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Planning and Funding of Stormwater Resilience in Duluth

Ryan Granlund, Utility Programs Coordinator

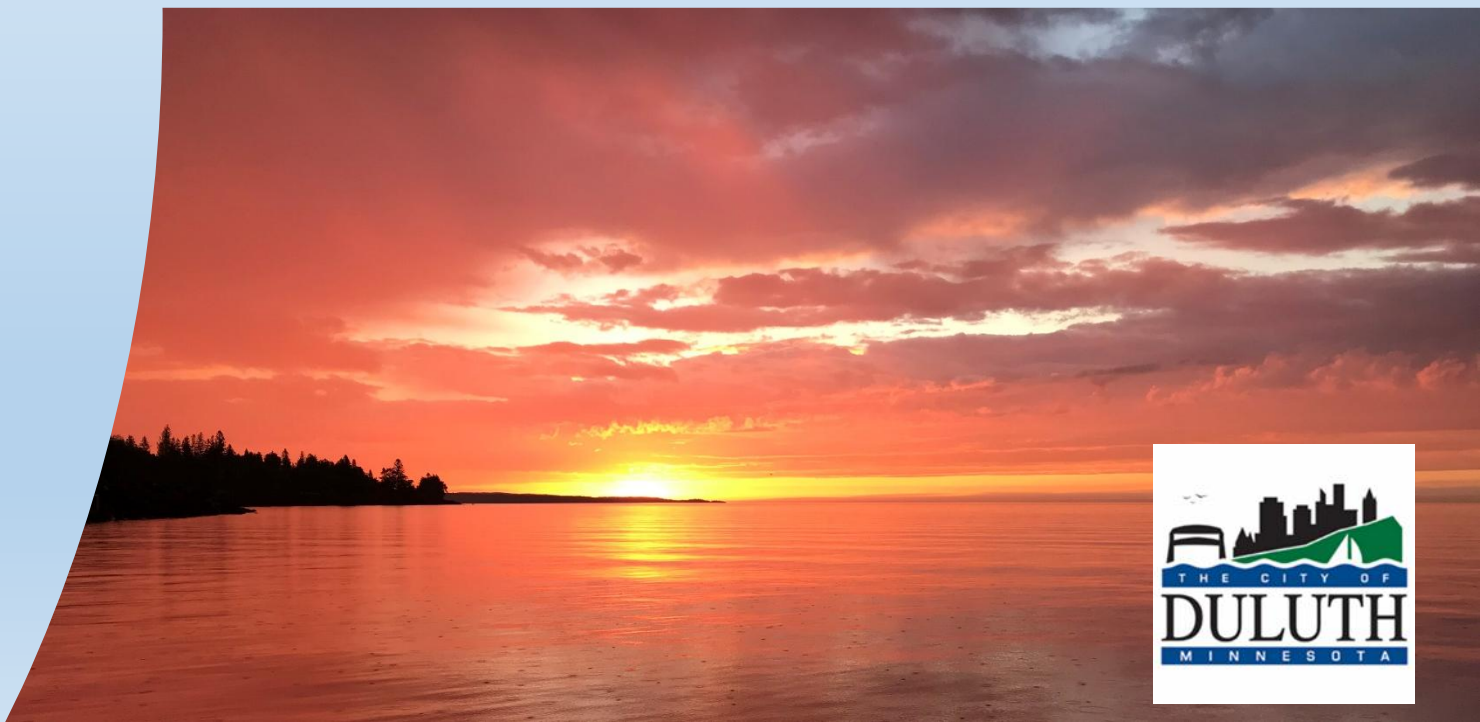
City of Duluth Public Works and Utilities

City of Duluth and Utilities

- **Duluth Characteristics**
  - Long, narrow City stretched along shorelines of Lake Superior and St. Louis Estuary. Population around 87,000 and home to a vibrant outdoor community, tourism, industry and critical services for the region.
- **Water**
  - City operated water treatment and conveyance to residents and customers.
- **Natural Gas**
  - Gas mains and service lines distribute gas for cooking and heating fuel to homes. City owns and operates natural gas distribution and service lines.
- **Sanitary Sewer**
  - City operates the collection and conveyance system. All wastewater is directly in a closed system to WLSSD for treatment prior to release to St. Louis River Estuary. I&I and age/integrity of the system are primary challenges in Duluth.
- **Storm Sewer**
  - Catch basins and storm sewer mains, tunnels convey runoff and precip to nearby receiving waters. Open system not combined with sanitary or wastewater infrastructure. Very de-centralized system, with around 840 outfalls to public waters.

Stormwater Receiving Waters

- Lake Superior
- St. Louis River Estuary
- 44 Named Streams
- 16 Trout Streams
  - High priority for increased attention to water quality and pollution prevention.
  - Sensitive species susceptible to environmental stressors.
    - Temperature
    - Sediment
    - Habitat Degradation



Duluth Stormwater Characteristics

- Aged infrastructure built from 1880s to present.
- Lacking stormwater management, most rate control is on private parcels and recent developments.
- Urban streams are in tunnels, under buildings, roads and other vulnerable locations. Built during wide range a time by multiple owners.
- Multiple major streams and drainages intersect the street grid. Large number of critical/large capacity/vulnerable inlets.
- Steep topography, type D soils and shallow bedrock lead to flashy streams and sewer sheds. Runoff rate is a factor in most flood damage.
- Increase in precipitation intensity with climate change.

Duluth Flooding

- Damage from erosive flood flows, aged infrastructure failures, road washouts and storm sewer surcharging
- Up-to-date, competent, and larger capacity infrastructure with redundancy is key
- **Prioritization**
  - Faced with aged infrastructure and rising construction costs, how can the City identify project areas and needs with multiple considerations?

Minnesota Pollution Control Agency – Planning Grants for Stormwater Resilience

- Opportunity in December 2021 to apply for up to $100k in funding for a Stormwater Resilience Planning Project
- 10% match requirement, can be met with staff funding
- This can help prioritize where to spend money and time first when proposing large scale stormwater management and infrastructure upgrades
- City successfully awarded planning project in 2022, setting the stage for an updated stormwater management plan

MINNESOTA POLLUTION CONTROL AGENCY

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City of Duluth Stormwater Management Plan

- Community Vulnerability Assessment
  - Large scale view at the City from a flood vulnerability standpoint.
  - Watershed Priority Matrix
- In-Depth Neighborhood Vulnerability Assessment
  - Focus on one specific watershed with known vulnerabilities.
  - Meet with the community in the watershed, learn from the people who live there what stormwater resilience looks like
- Identify Funding Opportunities

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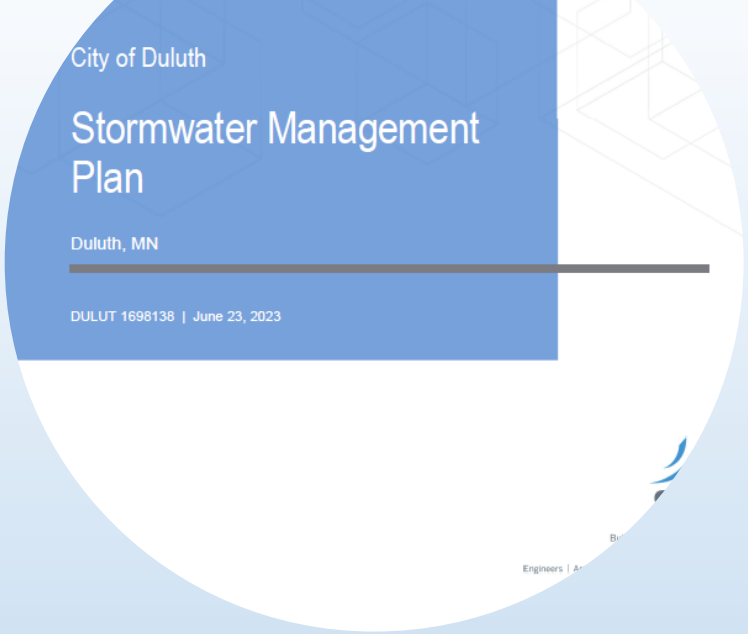
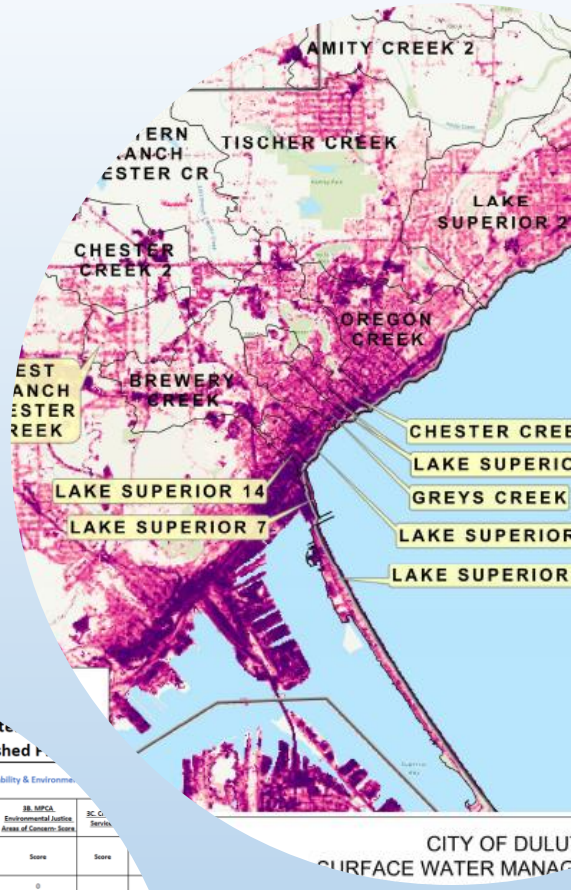
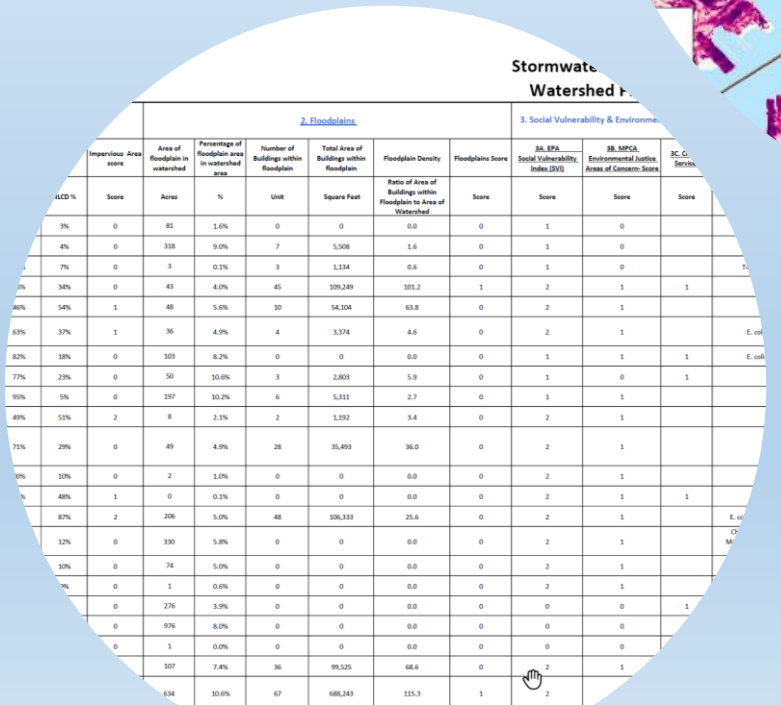
Watershed Priority Matrix at City Wide Scale

- Drainage characteristics
- Climate Vulnerability
- Rank watersheds to focus studies and implementation work
- Analyze existing data
  - GIS, FEMA Flood Maps, Utility Data, Damage Assessments, Land Use, Critical Infrastructure and Services
- <u>Tool to help prioritize areas based on data along with staff expertise</u>

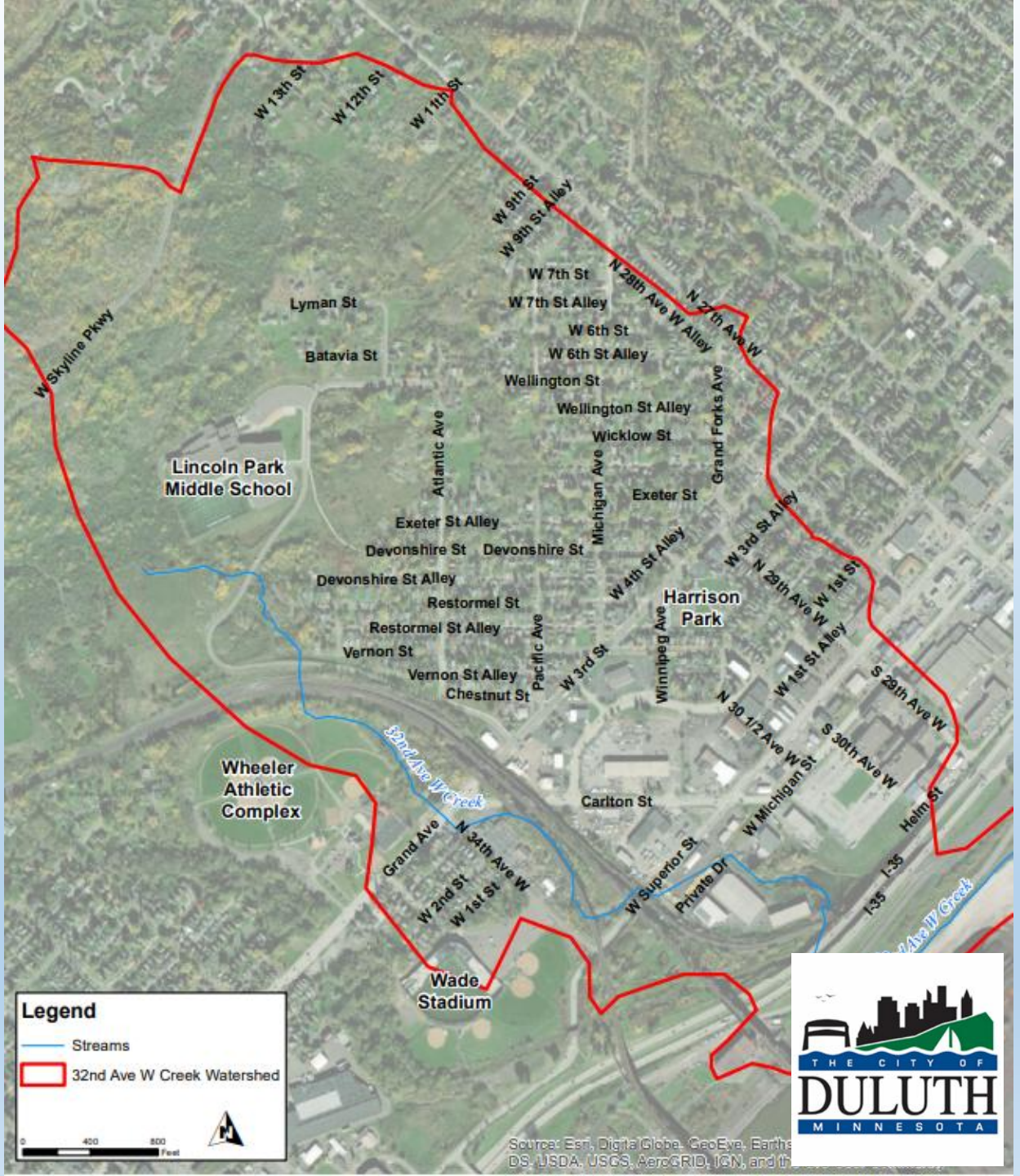




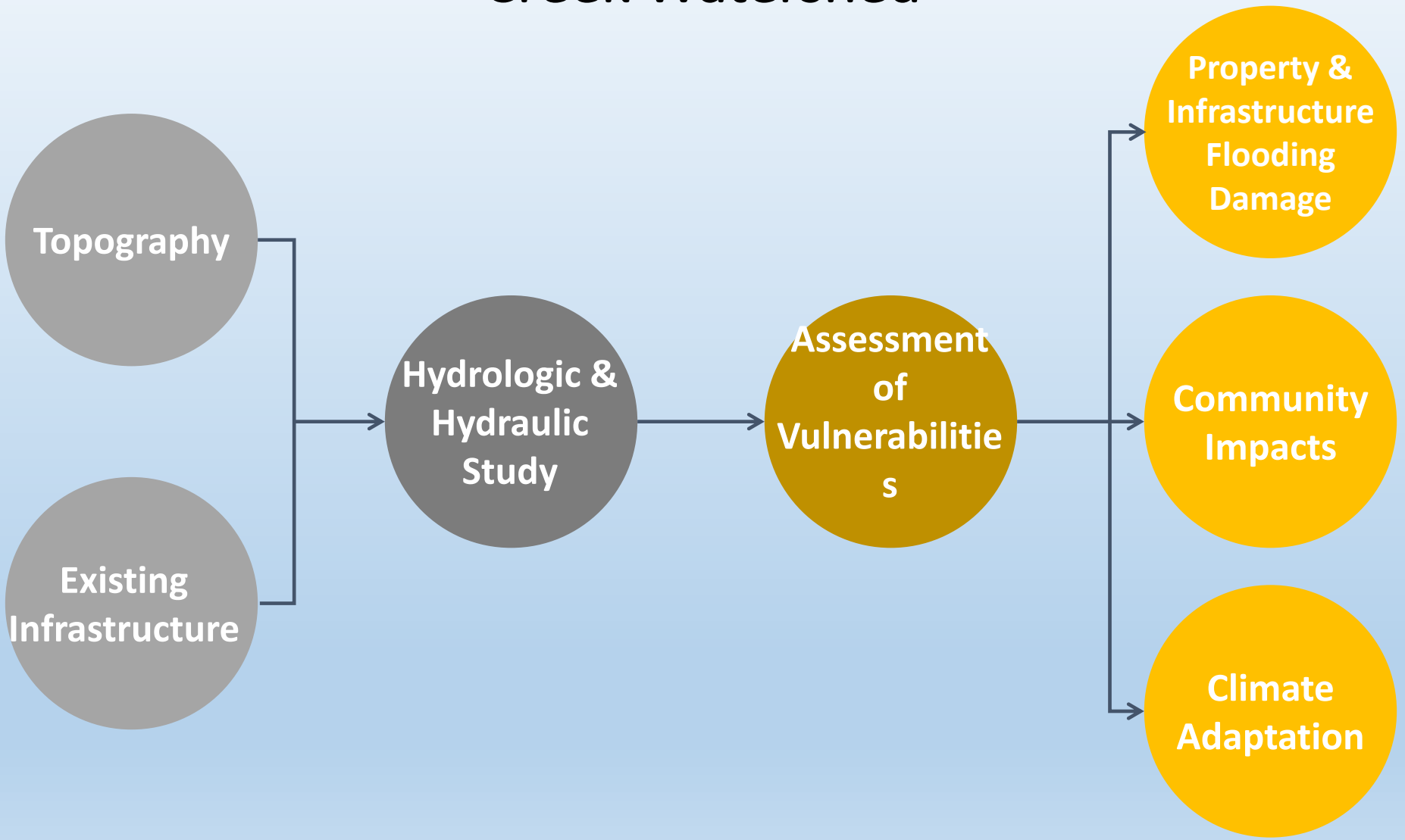


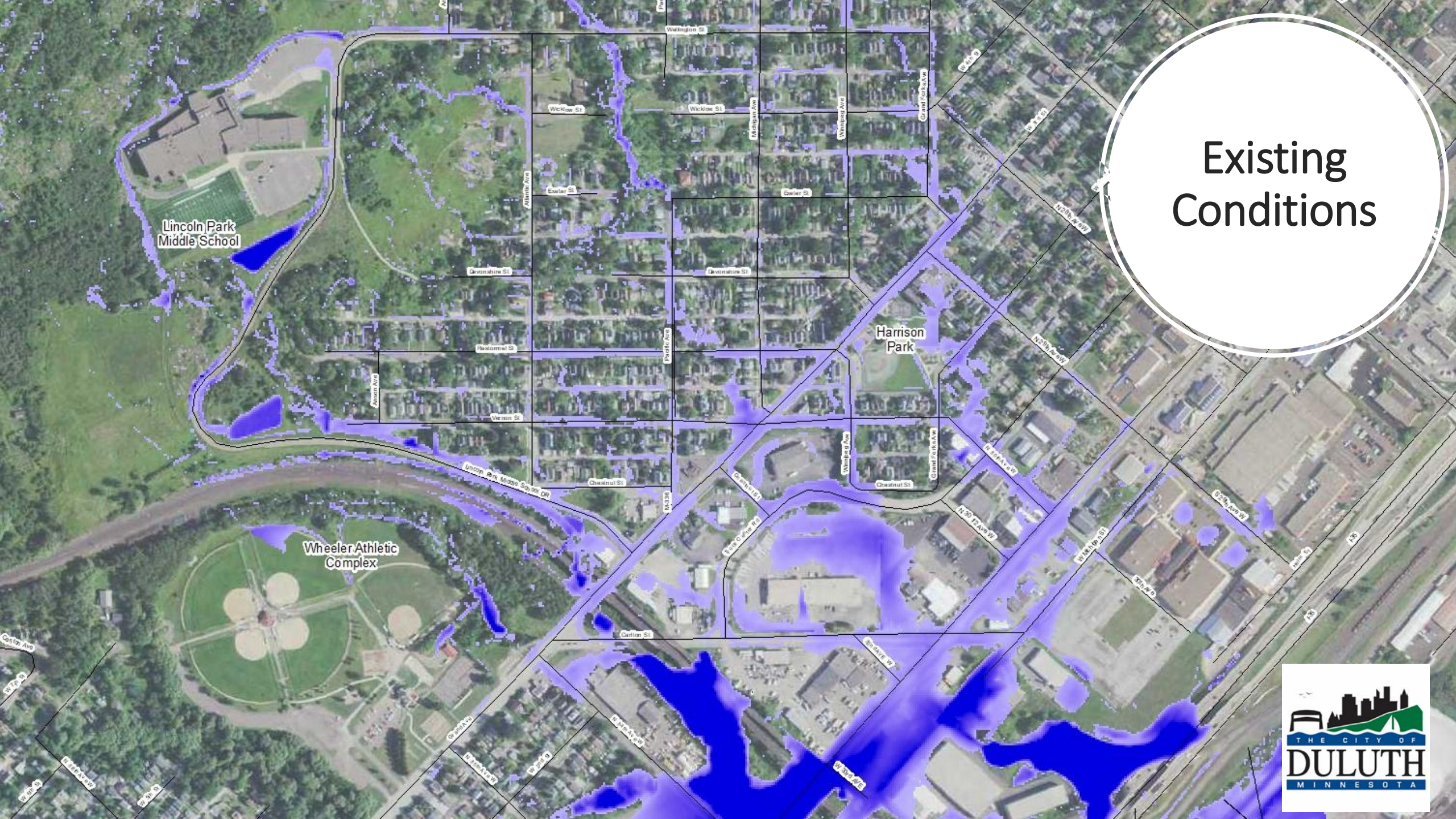
In-Depth Assessment of Specific Neighborhood at Watershed Scale

- 32nd Ave W Creek Watershed / Lincoln Park Neighborhood
- Analysis of local drainage and potential problem areas.
- Model watershed characteristics today and in the future with climate change considerations



32nd Avenue West Creek Watershed





Existing Conditions

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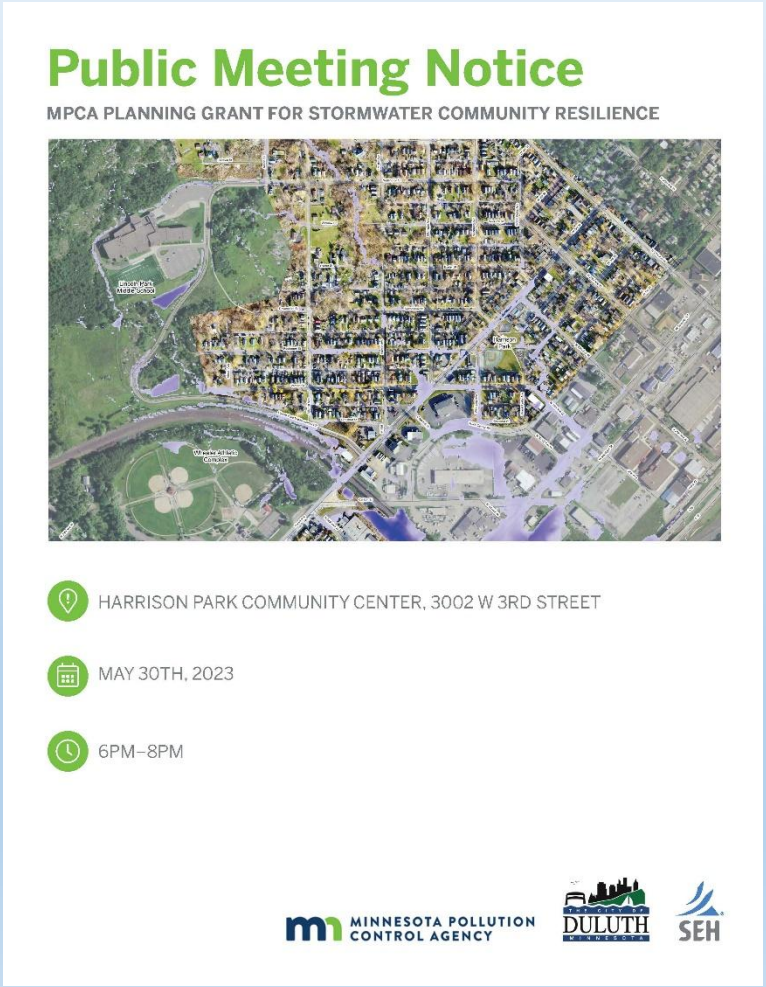
Public Meeting

Showcase findings and get feedback from the people who live there!



Following the presentation, representatives from the City of Duluth will be looking for feedback and testimony on water quality and flooding that local residents have experienced in order to best understand current flood risks and opportunities present to increase stormwater resilience in the community.

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Outcomes and Funding

- Stormwater Management Plan project final in June 2023
- Funding Matrix connected projects to funding sources
- Project areas in 32nd Ave W Creek Watershed
- Watershed Priority Matrix
  - **Brewery Creek notable**
- Need more inlets, stormwater management and pipe capacity

Program	Agency	Program Description	URL	Amount/Matching
Capital Bonding	MMB	Publicly owned infrastucture, facilities, sites	https://mn.gov/mmb/budget/capital-budget/	50% match required. No minimum or maximum
Building Resilient Infrastructure and Communities (BRIC)	FEMA	Hazard mitigation projects to make communities more resilient to flooding, wild fires, tornadoes, hurricanes, drought, sea level rise, and earthquakes	https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities	25% non-federal match required
Hazard Mitigation Grant Program	FEMA	Hazard mitigation projects to make communities more resilient to flooding, wild fires, tornadoes, hurricanes, drought, sea level rise, and earthquakes	https://www.fema.gov/grants/mitigation/hazard-mitigation	25% non-federal match required
Community planning grants for stormwater, wastewater, and community reslience	MPCA	Climate-planning projects to help communities be more resilient to climate change.	https://www.pca.state.mn.us/grants-and-loans/community-planning-grants-for-stormwater-wastewater-and-community-resilience	10% match required, may include in-kind match
Point Source Implementation Grant (PSIG)	PFA	Project must meet eligibility criteria found at link.	https://mn.gov/deed/pfa/funds-programs/point-source-grants.jsp	Grant for up to 80% of project cost, maximum $7 million
Army Corps of Engineers - 569 Program	USACE	Design and construction assistance for water-related environmental infrastructure and resource protection and development projects.	https://www.mvp.usace.army.mil/Home/Projects/Article/571011/environmental-infrastructure-assistance-section-569-northeastern-minnesota/	Typically $1M-$2M
Board of Water and Soil Resources Clean Water Fund	BWSR	Water quality issues	https://bwsr.state.mn.us/grants	25% match
Legislative-Citizens Committee on Minnesota Resources (LCCMR)	LCCMR	Funding for projects that protect, conserve, preserve, and enhance Minnesota's air, water, land, fish, wildlife, and other natural resources.	https://www.lccmr.mn.gov/	Local unit of government is eligible. No match required but those with a match score higher. No maximum award but usually in the $1,000,000 range
Clean Water Revolving Fund	PFA	Below-market rate financing	https://mn.gov/deed/pfa/funds-programs/cleanwaterrevolvingfund.jsp	
Sustain Our Great Lakes	NFWF	Funding to improve and enhance: 1) stream, riparian and coastal habitats; 2) water quality in the Great Lakes and its tributaries (Program priorities include: Expanding Green Stormwater Infrastructure in Great Lakes Communities)	https://www.nfwf.org/sustain-our-great-lakes-2022-request-proposals	$11.2 million available $1.36 m for project in Wisconsin's Lake Michigan watershed which Restore and Preserve Natural Areas and Biodiversity
Water Infrastructure Improvements for the Nation (WIIN) Act	EPA	This grant program was designed to assist small public water systems in complying with Safe Drinking Water Act (SDWA) requirements. The Wisconsin DNR has been appropriated $722,000 in grant monies to provide financial assistance to any qualifying other-than-municipal community and not-for-profit nontransient noncommunity water systems for this purpose.	https://www.epa.gov/dwcapacity/water-infrastructure-improvements-nation-act-wiin-act-grant-programs	45% funding match
Flood Mitigation Assistance Program (FMA)	FEMA	Projects and planning that reduces or eliminates long-term risk of flood damage to structures insured under the NFIP. FMA funding is also available for management costs.	https://www.fema.gov/flood-mitigation-assistance-grant-pro	

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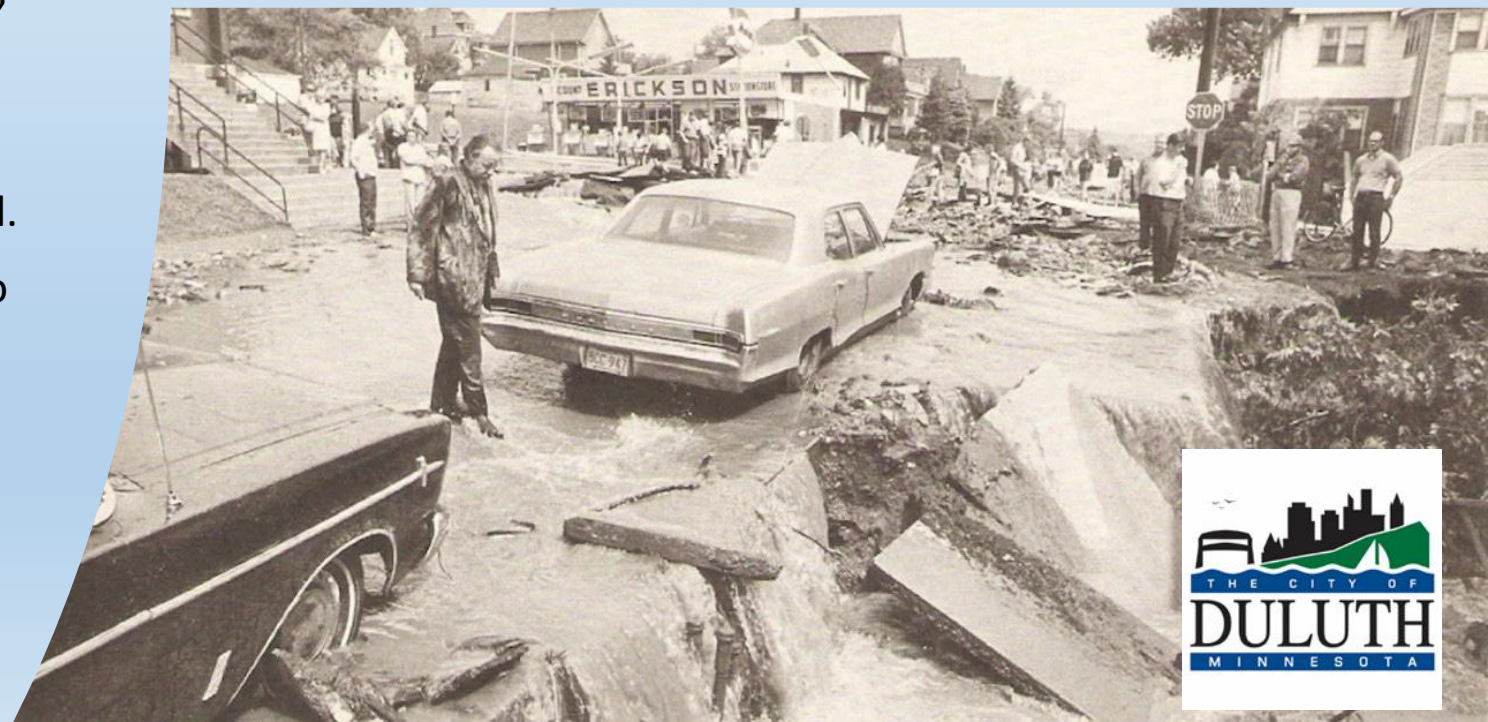
Brewery Creek

- Stormwater management within this watershed has been identified as crucial during the development of the 2023 Duluth Stormwater Management Plan, the Watershed Priority Matrix, and the Brewery Creek Tunnel assessments.
- Flood events in 1972, 2012 and 2023 have all shown the importance of flood risk in this system and the impacts on Central Hillside Neighborhood.
- Scored high on the Priority Matrix due to the ratio of storm sewer density, large amount of area within EPA Social Vulnerability Index areas,and potential impacts to critical services,.

h Street at 6th Avenue East



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Brewery Creek

- Brewery creek travels underground through an approximately 4,900 ft long tunnel under Central Hillside.
- Tunnel follows the natural alignment of the stream and was built in a non-contiguous fashion between the early 1900s to present.
- Unique community drainage system
- System has surcharged frequently due to high volume and rate of stormwater runoff
- Most recently twice in September 2023

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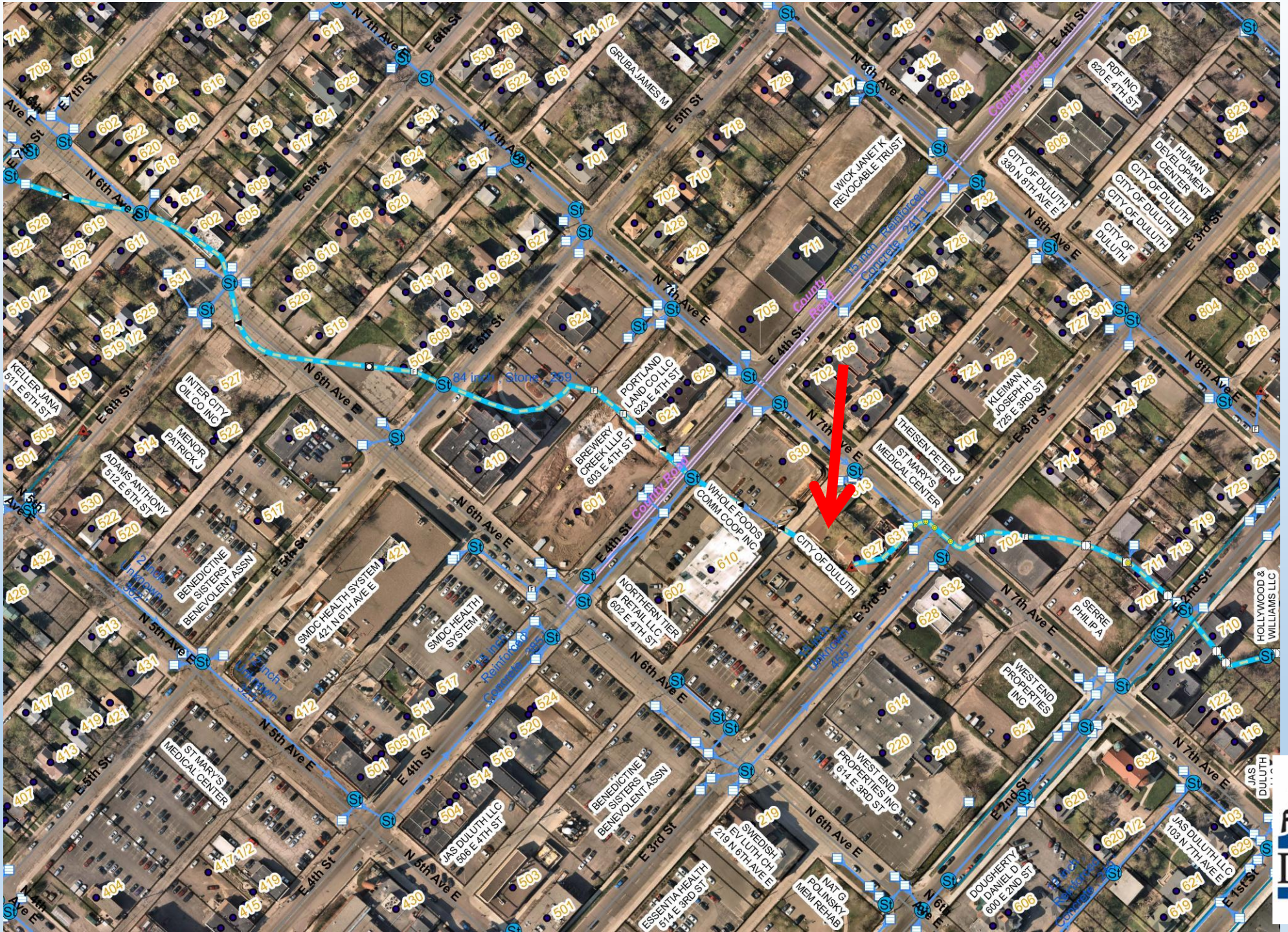
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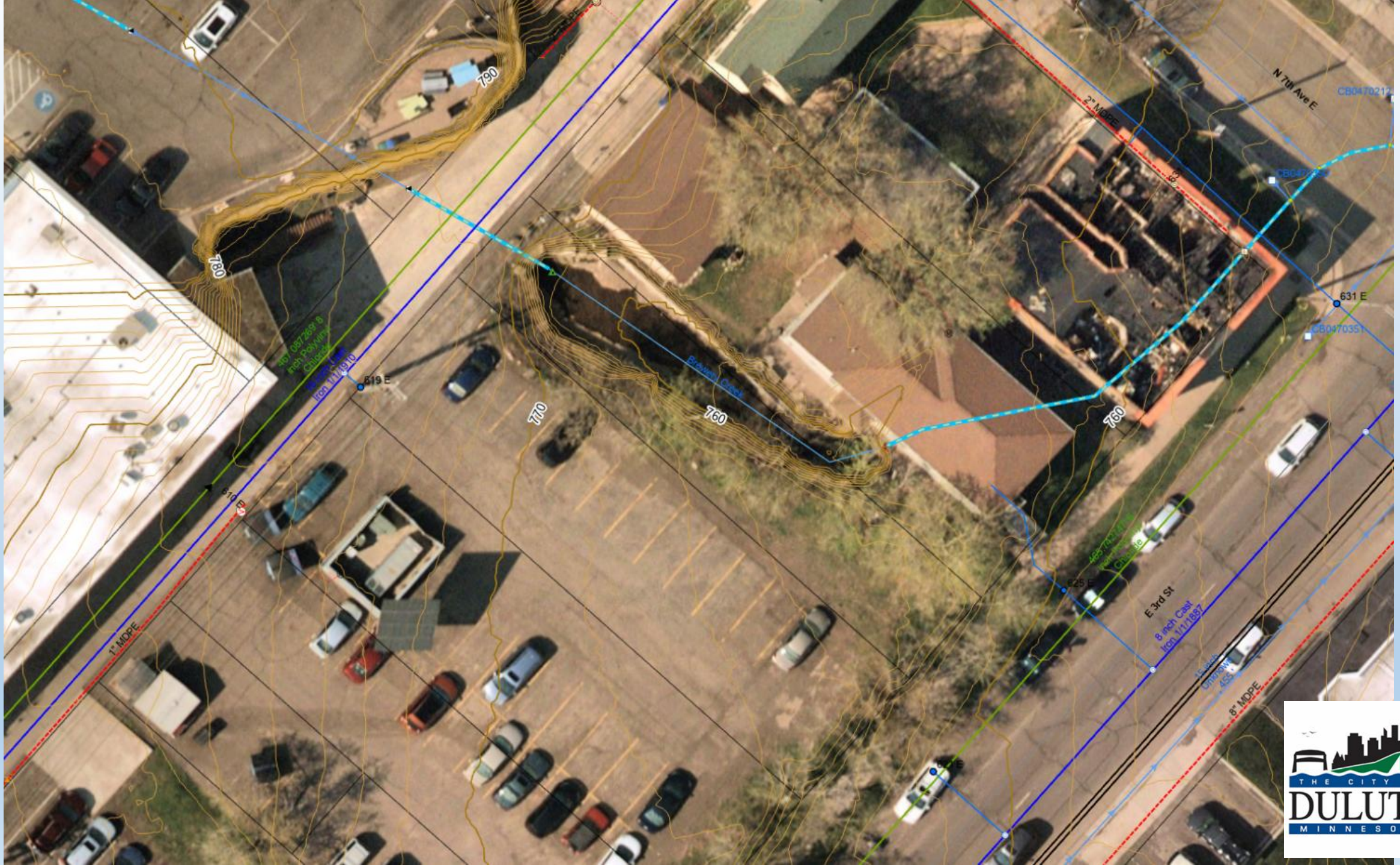
84 inch - Storm - 259'
15 inch - Reinforced Concrete - 241'
County Road
PORTLAND LAND CO LLC 623 E 4TH ST
BREWERY CREEK LLLP 603 E 4TH ST
WHOLE FOODS COMM COOP INC
CITY OF DULUTH
NORTHERN TIER RETAIL LLC 602 E 4TH ST
SMDC HEALTH SYSTEM 421 N 6TH AVE E
BENEDICTINE SISTERS BENEVOLENT ASSN
ST MARY'S MEDICAL CENTER
THEISEN PETER J
KLEIMAN JOSEPH H 725 E 3RD ST
WEST END PROPERTIES INC
WEST END PROPERTIES INC 614 E 3RD ST
SERRE PHILIP A
HOLLYWOOD & WILLIAMS LLC
JAS DULUTH LLC 506 E 4TH ST
JAS DULUTH LLC 103 N 7TH AVE E
SWEDISH EV LUTH CH 219 N 6TH AVE E
ESSENTIA HEALTH 514 E 3RD ST
DOUGHERTY DANIEL D 600 E 2ND ST
NAT G POLINSKY MEM REHAB
ADAMS ANTHONY 512 E 6TH ST
KELLER JANA 511 E 6TH ST
INTER CITY OIL CO INC
MENOR PATRICK J
GRUBA JAMES M
WICK JANET K REVOCABLE TRUST
CITY OF DULUTH 330 N 8TH AVE E
RDF INC 820 E 4TH ST
HUMAN DEVELOPMENT CENTER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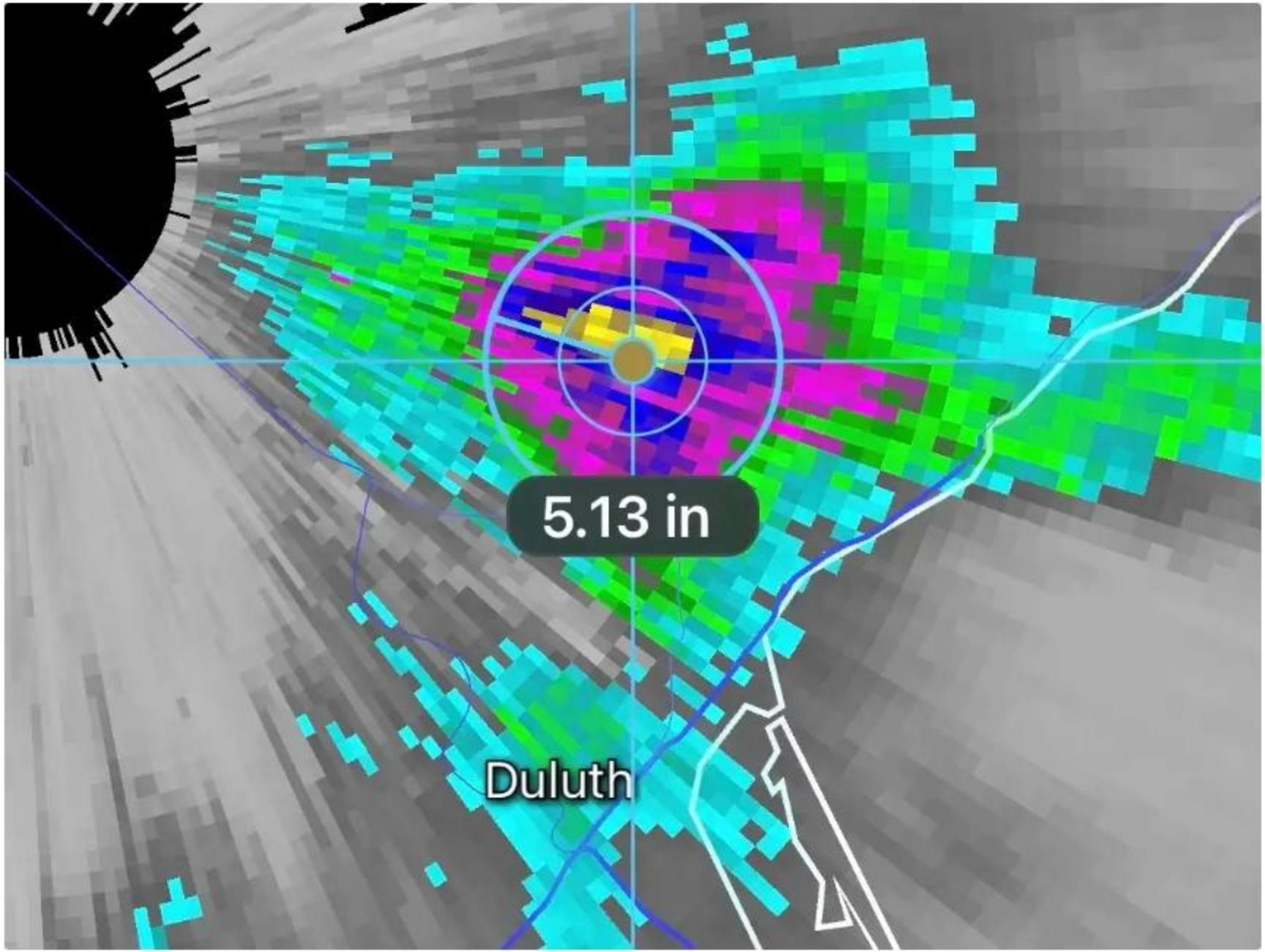
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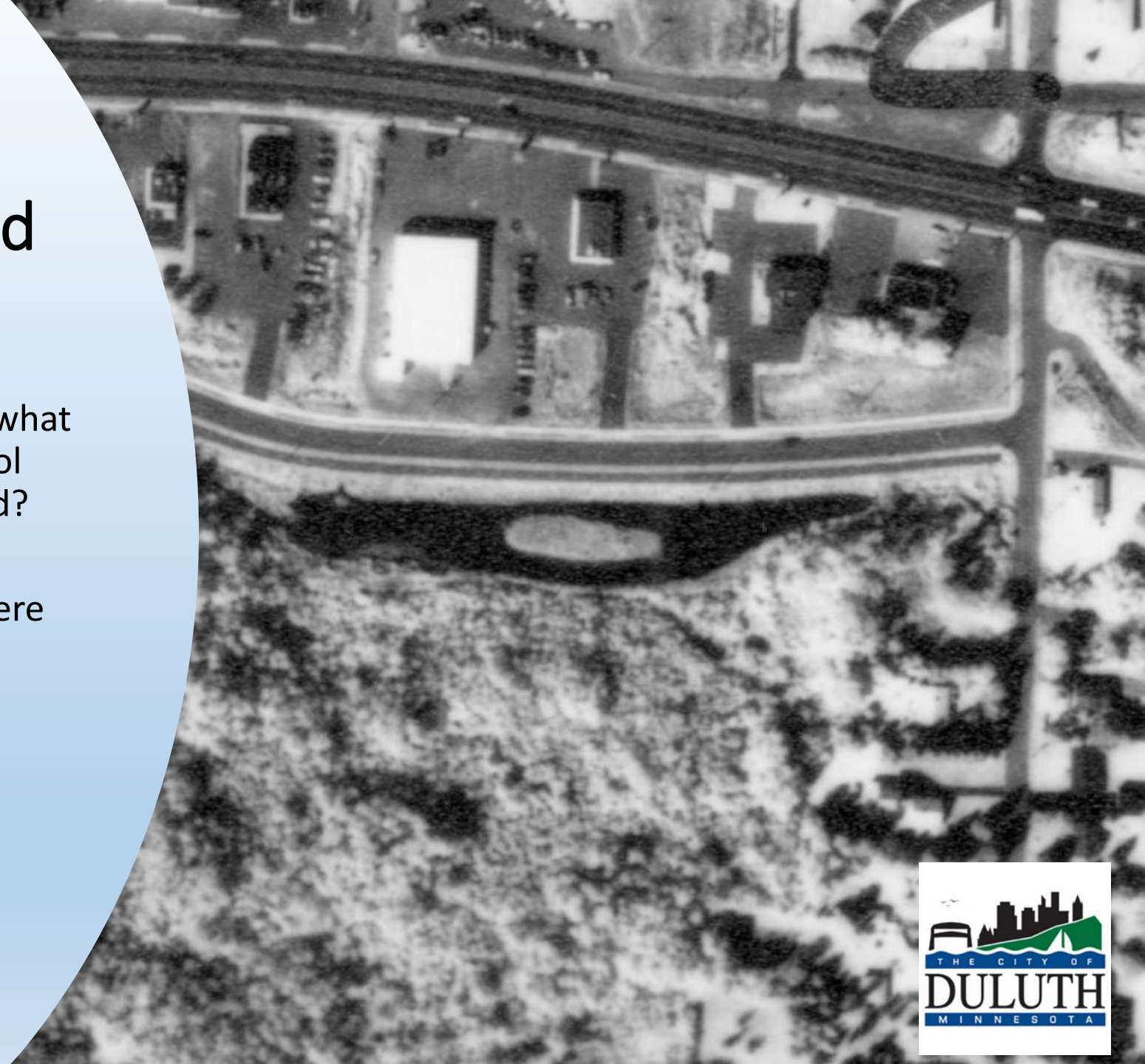
Duluth

Palm St Stormwater Pond

- Faced with continued intense flooding, what can the City do to implement rate control projects in the Brewery Creek watershed?
- Palm St stormwater pond, built in early 1980s provides one of few locations where large scale stormwater management is feasible.

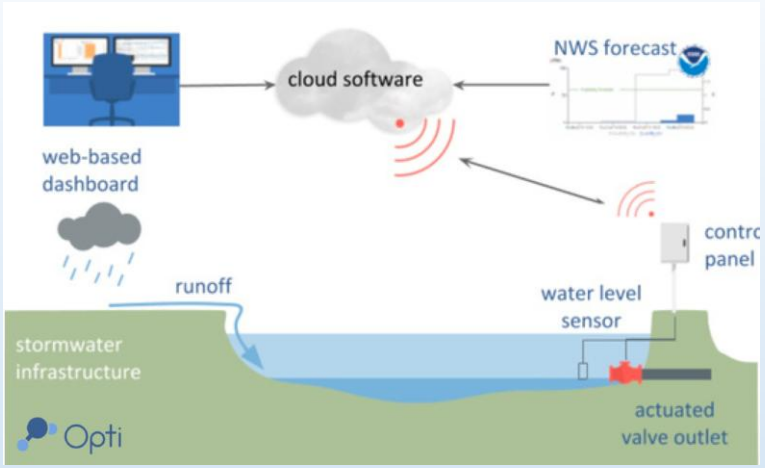


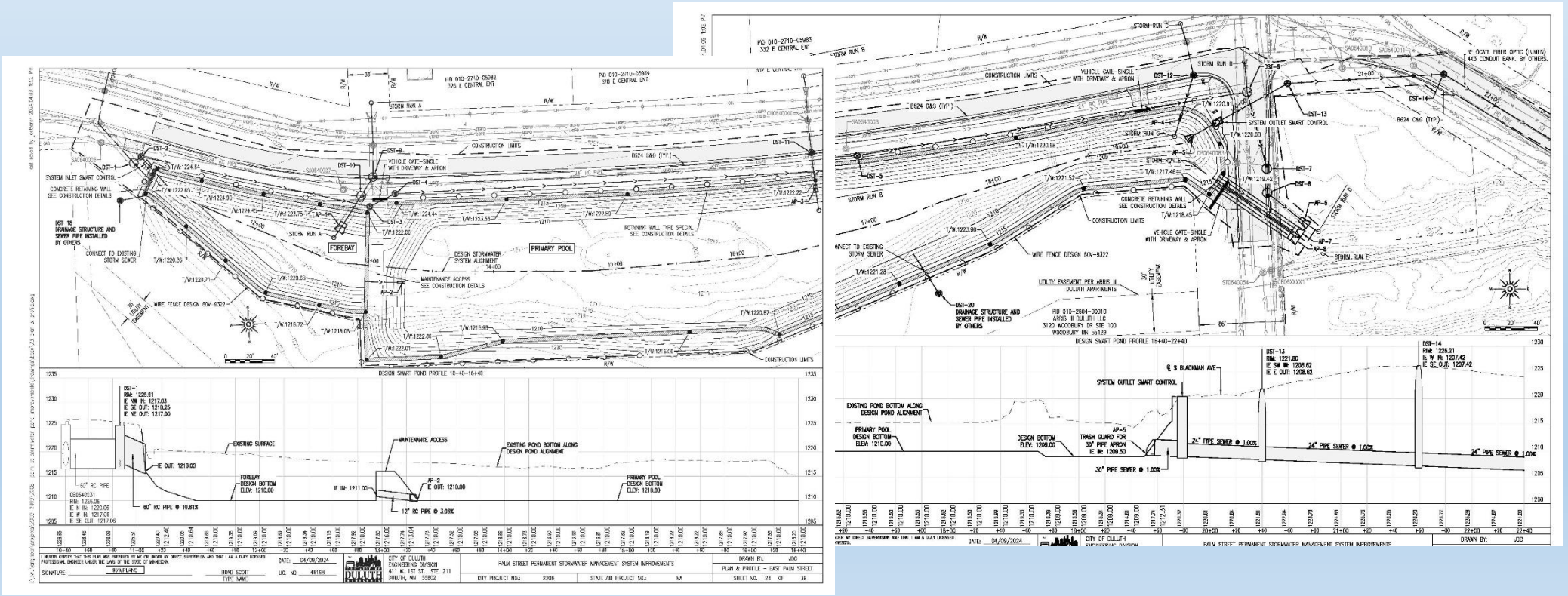
Palm St Stormwater Pond

- Existing Conditions = typical stormwater pond
- Filling in with years of sediment
- Provides some rate control and good water quality benefit
- Needs upgrades

Palm St Stormwater Management System

- Retro-fit existing stormwater pond to modern standards, adding “smart” pond features that will maximize rate control.
- Protect downstream Central Hillside and access to critical services for NE Minnesota
- Water Quality co-benefits include added removal of floatable trash and removal of existing sediment buildup from stormwater flows
- **How can we fund this?**





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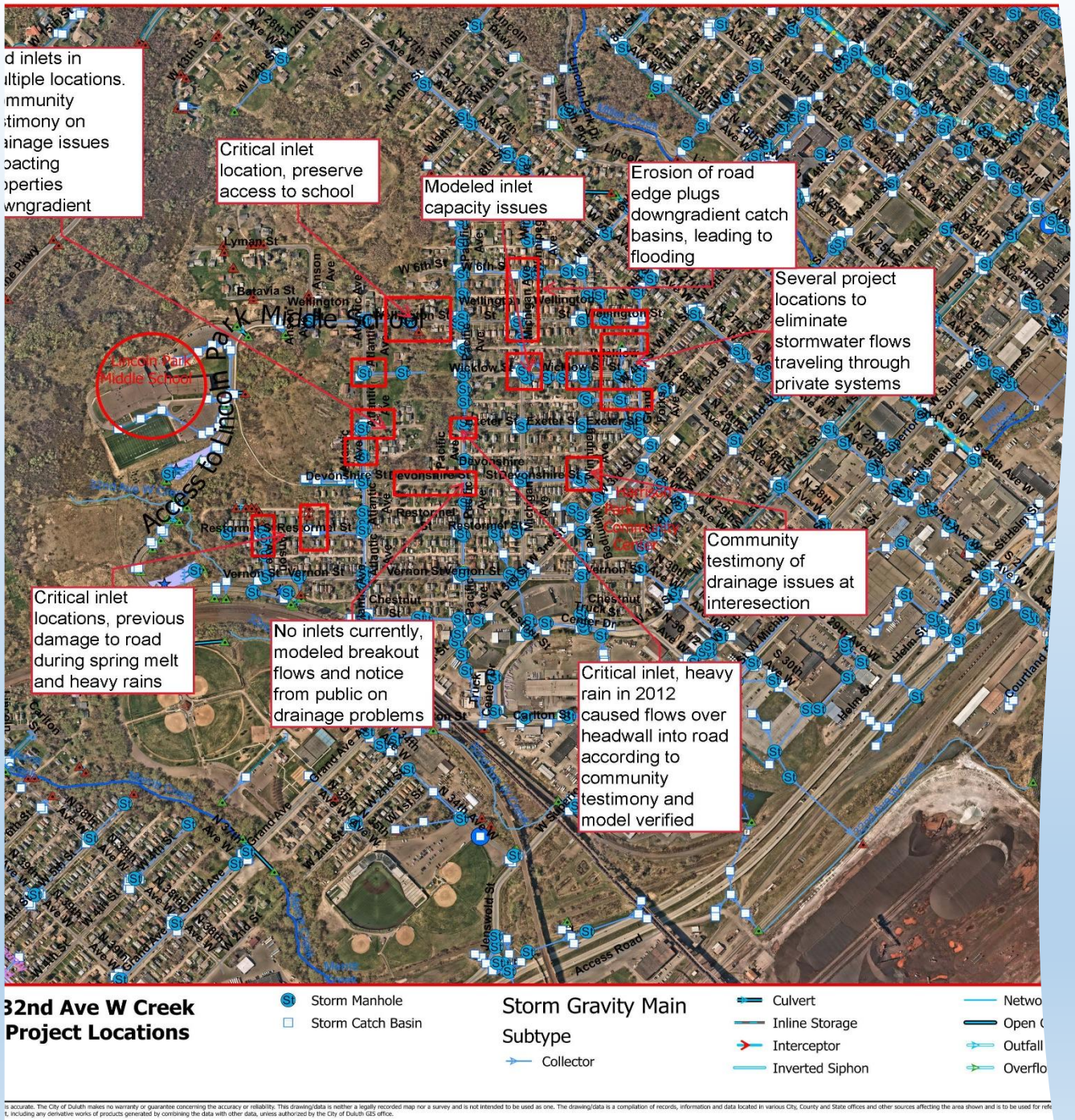
Leveraging Planning to Fund Implementation

- Stormwater Management Plan
- Watershed Priority Matrix
- Project areas in 32nd Ave W Creek Watershed
- Palm St Stormwater Management System
- **MPCA Implentation Grants for Stormwater Resilience**

Implementation Grant Project Applications

- 32nd Ave W Creek Watershed Resiliency Improvements
  - Update four critical inlet locations with additional redundancy and capacity in the event of debris blockage
  - 40 additional stormwater inlet locations for extra drainage capacity at road intersections
  - 27 modified inlets
  - 330 LF of abandon private storm sewer
  - Increase pipe capacity at one critical crossing location.
  - Increased flood resilience for road network that accesses over 100 residential structures, Lincoln Park Middle School and a Community Center.

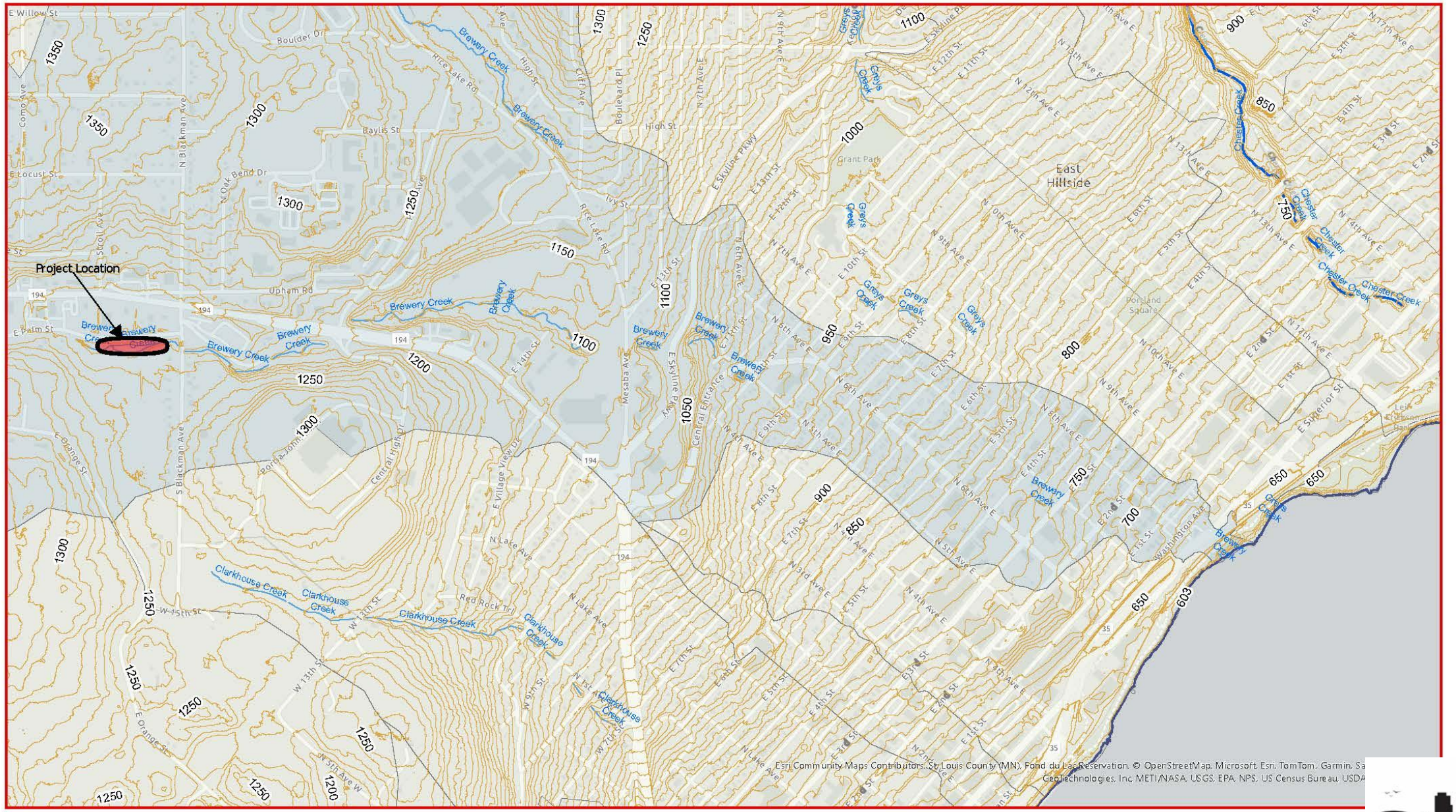


Implementation Grant Project Applications

- 32nd Ave W Creek Watershed Resiliency Improvements
  - Direct outcome of planning process for community resilience.
  - Estimated $ 2.47 million dollar project
  - $2.23 million grant award from MPCA
  - Construct in Fall 2025 and Summer 2026

Implementation Grant Project Applications

- Palm St Permanent Stormwater Improvements
  - Increase downstream stormwater system resilience by increasing existing storage capacity in pond by 3.6 acre/ft
  - Increased water quality effectiveness compared to current pond configuration
  - Reduce strain on a system that flows under a road network connecting Duluth and the surrounding region to critical community and regional services
  - Road network accesses approximately 670 residential properties ranging from single family to large multi-family, around 90 small commercial properties, several regional health campuses, school properties and the only accessible grocery store for the adjacent neighborhood



0 0.05 0.1 0.2 Miles

Palm St Permanent Stormwater Management System
Existing Storm Sewer Infrastructure

Watersheds

MINNAME

32nd Ave W Creek; 41st Ave W Creek; 44th Ave W Creek; 49th Ave W Creek; 58th Ave E Creek; 62nd Ave W Creek; 68th Ave

Brewery Creek

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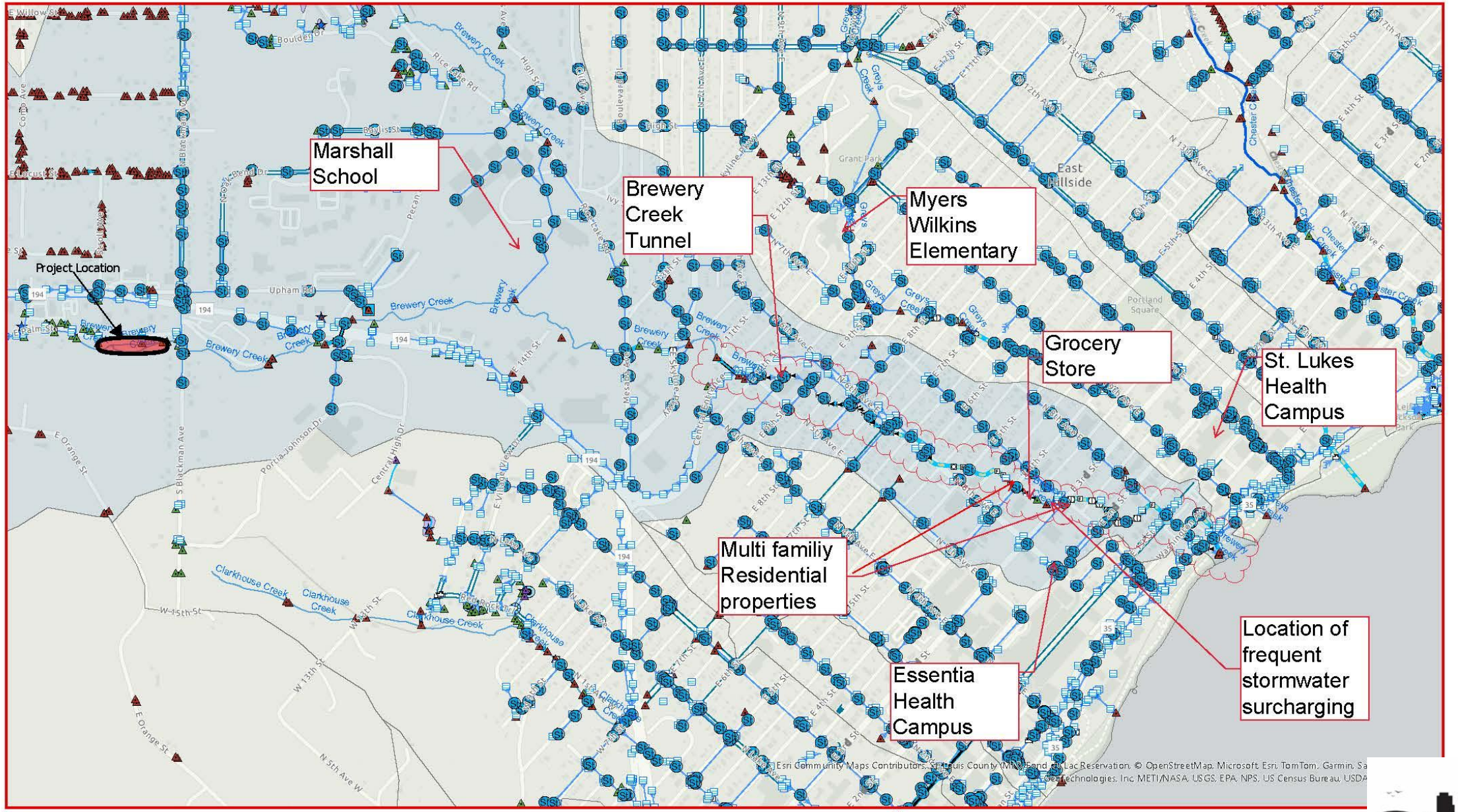

0 0.05 0.1 0.2 Miles

Palm St Permanent Stormwater Management System
Brewery Creek Watershed and Contours

Storm Manhole
Storm Catch Basin
Storm Gravity Main
Subtype
Collector
Culvert

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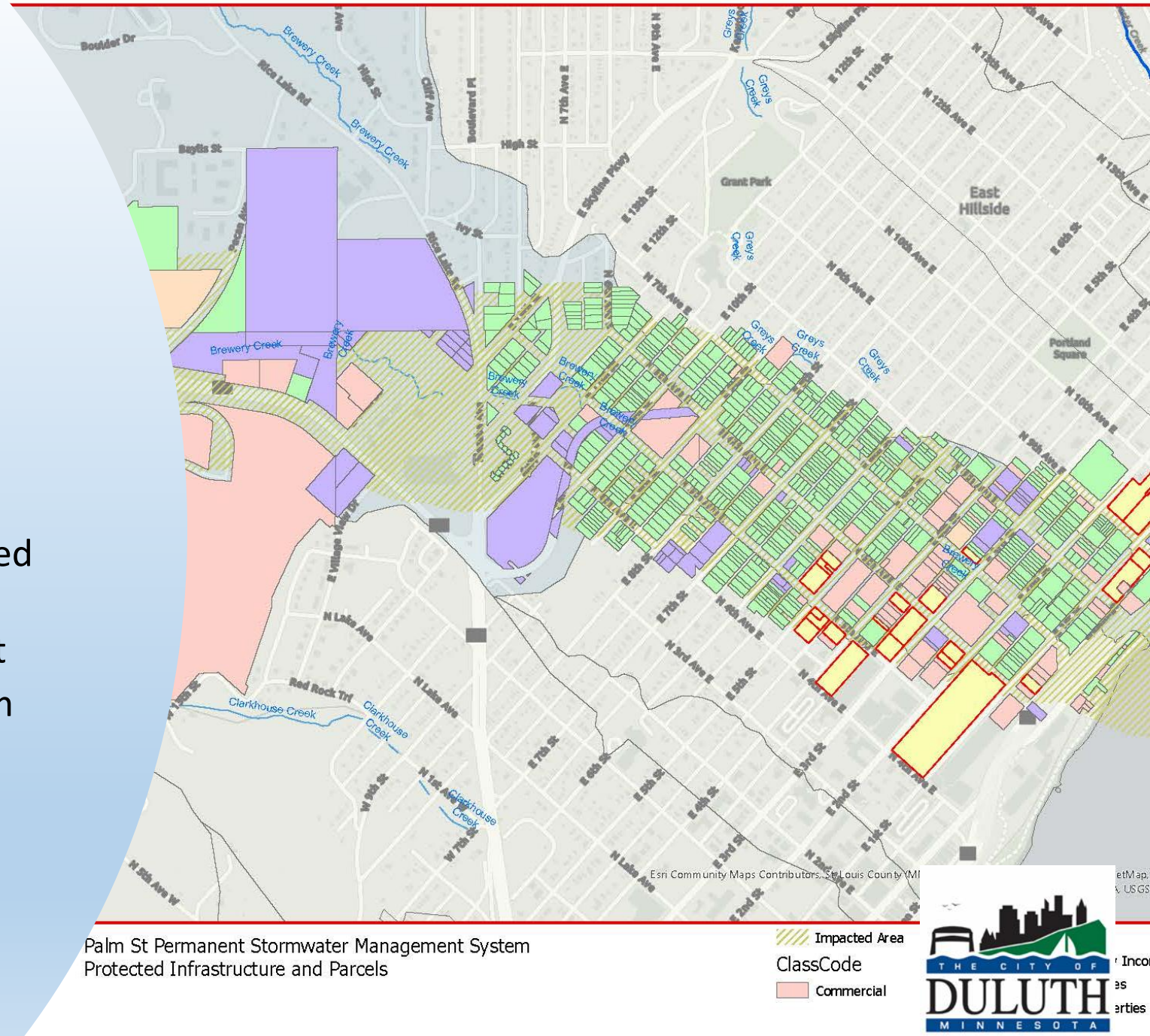
Implementation Grant Project Applications

- Palm St Permanent Stormwater Improvements
  - Leveraged planning process, past studies, assessments and documented community need.
  - Estimated $ 6.1 million dollar project
  - $4.99 million dollar grant award from MPCA



Final Outcomes

- Planning process is key to showing objective goals and proposed outcomes
- Include the neighborhood in the process
  - 32nd Ave W Creek Resiliency Improvements came at the result of community input along with utility analysis. This makes a better, more complete project
- Grant funding opportunities are key for cities, public works departments, communities.
- These grant process takes a lot of time and resources, but it can be critical for funding large, proactive projects


Thank you
Ryan Granlund
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JUNE 25-27

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