June 11, 2025

Phillip D. Roos
Director, Michigan Department of Environment, Great Lakes, and Energy (EGLE)
Constitution Hall
525 West Allegan Street
Lansing, MI 48909-7973

Subject: GWK Permit – Red Run Drain Flooding

Dear Director Roos,

As your department continues its review of the expired George W. Kuhn (GWK) discharge permit and repeated permit violations, please find the attached independent engineering review of the deteriorating conditions of the Red Run Drain.

The GWK in Oakland County is the largest RTB facility in the state and perhaps the country and is the only basin that discharges all their flows directly into another county. It discharges directly into Macomb County via the Red Run Drain. We are increasingly concerned not only about the quality of GWK's untreated SSOs or minimally treated CSO discharges, but also the volume and velocity of these discharges.

When GWK discharges, it sends a wall of water cascading down the Red Run, backing up other storm outlets and causes severe flooding in Macomb. GWK's wet weather discharges have contributed to documented flooding of thousands of basements, critical military and Defense Department installations in Warren (TACOM & TARDEC), the General Motors Technical Center, and the ITC power grid. At a time when the region has undertaken a large Southeast Michigan flood study in combined sewer areas, we question how can EGLE continue to permit these enormous flow volumes.

GWK's discharge volumes clearly exceed design standards or allowable flows as evidenced by the severely eroding Red Run banks. The attached report details that 75% of the Red Run or over 16 miles of bank is suffering from moderate or severe bank erosion. No surprise that most of the damage is within a mile downstream of the GWK discharge outlet. The condition is worsened by the increasing intensity of rain events impacting the GWK – these increased flows account for most of the flow volume into the Red Run. Repairing the bank damage caused by Oakland will cost tens of millions of dollars but will be unfairly borne by Macomb County residents.

The erosion is also documented in the attached article where a Warren homeowner attempting to mow grass along the drain fell down the eroding bank and died.

The Red Run was never designed to accommodate such high flows. In fact, the drain's current operations and maintenance manual was completed before the Red Run was enclosed upstream in Oakland County to create the GWK CSO basin. Prior to enclosing this section, flood waters could be retained through wetlands, channels, and nature-based approaches.

Because the State has permitted the GWK CSO discharges and is also a member of the Red Run Drain board, we ask the State to either help fund the tens of millions to repair the banks, or better yet, to solve the problem at its source. EGLE should take action to require Oakland County to separate their combined systems or increase storage and retainage to lessen the volume and velocity of their flows that have directly led to flooding and failed drain banks.

I urge EGLE to consider all these factors in their GWK permit review, including the impacts of flooding, bank erosion and damage to the Red Run. EGLE must require GWK to be responsible for having a detailed and actionable plan with enforceable timelines to eliminate these harmful conditions and cost to Macomb County residents.

We look forward to continuing to work with the State and Oakland County on solving these vital issues to protect water quality and reduce flooding hazards.

Sincerely,

Candice S. Miller

Candice S. Miller
Macomb County Public Works Commissioner

RED RUN INTERCOUNTY DRAIN

UAS FLIGHT, PROCESS, AND BANK CONDITIONS

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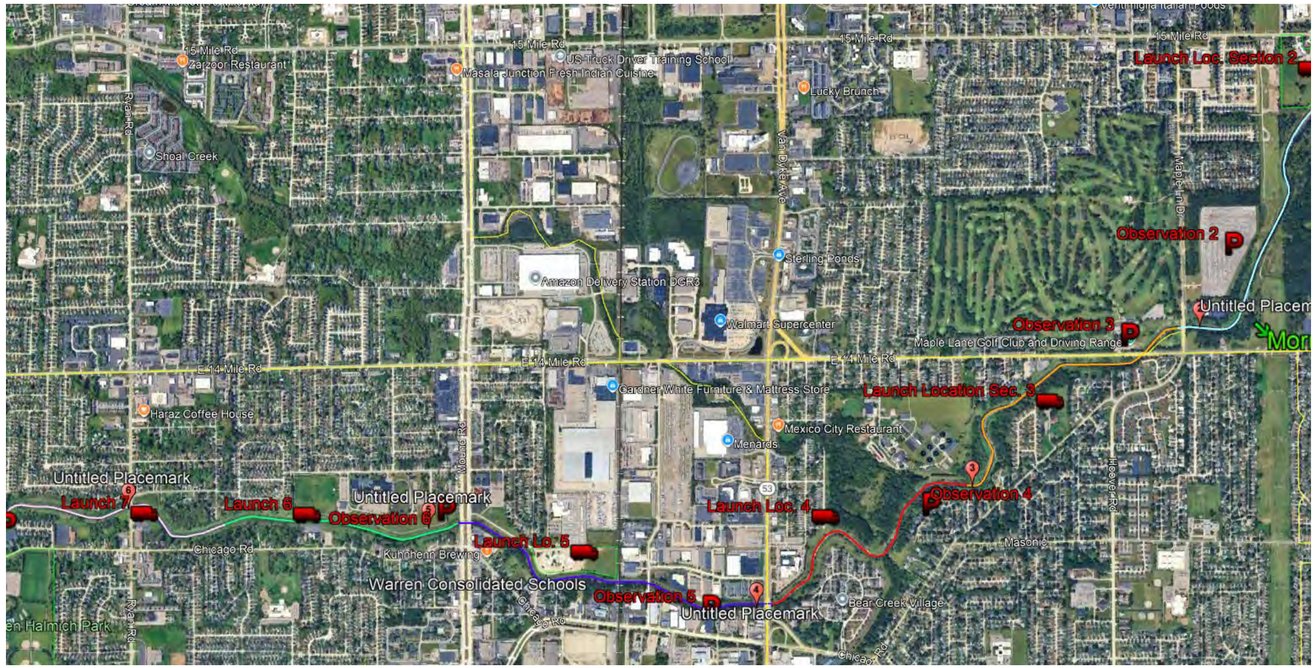
PLANNING AND DEVELOPMENT

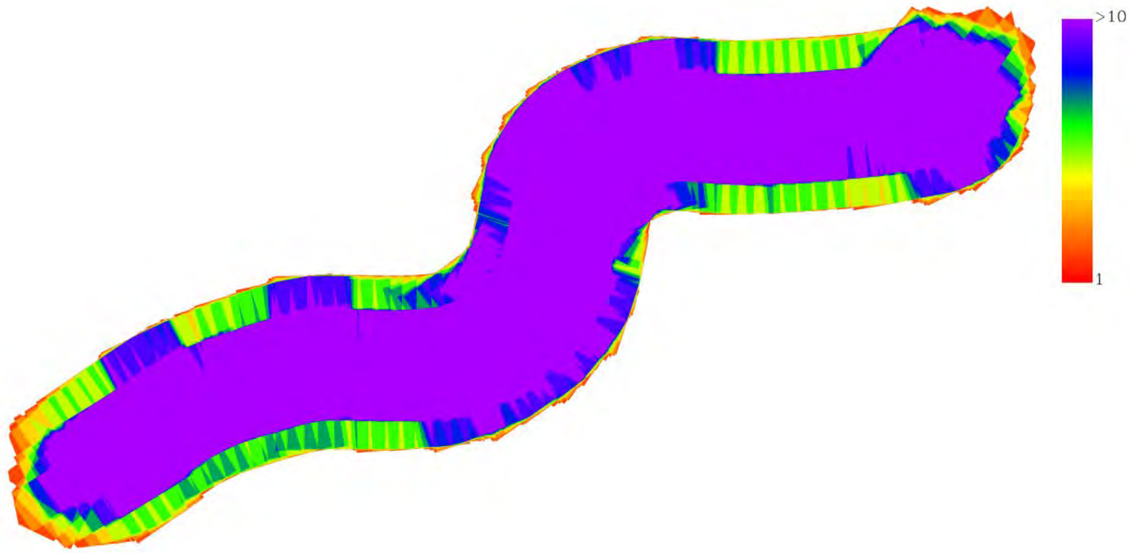
- A high- resolution camera was selected for the Unmanned Aerial System (UAS) to prioritized visual data over LiDAR.
- Using Google Earth, a .kml file was created approximating the centerline of the Red Run Intercounty Drain. Given the length of the target area, the centerline was divided into 8 sections to facilitate safe and efficient data capture.
- Over the course of two days, eight different UAS flights were conducted, each flying parallel to the centerline path.
- Accurate UAS positioning was ensured using Real-Time Kinematic (RTK) GPA connected to the MDOT CORS network.
- During the flights, the UAS captures aerial images and data, which are then stored for processing.



DATA PROCESSING

Once the data is collected, it is processed using DJI Terra software. This software converts the aerial images into high-quality digital maps and 3D models. The process involves several steps:

- ***Image Stitching*:** Combining multiple images to create a seamless map.
- ***Point Cloud Generation*:** Creating a 3D representation of the area using points derived from the images.
- ***Mesh Reconstruction*:** Forming a 3D mesh from the point cloud to represent the surface geometry.
- ***Texture Mapping*:** Applying textures to the 3D mesh to enhance visual realism.



DELIVERABLES:

After the data processing is complete, a 2D Orthomosaic image and a 3D Model were edited and reviewed for dispersal. These models allow the engineering team to have a full view of the drain to identify areas of concern.

- **2D Orthomosaic:** A high-resolution, georeferenced, distortion-free aerial image created by stitching together multiple photos taken by a UAS.
- **3D Model:** A mesh file created using the photographs taken by the UAS. The resulting data sets are accurate, georeferenced 3D models of the target area that are textured and colorized to represent real world conditions.

2D Orthomosaic Image

3D Model

DELIVERABLES: Comparison

2D Orthomosaic

3D Model

2D Orthomosaic: Image of Section 8-Red Run just East of Dequindre. Coordinate shown for comparison.

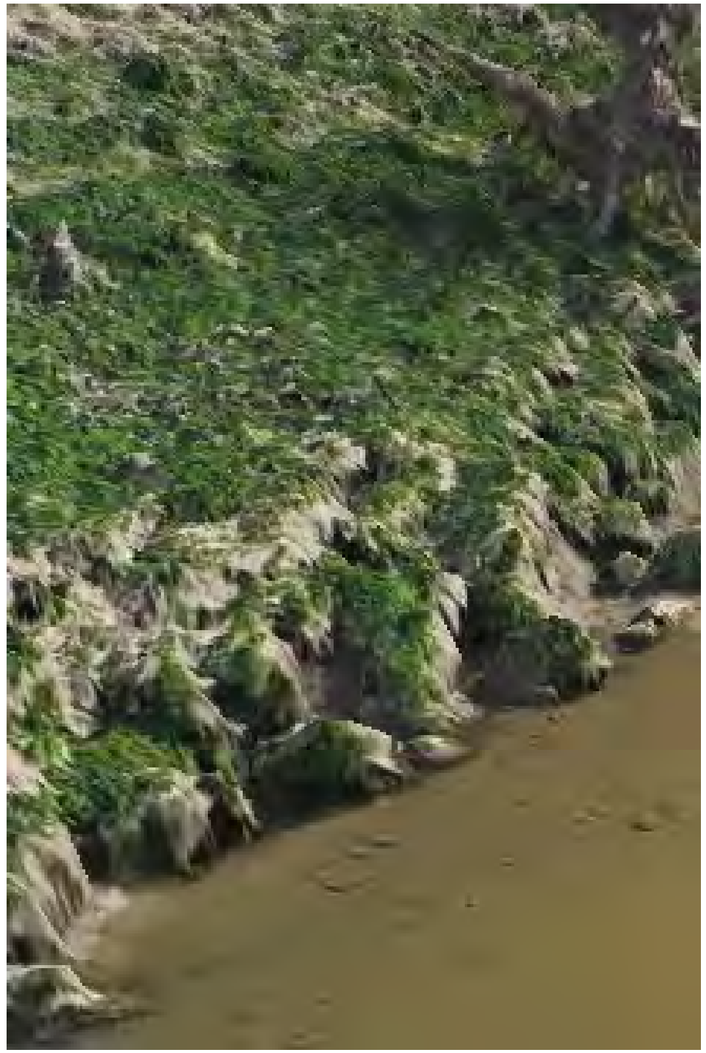
3D Model: Image of Section 8-Red Run just East of Dequindre. Coordinate shown for comparison

BANK CONDITION – No Erosion

BANK CONDITION – Mild Erosion

BANK CONDITION – Mild Erosion

BANK CONDITION – Mild Erosion



BANK CONDITION – Moderate Erosion

BANK CONDITION – Moderate Erosion

BANK CONDITION – Moderate Erosion

BANK CONDITION – Severe Erosion

Object ID 11 – Point 8

BANK CONDITION – Severe Erosion

Object ID 9 – Point 7

BANK CONDITION – Severe Erosion

Object ID 15 – Point 3

BANK CONDITION – Severe Erosion

Object ID 34 – Point 5

BANK CONDITION – Severe Erosion

Object ID 33 – Point 6

BANK CONDITION – Severe Erosion

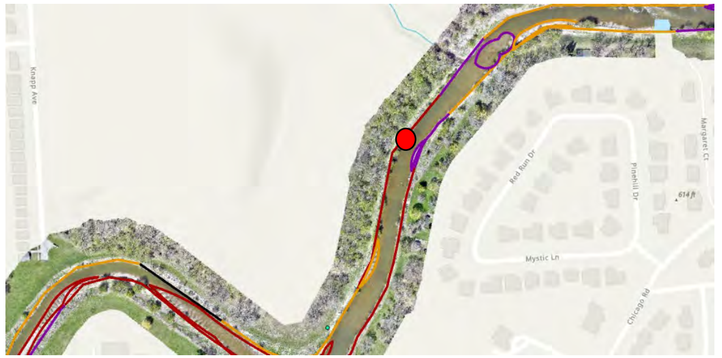
Object ID 35 – Point 1

BANK CONDITION – Severe Erosion

Object ID 19 – Point 10

BANK CONDITION – Severe Erosion

Object ID 30 – Point 2



BANK CONDITION – Severe Erosion

Object ID 24 – Point 4

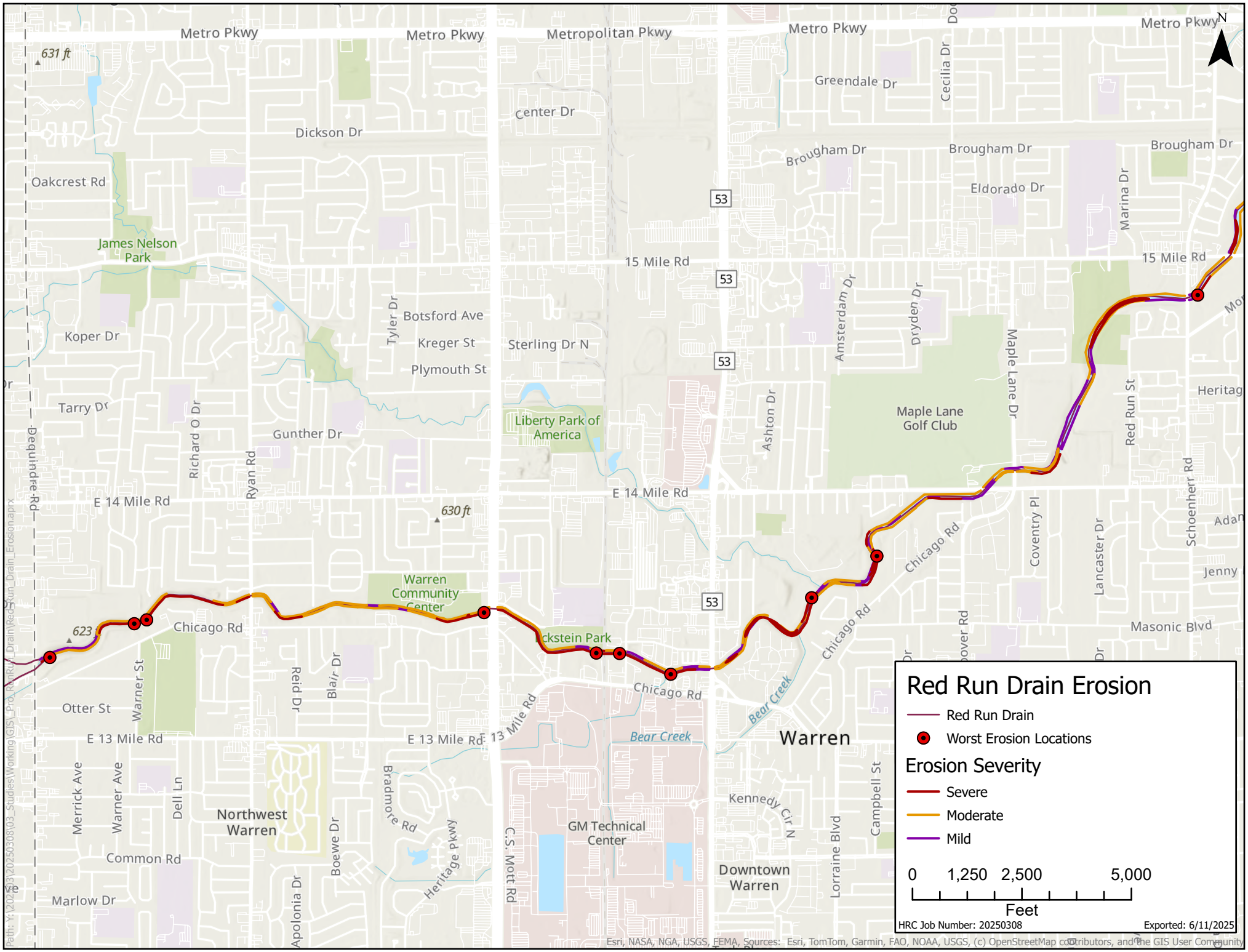
BANK CONDITION – Severe Erosion

Object ID 27 – Point 9

BANK CONDITION - Shoaling

BANK CONDITION - Shoaling

BANK CONDITION - Shoaling


Red Run Drain Erosion
Red Run Drain
Worst Erosion Locations
Erosion Severity
Severe
Moderate
Mild
0 1,250 2,500 5,000
Feet
HRC Job Number: 20250308
Exported: 6/11/2025
N
Metro Pkwy
Metropolitan Pkwy
631 ft
Dickson Dr
Center Dr
Greendale Dr
Cecilia Dr
Brougham Dr
Eldorado Dr
Marina Dr
Oakcrest Rd
James Nelson Park
15 Mile Rd
53
Koper Dr
Tyler Dr
Botsford Ave
Kreger St
Plymouth St
Sterling Dr N
Amsterdam Dr
Dryden Dr
Maple Lane Dr
Maple Lane Golf Club
Red Run St
Tarry Dr
Richard O Dr
Gunther Dr
Liberty Park of America
Ashton Dr
Beaudette Rd
Ryan Rd
E 14 Mile Rd
630 ft
Coventry Pl
Lancaster Dr
Schoenherr Rd
Warren Community Center
623
Chicago Rd
Masonic Blvd
Jenny
Otter St
Warner St
Reid Dr
Blair Dr
E 13 Mile Rd
Bear Creek
Warren
Merrick Ave
Warner Ave
Dell Ln
Northwest Warren
Common Rd
Boewe Dr
Braemore Rd
Heritage Pkwy
C.S. Mott Rd
GM Technical Center
Kennedy Cir N
Campbell St
Lorraine Blvd
Downtown Warren
Marlow Dr
Apolonia Dr
Esri, NASA, NGA, USGS, FEMA, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community

RED RUN INTERCOUNTY DRAIN - Current Conditions

- **The Red Run Intercounty Drain serves as the primary stormwater conveyance system for a 142 square-miles watershed, extending 8.6 miles in length.**
  - The affected drain length for the two banks is approximately 114,626 feet*.
- **There are 40 occurrences of shoaling.**
  - 9 are classified to be severe based off length and significance of sediment within the drain.

Severity	Length (ft)	% of affected length
Bank Erosion		
None	3297.00	2.9%
Mild	25590.54	22.3%
Moderate	58808.85	51.3%
Severe	26930.12	23.5%

*The measured affected drain length reflects the true path along the banks, incorporating all meanders and curvatures. This results in a larger total length compared to the simplified 8.6-mile measurement, which is based on a centerline approximation.

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Warren man dies after falling into the Red Run

City fire officials say it appears the victim fell off his riding mower and went over the embankment

Warren public safety officials believe a man who was mowing his grass near the Red R n fell into the water and died Wednesday night. (SUBMITTED PHOTO)

By **SUSAN SMILEY** | ssmiley@medianewsgroup.com | Macomb Daily

UPDATED: August 22, 2024 at 5:20 PM EDT

A Warren man who was reported missing Wednesday was found deceased later that night in the Red Run near 14 Mile and Chicago roads.

According to Warren Fire Commissioner Wilburt “Skip” McAdams, public safety officials believe the man was mowing his grass on a riding mower on River Drive near Surow Drive when he accidentally went over the edge of the embankment and fell into the water.

“The bank is quite steep at that point, but it appears he went upstream and tried to climb out and somehow fell back into the water,” McAdams said.

Warren Police requested assistance from the fire department at 8:16 p.m. at which time fire drones were deployed to search for the victim downstream from where it appeared he had fallen in the Red Run. The current runs east toward Lake St. Clair, but the victim’s body was found upstream from the point where public safety officials believe he fell.

The age and identity of the victim is not known.

“At this time, the thought is that the victim got too close to the bank and accidentally went over,” McAdams said. “It does not appear to be a medical emergency but we will have more information once the medical examiner submits their report.”

Originally Published: August 22, 2024 at 5:12 PM EDT