



Department of Public Works and Parks

6801 Delmar Boulevard, University City, Missouri 63130, Phone: (314) 505-8560, Fax: (314) 862-0694

AGENDA
COMMISSION ON STORM WATER ISSUES
HEMAN PARK COMMUNITY CENTER
975 PENNSYLVANIA
Tuesday, April 4, 2023,
5:30 PM

- 1. MEETING CALLED TO ORDER**
- 2. ATTENDANCE-ROLL CALL**
- 3. APPROVAL OF AGENDA**
- 4. APPROVAL OF MINUTES**
- 5. CITIZEN COMMENTS**
- 6. ANNOUNCEMENTS BY COMMISSIONERS**
- 7. SUBCOMMITTEE REPORTS**
- 8. NEW BUSINESS**
 - ❖ Comprehensive Plan Update
- 9. OLD BUSINESS**
 - ❖ Stormwater Master Plan, HR Green and Reitz & Jens
- 10 COUNCIL LIAISON COMMENTS**
- 11 ADJOURNMENT**



Department of Planning & Development

6801 Delmar Boulevard, University City, Missouri 63130, Phone: (314) 505-8560, Fax: (314) 862-0694

TO: Stormwater Commission
FROM: Mary Kennedy, Planner
DATE: April 4, 2023
SUBJECT: Comprehensive Plan Update

Overview:

The comprehensive planning process has been underway for several months and has been guided by staff (Department of Planning & Development), a consultant team led by Planning NEXT, the Plan Commission (focused on more technical land use issues), and an Advisory Committee (including Plan Commission members and others who are assisting with outreach and public engagement). The plan will build on the visioning work done in the Community Vision 2040 Roadmap, completed in July 2022, as well as the Economic Development Strategy, completed in 2021.

A comprehensive plan is a long-term (ten years or more) guide to land use and many other interrelated topics. It can lay the foundation for zoning changes and help the Plan Commission review development priorities and guide other decision-making about where and how the physical environment of the City should change over time. Approximately 400 individuals have participated so far in our first round of public engagement, which is underway now (workshops, online, paper surveys, pop-up events).

The planning team would like to present to the Stormwater Commission an update on the planning process and begin a preliminary discussion about land use policies and approaches for flood prone areas. This summer, the team will be drafting recommendations for the plan, and would like to come back to the Stormwater Commission to get more specific feedback on those recommendations at that time.



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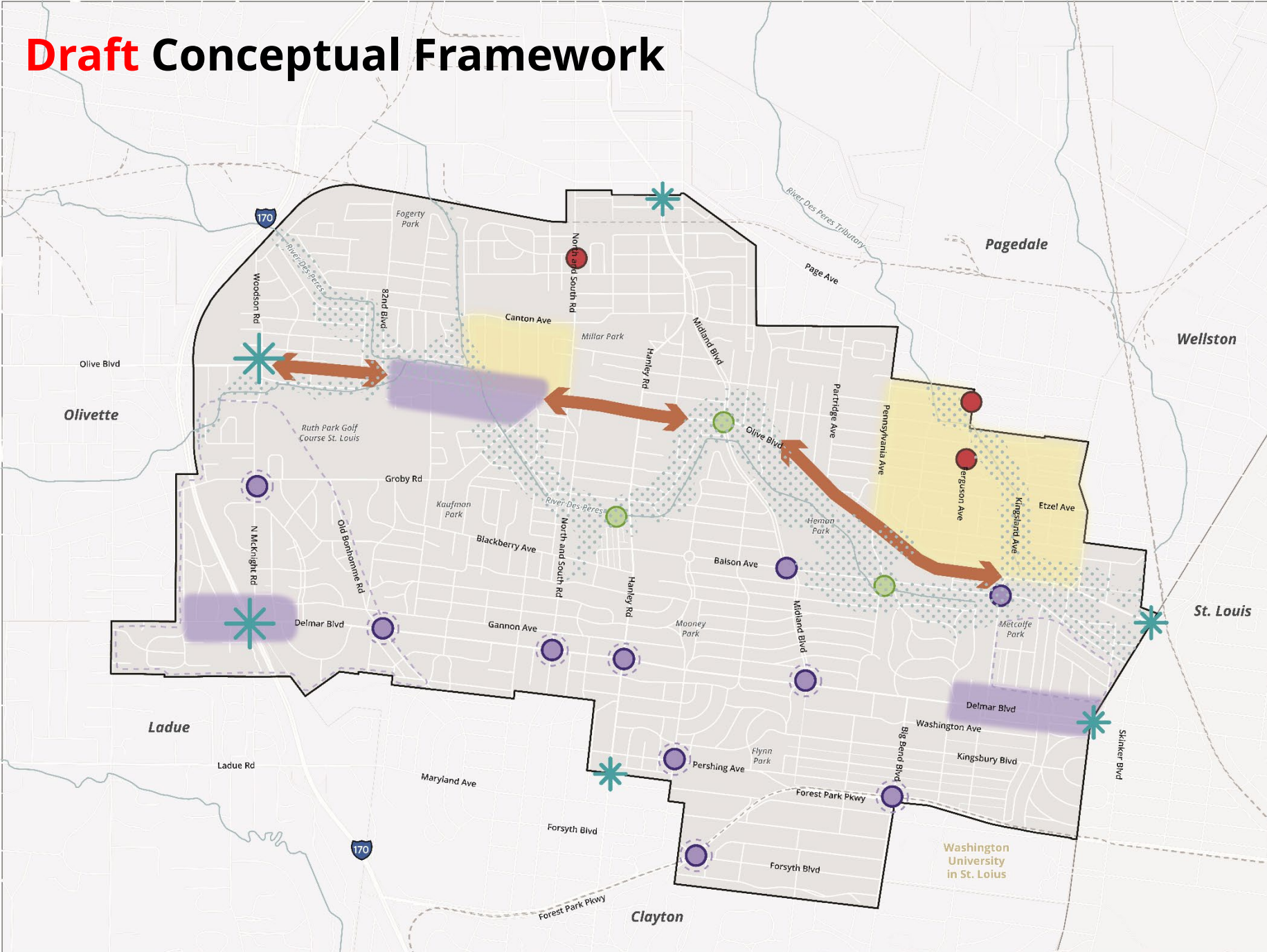
Stormwater Commission Meeting

April 4, 2023

Draft Goal Statements

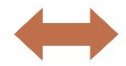
- 1. Preserve and enhance great places.** Maintain existing character, while encouraging creative development, and building resilient, vibrant places.
- 2. Advance shared prosperity.** Support and expand a diverse local economy, quality education, and a strong workforce that improves opportunities for all residents.
- 3. Connect community.** Invest in community connection to increase mobility options, improve social cohesion, and encourage civic involvement.
- 4. Leverage assets.** Capitalize on University City's diverse cultural, historical, and physical assets while investing in new amenities.
- 5. Strengthen livability.** Enhance neighborhoods as the building block of the community and center of day-to-day life.
- 6. Improve collaboration.** Prioritize commitment to action through responsive governance and strategic partnerships to realize the community's vision.

Draft Conceptual Framework



- Enhanced Corridors
- Community Gateways
- Mixed-Use District
- Existing Neighborhood Activity Nodes
- Potential Neighborhood Activity Nodes
- Potential Civic Activity Nodes
- Focused Growth and Redevelopment
- Community Stabilization
- Flood Mitigation Area

Corridors, Districts, and Nodes



Enhanced Corridors:

- Strengthen the appearance of the corridors
- Neighborhood-serving commercial
- Improved mobility options



Community Gateway:

- Create attractive entries into the City



Mixed-Use District:

- Encourage infill development
- Regional and local draw
- Commercial and residential uses
- Improved mobility options

Corridors, Districts, and Nodes

Neighborhood Activity

Nodes:

- Connect businesses and services to residential areas
- Safe pedestrian and bicycle access

Civic Activity Nodes

- New or expanded parks and open space
- Utilize flood-prone areas
- Stormwater mitigation

Development Strategies

Focused Growth and Redevelopment

- Support higher-density residential and mixed-use redevelopment

Community Stabilization

- Address vacancy and underutilized sites
- Integrate mixed-use development and neighborhood nodes

Flood Mitigation Area

- Address previous flooding impacts and integrate stormwater interventions

Critical Question 1:

Higher density housing within flood prone areas

It's not anticipated that the comprehensive plan will recommend significant new development in the Flood Mitigation area. However, in selected locations previous plans and community members have recommended higher density (multifamily) housing, such as north side of Heman Park. A potential recommendation in these areas is to allow some, limited multifamily residential development in these locations, provided that it includes accommodations such as elevating the building, incorporating barriers, or adding stormwater retention features.

Is this something that should be pursued?

Critical Question 2

Non-structural nodes in flood prone areas

There are some existing development nodes within the Flood Mitigation areas and some others that community members have identified as potential good locations for activity nodes. While significant development may not be appropriate in these areas, the plan could recommend non-structural gathering places (e.g. parks and open spaces).

How should non-structural nodes be developed within these areas and what factors are important to consider in designing them?

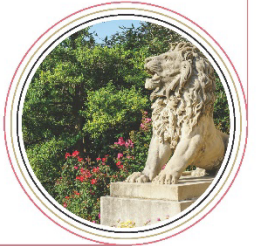
Continue Engagement

- Paper surveys available at the University City Hall, the Public Library, and the University City School District Office
- Online activities available at **WeMakeUCity.com**
- Rack cards available for pick-up at City Hall
- Social media images, flyers, and other outreach material available to anyone who can help with outreach

Shape the Future of University City

We Make U City is a special opportunity for everyone to share their ideas about the future of University City through a new comprehensive plan. The plan will address how land is used, how retail and office is developed, the look and feel of neighborhoods, public services and amenities, and more.

Join us for the first round of engagement and help shape your community!



Three Ways to Get Involved!

In-Person Events

| | |
|---|---|
| Thursday, March 2 6:00 - 7:30 pm Heman Park Community Center | Saturday, March 4 10:00 - 11:30 am Heman Park Community Center |
|---|---|

Registration Recommended – Visit WeMakeUCity.com

Online Activities

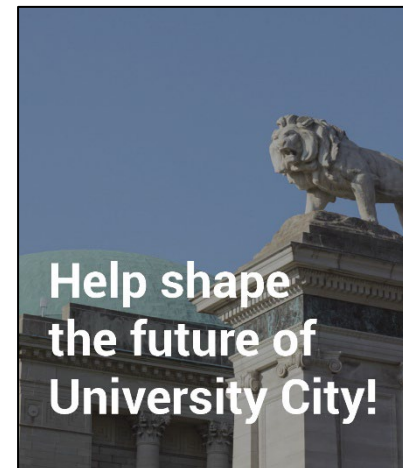
Complete interactive online activities at WeMakeUCity.com

Paper Surveys

Fill out a paper version of the activities at **City Hall, the Public Library, or the University City Schools District Office**

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Learn more, visit: WeMakeUCity.com



Help shape the future of University City!

There are many ways to get involved!

Visit WeMakeUCity.com for more information.

Questions?



Thank you!

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**Draft: MINUTES OF THE STORMWATER COMMISSION
March 7, 2023**

Call to Order. The thirty-first meeting of the Stormwater Commission (Commission) was called to order at 6:34 PM by Chair Todd Thompson.

1. **Attendance-Roll Call.** The following Commission members were present at the Community Center: Garry Aronberg, Robert Criss, Mark Holly, Eric Karch, Eric Stein, Todd Thompson. Also in attendance were; Darin Girdler, Director of Public Works; Mirela Celaj, Assistant Director of Public Works; John Mulligan, City Attorney.
2. **Agenda.** The following modified agenda was approved by voice vote (Messrs. Stein, Holly):
Attendance-Roll Call; Approval of Agenda; Approval of Minutes; Citizen Comments; Announcements by Commissioners; Committee Reports; New Business; Old Business; Council Liaison Comments; Adjournment.
3. **Minutes.** The minutes of the February 7, 2023, meeting were approved by acclimation with a spelling correction (approved by acclimation): correct Karch spelling in the motion to adopt to revised agenda.
4. **Citizen Comments.**
 - Susanne Valdez 8032 Lafon PI long-time resident made the following comments:
 - Two water main brakes have occurred in the last year and half. The water has caused extensive damage to property.
 - City leaders should encourage Missouri American Water to upgrade and replace water mains to minimize main breaks.
 - Complained about no city oversight of water main repairs.
5. **Announcements by Commissioners.**
 - Eric Stein commended The Journey church at Hanley and Amhurst has installed a retaining wall to protect neighbors to the north and west from their parking lot stormwater runoff.
6. **Committee Reports.**
 - Monitoring – Dr. Criss and Mr. Stein presented maintenance recommendations by power point slides and discussion:
 - Channel Maintenance needed:
 - Harvard at Dartmouth long standing water after July flood.
 - River Des Peres Tunnel
 - Water surface elevation (WSE) exceeded the FEMA-recognized 500-yr WSE at tunnel mouth.
 - but exceeded only the 10-yr WSE at Groby road crossing.
 - Indicates significant blockage likely in Tunnel.
 - Bridges and tunnel condition:
 - Many bridges overtopped and contended the bridge openings are too small.
 - Debris and sand have accumulated under bridges and in the channel causing diminished conveyance under the bridge.
 - Inspection 200 yards into tunnel indicates tunnel is partially blocked by concrete debris
 - Significant portions of RdP are City of U City property.



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- **Motion passed unanimously (Messrs. Criss and Stein moved and second):**
 1. **The Commission urges the City Council to recognize that inadequate channel maintenance does and has amplified flood damages.**
 2. **The Commission urges the City Council to remove vegetative debris that obstructs flow near, on and under the Groby, Hanley, Shaftesbury and Pennsylvania bridges in the next 60 days.**
 3. **The Commission urges the City Council to clean the channel of vegetative debris from the Vernon bridge to the Tunnel entrance, and debris on City property above and immediately downstream of that entrance.**
 4. **The Commission urges that the large obstructions in the RdP tunnel be further investigated as soon as possible.**

- The tributary to River des Peres at Amhurst and North & South continues to erode. The mitigation will be expensive – beyond the capability of the homeowner.

7. **New Business**

- The hour is late and we have not gotten to the new business that PW Director Girdler had included in the agenda. **Motion passed by acclamation: have another meeting on March 21 at 3 PM to discuss the New Business – ordinances modifications, public-private project definitions.**
- Councilman Smotherson email to Dr. Criss regarding concerns about Heman pool repair funding has been forward by email to the Commissioners for further discussion at a letter time or for comment by individual commissioners to Council Smotherson.
- PW Director Girdler reported:
 - Meters and gages upgrades and maintenance repairs for the early warning system will be paid by the City. Bills or invoices should be submitted to PW Director Girdler for processing through the City system.
 - Internet: City will establish a page for SW Commission to distribute and save important data. Commission should send data to PW Director Girdler for transmission to correct communication to correct staff.

8. **Old Business.**

- none

9. **Councilman**

- A new liaison council representative has not yet been appointed.

10. **Adjournment.** Motion to adjourn passed at 8:28 PM (Messrs. Holly and Karch). Minutes Preparation. The minutes were prepared by Garry Aronberg.



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**Draft: MINUTES OF THE STORMWATER COMMISSION
March 21, 2023**

Call to Order. The thirty-second meeting of the Stormwater Commission (Commission) was called to order at 3:02 PM by Chair Todd Thompson.

1. **Attendance-Roll Call.** The following Commission members were present at the Community Center: Garry Aronberg, Robert Criss, Mark Holly, Eric Stein, Todd Thompson. Also in attendance were; Darin Girdler, Director of Public Works; Mirela Celaj, Assistant Director of Public Works;

Regular attendees not in attendance were Commissioner Eric Karch and John Mulligan, City Attorney.

This meeting was a special meeting to consider business that had been on the agenda for the March 7 meeting but could not be addressed at that meeting because other business took the time that was available.

Visitors: Ms. Claudia Moran, 6923 Amhurst; Mr. Don Fitz, 6954 Dartmouth

2. **Agenda.** The following modified agenda was approved by voice vote (Messrs. Stein, Aronberg):
Attendance-Roll Call; Approval of Agenda; New Business.

3. **New Business**

- Modification of Ordinances to minimize stormwater problems.
 - Several modifications of ordinances were presented by Stormwater Management team of HR Green and Reitz & Jens.
 - Additional ordinance and procedures changes grew out of the wide-ranging discussion. The discussion included Commissioners, Staff, and Visitors.
 - The main points of discussion centered on the problems listed below
 - Area of improvements that trigger requirement that post-development runoff not increase;
 - No concentrated discharges unto neighbor, do not cause erosion on neighbor;
 - Increased use of detention,
 - Increased use of green space, reduced parking lot size
 - Increased setback at streams.
 - Comments are summarized below:
 - Small trigger for triggering land disturbance, stormwater quantity, and stormwater quality requirements is favored by Commission at this time – 400 sq ft.
 - Consideration should be given to reducing permitted pavements such as fewer parking spaces and smaller parking lots and smaller driveway pavements – likely subject for zoning code. Use of gravel drives may be considered.
 - Continue to require setback for discharge of downspout.
 - Require permits for flatwork expansion and prohibit adding stormwater onto neighboring property.
 - Improve enforcement of stormwater control requirements for both small projects and larger projects.
 - Review all stormwater changes for upgrades to existing properties for impact on



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affordability and practicality.

- 4. Adjournment.** Motion to adjourn passed at 4:40 PM (Messrs. Holly and Criss).

Minutes Preparation. The minutes were prepared by Garry Aronberg.

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DRAFT



MEMORANDUM

TO: Darren Gilder, Director of Public Works
Mirela Celaj, CFM, Assistant Director of Public Works

FROM: Stormwater Master Plan Team (HR Green and Reitz & Jens)

SUBJECT: University City Stormwater Master Plan
City Code – Review and Suggest Improvements Scope of work Task 2.5

DATE: February 8, 2023

Suggesting changes in the City code that would minimize stormwater quantity and quality problems is a requirement of our work for the Stormwater Master Plan for University City. Further, we recognize that the Department of Public Works is interested in working with the Department of Planning and Development to change the City code to minimize stormwater problems. The engineering community has established that increases in impervious area are tied to increases in non-point source pollution and erosion, so ordinances that limit impervious area or require additional stormwater management for these increases will benefit stormwater quantity and quality.

Therefore, we submit for your consideration the following recommendations regarding the City code. These suggestions are part of our Stormwater Master Plan Scope of Work Task 2.5. These recommendations build on work by the University City Stormwater Task Force¹, authored in part by members of the Stormwater Master Plan Team, and adds new information and example ordinances. A review of the codes of neighboring communities and local regulators helps identify potential ordinances that could be adapted to University City. These codes are available online, but the MSD Legal Impediments Workgroup document is provided as an appendix since it is not available online.

City officials and the Stormwater Commission have expressed a primary interest to protect property from excess stormwater volume. Current City ordinances appear to be more useful at preventing new stormwater problems associated with future large developments. But Code changes discussed below would minimize some existing stormwater problems. We recommend the following Code improvements:

1. Add an ordinance that no project, modification, or grade change of any size may increase stormwater runoff on adjacent properties or cause sedimentation or erosion. This could address stormwater quantity.
 - a. Ladue² states that “no improvements shall increase storm water runoff onto adjacent properties.”
2. Reduce the threshold development size that triggers stormwater management requirements.
 - a. City code currently defers to the MSD plan review process which is triggered by development projects having a land disturbance of 1 acre or greater³.
 - b. MSD requirements are effective at addressing water quantity (e.g. flood control) and water quality (non-point source pollution control) for 1+ acre projects, but not smaller projects such as infill tear-down-rebuild projects and simple flatwork projects that expand driveways. These small foot-print projects will cumulatively increase regional flooding and cause serious local stormwater damage to neighboring property. So, the City Code needs to set a low trigger point for requiring stormwater mitigation features.

¹ University City Stormwater Task Force Report. November 2019. p 22.

² Ladue Section 110-142

³ University City Section 405.490 C.6

- c. MSD allows for more stringent design criteria, and states that “Stormwater management facilities shall be provided and designed in accordance with the requirements of this section. If another local jurisdiction requires more stringent design standards, then they shall govern in that locale.”⁴
 - d. Several local municipalities have adopted stormwater codes more stringent than MSD. For example, Town & Country reduces the permitting threshold to 2,500 square feet⁵. Ladue and Olivette’s threshold are both 400 square feet⁶ which may be more appropriate given that University City lots are generally smaller than Town & Country, and that Olivette is located immediately upstream of University City. Crestwood⁷ and Ladue⁸ require that any increased water discharge must be retained on that property and controlled by facilities like rain gardens, rain barrels, French drains, dry wells.
3. Add protection for discharge of stormwater at property lines.
 - a. Town & Country⁹ requires that “water shall not be directed through a pipe, culvert, hose, spout or drain which discharges within ten (10) feet of an abutting property line.” This statement is a good bare minimum that is not currently in the U City ordinances. Roof drains can carry a lot of water and discharges even as far as 10 feet from a property line can cause problems to neighbors. However, this statement would be useful when taken together with U City section 405.49 C.6, and a lower threshold on projects that require a land disturbance permit.
 - b. Webster Groves¹⁰ requires that “no stormwater shall be discharged to an adjoining public or private property in a manner that negatively impacts the adjoining property. Existing conditions shall be the basis for determining negative impact.”
 4. Reduce Erosion.
 - a. Town & Country¹¹ requires that “every land development or subdivision shall make adequate provisions to accommodate or dispose of stormwater and prevent damage to off-site streets and downslope of adjacent properties due to soil erosion or siltation by means of sodding, erecting silt barriers, detention storage areas, sewers, catch basins, culverts, terracing, walls and other facilities or combination of similar methods per the requirements of this Article....” This language also provides City staff with the flexibility to require detention and/or rain gardens for infill development.
 5. Increased use of detention and decreased use of impervious surfaces should be encouraged.
 - a. Webster Groves¹² requires that “if any existing impervious surface is removed during construction or development, that area shall be considered as pervious for the purpose of calculating the differential runoff from the new construction.” For example, when constructing a new house on a lot where a house was torn down, the lot will be treated as if it had been entirely undeveloped, thereby requiring 100% of the stormwater to be addressed. The same could apply to a homeowner replacing 100 square feet of patio with 200 square feet of home addition, the differential would be based on the full 200 square feet. This is one way that an ordinance can address existing stormwater problems in addition to minimizing future problems.
 - b. Town & Country¹³ requires that “facilities for storm drainage shall be designed and constructed so as to prevent any increase in the rate of storm runoff into the water shed over that which existed prior to development...”

⁴ MSD Rules and Regulations and Engineering Design Requirements 4.060.01

⁵ Town & Country Code Section 415.080 A.2.b

⁶ Olivette Code Section 422.080 A.2.b

⁷ Crestwood Section 26-44 N

⁸ Ladue Code Section 110-143 (3)

⁹ Town & Country Code Section 415.100 J

¹⁰ Webster Groves Code Section 82.100 d

¹¹ Town & Country Code Section 415.100 C

¹² Webster Groves Code Chapter 82.100

¹³ Town & Country Code Section 415.100 A

6. Expand stormwater detention requirements to make up for previously unmanaged impervious area, thereby attempting to address existing stormwater problems in addition to minimizing future problems.
 - a. Webster Groves¹⁴ requires that “the calculation of differential stormwater resulting from the new construction shall assume that the area covered by new impervious materials is replacing pervious areas, regardless of the preconstruction status of the site.”
 - b. Town & Country¹⁵ requires “provision of a system which mitigates one hundred fifty percent (150%) of the flow rate increase identified in Section 415.105(A)(2) above by storing a volume equal to one hundred fifty percent (150%) of the calculated volume for the fifteen-year, twenty-minute design storm. This shall then be designed with a release mechanism which allows for dissipation over a twelve-hour-to-thirty-six-hour period using small orifice structures or Metropolitan St. Louis Sewer District-approved volume reduction best management practices.”
7. Adjust minimum requirements for off-street parking.
 - a. The 2009 MSD Legal Impediments to Stormwater Best Management Practices Workgroup provided recommendations to reduce impervious area associated with off-street parking required by City code. Code could encourage reduced stall dimensions and efficient stall configurations like 45-degree angle parking. Phantom parking would allow a development to use fewer parking spaces than required by code, with the understanding that reserved green space would be activated (i.e. paved) if proven necessary. The City could also allow developers to provide “parking studies” to demonstrate that a reduced number of spaces is adequate.
8. Increase setback from stream bank and require a vegetated buffer.
 - a. City code¹⁶ currently requires that “development along natural watercourses shall have residential lot lines, commercial or industrial improvements, parking areas or driveways set back a minimum of fifteen (15) feet from the top of the existing stream bank.” Most watercourses through the City are 10 to 20 feet deep, so the current buffer could allow development to occur too close an over-steeped (less than 1.5 horizontal : 1 vertical) streambank.
 - b. Frontenac¹⁷ requires a 25-foot undisturbed natural vegetative buffer from the top of bank.
 - c. Ladue¹⁸ requires a 50-foot undisturbed natural vegetative buffer from streams depicted as a blue line on the USGS quad map (e.g. River des Peres). For all other streams that buffer is 25-foot minimum. They go on to add an additional setback of 25-feet measured horizontally from the edge of the undisturbed natural buffer beyond which all impervious area shall be prohibited. University City lots are generally smaller than Ladue, and may not have the luxury of establishing setbacks of this size, but the concept of establishing buffers relative to stream size is worth considering.

We would be delighted to meet with City officials to discuss these recommendations.

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¹⁴ Webster Groves Cod 82.100 b

¹⁵ Town & Country Code Section 415.105 A.3

¹⁶ University City Code Section 405.21 A.3.b.6

¹⁷ Frontenac Code Section 506.48

¹⁸ Ladue Ordinance 1951



MEMORANDUM

TO: Darren Girdler, Director of Public Works
 Mirela Celaj, CFM, Assistant Director of Public Works
 FROM: Stormwater Master Plan Team (HR Green and Reitz & Jens)
 SUBJECT: University City Stormwater Master Plan
Public versus Private – Recommended Definition Scope of work Task 2.2
 DATE: February 28, 2023

An important piece of our work to develop a Stormwater Master Plan for University City is to assist in developing a definition of a public stormwater project versus a private stormwater project. Phase II of the Master Plan development will develop a list of stormwater Capital Improvement Projects (CIP) and stormwater Operation & Maintenance (O&M) projects. A clear definition of public versus private projects is needed so that the Stormwater Master Plan focuses on projects that are considered in the public interest and worthy of public funding. Other municipalities have determined the difference between public and private problems – either in practice or through a set of criteria. Our experience and observations of other municipalities have informed the proposed criteria which follows.

We propose utilizing a series of criteria to determine whether a stormwater project should be considered public. We recommend that public stormwater projects meet at least two of the following criteria:

1. Two or more private properties would benefit
2. Required improvements extend to at least two private properties
3. The drainage area is greater than or equal to 1 acre
4. Flooding or erosion to a public or private building occurs
5. Frequent flooding or erosion to a roadway occurs
6. Repair or upgrade to existing publicly-owned stormwater handling system is needed
7. Repair of publicly-owned retaining wall is needed
8. High-flow overland path for runoff from the backyard to the street is blocked by soil or other obstruction and is causing structural flooding. Repair would require work on neighboring yard.
9. Project cost exceeds 10% of the total appraised value of the property

The paragraphs and table below present examples of public and private stormwater problems.

- Some stormwater problems are clearly public. They reduce ongoing operating costs or minimize losses to public infrastructure.
- Some stormwater problems are clearly private. The source of the stormwater concern and the project needed to address the stormwater concern both occur within a single private property.

Below are examples of projects evaluated against each criterion. Note that a public project requires a positive response to at least two of these criteria.

| Criteria | Example |
|--|---|
| 1 Two or more private properties would benefit | At 7591 Amhurst (at North and South Rd), a creek bank has eroded to within 9 ft of home. Mitigation would involve stabilizing the creek bank and would benefit multiple properties. The creek bank erosion is caused by runoff from scores of properties. (See Erosion Project 1 attached.) |



| | | |
|---|---|--|
| 2 | Required improvements extend to at least two private properties | Street flow exceeds gutter capacity at two driveways and runs into basement garages at Old Bonhomme east of Alanson Drive. MSD has studied the problem and recommends upsizing the existing storm sewer which crosses at least 4 properties (See Street Project 2.) |
| 3 | The drainage area is greater than or equal to 1 acre | Runoff from nearby commercial property flows through several residential backyards in the Grenville Subdivision. The drainage area to the backyard of 1561 Westmont Place through 1573 Westmont Place is approximately 3.3 acres. (See Backyard Project 3.) |
| 4 | Flooding or erosion to a public or private building occurs | Several basement garages along Amherst Ave flood from street drainage which escapes the gutter and flows down the driveways. (See Street Project 1.) |
| 5 | Frequent flooding or erosion to a roadway occurs | The erosion of River Des Peres threatens Mona Drive. The top of the bank is 16 ft high and 5 ft from the curb. (See Erosion Project 2.) |
| 6 | Repair or upgrade to existing publicly-owned stormwater handling system is needed. | An MSD-owned area inlet in the backyard of 7353 Milan Ave clogs easily and may also have inadequate capacity. Water frequently backs up, flooding the entire yard, back patio, and basement. (See Backyard Project 2.) |
| 7 | Repair of a publicly-owned retaining wall is needed | At 7425 Shaftesbury Ave a privately-owned wood tie wall protects a yard from River Des Peres (RDP) bank erosion. Flow in the RDP drains a large area. This would <u>not</u> meet the criteria in question and therefore might not be considered a public project. (See Erosion Project 5.) |
| 8 | High-flow overland path for runoff from the backyard to the street is blocked by soil or other obstruction and is causing structural flooding. Repair would require work on neighboring yard. | Runoff from yards on Stanford Ave flow into several backyards at 7842 through 7820 Balson Ave. Inadequate overland flow path causes flooding of at least two homes. (See Backyard Project 1.) |
| 9 | Project cost exceeds 10% of the total appraised value of the property | |

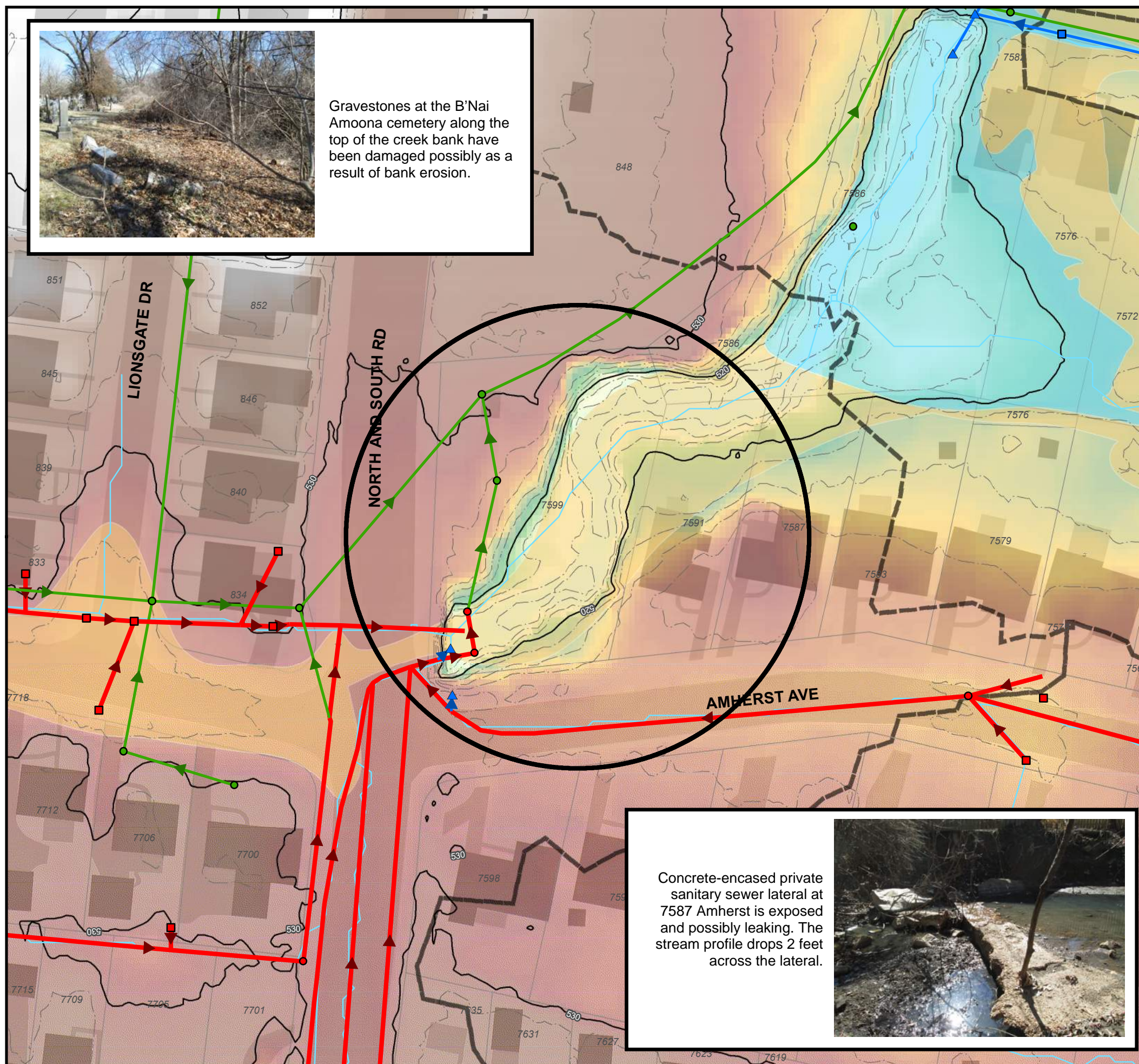
We would be delighted to meet with City officials to discuss these recommendations.

Attachments:

- Erosion Project 1: Tributary to River Des Peres Between Amherst Ave and Blackberry Ave
- Erosion Project 2: River Des Peres at Mona Dr
- Erosion Project 5: River Des Peres at 7425 Shaftesbury Ave
- Street Project 1: Amherst Ave
- Street Project 2: Old Bonhomme Rd
- Backyard Project 1: Balson Ave
- Backyard Project 2: Milan Ave
- Backyard Project 3: Grenville Subdivision



Gravestones at the B'Nai Amoona cemetery along the top of the creek bank have been damaged possibly as a result of bank erosion.



Concrete-encased private sanitary sewer lateral at 7587 Amherst is exposed and possibly leaking. The stream profile drops 2 feet across the lateral.

Problem Description:

An un-named tributary to the River des Peres flows from a closed storm sewer outfall at Amherst and North & South. A 500-foot reach of the creekbank is over-steepened and actively eroding. MSD and the City initially identified this bank erosion in 1988, and MSD confirmed the issue and developed a conceptual solution and cost estimate in 2007.

The 13-foot high eroding bank at 7591 Amherst is 20 feet from the home (measured from the toe of bank), and has not advanced significantly since 2006, but is considered severe by MSD's bank erosion rating (V/H=1.46). The July 26, 2022 flood was above the basement floor of 7591 Amherst and collapsed their fence.



The 13-foot high eroding bank at 7591 Amherst is 9 feet from the home (measured from the top of bank).

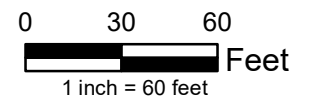


Creek erosion along 7587 Amherst is undermining their fence. The erosion rating at 7587 Amherst is considered a threat to the home (V/H=0.25).



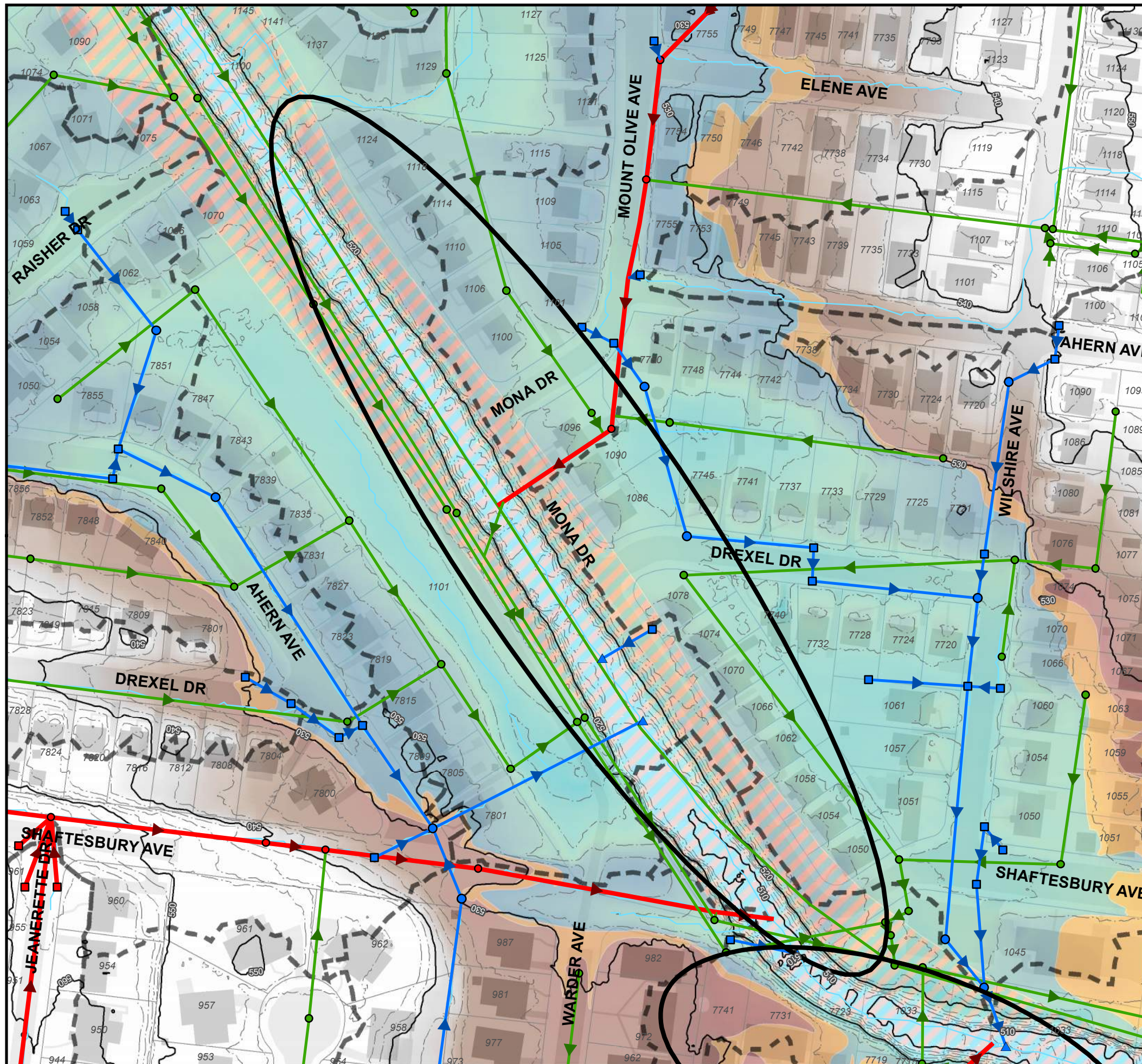
Legend

- Stormwater Problem Point
- Problem Location
- Flow Path Line
- Watershed Boundary
- Existing MSD System
 - Combined Inlet
 - Storm Inlet
 - ▲ Storm Intake-Outfall
 - Combined Manhole
 - Sanitary Manhole
 - Storm Manhole
 - Combined Sewer
 - Sanitary Sewer
 - Storm Sewer
- Flood Hazard Zone**
 - 1.0% Annual Chance Flood Hazard
 - 0.2% Annual Chance Flood Hazard
 - Regulatory Floodway



**Tributary to River Des Peres
Between Amherst Ave and
Blackberry Ave**

Ranked #1 in the Erosion Category



Problem Description:

A 700-foot reach of the River des Peres is over-steepened and actively eroding. The top of bank is 16-feet high and has eroded to within 5 feet of the curb line of Mona Drive. The north end of Mona Drive is the only road access/egress for six homes. Using MSD's erosion rating, the street is more severely threatened (V/H=0.44) than the homes (V/H=0.18). MSD installed riprap along portions of Mona Drive in approximately 2017, but most of this riprap has since eroded and slid off the bank. An additional 600-foot reach of bank along the downstream end of Mona Drive is somewhat more stable. The homes along Mona Drive flooded on July 26, 2022.

Over-steepened channel banks threaten Mona Drive which provides the only access to 6 houses.



Over-steepened channel banks, and the remains of riprap placed by MSD that has since eroded and slid off the bank.

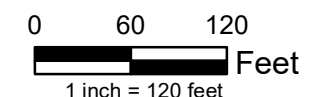


Channel bottom contains riprap, some of which slid off the bank from a previously installed MSD project.

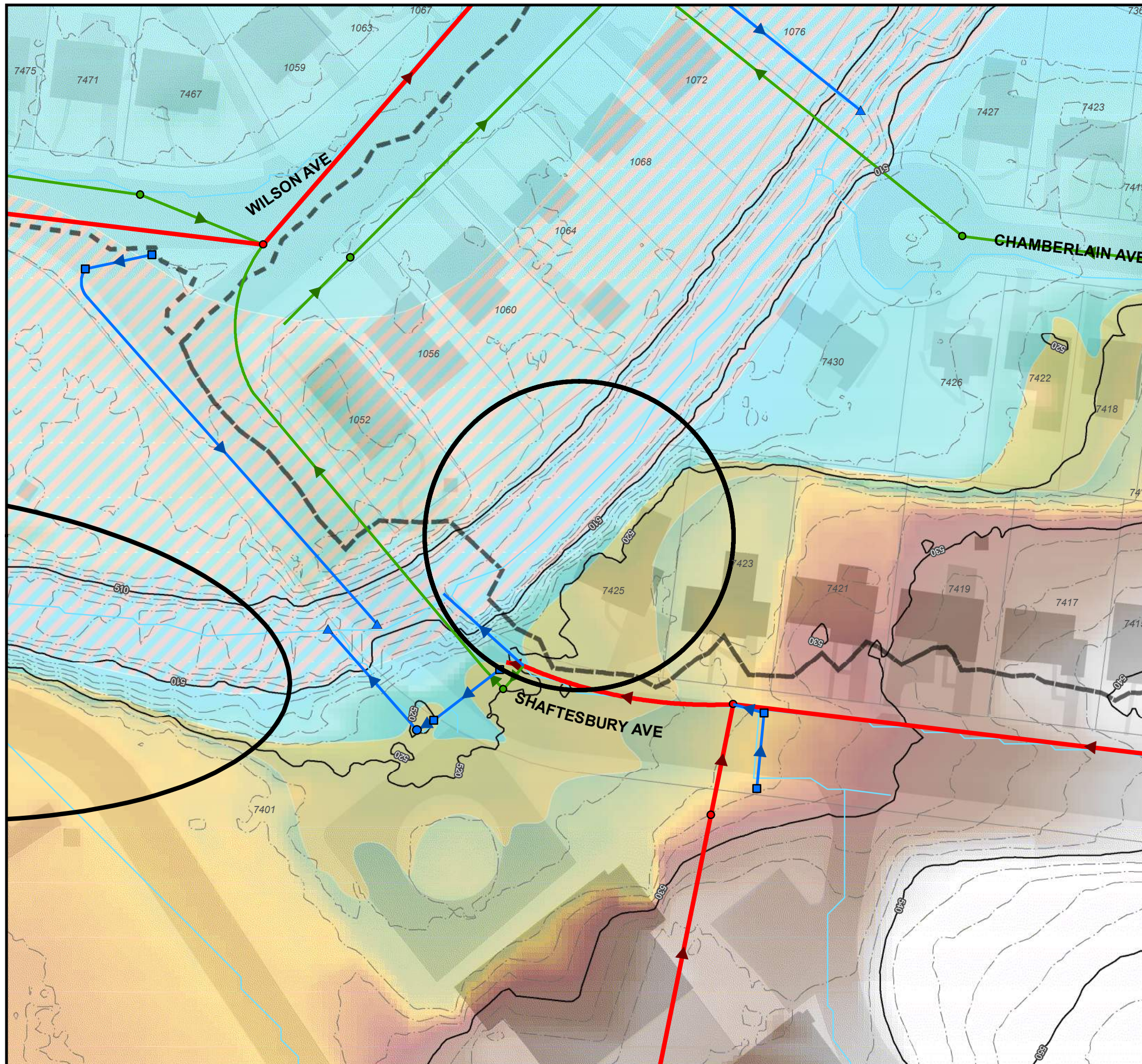


Legend

- | | |
|----------------------------------|----------------------------|
| ● Stormwater Problem Point | Existing MSD System |
| ▭ Problem Location | ■ Combined Inlet |
| — Flow Path Line | ▲ Storm Inlet |
| - - - Watershed Boundary | ▲ Storm Intake-Outfall |
| Flood Hazard Zone | |
| Light Blue Area | ● Combined Manhole |
| Light Orange Area | ● Sanitary Manhole |
| Light Yellow Area | ● Storm Manhole |
| Light Blue Area with Dashed Line | — Combined Sewer |
| | — Sanitary Sewer |
| | — Storm Sewer |



River Des Peres at Mona Dr
Ranked #2 in the Erosion Category



Problem Description:

A 16-foot high bank with a combination of public and private walls is compromised and a house located only 7 feet from the top of wall is at risk. The wood tie wall is compromised, but the lower 6-feet of the bank of the Rider des Peres at this location is a WPA hand-placed stone wall, which appears stable.



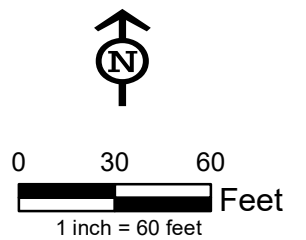
Wood tie wall and WPA block wall. 7425 Shaftesbury Ave is the house behind the wall in the photo.



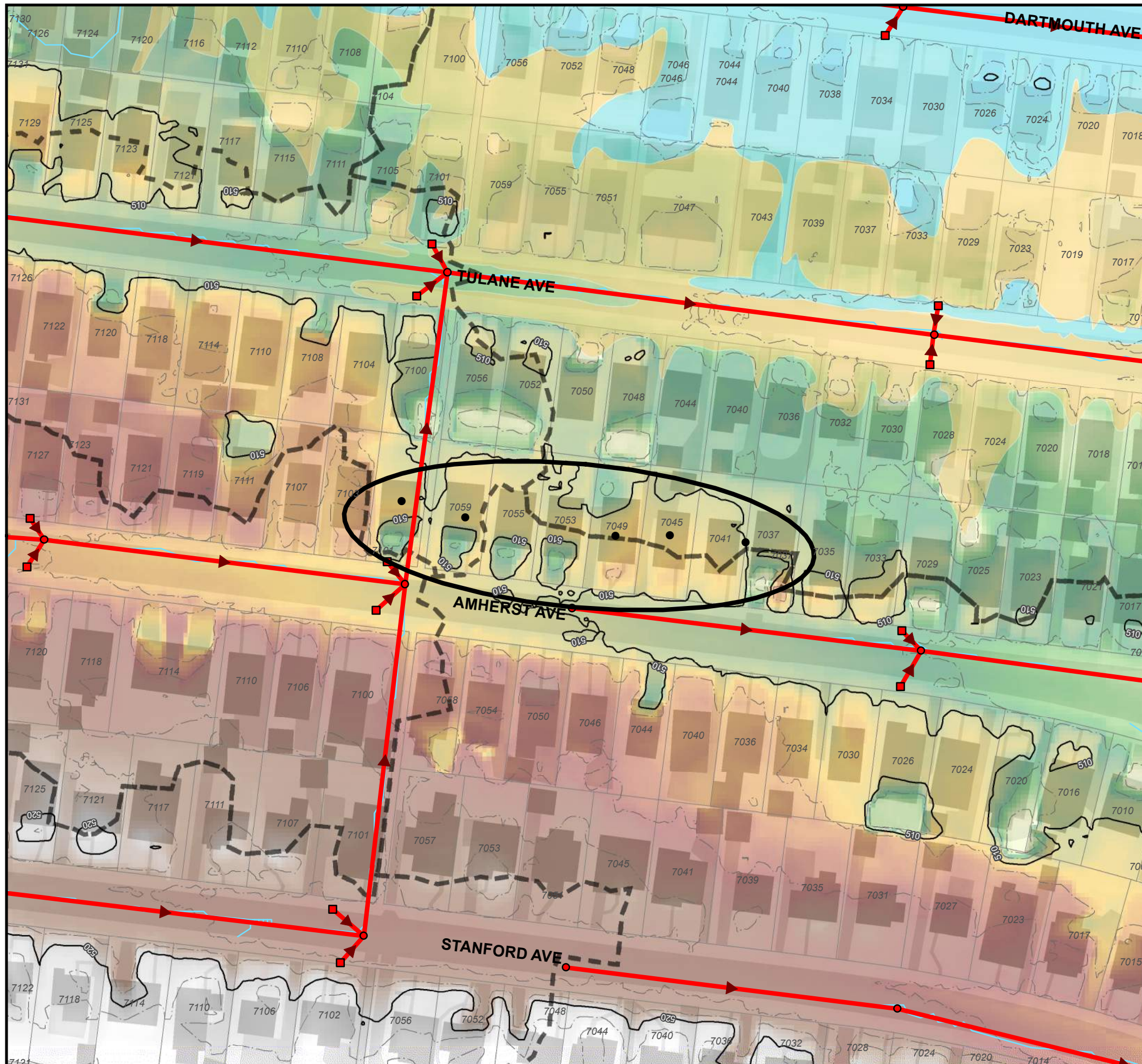
Wood tie wall and WPA block wall, looking downstream.

Legend

- Stormwater Problem Point
- Problem Location
- Flow Path Line
- ▭ Watershed Boundary
- Flood Hazard Zone**
- 1.0% Annual Chance Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Regulatory Floodway
- Existing MSD System**
- Combined Inlet
- Storm Inlet
- Storm Intake-Outfall
- Combined Manhole
- Sanitary Manhole
- Storm Manhole
- Combined Sewer
- Sanitary Sewer
- Storm Sewer



River Des Peres at 7425 Shaftesbury Ave
Ranked #5 in the Erosion Category



Problem Description:

Several basement garages along Amherst Avenue flood from street drainage. Combined sewers with street inlets exist on the street. Amherst Ave is very flat, which reduces inlet capacity.

Although not all of these residents responded, it is likely that 7101, 7059, 7055, 7053, and 7037 Amherst Ave have frequent basement flooding due to water escaping the street and flowing down the driveway.

Grated drains were observed near each garage door. It is likely that each of these are connected into the nearby combined sewer. Therefore, it is possible the flooding is due to backup from the combined sewer main.

The driveway at 7101 Amherst Ave.



The driveway at 7037 Amherst Ave.



Looking east along Amherst Ave towards the inlets between 7033/7029 Amherst Ave.

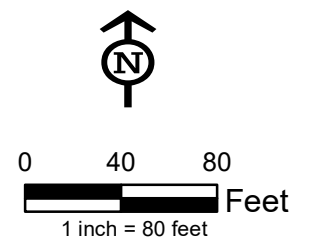


Legend

- Stormwater Problem Point
- Problem Location
- Flow Path Line
- Watershed Boundary
- Existing MSD System
 - Combined Inlet
 - Storm Inlet
 - ▲ Storm Intake-Outfall
 - Combined Manhole
 - Sanitary Manhole
 - Storm Manhole
 - Combined Sewer
 - Sanitary Sewer
 - Storm Sewer

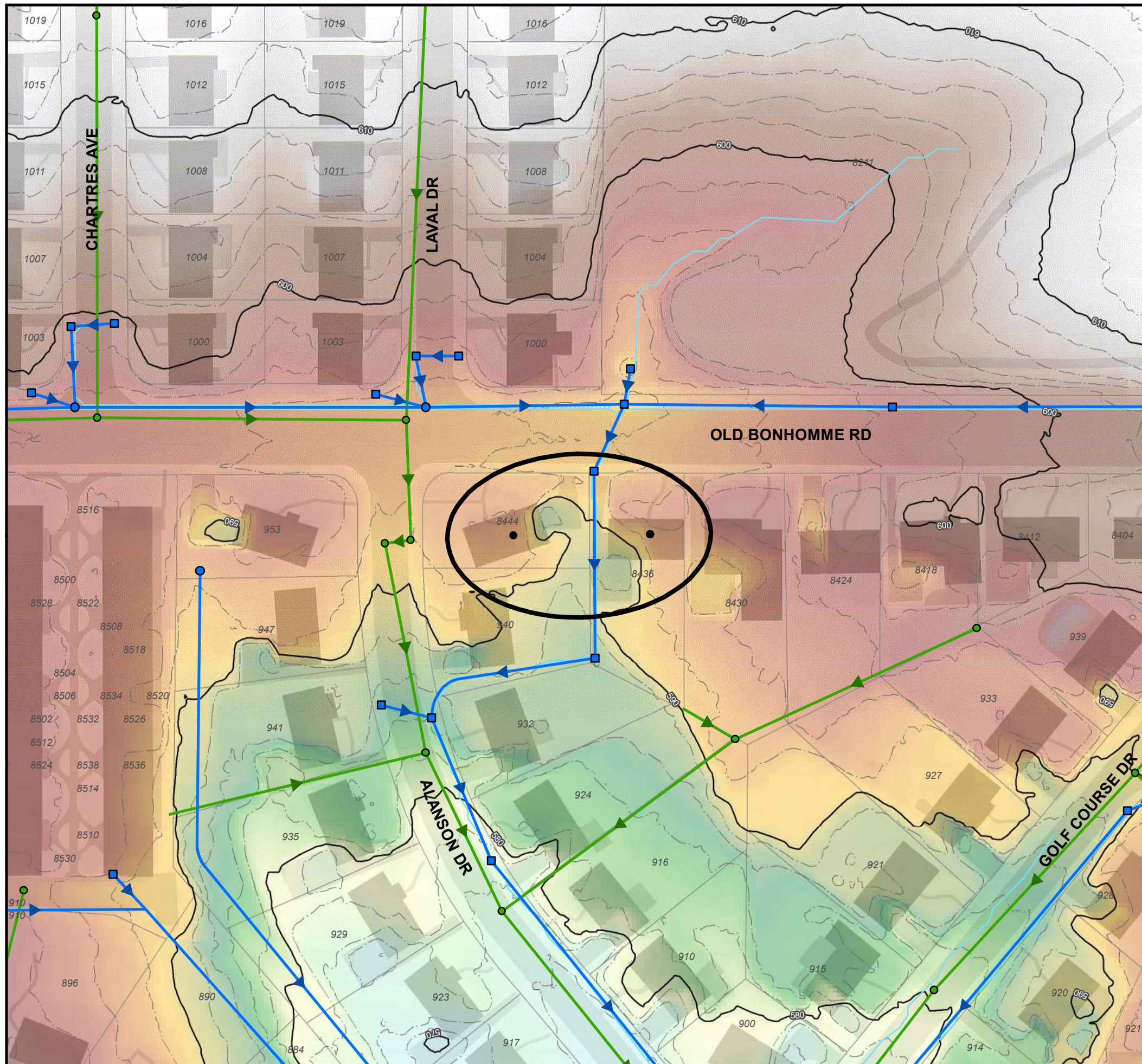
Flood Hazard Zone

- 1.0% Annual Chance Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Regulatory Floodway



Amherst Ave

Ranked #1 in the Street Category



Problem Description:
 Basement garages at 8444 and 8436 Old Bonhomme Rd flood frequently from water which comes down the driveway at 8436 from the street. There is a triple curb inlet in front of 8436 Old Bonhomme Rd which accepts water from about 1,200 feet of Old Bonhomme Rd. The downstream pipe is 24" in diameter.

MSD has studied the problem and identified storm sewer upsizing as a solution. It may also be beneficial to investigate other opportunities for improvement, such as: A) increase inlet capacity at the street by adding inlets east of the triple inlet, B) raise a portion of the driveway at 8436 to keep water in the street, or C) provide a conveyance path down driveway and towards the at the property corner between #8436 and 940/932 Alanson Dr.



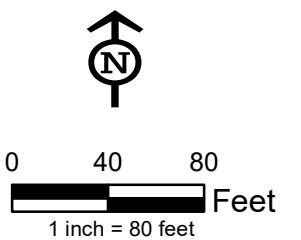
Looking south across Old Bonhomme Rd. #8436 is on the left and #8444 is on the right.



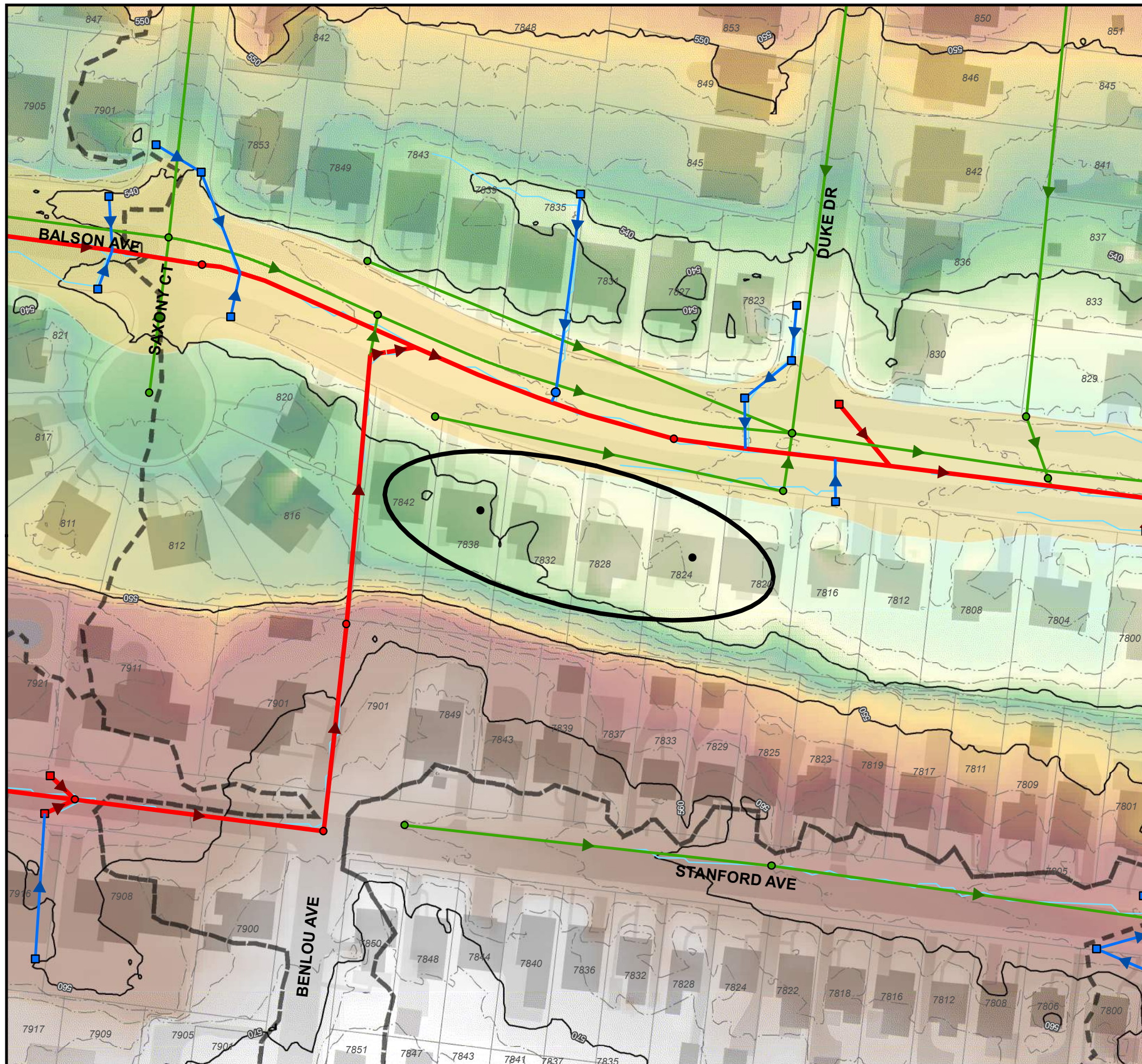
Looking at the ground in front of the driveway at 8436 Old Bonhomme Rd.

Legend

- | | |
|-----------------------------------|------------------------|
| ● Stormwater Problem Point | Existing MSD System |
| □ Problem Location | ■ Combined Inlet |
| — Flow Path Line | ■ Storm Inlet |
| ▭ Watershed Boundary | ▲ Storm Intake-Outfall |
| Flood Hazard Zone | |
| Light Blue Box | ● Combined Manhole |
| Orange Box | ● Sanitary Manhole |
| Light Blue Box with Dashed Border | ● Storm Manhole |
| Light Blue Box with Dotted Border | — Combined Sewer |
| | — Sanitary Sewer |
| | — Storm Sewer |



Old Bonhomme Rd
Ranked #2 in the Street Category



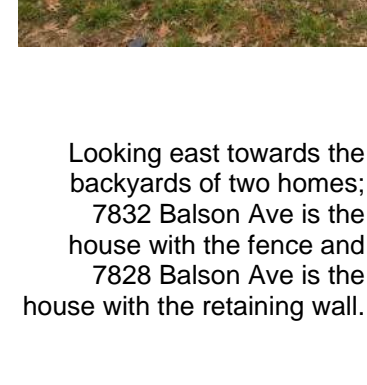
Problem Description:

The homes on Stanford Avenue sit about 18 feet higher than the homes on Balson Ave. Between the houses is at a 3:1 slope. The flow path from the backyards to the front yards on Balson Ave is inadequate, causing frequent flooding to at least two of the homes on Balson Ave. The drainage area to the back of the homes is about 1.3 acres.

The basement stairwell at 7838 Balson Ave. Sand bags and sump pumps have been added to try to keep the basement from flooding.



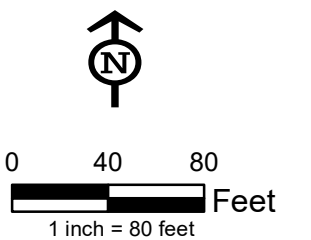
Looking west in the backyard of 7838 Balson Ave. The house is on the right.



Looking east towards the backyards of two homes; 7832 Balson Ave is the house with the fence and 7828 Balson Ave is the house with the retaining wall.

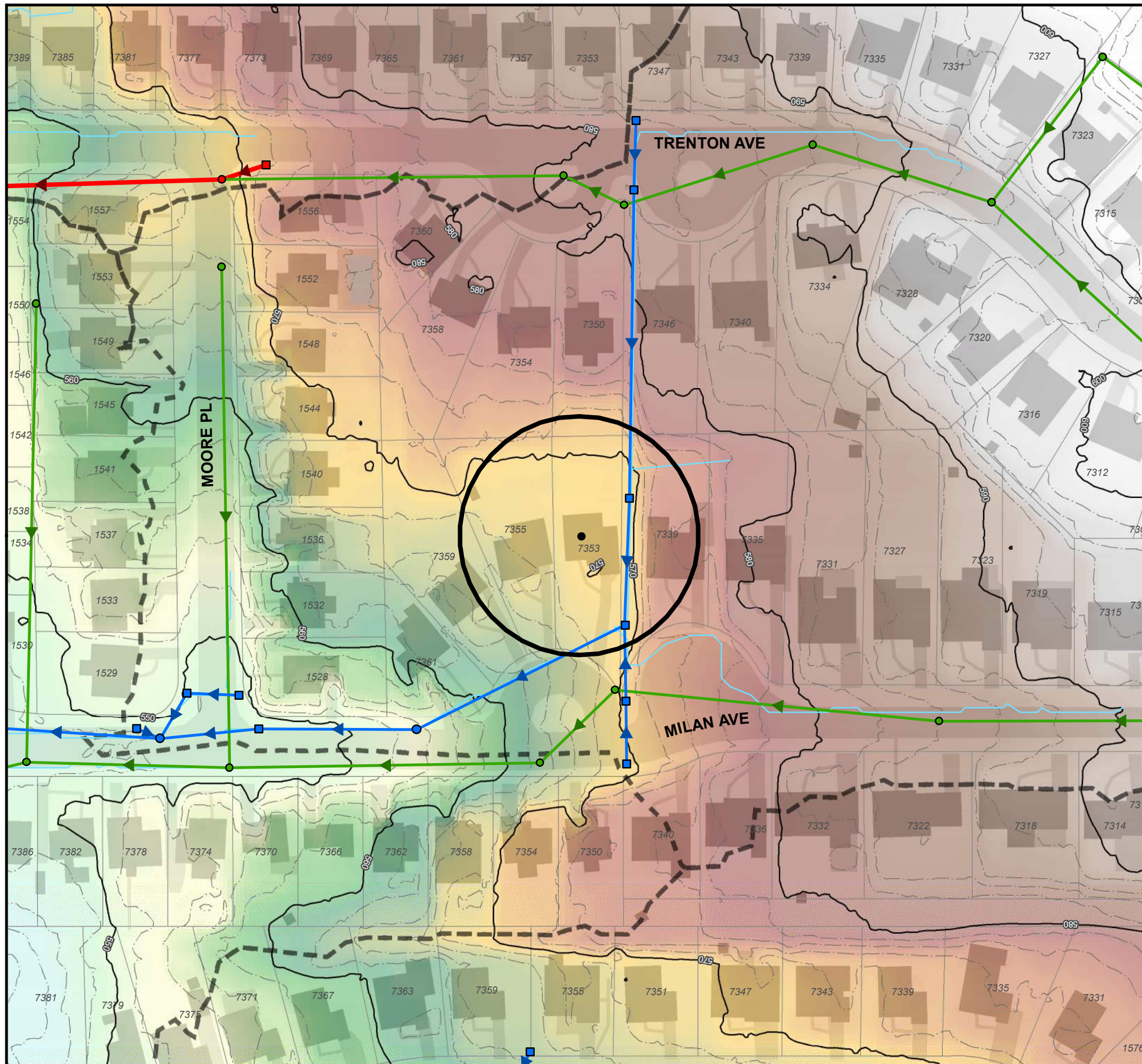
Legend

- | | |
|----------------------------|------------------------|
| ● Stormwater Problem Point | Existing MSD System |
| □ Problem Location | ■ Combined Inlet |
| — Flow Path Line | ■ Storm Inlet |
| - - - Watershed Boundary | ▲ Storm Intake-Outfall |
| Flood Hazard Zone | |
| Light Blue Box | ● Combined Manhole |
| Light Yellow Box | ● Sanitary Manhole |
| Light Orange Box | ● Storm Manhole |
| Light Red Box | — Combined Sewer |
| Light Blue/White Box | — Sanitary Sewer |
| | — Storm Sewer |



Balson Ave

Ranked #1 in the Backyard Category



Problem Description:
 About 3 acres of drainage flows to the backyard at 7353 Milan Ave. An area inlet just east of the backyard clogs easily and may also have inadequate capacity. Water backs up, flooding the entire yard until it can flow east. Water has nearly reached the threshold of the back door to the house. The basement has flooded from both seepage and overland flow in 2014, 2015, and 2022.

Looking south along the property line between #7353 and 7339.



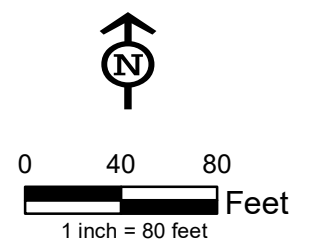
Looking towards the back patio at #7353. Ponded water has nearly reached the threshold of the door into the house (not the door to the screened in patio).

Looking north towards the area inlet in the backyards. #7353's backyard is on the left.

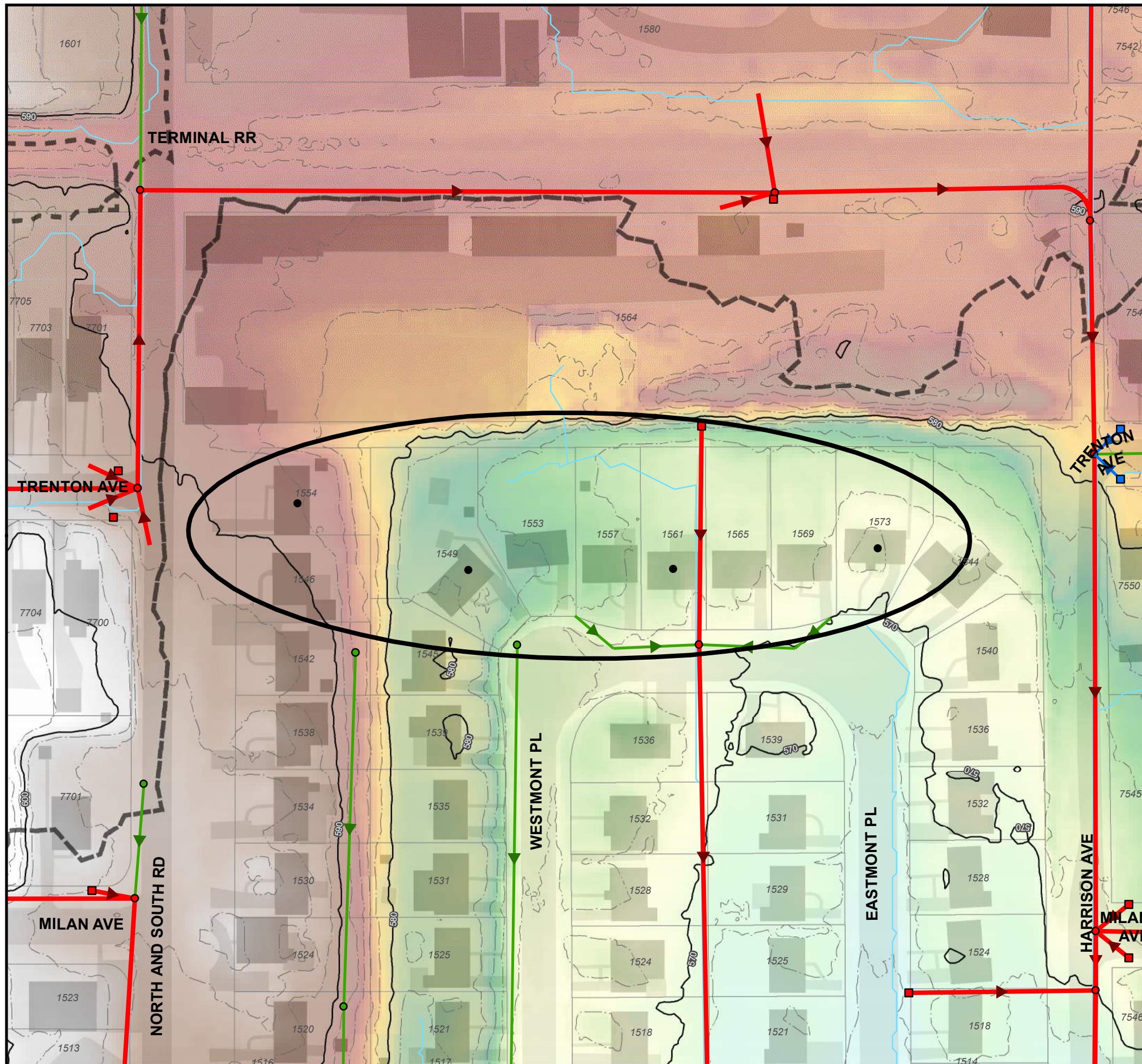


Legend

- Stormwater Problem Point
- Problem Location
- Flow Path Line
- - - Watershed Boundary
- Existing MSD System
 - Combined Inlet
 - Storm Inlet
 - ▲ Storm Intake-Outfall
 - Combined Manhole
 - Sanitary Manhole
 - Storm Manhole
 - Combined Sewer
 - Sanitary Sewer
 - Storm Sewer
- Flood Hazard Zone**
 - 1.0% Annual Chance Flood Hazard
 - 0.2% Annual Chance Flood Hazard
 - Regulatory Floodway



Milan Ave
Ranked #2 in the Backyard Category



Problem Description:

The property north of the Grenville Subdivision sits about 6-10 feet above the backyards of several houses. About 3.3 acres of drainage reaches the backyards of 1561 to 1573 Westmont Place.

The backyards are relatively flat; there is no adequate conveyance which carries water from the backyards to the street, so the yards flood frequently. Seepage occurs into the basements of some of the homes.

There is an inlet behind 1561, but only about half of a side is able to accept water due to grading issues. Note the inlet appears to be in a strip of ROW between the houses and business.

Looking northwest towards the strip of ROW between homes (on the left) and the business to the north (on the right).



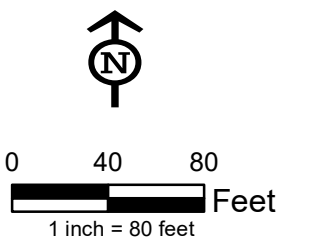
Looking towards the inlet north of #1561. Due to grading, the inlet does not appear to collect much runoff.



Looking south towards the backyard at #1561.

Legend

- | | |
|---------------------------------|------------------------|
| ● Stormwater Problem Point | Existing MSD System |
| □ Problem Location | ■ Combined Inlet |
| — Flow Path Line | ■ Storm Inlet |
| ⋯ Watershed Boundary | ▲ Storm Intake-Outfall |
| Flood Hazard Zone | ● Combined Manhole |
| 1.0% Annual Chance Flood Hazard | ● Sanitary Manhole |
| 0.2% Annual Chance Flood Hazard | ● Storm Manhole |
| Regulatory Floodway | → Combined Sewer |
| | → Sanitary Sewer |
| | → Storm Sewer |



Grenville Subdivision
Ranked #3 in the Backyard Category