILLE SHALE

INTERMEDIATE COVER MATERIAL

WASTE
Creating a Seed Bed.
Not Compacted Clay.
Lifts of loose soil placed 2 – 3 ft. thick
Farmland topsoil on left; tan overburden clay on right. Result: Vegetation Variance
Vegetation Planting History

March/April 2006 – Initial Native Prairie Grass Seed Drilled

April 2012 – Planted 13 Tree Islands on North Slope - 225 Trees

April 2013 – Planted 500 Trees in linear fashion along the access roads and terraces

April 2015 – Planted 800 trees on south slope.
Native Grass Planting
Why Use Native Plants?

- Do not require fertilizer
- Require less water (no water once established)
- Provide shelter and food for wildlife
- Native plants are critical to a diverse number of pollinators
Native Grasses

Grasses planted included:

• Big Bluestem
• Little Bluestem
• Indiangrass
• Sideoats Gramma
• Blue Gramma
• Sand Dropseed
Tree Planting Scheme Design

- Tree Islands with limited mowing zones
- Volunteer Trees
- Create “Edge Effect”
- Select native grasses are planted 2-4 years prior to co-exist with trees
Hamm Poplar Cutting – 1 Month
Hamm Tree Island
Hamm Landfill Volunteer Trees
Evaluation of 2012 Tree Islands

2017 Evaluation

- Survival rate:
  - 58% of the original softwoods;
  - 31% of the original hardwoods;
  - Many Volunteer Native Trees;

- Average trunk diameter: 3.2” softwoods; 1.7” hardwoods;

- Some trees 18’-20’ tall;

Volunteer trees in vicinity of tree islands impacted by GCCS construction
Summary

• Build a “Sustainable Natural Cap”
• Improved Wildlife
• Originally plant what Mother Nature will replace with over time
• Significant Construction and O&M cost savings
• After Closure – Hiking/Biking Trails
Questions?

Charlie Sedlock – Hamm Waste Services
csedlock@nrhamm.com
785-597-5111

Mike Kukuk – Blackstone Environmental, Inc.
mkukuk@blackstone-env.com
913-495-9990
Evapo-Transpiration Landfill Covers (ET-Tree Cap)