



Soil and Materials Engineers, Inc.

Waste Site to Renewable Energy Industry

A Brownfield Redevelopment Challenge

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BROWNFIELD SUCCESS STORY



2012 Brownfield Renewal Award Winner
Environmental Impact Category

VENTOWER

OVERVIEW

- ❖ **Project Overview**
- ❖ **Challenges and Responses**
- ❖ **Brownfield Funding**
- ❖ **Sustainable Approaches and Lessons Learned**



PROJECT OVERVIEW

DEVELOPMENT

- ❖ **Wind tower manufacturing**
- ❖ **48-acre site**
- ❖ **100,000 sq. ft. factory + 10,000 sq. ft. offices**
- ❖ **Heavy products - high floor, pavement and ground loads**
- ❖ **Requires road, rail and water transportation facilities**
- ❖ **\$19,000,000 startup**

DEVELOPMENT



SITE CONDITIONS



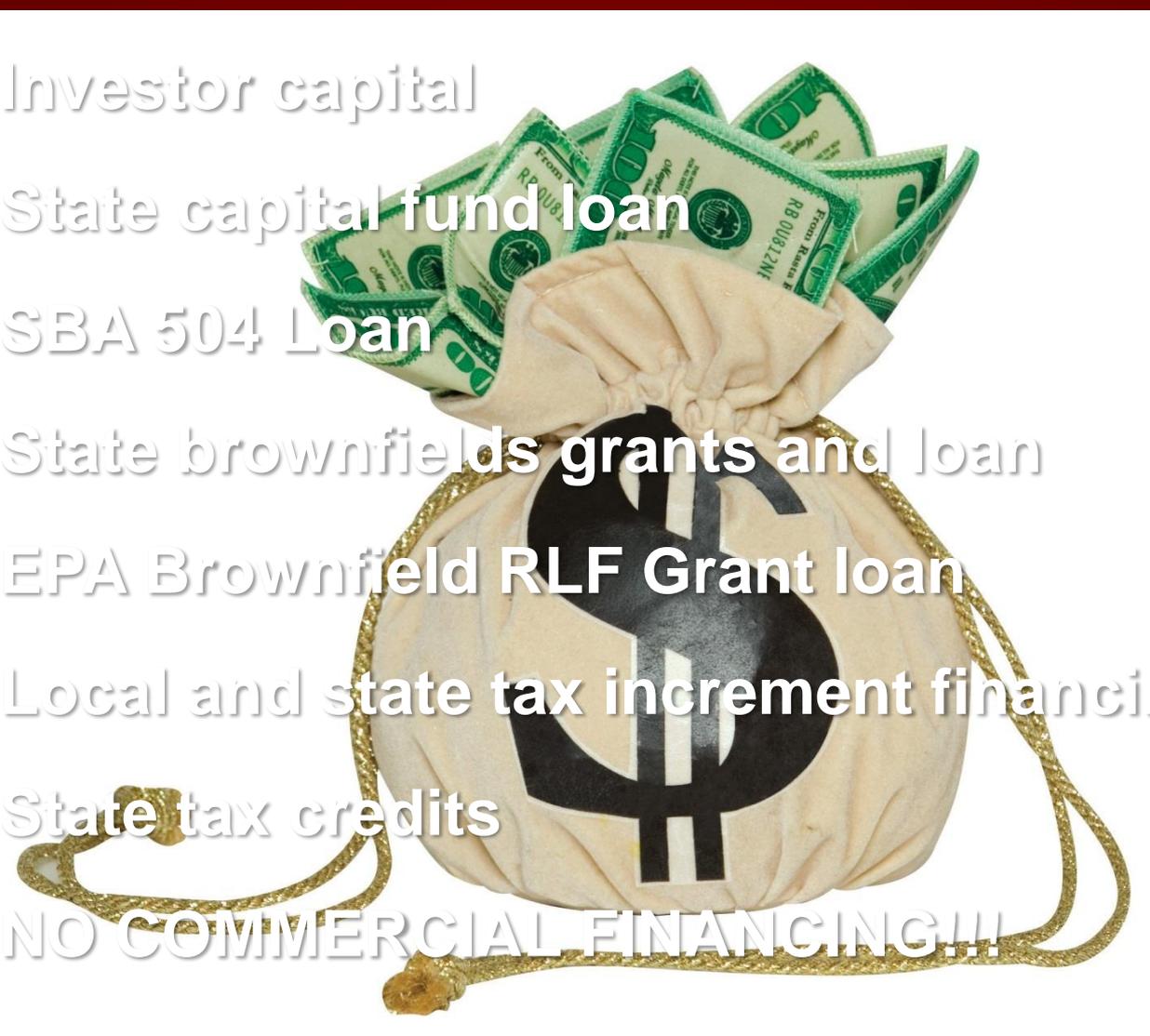
SITE CONDITIONS

- ❖ **Industrial waste landfill (1950s – 1975)**
 - Foundry sand
 - Coal tar
 - Colorful chemical wastes
- ❖ **Groundwater/leachate contamination**
- ❖ **“Soil” contamination issues**
 - Human contact
 - Vapor intrusion

SITE CONDITIONS



PROJECT FINANCING

- ❖ Investor capital
 - ❖ State capital fund loan
 - ❖ SBA 504 Loan
 - ❖ State brownfields grants and loan
 - ❖ EPA Brownfield RLF Grant loan
 - ❖ Local and state tax increment financing (TIF)
 - ❖ State tax credits
 - ❖ **NO COMMERCIAL FINANCING!!!**
- 
- A money bag overflowing with US dollar bills, symbolizing investment and financing. The bag is light-colored with a large black dollar sign on the front. The bills are green and white, and are spilling out of the top of the bag. The bag has a gold drawstring.



CHALLENGES AND RESPONSES

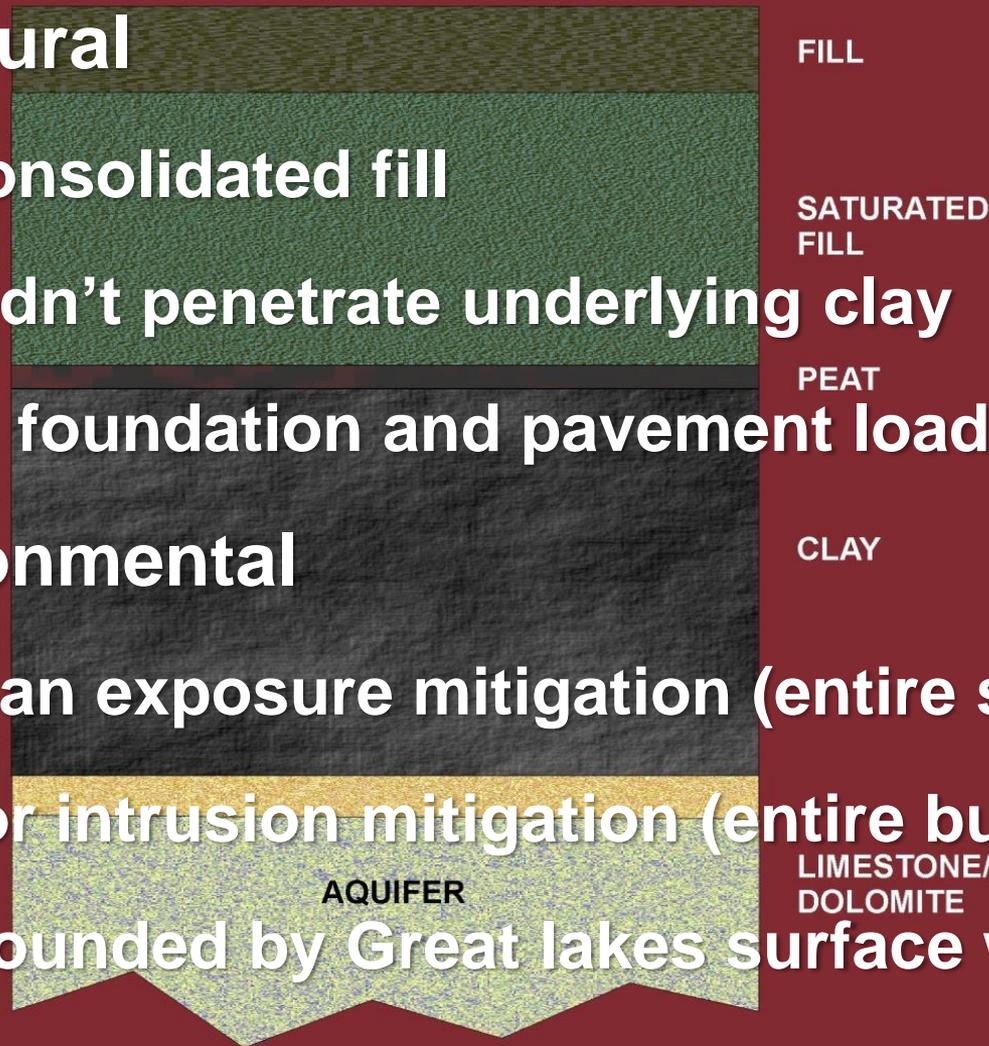
CHALLENGES

❖ Structural

- Unconsolidated fill
6' - 10'
- Couldn't penetrate underlying clay
1' - 2'
- High foundation and pavement loads

❖ Environmental

- Human exposure mitigation (entire site)
- Vapor intrusion mitigation (entire building)
- Surrounded by Great lakes surface water



HOW DO WE?

- ❖ **Integrate structural and environmental responses**
- ❖ **Minimize and financing the extra costs**



STRUCTURAL AND ENVIRONMENTAL ISSUES

❖ Structural issues

- Building support
- Pavement and external loads
- Generate no excess fill/waste

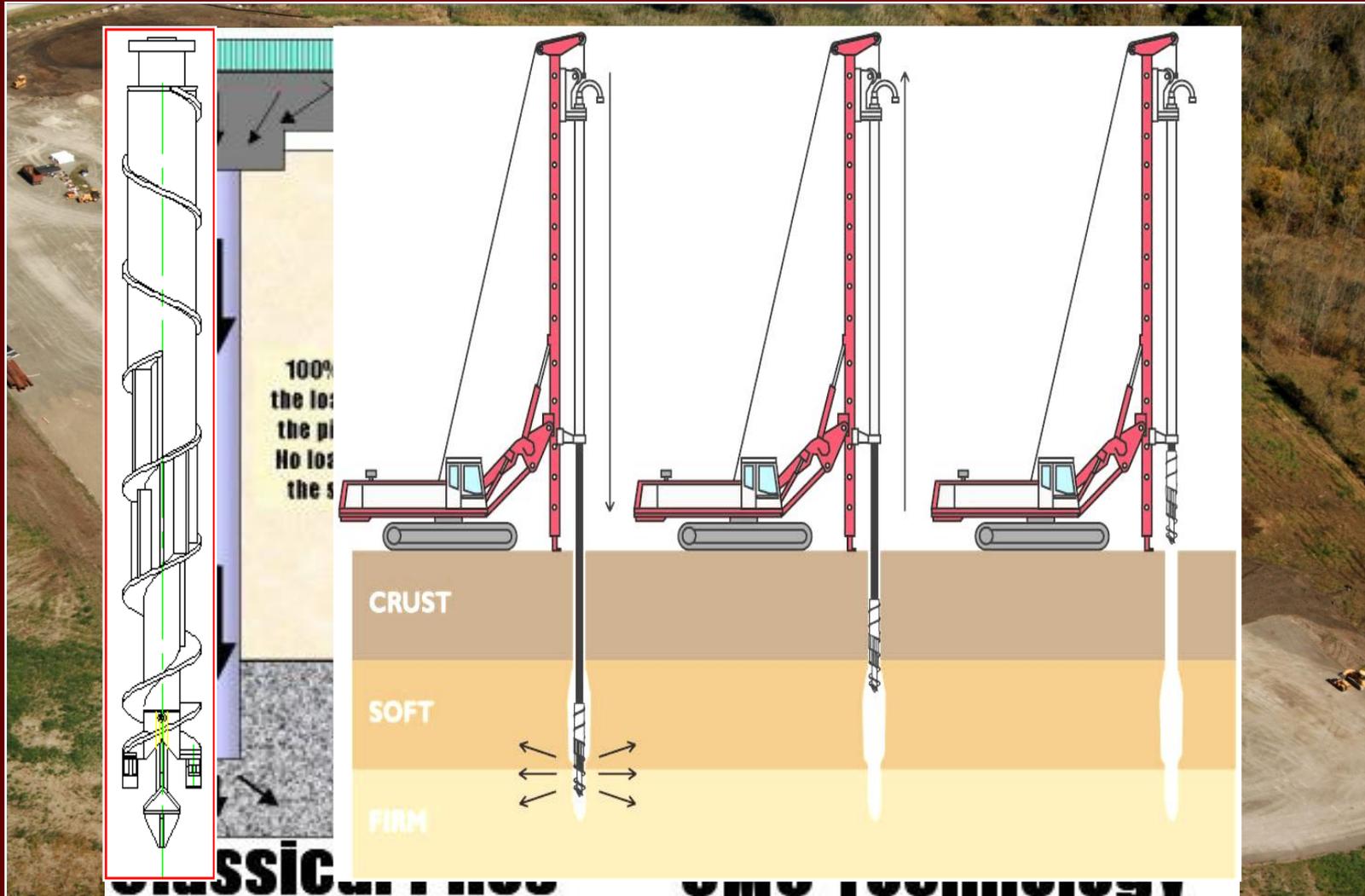
❖ Necessary environmental responses

- Subslab vapor intrusion barriers
- Human contact exposure barriers
- Storm water detention pond liners

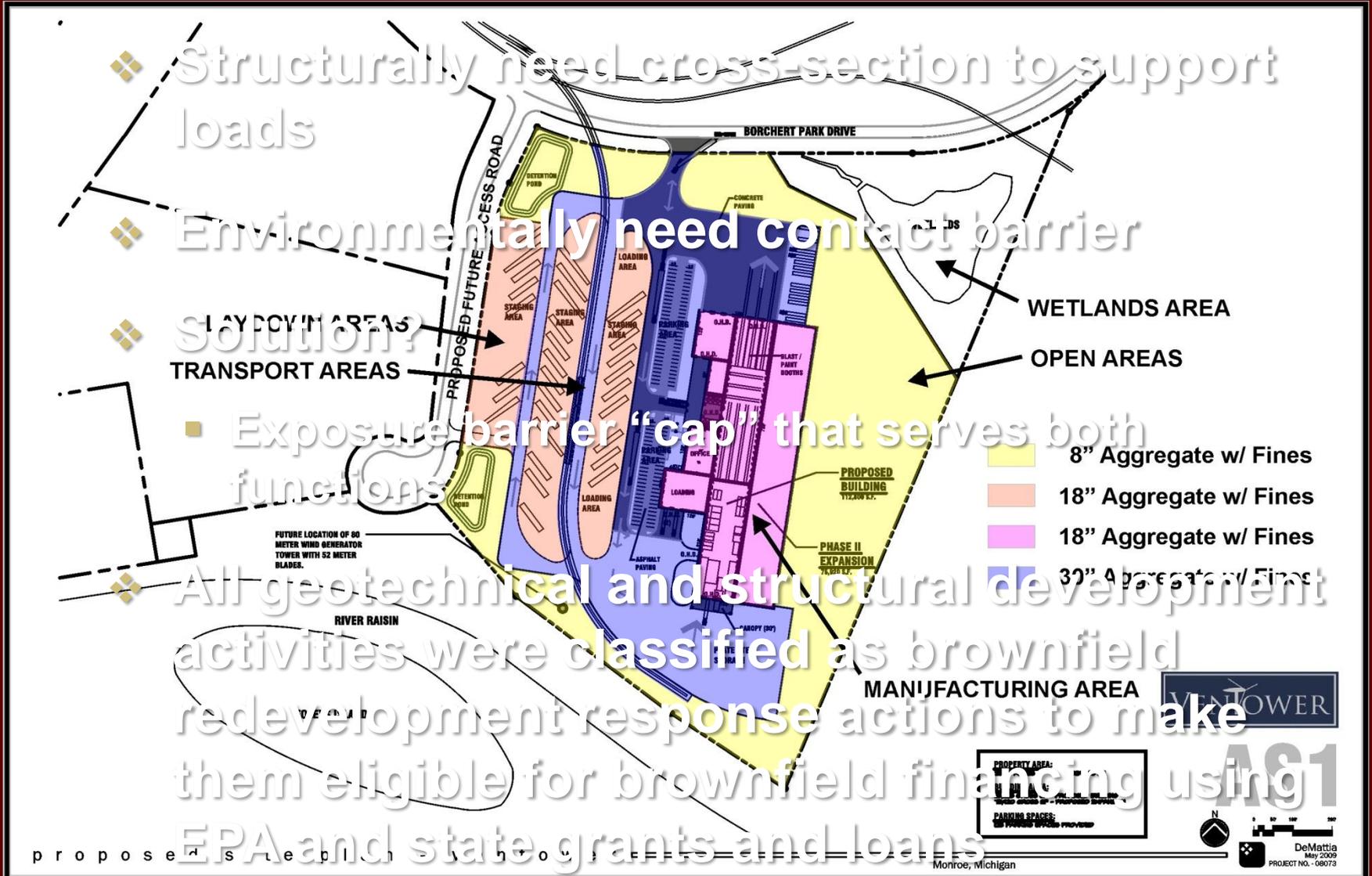
FOUNDATION STRATEGIES

- ❖ **Replace industrial wastes with engineered fill**
- ❖ **Driven conventional piles**
- ❖ **Auger cast piles**
- ❖ **Soil stabilization**
 - **Controlled Modulus Columns (CMC)**
 - **Rammed Aggregate Piers**

CMC INSTALLATION



PAVEMENT AND LAYDOWN AREAS





BROWNFIELD FUNDING

BROWNFIELD ELIGIBILITIES

- ❖ **Building structural – needed for redevelopment of a landfill and to protect underlying aquifer**
- ❖ **Engineered bases for pavement and operations areas – needed for human contact barrier**
- ❖ **Vapor and contact barriers – human health protection**
- ❖ **Storm water detention pond liners – prevent exacerbation by leaching**

BROWNFIELD FINANCING

❖ Environmental =	\$5,200,000
▪ State assessment grant =	\$70,000
▪ State brownfield grant =	\$1,000,000
▪ State brownfield loan =	\$1,000,000
▪ EPA RLF Grant loan =	\$2,200,000
▪ State/local brownfield TIF =	\$4,130,000

BROWNFIELD COSTS

- ❖ **Assessment and due diligence = \$70,000**
- ❖ **Site Preparation = \$225,000**
- ❖ **Geotechnical engineering = \$55,000**
- ❖ **Soil stabilization = \$1,200,000**
- ❖ **Contact exposure barrier = \$2,700,000**
- ❖ **Vapor intrusion barrier = \$625,000**
- ❖ **Storm water detention pond liners = \$170,000**
- ❖ **Env management and monitoring = \$160,000**



SUSTAINABLE APPROACHES AND LESSONS LEARNED

SUSTAINABILITY

- ❖ **Excess fill retained on site**
- ❖ **Soil stabilization with no spoils**
- ❖ **Minimal remediation – resources directed to site development**
- ❖ **Local contractors – minimal commuting**
- ❖ **Minimal on-site engine idling**
- ❖ **Use of biodiesel**

LESSONS LEARNED

- ❖ **Integration of solutions for environmental and structural challenges was key to project success**
- ❖ **Project would have been impossible without public funding support at local, state, and federal level**

VENTOWER TODAY

- ❖ Ventower is approaching plant production capacity and is evaluating implementing Phase II building expansion
- ❖ Plant is operating seven days a week and running three shifts
- ❖ Plant employment is approaching 100 full-time, high-paying, manufacturing jobs

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