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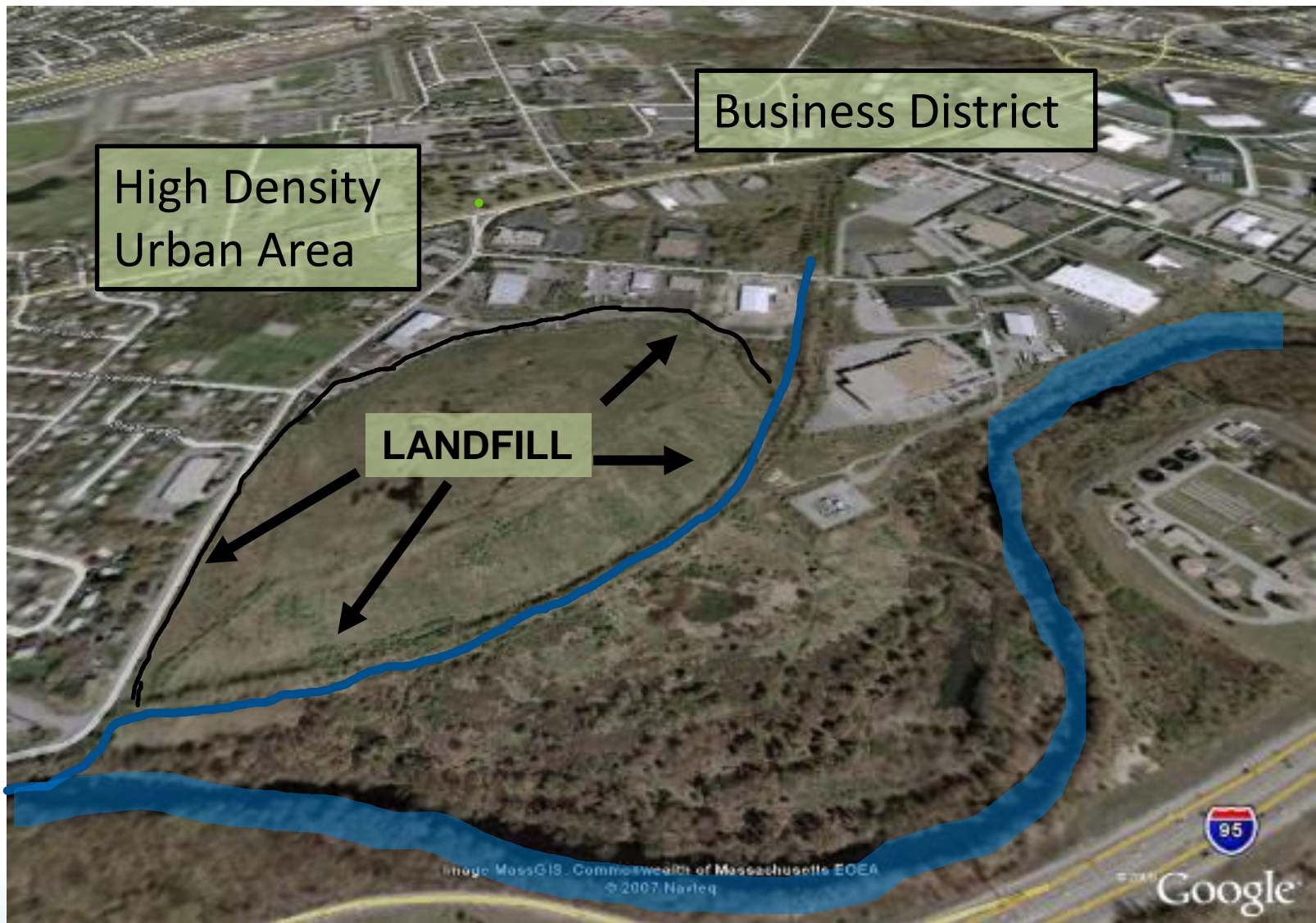
# **A Novel Solution To Closing Old Landfills with Significant Property Constraints**

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*Session 4 - SOIL REMEDIATION*

19th September 2019

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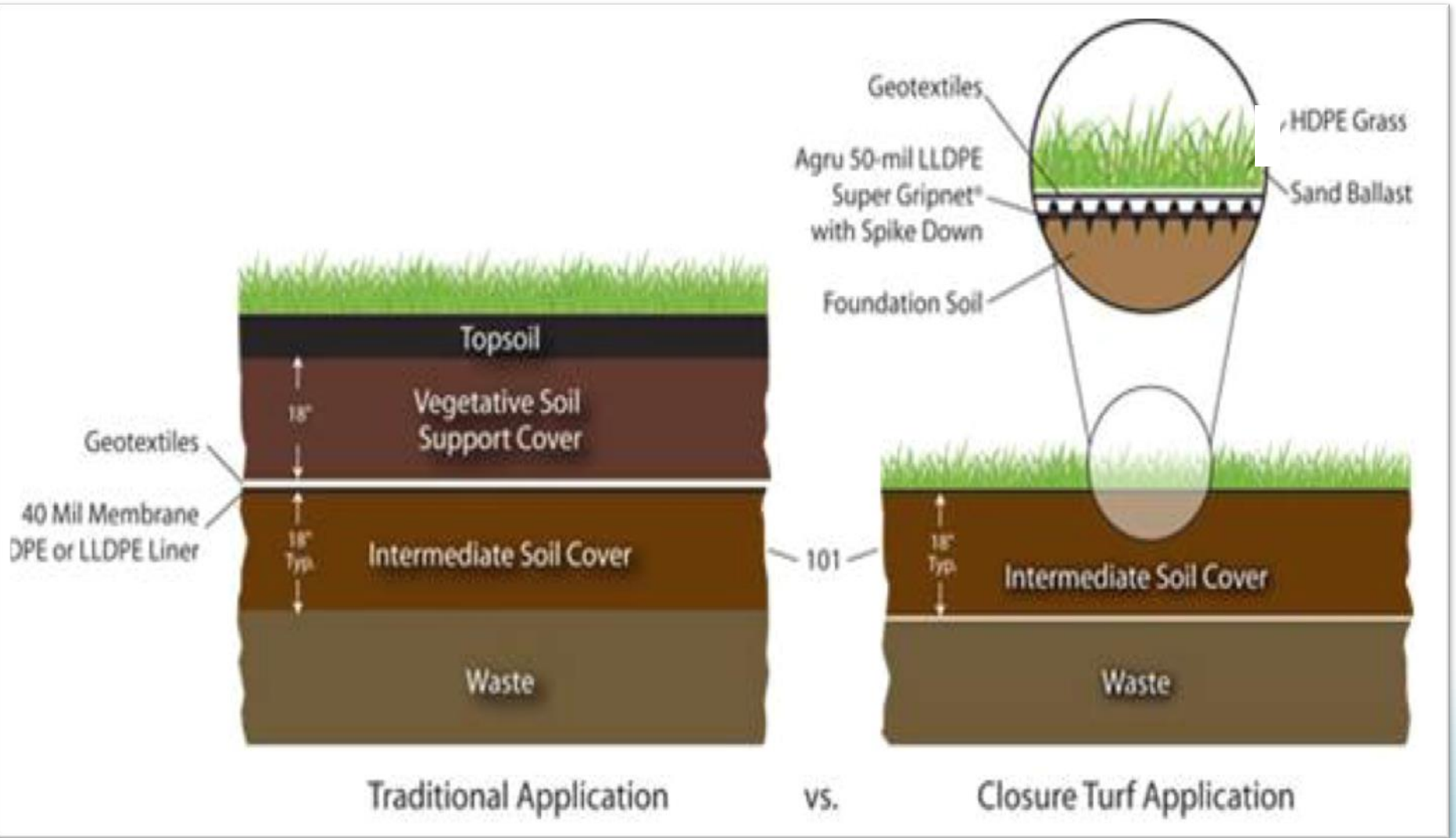
## The Challenge:

- 40-acre closure in a populated urban area
- Bordered by a protected river

## Primary Goals of BASF

- Minimize Construction Impact – Soil /Earth Moving
- Create Quality Surface Water Runoff
- Predictable Performance with Low Maintenance

# Traditional vs. ClosureTurf®





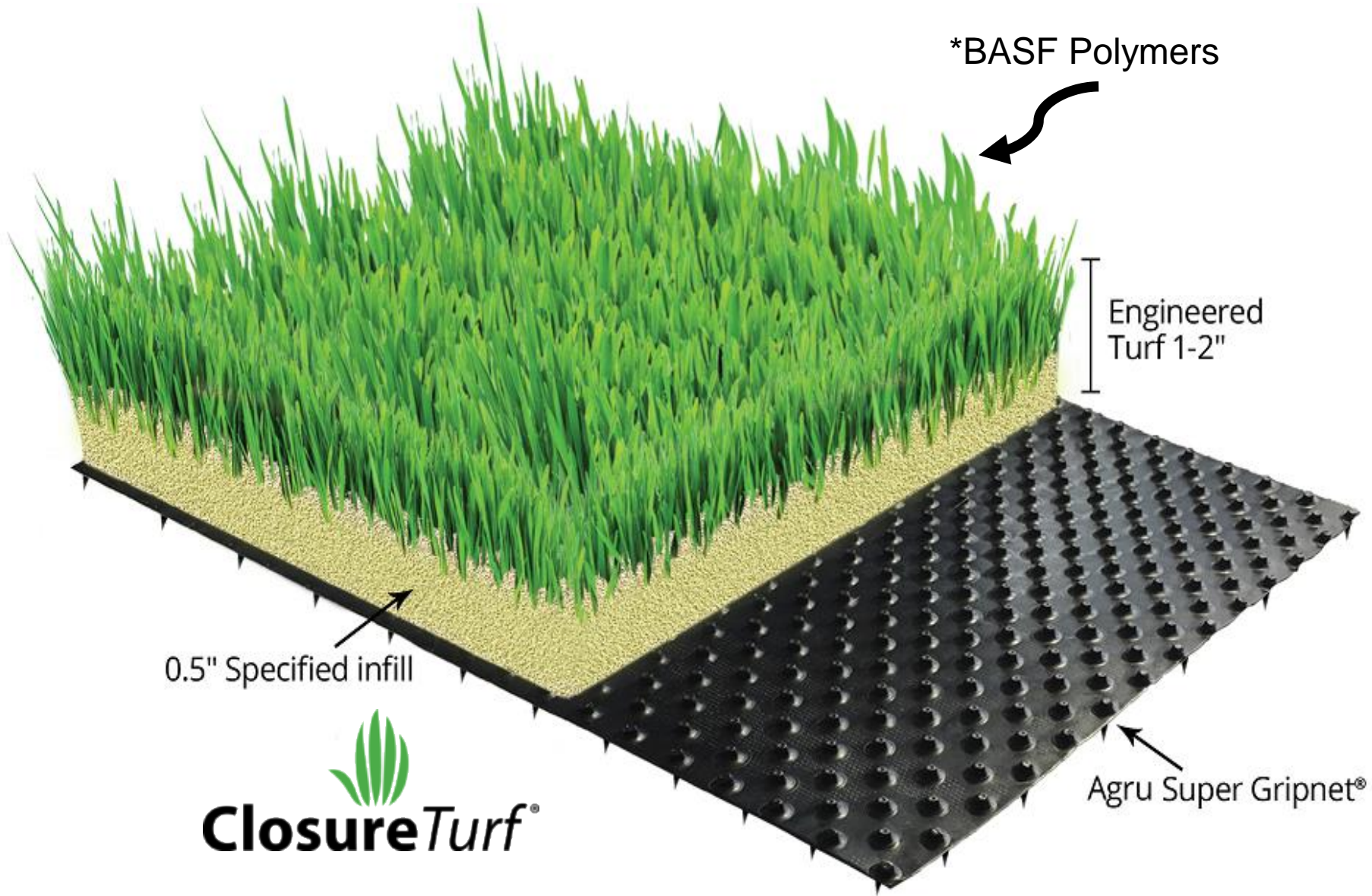










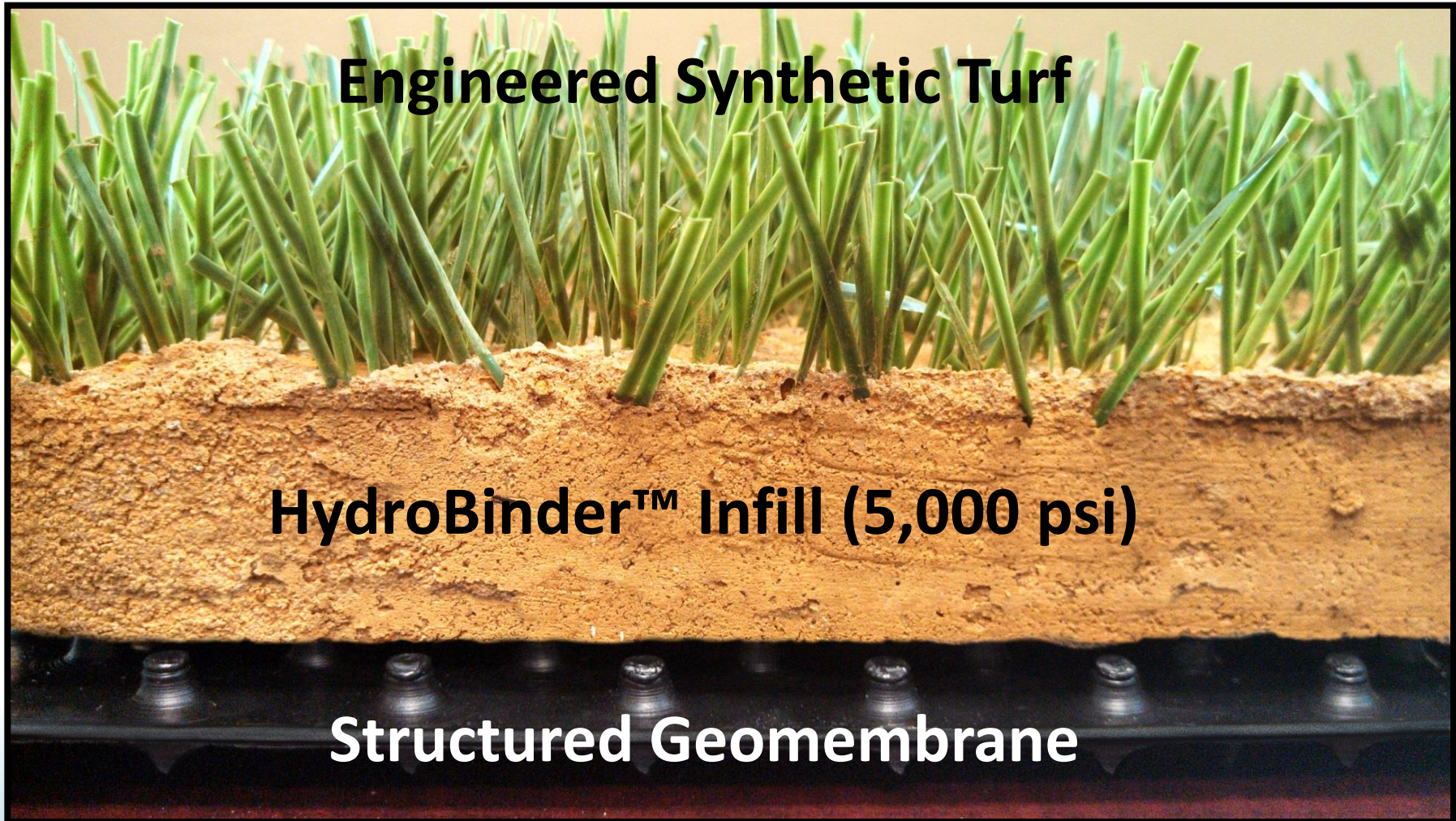


**ClosureTurf®**

Agru Super Gripnet®



# Hydraulic Shear Forces





# Geotechnical Stability



# Hydraulic Stability





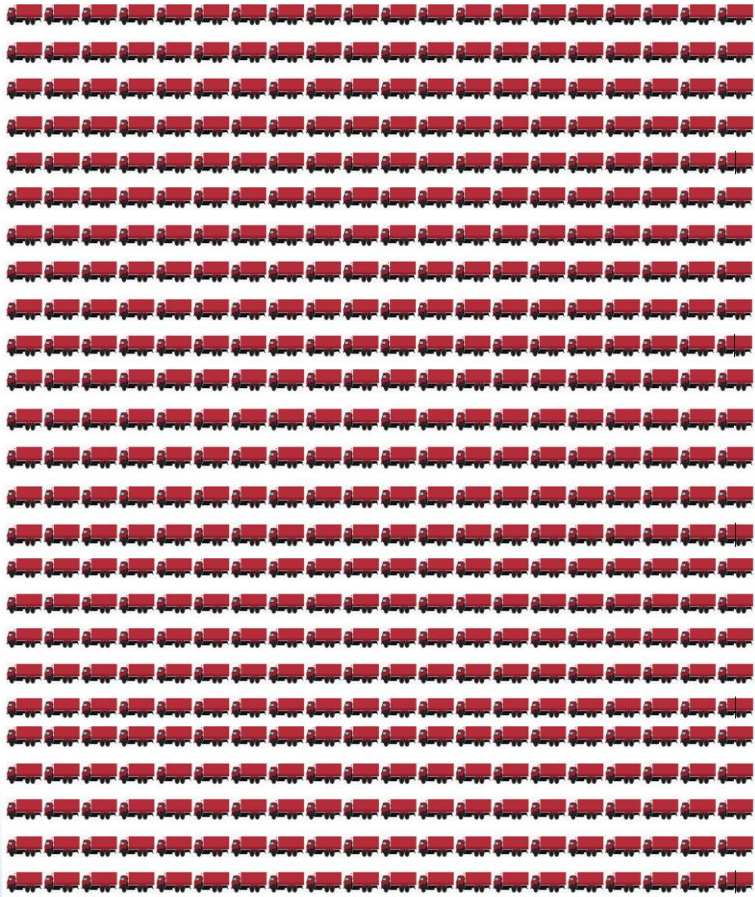
# Hydraulics Lab for Levee Overtopping



# Construction Impacts

Soil Cover .

ClosureTurf



550 Trips/acre  
1,360 Trips/Hectare



4 Trips/acre  
10 Trips/Hectare



# Construction Impact Comparison

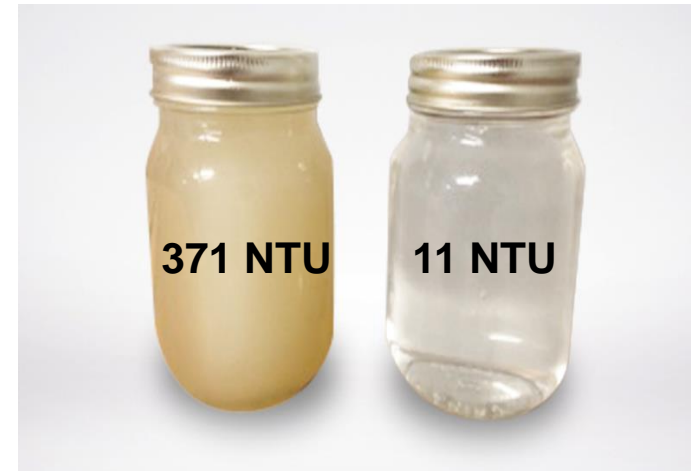
	Traditional Cover	ClosureTurf
Total for Project	<b>22,000 Trips!</b>	160 Trips

# ClosureTurf Runoff Quality

- No soil erosion due to removal of soil layers
- Significantly improved stormwater runoff quality



Testing site: Louisiana, USA



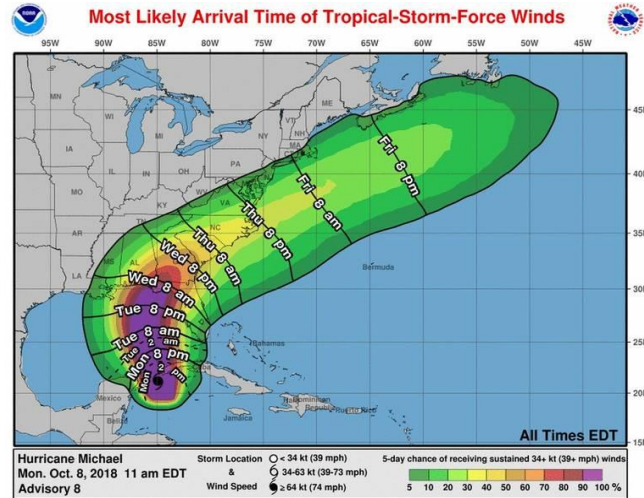
Vegetative  
Cover

ClosureTurf  
Cover

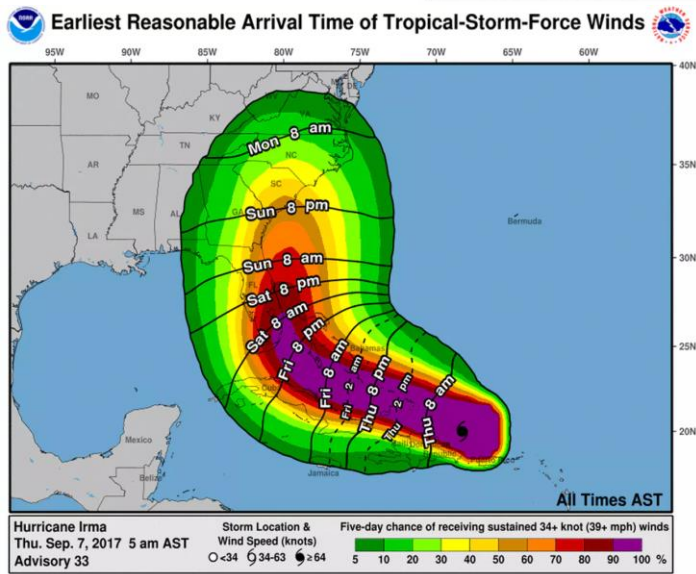
*\*Nephelometric Turbidity Units*



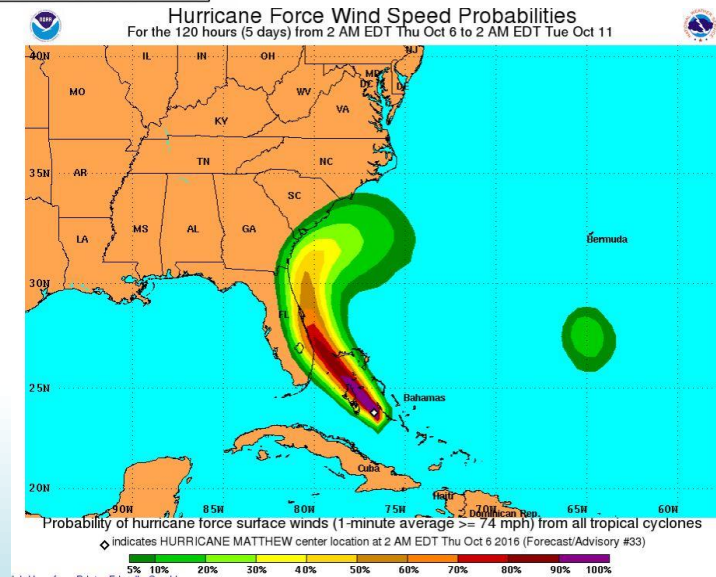
# Historic Rain Events



Hurricane Michael, October 2018



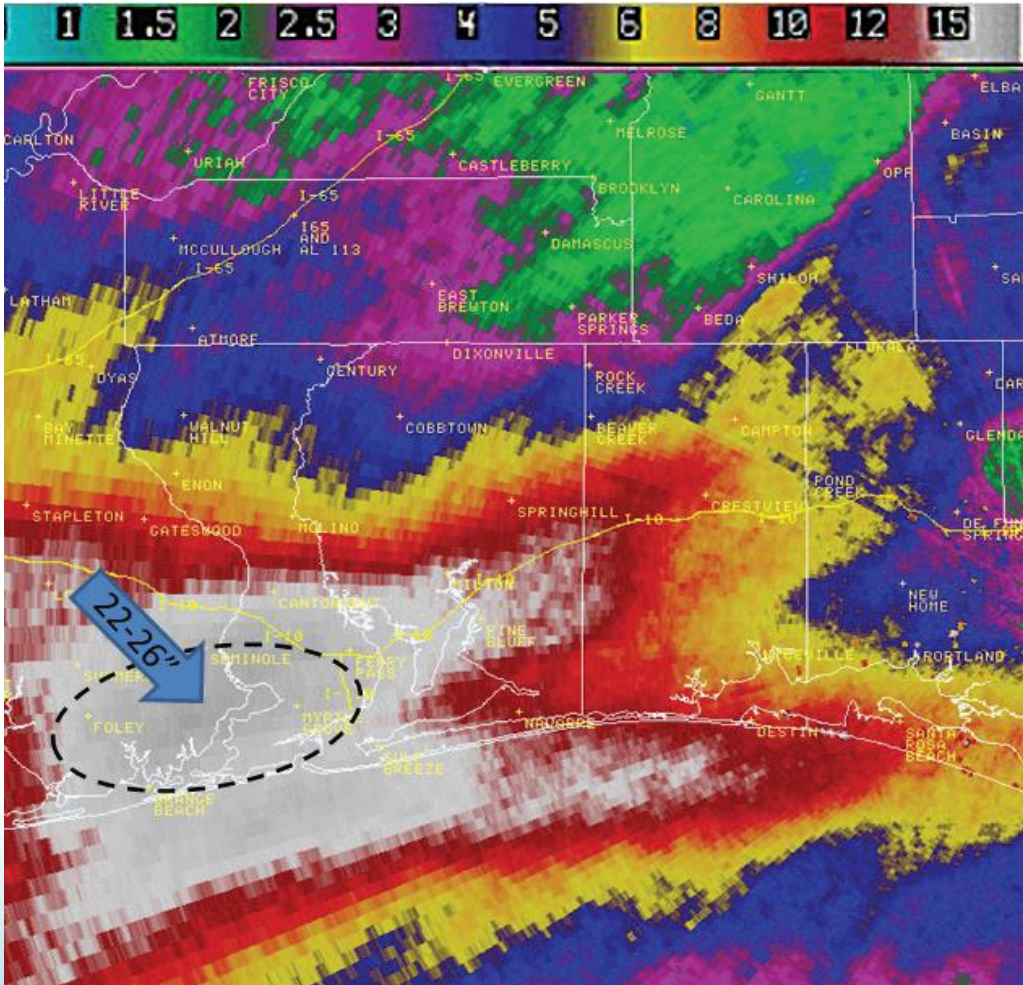
Hurricane Irma, September 2017



Hurricane Matthew, October 2016

# Historical Storm Event

22+ Inches in 24 hours





# Historic Rain Events



Saufley Field Road Landfill

# Historic Rain Events



Perimeter Channels of ClosureTurf Versus Soil Cover  
(Photos taken on Nov. 2018)



# BASF FINAL CLOSURE





# BASF FINAL CLOSURE



## COST??

- € < off site Soil
- € ≤ on site for soil
- 90% less Maintenance.

# **BASF Objectives**

## ✓ **Less Construction Impact On Community**

**Minimal truck traffic**

**Faster Construction**

## ✓ **Save Land for Other Uses**

## ✓ **Clean water runoff**

### **Other Benefits:**

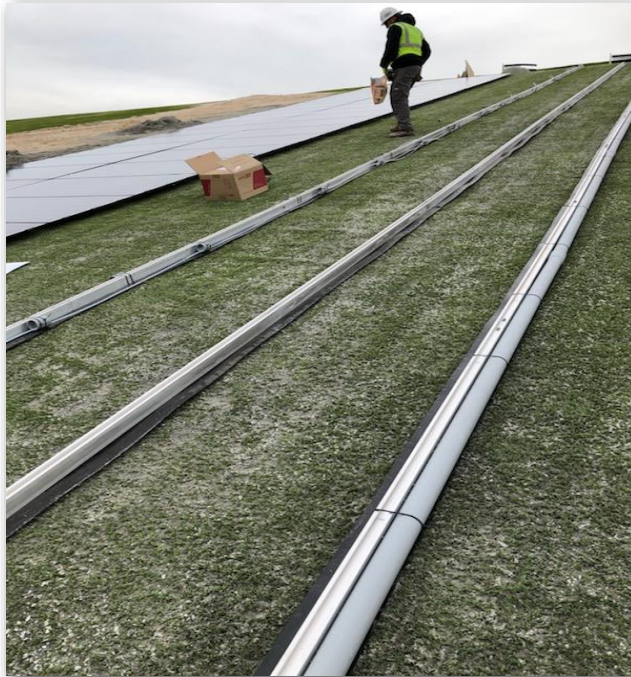
- Regulatory compliance: Less leakage rate and less erosion
- Safety: no hauling and dumping of material and no mowing
- Sustainability: 70%+ carbon footprint reduction
- Geotechnical Factors of Safety: 3 times greater
- Fugitive emissions: Less dust closure and post closure
- Post-closure oversight less critical
- Ideal Foundation for Solar Array



# A Liability To An Asset.....



# Slope Mounting Technology



**Friction Strip Installation**



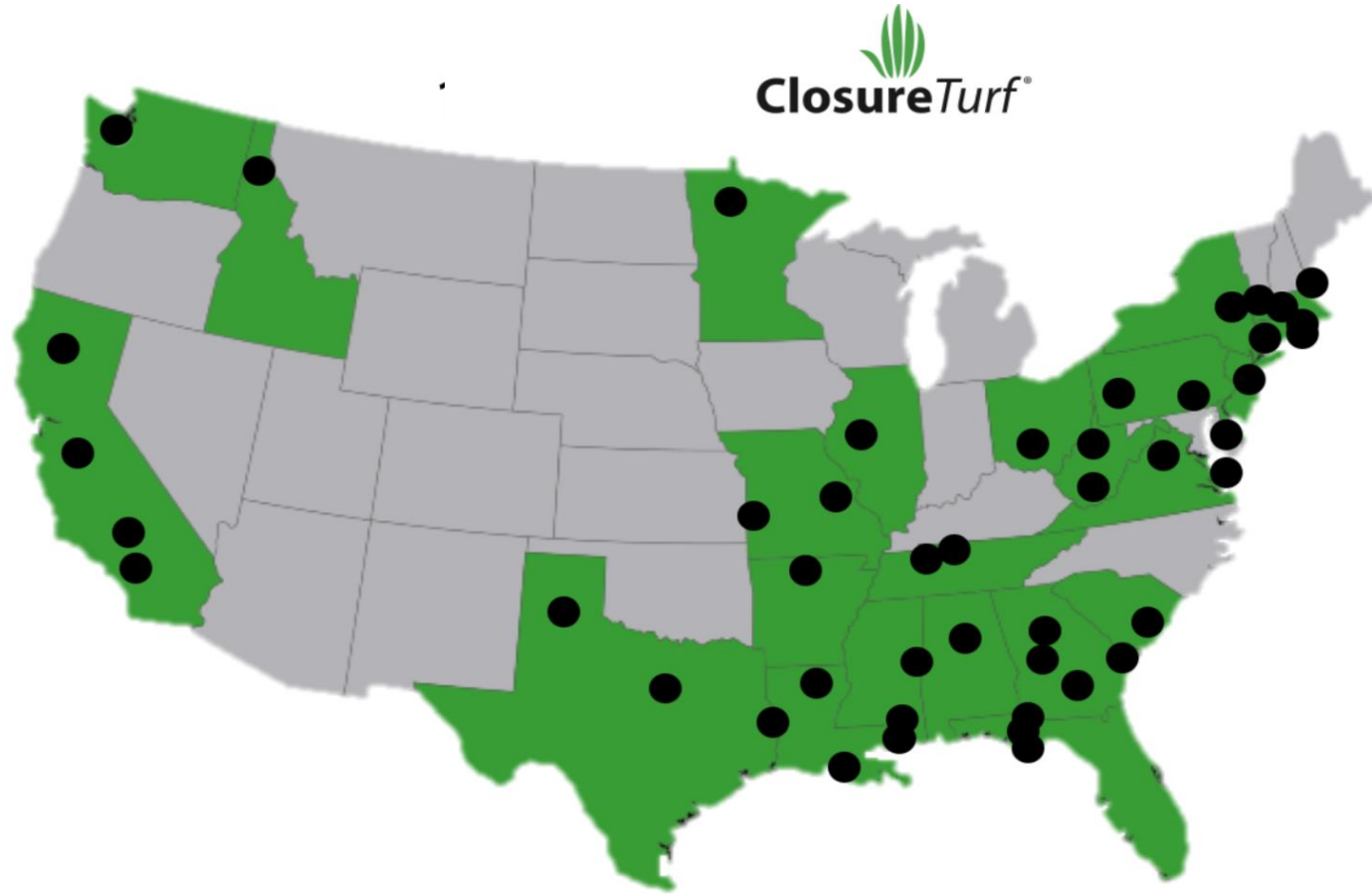
**Panel Installation**



# Fast and Efficient Installation



# Market Adoption



- Over 2,000 acres (800 hectares)/ 70 projects
- 2,500 acres (1,000 Hectares) currently in design



**THANK YOU!**

**Michael Ayers**

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