# Civil Engineering Use of Scrap Tires Waste to Reuse







# 2019 - Dickinson County Road Commission County Road 607 Project

- EGLE Scrap Tire Grant Program provided half the cost -- or \$325,000 -- of the \$650,000 project, which used nearly 4,000 scrap tires.
- "Our hopes are that this project will demonstrate that rubberized asphalt not only is smoother, quieter, and longer lasting than traditional asphalt, but can also be made economically," said Lance Malburg, an engineer with the Dickinson County Road Commission.
- Project partners:
  - Dickinson County Road Commission
  - Michigan Technological University
  - Asphalt Plus LLC
  - BAACO Construction Company
- Three sections of road were paved for comparison and testing using:
  - Conventional hot mix asphalt base top layer.
  - Engineered crumb rubber hot mix asphalt base with conventional top layer.
  - Hot mix base with engineered crumb rubber as both the base and top layers.
- The ground tire powder was added to the asphalt at the plant. Known as a "dry" process, it is easier to control and monitor, and is less expensive than adding the rubber through the liquid asphalt. Using the powder also makes the process easier to duplicate by other asphalt contractors.
- The sections will be compared, monitored, and tested by MTU and the Road Commission, specifically watching for cold weather cracking resistance of the two asphalt mixes.



## 2019 - Dickinson County Road Commission County Road 607 Project

#### Michigan EGLE @ @MichiganEGLE - Jun 12 EGLE Recycled tire scraps are potentially paying th

Recycled tire scraps are potentially paving the way to future roadways, through a \$650,000 grant partially funded by EGLE. The research project, which began last week, has paved 3 sections of a county road using conventional asphalt & #recycled rubber tires. #MIRecycles



Michigan Tech

Q1 121 06 III



### 2018 Road Commission of Kalamazoo County West W Avenue Project

- EGLE Scrap Tire Grant Program provided half the cost -- or \$221,964 -- of the \$443,928 project, which used an estimated 13,672 scrap tires.
- "The purpose of the project is to evaluate the new reacted and activated rubber and to investigate the applicability of such rubber mainly composed of finely grinded scrap tires. The aim is to create a more cost-effective, long-lasting, safe and environmentally friendly, mixes and surface treatments." Dr. You said.
- Project partners:
  - Road Commission of Kalamazoo County
  - Michigan Technological University
- Four sections, each approximately 4,000 feet spanning both lanes:
  - Hot Rubber Chip Seal (never done before used in the United States)
  - Hot Rubber Thin Overlay
  - Two conventional chip seal application segments for control purposes.
- The project won a 2018 Branch Award for Public Works Project of The Year from the Michigan Chapter of the American Public Works Association.



### 2018 Road Commission of Kalamazoo County Project Videos (courtesy MTU)



# 2017 Midland County Road Commission Eastman Road Project

- EGLE Scrap Tire Grant Program provided half the cost or \$431,947 -- of the \$863,894 project.
- Project partners:
  - Midland County Road Commission
  - OHM Advisors
  - Central Asphalt
- Tires utilized in the project:
  - TDA (Tire Derived Aggregate) Subbase: 115,153
  - TDA Culvert Backfill: 1,622
  - RMA (Rubber Modified Asphalt) Paving: 2,780
  - Total scrap tires used: 119,555
- EGLE Scrap Tire is taking water quality samples on the project.



## 2017 Midland County Road Commission Eastman Road TDA Installation







# 2016 St Clair County Road Commission Lightweight Bridge Deck Project

- EGLE Scrap Tire Grant Program provided half the cost -- or \$33,176 -- of the \$70,352 project, which used an estimated 130 scrap tires.
- Project partners:
  - St Clair County Road Commission
  - Recycling Infrastructure Solutions (RIS)
- Three bridges utilizing MDOT approved epoxy resin along with recycled aggregate of crushed glass and poly fiber crumb rubber.
  - Comstock Road
  - Norman Road
  - Griswold Road
- Use of 190 cubic feet of crushed glass for every 1,000 square yard replaced. Estimated savings of \$6,000 for landfill costs of glass alone.



## 2016 St Clair County Road Commission Lightweight Bridge Deck Project





# 2016 Bay County Road Commission Wilder Road Project

- EGLE Scrap Tire Grant Program provided half the cost -- or \$433,704 -- of the \$867,408 project, which used an estimated 6,435 scrap tires.
- Project partners:
  - Bay County Road Commission
  - EGLE Scrap Tire Program
- The project utilized ground rubber hot mix asphalt to pave five lanes for a length of approximately 1.6 miles.



## 2016 Bay County Road Commission Wilder Road Project





## Other Scrap Tire Grant Projects of Interest

- City of Mackinac Island Paving utilizing waste glass generated on the Island. Project Partner is Renewable Infrastructure Solutions (GreenDeck).
- Kent County Road Commission Paving 0.5 miles of Cascade Road (from Burton to 28<sup>th</sup>) at a width of 60 feet. Comparison project with half to utilize polymermodified and half to utilize emulsified rubber. Michigan Tech University as partner.
- Detroit Police Department Law enforcement grant to reduce dumping of scrap tires in the City of Detroit.
- Lake Superior Shoreline in Ontonagon Cleanup grant to remove nearly 100 oversized mining tires from 1.5 miles of shoreline.



# Other Innovative Uses of Scrap Tires

- Scrap Tires can be reused in other ways:
  - Mulch
  - Rain Gardens
  - Septic Fields
  - Construction Barrel Weights
  - Silage Weights
  - Plastic Molded & Extruded Products
  - <u>Porous Pave</u>, Grant, Michigan (2019 porous pavement at the Dow Gardens Canopy Walk)
  - Manure Scrapers Mensch Manufacturing, Hastings, Michigan



### Other Uses of Scrap Tires



Scrap tires silage weights.



# Scrap Tire Grant Funding

- EGLE Scrap Tire Program has \$3.5 million for grant funding annually\*.
- Grant money is prioritized:
  - Cleanup
  - Law Enforcement
  - Market Development
- Cleanup Grants community collection days, cleanups of abandoned tires – usually around \$1.25 million and cleans up over 600,000 scrap tires. (\$2 per tire; \$2000 per loaded semi trailer of ~1000 tires)
- Market Development Grants receive the remainder of the annual funding and are reviewed and scored by a committee composed of EGLE and MDOT staff.



### Questions?



#### **Michigan Scrap Tire Program**





MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

# EGLE Update CEW 2020

# James Watling, PE WRD - Transportation Review Unit 517-599-9002 | watlingj@michigan.gov



# **Organizational Changes**

- New name
- Public advocate offices make it easier for citizens to register their concerns and improve accountability
- New office on climate policy reduce emissions of greenhouse gases and promote renewable energy while helping Michigan adjust to a warmer world
- Strengthening an interagency team dealing with the emerging threat of toxic chemicals in drinking water, known as per- and poly-fluoroalkyl substances, or PFAS
- The Michigan Agency for Energy and the Office of the Great Lakes is now part of Dept of Environment, Great Lakes, and Energy.



#### More Changes – Water Resources Division



EGLE

#### **TRU Permitting Staff**



EGLE

#### **TRU Engineering Staff**



EGLE

#### Websites

TRU webpage:

www.michigan.gov/deqtransportationreview

MiWater: miwaters.deq.state.mi.us/miwaters

Joint Agency Transportation Committee: <u>www.michigan.gov/deq/0,4561,7-135-3313\_3684\_15299-</u> <u>11310--,00.html</u>



#### FY 2019 Report

	MDOT	County	Municipal	Total
Applications Received	92	418	58	568
Incomplete Applications	14	127	24	165
Emergency Applications	0	13	2	15
Permit Revision Requests	18	21	6	45
Applications Processed	108	432	46	586
PNs Processed	30	115	12	157
Red Files Processed	2	2	0	4
MPs Processed	74	313	28	415
GPs Processed	4	4	6	14
Preliminary Reviews (Hvd + Env)	85	313	14	412
Complaints Resolved	9	29	0	38
Hydraulic Reviews	9	102	5	116
Part 31 Review (No Modeling)	77	337	30	110
Flood Discharges Provided	136	312	33	481



#### 5 Year Comparison

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Applications Received	510	641	493	539	568
Applications Processed	482	529	460	520	586
Preliminary Reviews	531	419	516	550	412
Hydraulic Reviews	347	498	426	553	560
Flood Discharges Provided	396	323	389	454	481
Incomplete Applications	21%	*	28%	29%	28%

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Meetings/Field Inspections	931	867	1031	1186	898
CRC Council Meetings Attended	14	20	31	17	16
Presentations/Training/Technical	F	Л	10	10	26
Assistance Made	5	4	10	19	30

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
30 days & under	66%	47%	67%	70%	70%
31-60 days	28%	44%	27%	25%	27%
61-90 days	4%	6%	3%	4%	2%
over 90 days	2%	3%	3%	2%	1%

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#### **MiWaters**

EGLE MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY MIWATERS

NPDES, Groundwater, Resource Permitting, Aquatic Nuisance Control, Wastewater Construction

#### Permitting & Compliance

#### What can I do here?

For registered users, MiWaters is the portal to several types of actions:

- Apply for permits
- Manage your permits (pay fees, apply for renewals)
- Submit reports (required by your permit or certification)
- Submit service requests
- View issued permits
- See your notifications
- · Review evaluations / site inspections

To get started, you'll need an account.

k

CREATE A MIWATERS ACCOUNT

Sign in with an existing account



#### MiWaters - Transportation

Start a New Form View All Apps, Reques	i Find and submit a new applica	tion or service request from this scr
Form Name	Form Description 🗢	Program Area 🗘
Transportation ×		(All) T
Digital PUBLIC TRANSPORTATION AGENCY Projects EGLE/USACE Joint Permit Application (JPA) for Inland Lakes and Streams, Great Lakes, Wetlands, Floodplains, Dams, Environmental Areas, High Risk Erosion Areas and Critical Dune Areas	PUBLIC TRANSPORTATION AGENCIES ONLY in Inland Lakes and Streams, Great Lakes, Wetlands, Floodplains, Dams, High Risk Erosion Areas and Critical Dune Areas	Resources Begin Submission
Digital Transportation Emergency Request Form	Emergency Information Sheet For Bridge or Culvert Failure	Resources Begin Submission
Transportation Service Request – T&E Species Map/Data Review (Preliminary Desktop Review)	Request a desktop review for the occurrence of threatened & endangered species and other items of concern such known contamination and proximity to Section 10 waters. Transportation project that use federal funds and require T&E clearance can submit this	Resources Begin Submission
Voluntary Transportation Preliminary Review Request	The Joint Agency Transportation Committee (JATC) consisting of a number of departments including EGLE has developed this form to allow Public Transportation Agencies to solicit early hydrologic/hydraulic and environmental input on their future projects.	Resources Begin Submission



#### MiWaters – Permit Revisions





- Use Correct "TRANSPORTATION" form
- Place site on map correctly (kml files for larger projects)
- MiWaters is organized by "site" or project location.



#### New Digital Joint Permit Application

9	Instructions	*		
	Contact Information		SELECT THE ACTIVITIES from the ALL that apply). If you don't see yo These activities listed require add application.	ist below that are proposed in your project (check ur project type listed, select "Other Project Type". tional information to be gathered later in the
6	Project Location	$\square$	Bridges	Buoys
			Boat Well	Boat Ramp
	Background		Boat Hoist	Culverts
	mormation		Dock/Pier/Mooring	Drawdown
	Permit Application		Fences	Intake or Outfall Structures
	Category and Public Notice Information	L	Marina Construction, Expansi Reconfiguration	n & Shore Protection such as Seawalls, RipRap, and Bioengineering
5	Project Description	L	Stream, River or Drain Construction Relocation and	Utility Crossings
	Resource and Activity Type	L	Wetland Restoration	Other Project Type
	Bridges (1)	•	The Proposed Project will involve Wetland	he following resources (check ALL that apply).
þ	Culverts (1)		Stream or River	Channel or Canal
	Upload of Proposed		Proposed Stream Mitigation	Inland Lake (open water greater than 5 acres in size)
	Site Fians		Great Lake	Pond (open water less than 5 acres in size)
	Fees		100-year Floodplain	Dam
	Paviow		Critical Dune Area	High Risk Erosion Area
	ICHE#		Environmental Area	



#### **Correction Requests**

	Priority (2) Upcoming (0) As Needed (0) Draft (1) In Process (2)
Correction and	HIGH PRIORITY
tput	Testing Correction and Form Output
	Apeleration HNJ-TXYR-5BZBE — Internal Testing of JPA - new version 12 Revise
	CON HOLD - ACTION NEEDED The submission was received on 12/05/2018. blah blah. Contact Mark Schieber at (269) 568-2750 or SchieberM@TESTmichigan.gov with questions.
d	Testing Correction and Form Output
ons	Application HNJ-TOKW-TEW2V — Internal Testing of JPA - new version 12
	ON HOLD - ACTION NEEDED     The submission was received on 12/04/2018. The latest draft revision is v3. please respond to correction request. review application and     Delete Draft
	respond to requests for corrections Contact Mark Schieber at (269) 568-2750 or SchieberM@TESTmichigan.gov with questions.
List	
uests and Reports	



#### **Correction Requests**

Organization Name			
Phone Type Phone Numb Home + 222-222-2	97 122	e	nter info
Email markschieber@TESTgmail.com	Comment		🗩 Add Comment
Fax			
Address Line 1 1234 run street	Content		Mark Complete
Address Line 2	No really I am the owner. maybe records are not updated yet.		
City State/Area Mi	Postal Cc 49006		
Country United States			
VALIDATE ADDRESS			
Is the Property Owner different from the Applicant?	Cancel		
No	*		



# **Bankfull Structures**

- Under Part 301, resource impacts must be minimized
- Bankfull considered "minimal" impact
  - Allows for natural stream function (transporting water & sediment)
  - Fish passage (<2 fps for < bankfull events)</li>
- Bankfull incentivized by qualifying for minor project
- Applications <Bankfull must be justified (and documented)</li>
- Alternatives Analysis

**Bankfull Measurements** 



# Pathway Projects

- Road Commission must be "proper" applicant.
  - Own the right-of-way/property
  - Oversee construction
- Responsible for permit compliance







# T&E Species



- EGLE Screening Tool
- No Review Required

- Placement of structures on pilings, such as docks, boat hoists, and spring piles.

- Maintenance dredging within the footprint of an area that has been actively dredged in the past 5 years under a MDEQ/EGLE permit.

- Culvert replacements that do not increase the length of the culvert.





- No Review (GPs)
  - Clear Span Bridge (C)
  - Structures on pilings (Z)
  - Dry Hydrants (J)
- No Review (MPs)



- Maintenance/Repair Serviceable Structures (22)



#### **Review Required**

Initial screening by EGLE staff includes:

- 1. Consider any previous survey effort within or near a project area;
- 2. A site inspection by EGLE staff or qualified individual (someone with a state or federal permit to handle native mussels).
  - This site inspection should include a visual review of stream substrates, as well as a visual survey of the stream bed and banks for shells, shell fragments or live mussels.

### **EGLE Permit Processing**

- If initial screening indicates **federally listed mussels are** *likely* **present**, then the permit application would be **Red-Filed**.
  - During the Red File process, EGLE, FWS and the applicant will discuss necessary survey effort and appropriate process under the Endangered Species Act to authorize relocation activities. FWS will coordinate with EPA.
  - Applicant may need to withdraw EGLE application if survey timing is problematic.
- If initial screening indicates **state listed mussels are** *likely* **present**, then the permit application will be **Public-Noticed**.
  - DNR Fisheries Division staff and Wildlife Division staff copied on PN.
  - During the Public Notice process, EGLE, DNR, and applicant will discuss necessary survey effort and relocation plan.



#### Eastern Massasauga Rattler

#### Google "Environmental Screening for Eastern Massasauga in Michigan"

#### Use Herp-Friendly stabilization







- Soil Erosion and Sedimentation Control
- Asbestos Testing
- Environmental Licensing Agreement (Part 213)
- Water Withdrawal



#### Soil Erosion and Sedimentation Control #1 PTA Violation

- Transportation APAs must follow their approved SESC Operating Procedures to be in compliance with the program.
- Maintenance projects are subject to SESC and again should be listed in their approved SESC Procedures.
- Temporary SESC measures shall be maintained on a daily basis and Permanent stabilization shall occur within 5 days of final grade.
- Inspections must be completed and documented on all projects, including maintenance projects. Maintenance projects are not exempt from inspections.
- The best way to show that the agency completed the project with the correct stabilization is photos.
- Documented inspections MUST occur, and Temporary measure MUST be maintained until the site is STABILIZED.



#### **Asbestos Testing**

- Required for all "facilities" (includes bridges)
- Certified Asbestos Tester
- Each different material must be tested.
- Must file "Notification of Intent to Renovate/Demolish" online submission
- Contact Jeremiah Brown, AQD 517-599-7825



#### **Environmental Licensing Agreement (Part 213)**

- Leaking Underground Storage Tank Sites
- Allows Contaminated Site to be closed and contamination to remain in place under roads.
- Environmental Mapper
- Road agency must notify MDEQ if performing work in a site with an ELA (Notice of Onsite Work Activity – 48 hours)
- Resource and Redevelopment Division Contacts: Joshua Mosher (517) 285-5137 or Kevin Schrems (517) 284-5149



#### Large Quantity Water Withdrawal (Part 327)

- 'Withdrawal' is removal of water from its source, including from groundwater or a surface water body
- Construction Dewatering/Dust Control/Other consumptive use (Discharging back to watershed is exempt)
- No Adverse Resource Impact
- >70 gpm pumping capacity maintain records
- If total volume is >3 million gallons over 30 days, need to register with EGLE
- 2 levels of authorization: registration (180 MG total) and permit (>180 MG and > 2 MGD)
- Apply for Registration via online Water Withdrawal Assessment Tool (not through MiWaters)
- Immediate Registration or up to 2 weeks if EGLE review req'd
- Permit review period is up to 120 days (incl. PN) and \$2k fee.
- Contact Andy LaBaron (517) 284-5563



# **Voluntary Preliminary Reviews**

- Request in MiWaters
- Prior to project design
- Includes T&E Search and usually DNR Comments
- Includes a site inspection
- Typically 60 day turn-around
- Can also submit hydraulic models



# T&E Species Map/Data Reviews

- Request in MiWaters
- Project Scoping/Scheduling
- Provides Documentation for environmental clearances for upland projects that won't require a EGLE permit
- Don't submit with permit application
- Typically 15 day turn-around



# Great Lakes Water Levels



- Water levels are cyclical with periods of low and high water
  - Can last for several years
  - Influenced by precipitation, runoff, and evaporation
  - All the Great Lakes are currently at or near record highs



# **Great Lakes Water Levels**



EGLE

# Precipitation ranks (detailed)

Nov 2018–Oct 2019	41.83"	32.78" (822.61mm)	78" 9.05" 124th Driest Driest since: 2018	Driest since: 2018	1963	
T2-Month	(1,062.48mm) (832.61mm) (229.87mm)		(229.871111)	1st Wettest	Wettest to Date	2019
May 2018–Oct 2019	65.44"	52.05" (1 222 07mm)	13.39" (240.11mm)	124th Driest	Driest since: 2018	1963
ro-month	(1,002.181111)	(1,322.071111)	(340.1111111)	1st Wettest	Wettest to Date	2019
Nov 2017–Oct 2019	80.15"	65.54"	14.61" (271.00mm)	123rd Driest	Driest since: 2018	1963
24-month	-Month (2,035.81mm) (1,664.72mm) (371.09mm)	(371.091111)	1st Wettest	Wettest to Date	2019	
Nov 2016–Oct 2019	120.79"	98.30"	22.49"	122nd Driest	Driest since: 2018	1964
36-Month	(3,068.07mm)	(2,496.82mm)	(571.25mm) <sup>1</sup>	1st Wettest	Wettest to Date	2019
Nov 2015–Oct 2019	158.50"	131.09"	27.41"	121st Driest	Driest since: 2018	1964
48-1001111	Month (4,025.90mm) (3,329.69mm) (696.21mm)	(696.2111111)	1st Wettest	Wettest to Date	2019	
Nov 2014–Oct 2019	191.62"	163.85"	27.77"	120th Driest	Driest since: 2018	1934
60-Month	FMonth (4,867.15mm) (4,161.79mm) (705.36m		(705.36mm)	1st Wettest	Wettest to Date	2019

EGLE

# What is EGLE doing about it?

Internal response team (October 28, 2019):

- Expedite permits
- Help customers
- Improve Communications





# **Emergency Permit Applications**

- Request in MiWaters: Digital Transportation Emergency JPA
- Complete as much of digital JPA as possible
- If MP project, will issue the permit
- If Individual project, will issue a conditional permit
- Conditional Permits require complete application and public notice follow up and issuance of final permit.





Michigan Department of **Environment, Great Lakes, and Energy** 

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