

# City of Redwood Falls I/I Reduction Program



# ISG Overview



# ISG Overview

## Services

### Architecture

Architecture  
Interior Design  
Landscape Architecture  
Planning

### Engineering

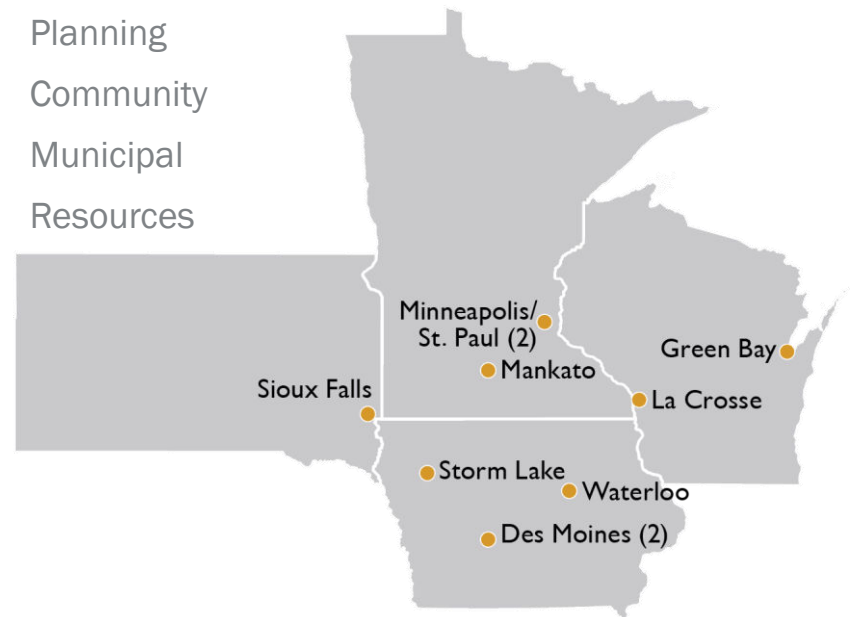
Civil  
Drone Services  
Electrical  
Land Surveying  
Mechanical  
Municipal  
Steam + Power  
Structural  
Transportation  
Water/Wastewater  
3D Scanning

### Environmental

Assessments  
Geographic Information Systems  
Permitting  
Planning + Feasibility  
Testing  
Planning  
Community  
Municipal  
Resources

### Planning

Community  
Municipal  
Resources  
Urban



# ISG Overview - Markets



AGRICULTURE



COMMERCIAL



EDUCATION



ENERGY



FOOD + INDUSTRIAL



GOVERNMENT + CULTURE



HEALTHCARE



HOUSING



MINING



PUBLIC WORKS



SPORTS + RECREATION



TRANSPORTATION



# Background



## Background

- The City maintains a 39-mile wastewater collection system that collects and conveys wastewater, primarily by gravity, to the City's Wastewater Treatment Facility
- Wastewater from individual properties is conveyed to the City system via private service lines
- In addition to wastewater, clear & clean water can also enter sanitary systems
- This intrusion is known as Inflow & Infiltration (I/I)

# Background

- Sanitary sewer systems are designed to handle fluctuations in wastewater flows that result from relatively predictable peak water uses by the community as a whole
  - e.g. morning showers

# Inflow and Infiltration (I/I)





# I/I Sources

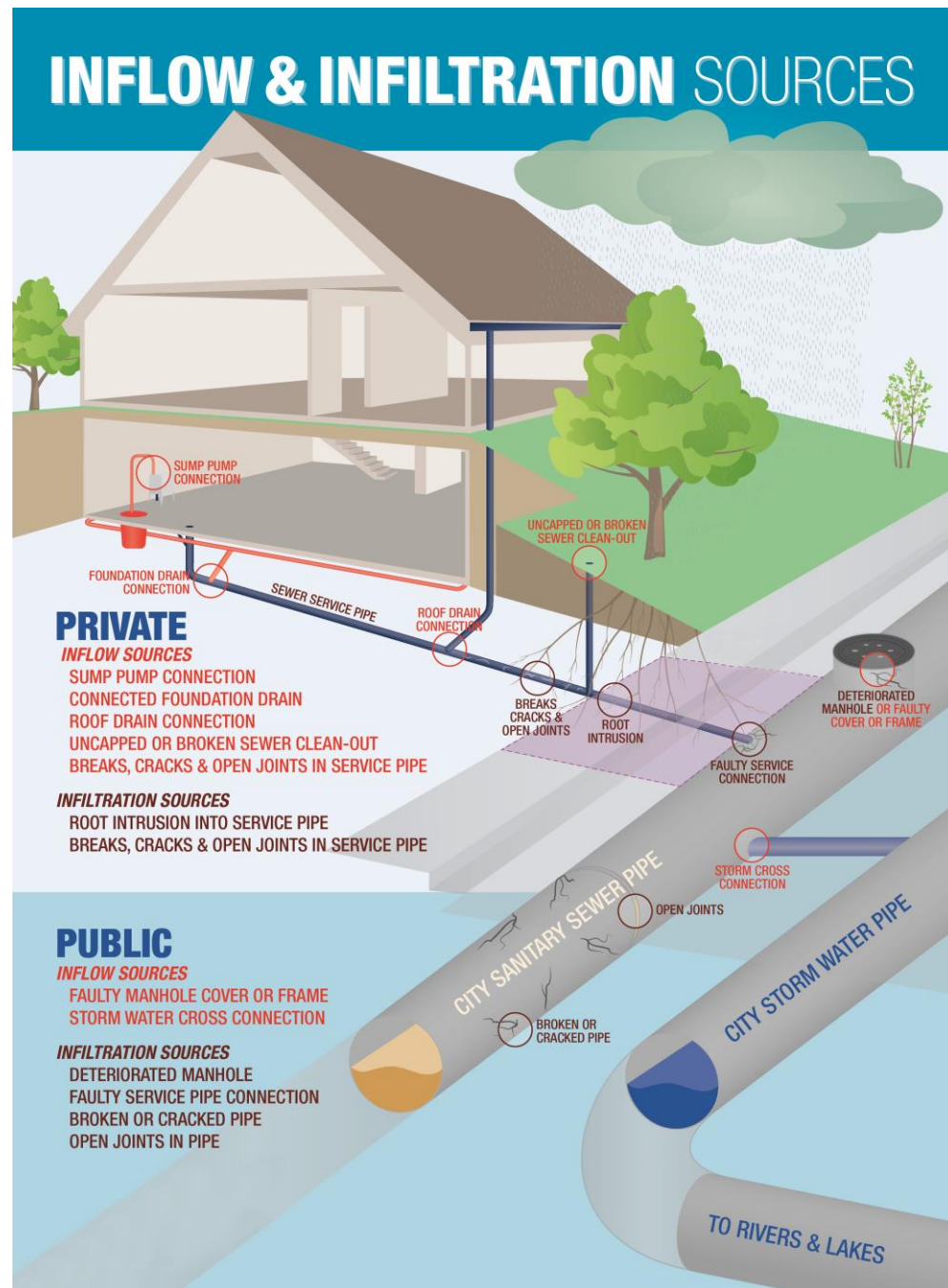
## Inflow

- Increases peak flows in the system
- Improper direct connections to the sanitary system
- Generally easier to identify and correct

## Infiltration

- Increases base flows in the collection system
- Clear water intrusions through leaky pipes, joints, and manholes

# I/I Sources

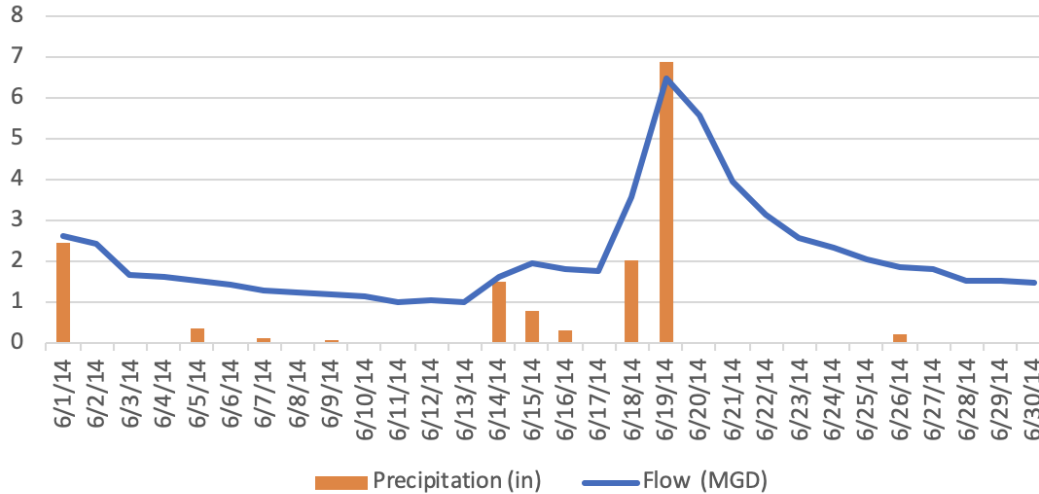


## Impacts of I/I

- Sanitary sewer systems are NOT designed to handle extreme fluctuations caused by I/I

# Impacts of I/I

Flow vs. Precipitation



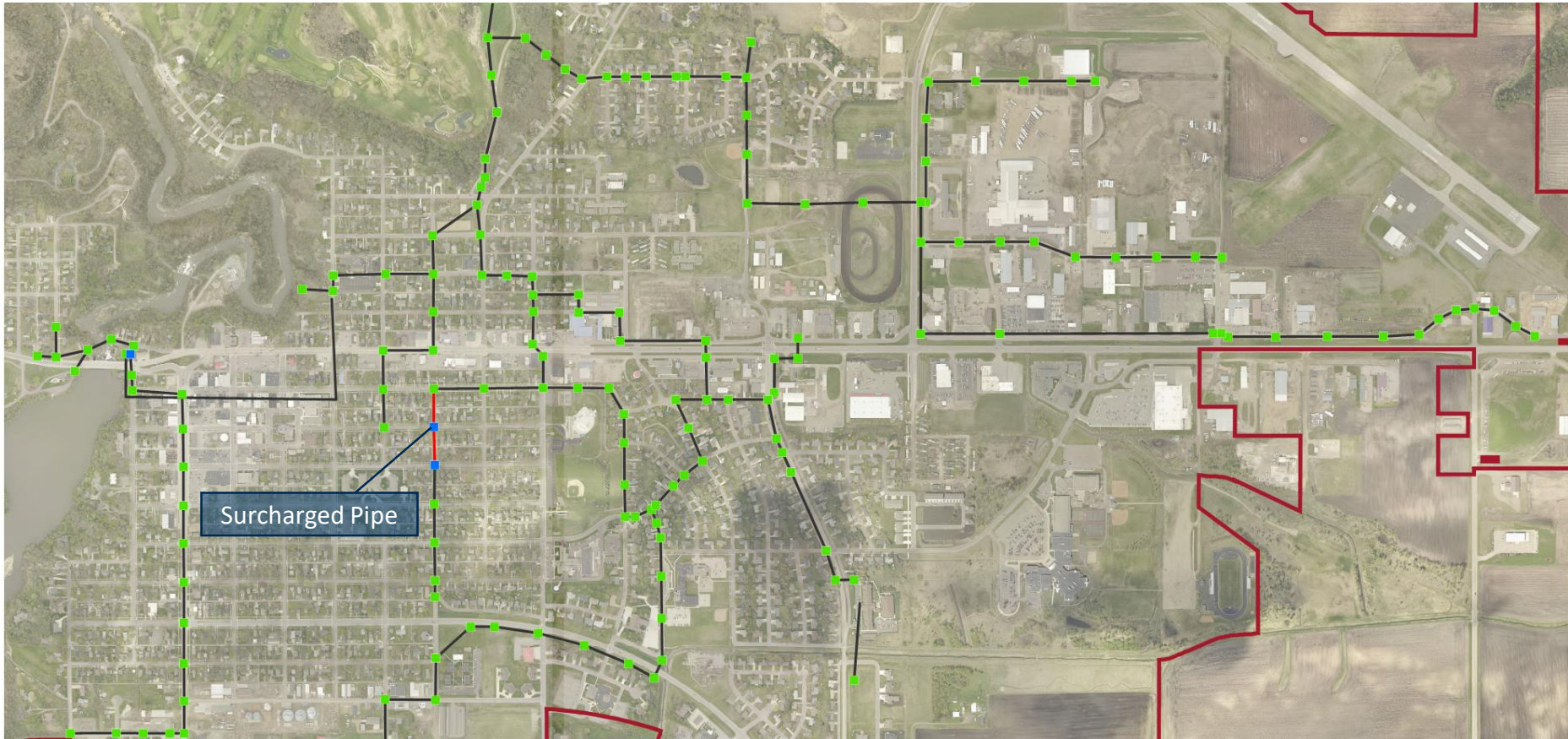
Date	Flow (MGD)	Precipitation (in)
6/1/14	2.629	2.46
6/2/14	2.407	0.05
6/3/14	1.677	
6/4/14	1.633	
6/5/14	1.512	0.38
6/6/14	1.429	
6/7/14	1.295	0.1
6/8/14	1.254	
6/9/14	1.196	0.06
6/10/14	1.149	
6/11/14	1.001	0.03
6/12/14	1.062	
6/13/14	0.999	
6/14/14	1.623	1.49
6/15/14	1.961	0.8
6/16/14	1.795	0.32
6/17/14	1.783	0.01
6/18/14	3.571	2.02
6/19/14	6.498	6.86
6/20/14	5.548	
6/21/14	3.948	
6/22/14	3.124	0.02
6/23/14	2.552	
6/24/14	2.33	
6/25/14	2.032	
6/26/14	1.844	0.22
6/27/14	1.824	0.01
6/28/14	1.527	
6/29/14	1.531	
6/30/14	1.462	0.01

# Overloaded Wastewater Treatment Facility



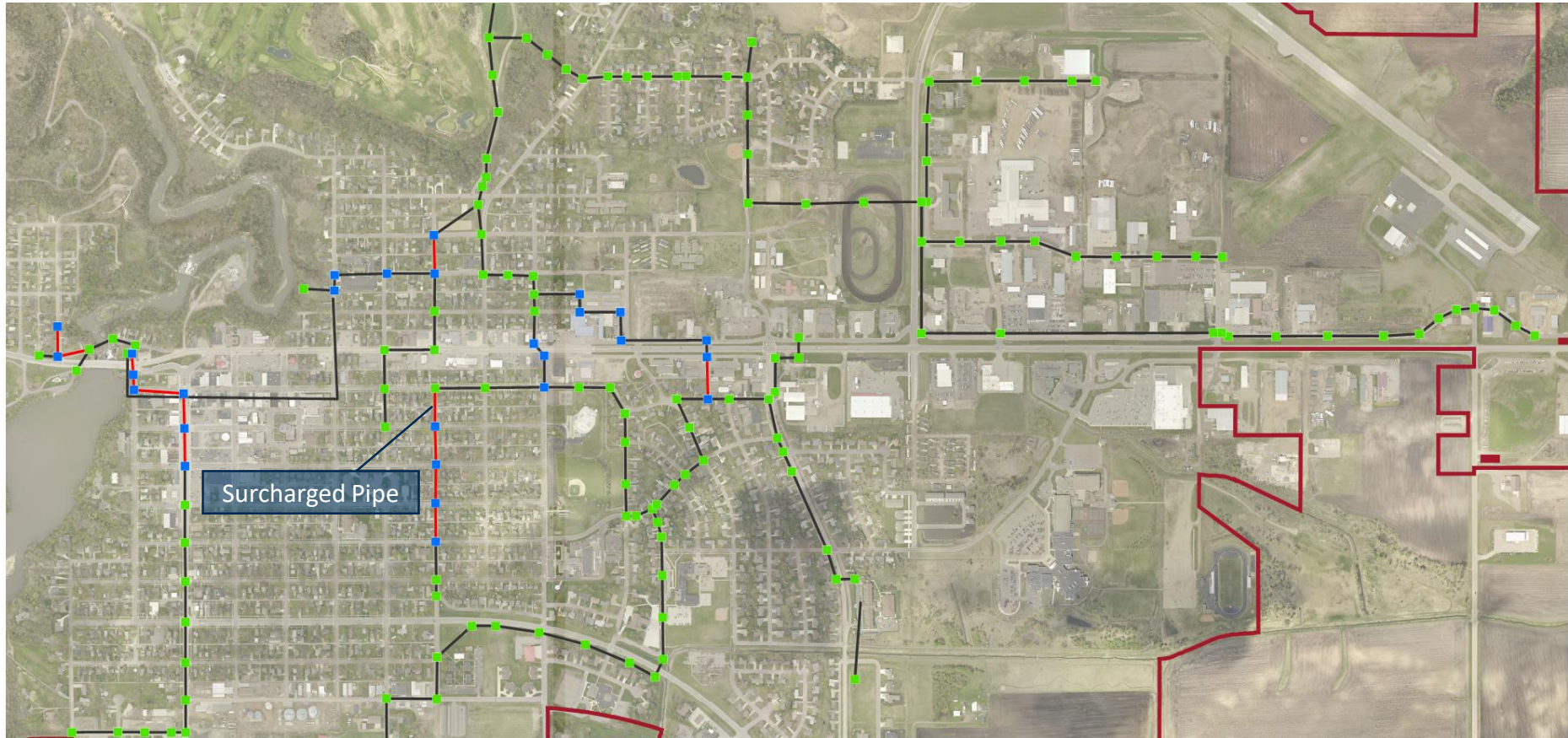


# Trunk Sewer Model – Normal Conditions



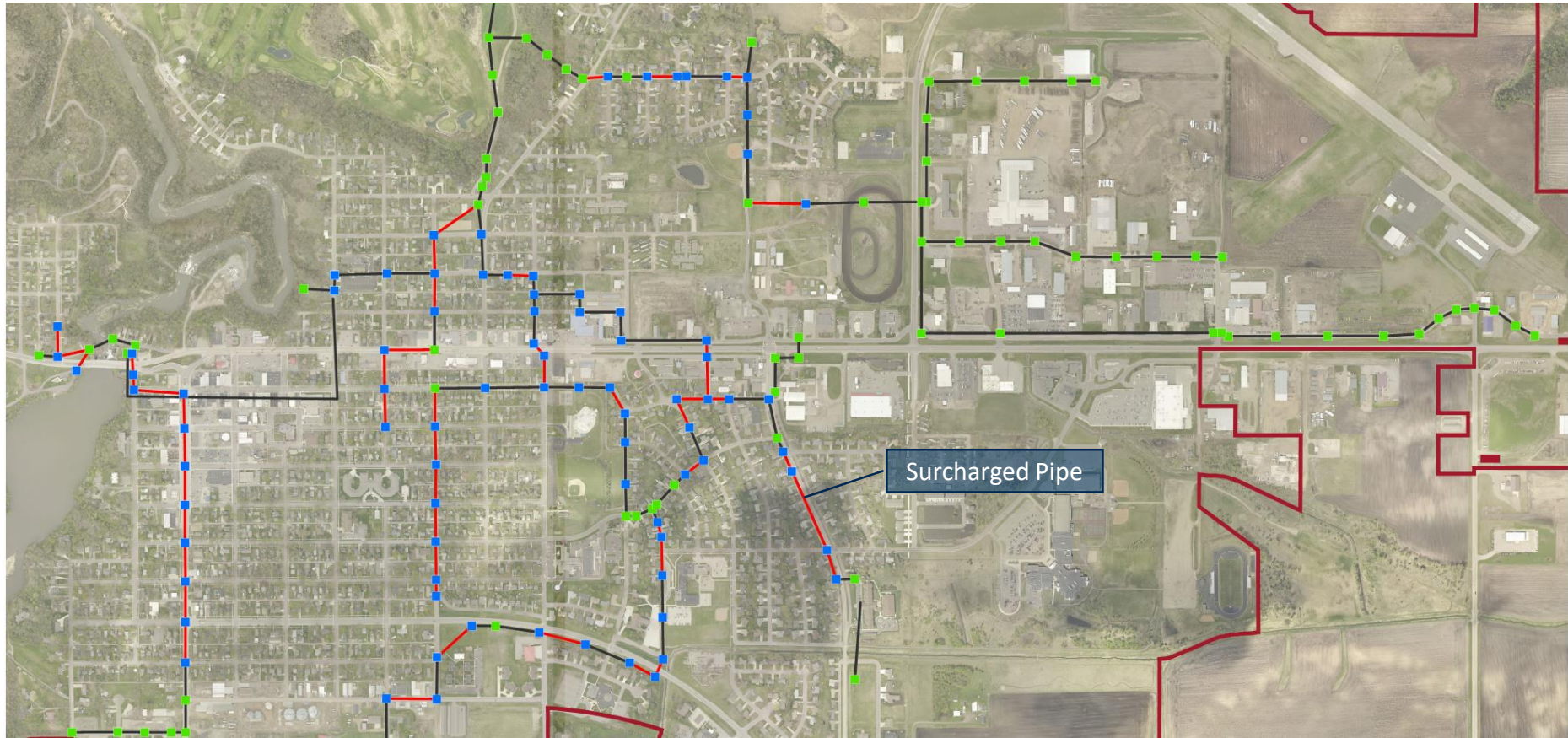


# Trunk Sewer Model – 5% Sump Pumps Running



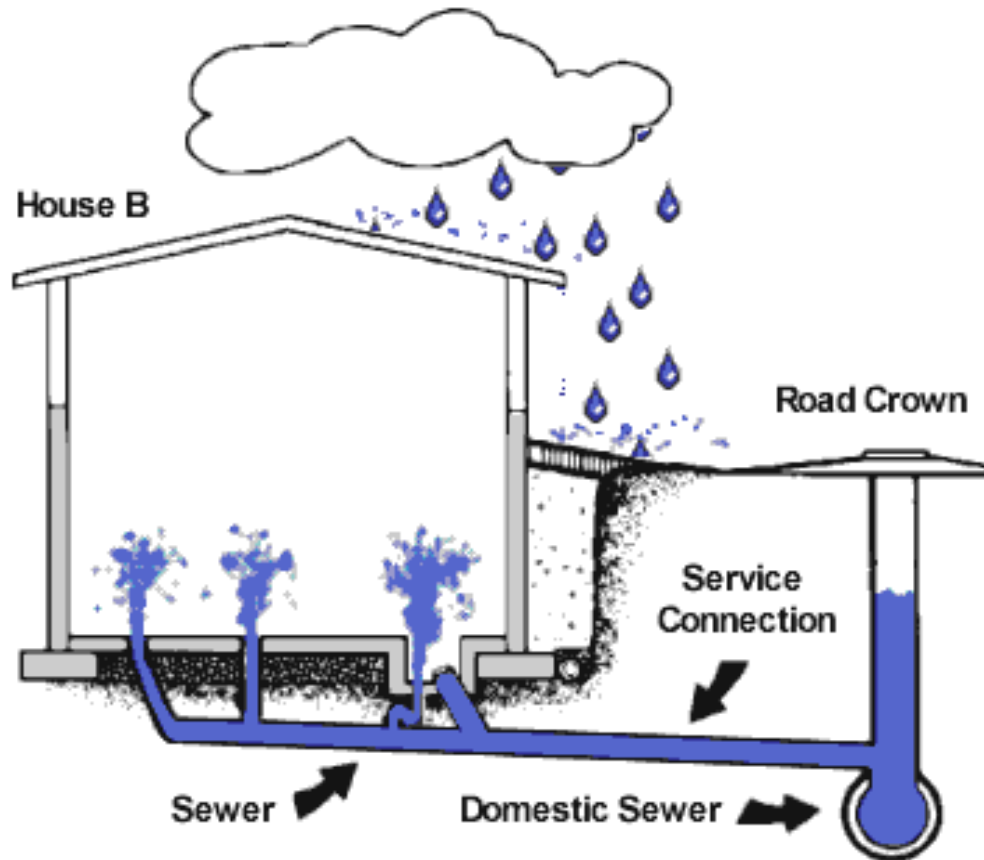


# Trunk Sewer Model – 50% Sump Pumps Running





# Impacts of I/I

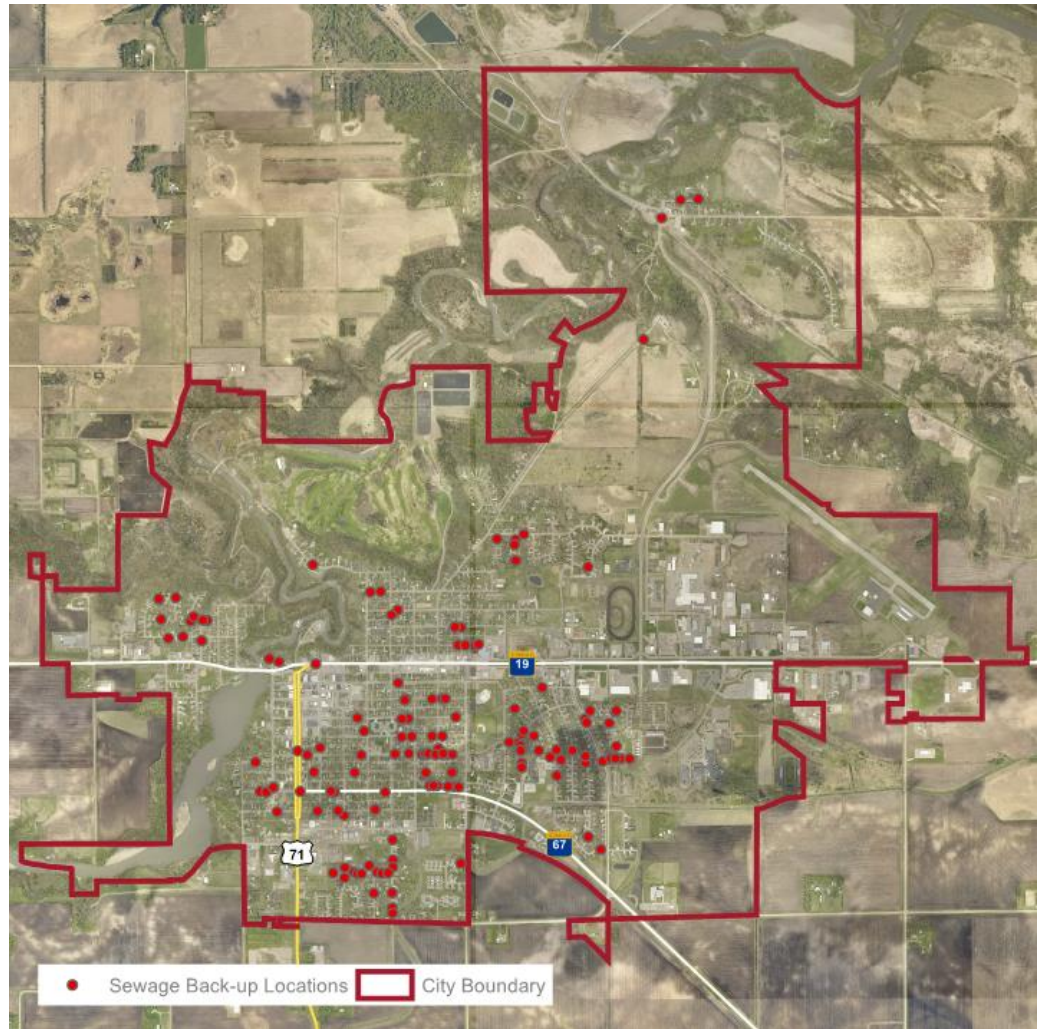


# Impacts of I/I



# Impacts of I/I

## June 2014 Sewage Backups





# Typical Mitigation Practices

- To mitigate impacts to private property and infrastructure, cities will:
  - Bypass pump from the collection system to storm sewer, curb & gutter, and other stormwater conveyance systems
  - Discharge partially-treated wastewater from treatment facilities to provide needed capacity for incoming flows
- Often times, these measures are not enough anyway

# Minnesota Pollution Control Agency



# Minnesota Pollution Control Agency

- In October, the MPCA issued a Notice of Violation
  - Six unauthorized bypasses (due to surcharged collection system) between March 1, 2018 and August 31, 2019.
  - 18 alleged effluent limit violations (wastewater that was only partially treated needed to be released from wastewater treatment facility due to system reaching capacity) between March 1, 2018, and August 31, 2019.

# Corrective Action

- Notice of Violation reinforces need for I/I reduction

## CORRECTIVE ACTION

To address the alleged violations cited in this Notice of Violation (NOV), the Regulated Party is to complete the following actions:

1. Within ten days after receipt of this NOV, submit a plan to the MPCA to reduce phosphorus loading and discharge below the 12 month moving phosphorus limit and implement that plan immediately.
2. Within 60 days after receipt of this NOV, submit a plan detailing how the Regulated Party intends to prevent unauthorized releases of wastewater in the future, including any planned collection system work or other clear water I&I elimination. Additionally, the plan should include an evaluation of the I&I contributions from individual service laterals. If necessary, establish a plan to inspect individual service laterals and develop an ordinance requiring property owners to replace or repair damaged or non-conforming service laterals. If it is determined that a service lateral ordinance is needed, please see the information below to aid in development of the ordinance.

- City initiated I/I Reduction Program in early 2019, prior to receiving Notice of Violation

## Corrective Action

*“Within 60 days after receipt of this NOV, submit a plan detailing how the Regulated Party intends to prevent unauthorized releases of wastewater in the future, including any planned collection system work or other clear water I&I elimination. Additionally, the plan should include an evaluation of the I&I contributions from individual service laterals. If necessary, establish a plan to inspect individual services laterals and develop an ordinance requiring property owners to replace or repair damaged or non-conforming service laterals”*



# I/I Reduction Program



# I/I Reduction Program

- City of Redwood Falls is implementing an I/I reduction program to identify both public and private sources
  - Smoke Testing
  - Sump Pump Inspections
  - Updates to Sanitary Sewer and Storm Sewer Master Plans
  - Updates to City Ordinance

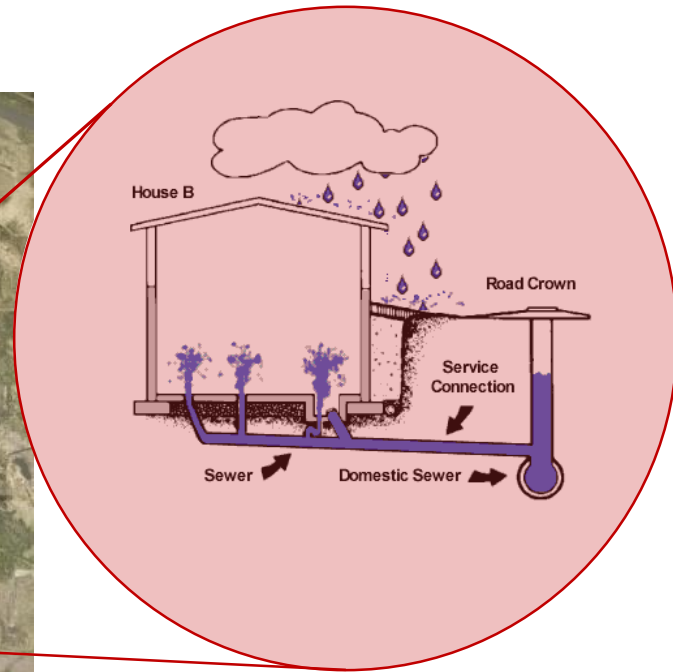
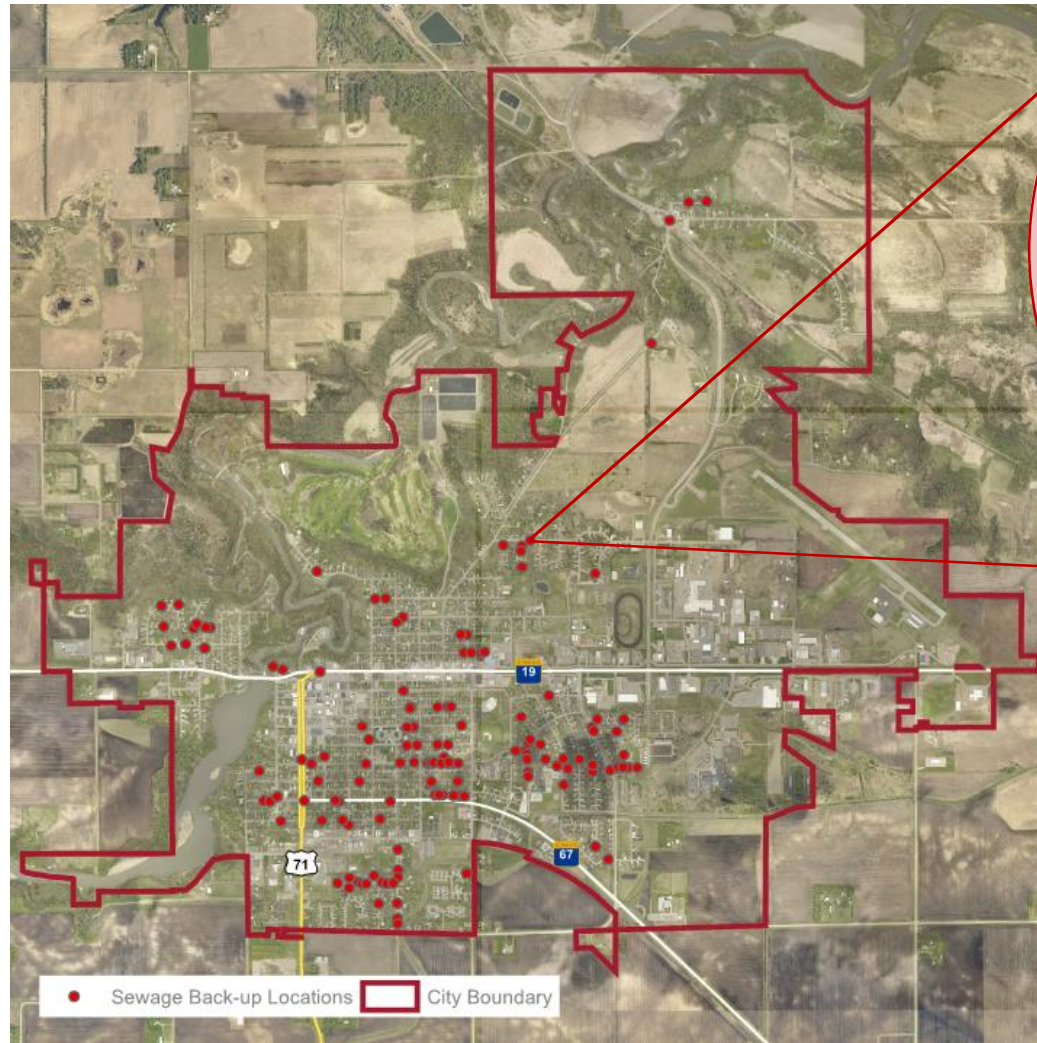
## Upsize the System?

- Earlier, we stated that “*sanitary sewer systems are NOT designed to handle extreme fluctuations caused by I/I*”, so why not just upsize all of the pipes?
- 39 miles of sanitary sewer
- City had previously estimated \$280M replacement cost
- For reference, \$20M Water Treatment Plant resulted in average utility bill increases of \$50/month

## Upsize the System?

- Wastewater Treatment Facility would be overloaded even more frequently as more flows would get to it instead of being bypassed
- Project of that scale would take several years of planning and design, and potentially decades of construction

# Meanwhile



# City Ordinance Update



## Existing City Ordinance

- Gives the City the right to inspect
- Currently illegal to discharge clear water into sanitary system
- Does not allow property owners to choose their own licensed plumber to perform an inspection
- Penalty for non-compliance/failure to act is a misdemeanor, correction by City, and then City lawsuit against property owner for all costs and attorney fees; costs assessed to the property

# Updates to City Ordinance

- First reading on October 15, 2019
- Second reading and potential of adoption tonight, November 5, 2019

## ORDINANCE NO. 66, FOURTH SERIES

AN ORDINANCE BEING IN THE ENTIRETY THE LANGUAGE OF REDWOOD FALLS CODE OF ORDINANCES § 3.50 FOR SUMP PUMPS AND ENACTING A NEW ORDINANCE ALLOWING FOR INSPECTIONS OF PROPERTY TO DETERMINE IF THERE IS DISCHARGE OF PROHIBITED CLEAR WATER DRAINAGE AND TO PROVIDE A SURCHARGE FOR NON-COMPLIANCE WITH INSPECTION AND CONNECTION REQUIREMENTS.

WHEREAS, the City Council of Redwood Falls finds that the discharge of water from any surface, groundwater sump pump, roof, yard, lawn, streets, alleys, footing tiles, or other natural precipitation into the municipal sanitary sewer system has the potential to cause property damage and overload the municipal and regional sanitary sewer systems. Such overloading of the sanitary sewer system may result in sewage flowing into basements and/or residences and businesses, creating hazardous public health conditions and significant damage to properties. The City Council therefore finds it essential for the maintenance of health, minimization of property damage, and to maintain the life and capacity of the wastewater treatment system that the provisions of this Ordinance be strictly enforced.

THE CITY COUNCIL OF REDWOOD FALLS, MINNESOTA HEREBY ORDAINS:

### § 3.50 DISCHARGE OF PROHIBITED CLEAR WATER DRAINAGE

#### Subd. 1. Definitions

- Clear Water Drainage:** For the purposes of this section, clear water drainage is defined as stormwater, natural precipitation, ground water or flow from roof runoff, surface runoff, subsurface drainage, down spouts, cave troughs, rainpipes, yard drains, sump pumps, foundation drains, yard fountains, ponds, cistern overflow or water discharge from any non-residential air conditioning unit or system.
- Ownership:** The property owner shall own and be responsible for the maintenance of the sanitary sewer service lateral between the city's sanitary sewer main within the street and the building being served, including the connection to the main.
- Prohibited Discharge:** Except as otherwise expressly authorized in this section, no ponds, water fountains, water from any roof, surface, groundwater sump pump, swimming pool, or other natural precipitation or groundwater shall be discharged into the sanitary sewer system. A permanent installation shall be one which provides for year round discharge capability to either the outside of the dwelling, building, or structure, or is connected to a storm sewer or discharge through the curb and gutter to the street.
- Prohibited Connections:** No person shall make or maintain a connection between any conductors used to carry clear water drainage into the city's sanitary sewer system unless otherwise authorized under Subd. 2 F.

Subd. 2. **Sump Pumps:** Dwellings and other buildings and structures that require a sump pump system to discharge excess water because of the infiltration of water into basements, crawl

spaces and the like shall obtain a building permit, if required, and have a permanently installed discharge line that complies with the following:

- Sump Pit:** The building shall have a drain tile placed around the inside or outside perimeter of the foundation connected to a sump pit. All basement seepage collection systems shall be discharged to the sump pit.
- Discharge Pipe:** A discharge pipe shall be installed to the outside wall of the building with rigid PVC pipe minimum inside diameter minimum. The discharge pipe must have a check valve within one foot of the floor grade and a union or other approved coupling for easy disconnection for repair or replacement. The discharge shall extend at least three feet outside of the foundation wall.
- Alternate Method of Installation:**
  - The discharge pipe may be connected directly to the municipal underground storm sewer system provided the discharge is at a higher elevation than the normal flow level and that an approved backflow prevention device is installed.
  - The discharge may be connected directly to the municipal curb and gutter system provided the pipe is placed under the sidewalk or boulevard and through the back of the curb and that an approved backflow prevention device is installed. This method shall only be allowed if there is not storm sewer or street underdrain available adjacent to the property.
- All New Construction:** Any new construction in which a sump and pump will be installed, shall be required to install a rigid pipe connection discharge in accordance with the provisions of this section.
- All Existing Construction:** Any existing construction in which a sump and pump have been or will be installed, shall be required to install a rigid pipe connection discharge in accordance with the provisions of this section.

F. **Exceptions:** In certain locations where surface storm water discharge would create a safety hazard during freezing weather, connection to the sanitary sewer may be maintained from October 15 to March 15 with the use of a dual-use system. In no case shall any connection to the sanitary sewer be maintained from March 15 to October 15. Exceptions shall be granted by permit on a case by case basis as determined by authorized City personnel.

Subd. 3. **Inspections:** The purpose of inspections shall be to confirm that there is no discharge of prohibited clear water drainage and the property is in compliance with this section. The inspection shall include, but is not limited to: inspection of the properties down spouts, cave troughs, rainpipes, yard drains, perimeter drains, sump pumps, foundation drains as the like. The owner of any dwelling, building, or other structure shall have a period of thirty (30) days to schedule an appointment for an inspection from the date the City sends a written notice to the owner requesting admittance to the owner's property for an inspection, to either allow a City inspector of the property, or to contact with a licensed plumber to perform the inspection, and notify the City of the results thereof. Upon completion of an inspection, the City inspector or a licensed plumber hired by the owner of the property, shall provide the owner a copy of the inspection report. The report shall indicate whether or not the property is in compliance with this section. If the property is not in compliance with this section, the report shall indicate all deficiencies and violations discovered in sufficient detail to identify the violations and the required corrections in order to be in compliance with this section. The owner shall have a period of ninety (90) days from the date the owner is informed of the deficiencies and violations to obtain a building permit, if required, to disconnect the sump pump or other prohibited discharge,

to complete all the necessary corrections as outlined in the inspection report and schedule a re-inspection with either the City inspector or licensed plumber to certify that the property is now in compliance with this section. If there are any corrections outlined in the inspection report that require the issuance of a building permit, then the City Building Official shall conduct the re-inspection for compliance with all applicable City code requirements and shall provide the necessary documentation to verify the property is in compliance. **If owner leaves the subject property, owner ultimately has the duty to arrange these services every month of the year.** No lease or other contract purporting to shift maintenance or repair obligations to a tenant shall relieve owner's obligation to comply with these regulations. Owners in any property within the City have an obligation to cooperate with the Owner and the City, Utilities and their designees with respect to the completion of any required inspections or necessary modifications.

#### Subd. 4. Required Inspections: Inspections are required when one of the following occurs:

- The owner of a property receives notice from the City that their property needs to be inspected under the inspection program as reference above.
- The property is offered for sale or conveyance by deed or contract for deed, unless the City has verification that the property was already inspected and found to be in compliance within the last ten (10) years.
- The city orders a street improvement project and the property is adjacent to a street in the project area.
- For the purpose of safeguarding the health and safety of the general public or occupants of a building to determine compliance with the code.

Subd. 5. **Powers and authority of inspectors:** Duty authorized employees of the City, and its designees, bearing proper credentials and identification shall be permitted to enter all properties for the purposes of inspection, observation, measurement, sampling and testing pertinent to discharge by any public sewer or natural outlet in accordance with the provisions of this section. Sampling pertaining to industry will reflect the number of days an industry is not operating as well as the days in operation and discharging waste to a public sewer.

Subd. 6. **Removal of Connections:** Any property owner who, after being found in compliance with this section, makes a prohibited connection or conducts an installation in violation of this section shall immediately remove the connection or correct the installation. Notice of the violation shall be provided to the owner by leaving the notice on the premises, by personal service, or by certified mail. If the violation is not corrected within thirty (30) days of receipt of the notice of violation, the City may impose a surcharge in the amount provided in subdivision (7) below. The owner of a building or premises found to be not in accordance with this subdivision during periodic re-inspections may be subjected to a surcharge as provided in subdivision (7) below.

Subd. 7. **Surcharge:** A monthly surcharge in an amount duly adopted by the City Council and set forth in the City's Fee schedule shall be assessed against any property on which clear water is discharged in violation of this Ordinance. The monthly surcharge will be charged to the property owner who will receive a monthly billing statement if one or more of the following conditions apply:

- If the property owner fails to schedule an inspection within (thirty) 30 days after receipt of the notice from the City per subd. 4. One provides an affidavit from a licensed plumber that the property was inspected and in compliance with this section, then the City inspector will set a specific date and time for the inspection and will mail notice of the scheduled inspection to the property owner. If the property owner is not present for the scheduled inspection or refuses to allow the property to be inspected, the surcharge shall be imposed.
- The property owner or occupant fails to provide sufficient access to the sanitary sewer service lateral within the dwelling, building or structure, including removal of any obstacles so that the sanitary sewer lateral is completely accessible to the inspector or fails to make the sewer line cleanout readily available for the inspection causing the inspection to be rescheduled.
- The necessary corrections have not been made within the ninety (90) day timeframe or a re-inspector to verify compliance has not been scheduled.
- The property owner or occupant reconnects a clear water discharge line to the municipal sanitary sewer system after it has been previously disconnected at the City's or a court's direction.

A surcharge as established by the City Council will be assessed for every month during which the property is not in compliance.

Subd. 8. **Nonpayment of surcharge:** If the surcharge is not received by the City of Redwood Falls, the City reserves the right to assess the property owner the unpaid balance.

Subd. 9. **Criminal Penalties:** Any person violating any of the provisions of this section shall be guilty of a misdemeanor that imposes a maximum penalty of 90 days in jail, a \$1,000 fine, or both.

Subd. 10. **Effective date:** This section shall be in full force and effect from and after its passage and publication.



## Updates to City Ordinance

- Property owner is solely responsible for compliance with Ordinance
- Property owner will be in violation of the Ordinance for:
  - Failure to schedule a sump pump inspection with the City or have inspection *completed* by licensed plumber at *property owner's expense* within 30 days of receiving notice to schedule
  - Failure to make required corrections within 90 days of receiving notice of non-compliance or action required

## Updates to City Ordinance

- Violations of the ordinance shall be subject to a monthly surcharge (currently proposed to be \$100/month for 2020)
- Unpaid surcharges will be assessed to the property

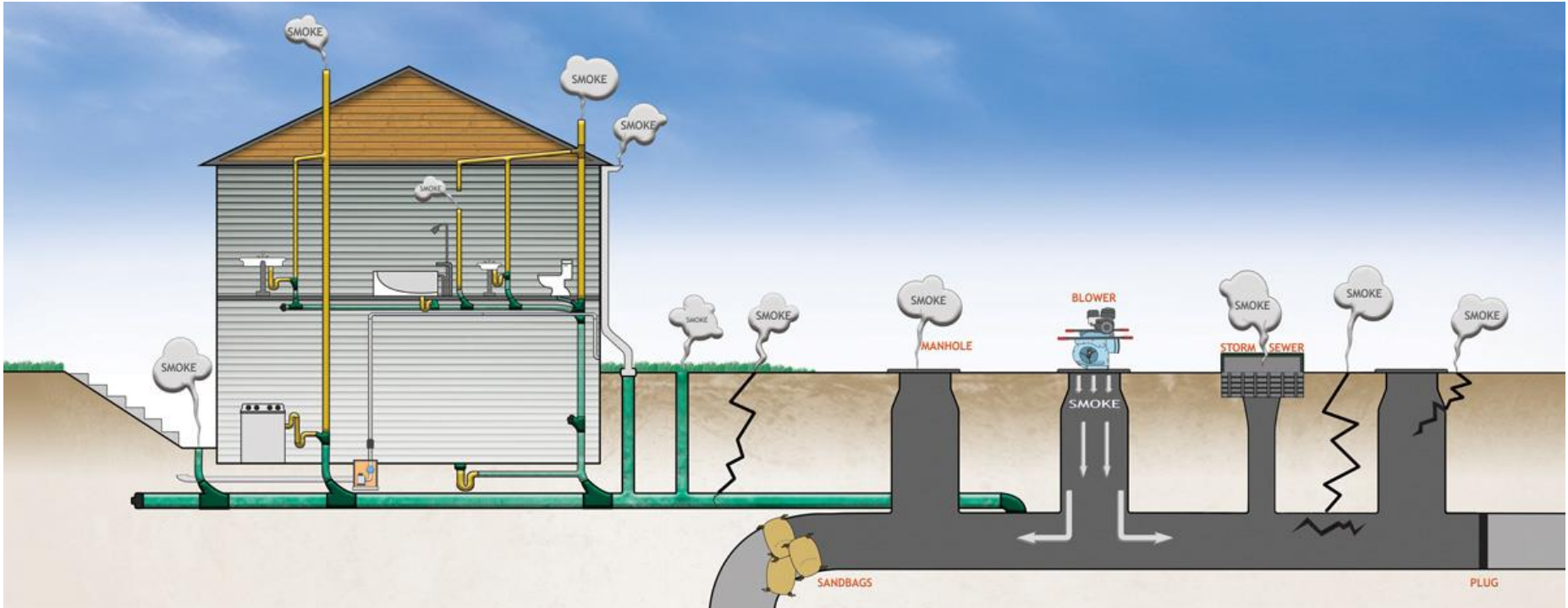
# Smoke Testing



# Smoke Testing

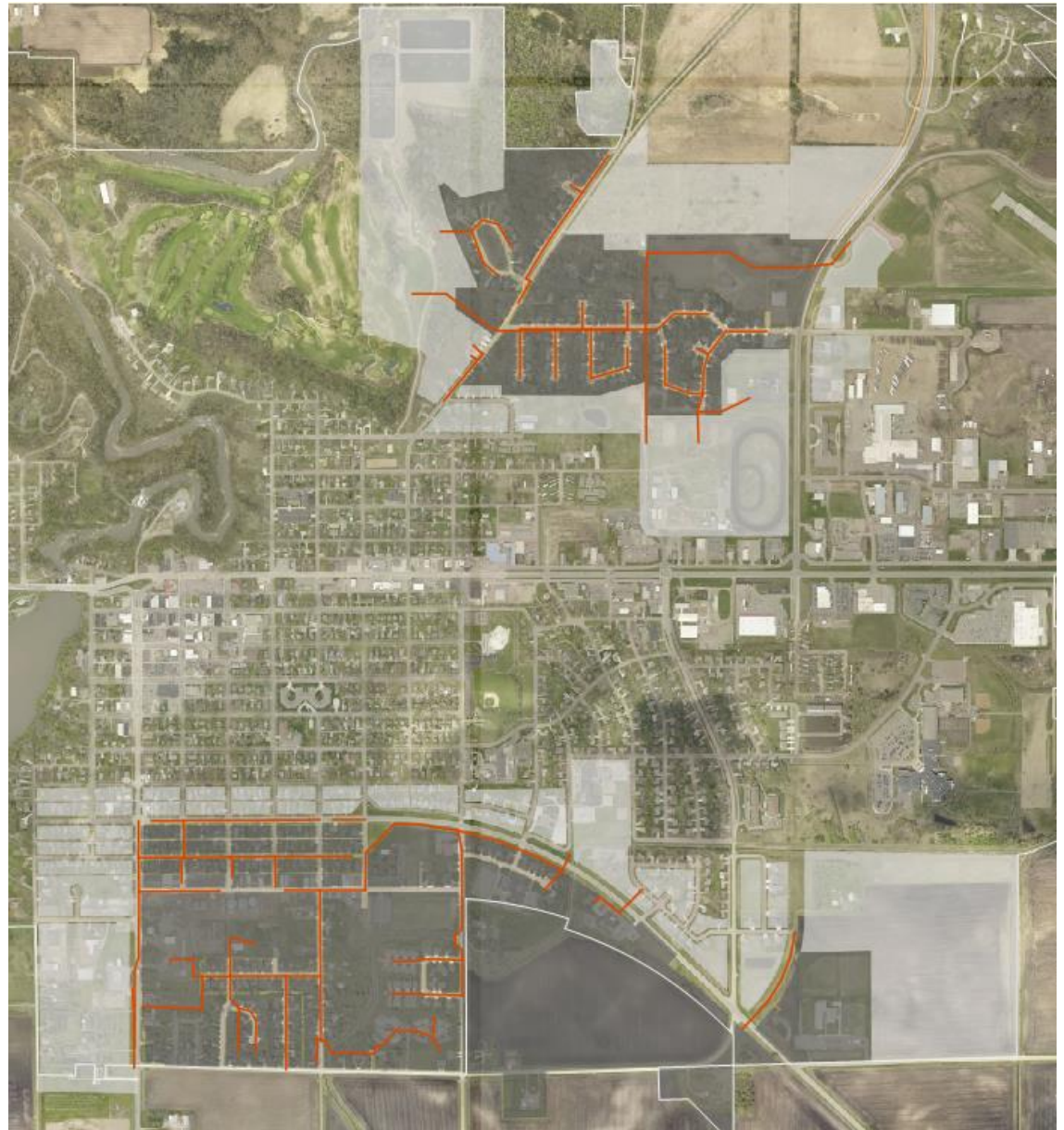
- Non-toxic smoke is pumped under low-pressure into isolated sections of the City's sanitary collection system
- Smoke emitting from improper locations will indicate an I/I source
- The smoke does not care where the property line is and will identify both public and private sources

# Impacts of I/I



# Smoke Testing

- City staff will be completing smoke testing of portions of the sanitary system this fall





# Smoke Testing

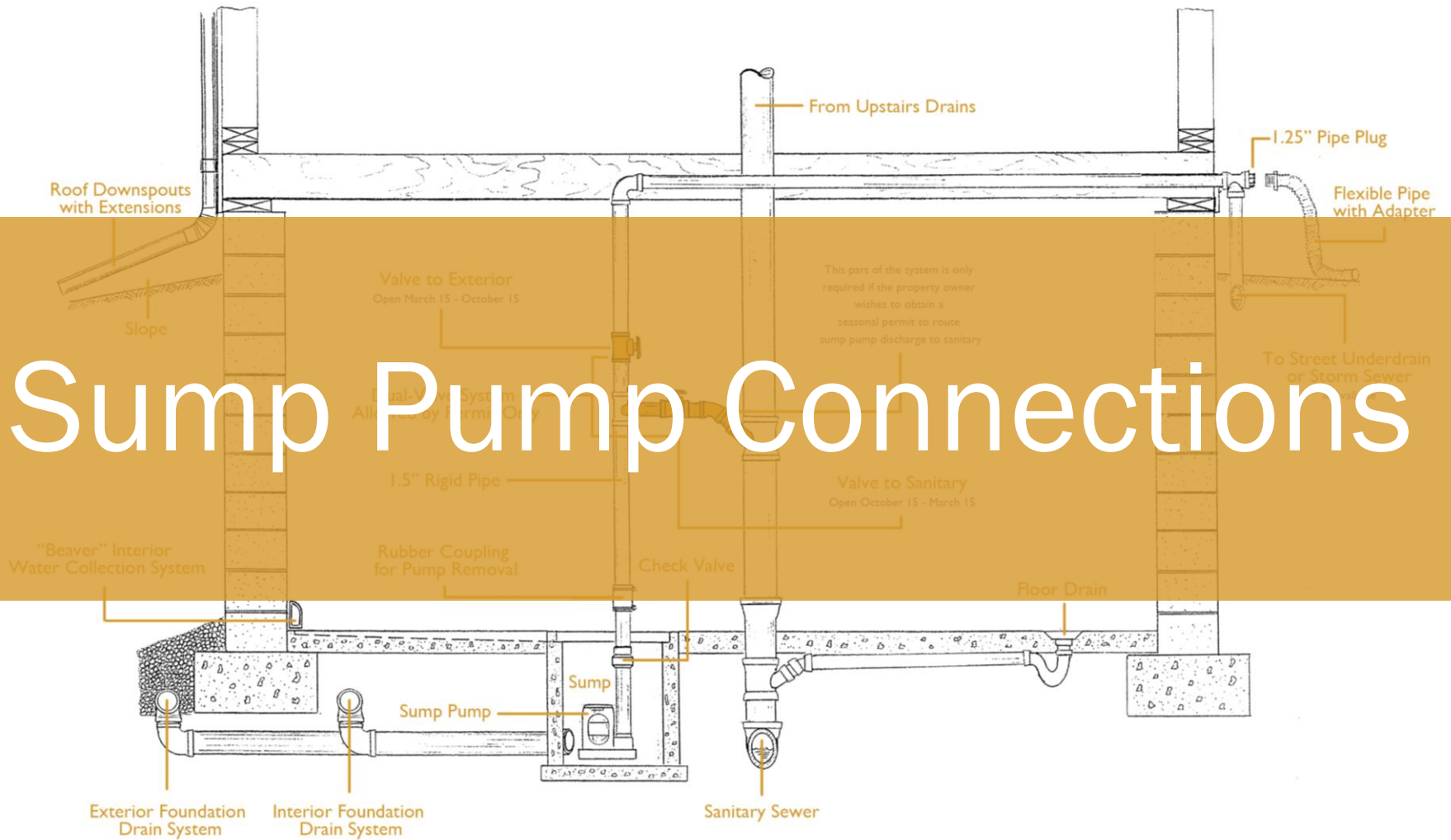
- The City will be mailing and/or placing notices on doors prior to the testing
  - Homeowners will be asked to fill the traps in all fixtures and floor drains by running water through them
  - If a trap is dry, smoke will enter the home; again, the smoke is non-toxic
  - If smoke testing indicates a potential private I/I source, the property owner will be notified along with the results of the property's sump pump inspection

# Previous Smoke Testing

- Anecdotally, previous smoke testing of 60 homes resulted in three properties exhibiting potential compromised sewer connections
- Actual results will vary due to soil types, soil moisture, soil temperature,
  - All of those conditions will vary by area of town
  - Those conditions will not produce a false results (smoke that isn't escaping the sanitary system would not be visible either way)



# Sump Pump Connections



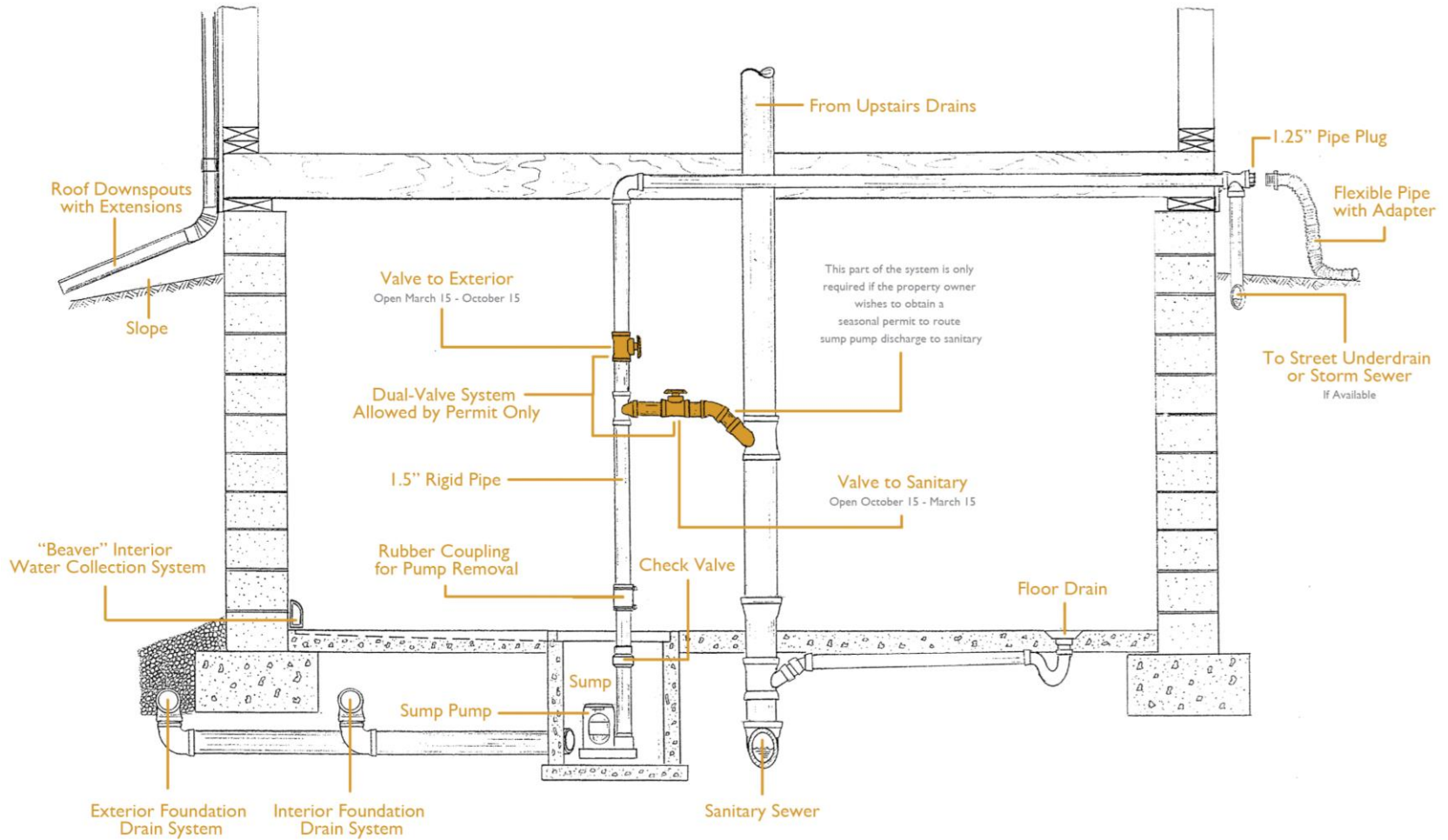
# Sump Pump Connections

- A permanent rigid-pipe connection to the exterior is required
- Roof drain, footing drain, sump pump discharge, or other clear-water source may not be connected to the sanitary system
- Leaking sanitary service pipes allow groundwater to enter the system and are therefore non-compliant

## Season Exceptions by permit only

- Property owners may apply for a seasonal permit to route sump pump discharges to the sanitary sewer
  - Allowed October 15<sup>th</sup> through March 15<sup>th</sup>
- Rigid pipe dual valve system is required

# Typical Sump Pump Installation Details



# Sump Pump Inspections





# Sump Pump Inspections

- The proposed ordinance (and existing ordinance) prohibit sump pump discharges to the sanitary sewer system
- Sump Pump Inspections will be completed over the next three winters, starting January 2020
- Property owners will have the opportunity to select an available timeslot for their inspection
  - At the property owner's option and cost, a licensed plumber may complete the initial inspection and submit documentation
- Non-compliant property owners will have 90-days to make corrections and submit certification

# Supplemental Service Inspection

- In some cases, the compliance of a property cannot be confirmed from an interior sump pump inspection
- If there is not a sump pump present, it is likely that the property's footing tile connects directly to the sanitary service
- In this case, the property owner will be responsible for having a licensed plumber camera the sanitary service

# Supplemental Service Inspection

- Licensed plumber shall certify that the property's sanitary service is compliant and submit documentation within 90-days of receiving notice that action is required
  - Correction may be required by plumber before they are able to certify

# Summary of Non-Compliance

- Sump pump discharge connected to sanitary service
  - Includes discharges to laundry tubs, floor drains, or other plumbing fixture
- Direct connection of footing drain or downspout to sanitary service
  - Identified through smoke testing and/or televising by licensed plumber
- Leaking sanitary service pipe
  - Identified through smoke testing and/or televising by licensed plumber

# Inspection Program



# Sump Pump Inspections - Scheduling

- Inspections will be completed over the next three winters, starting January 2020
- The City will be divided into zones and subzones
- Property Owners within this winter's inspection zones will receive a mailing with instructions for scheduling an appointment online
- Each zone will have a variety of timeslots to pick from, but timeslots will fill up



# Sump Pump Inspections - Scheduling

- Inspections must be scheduled within 30 days
  - The scheduling needs to be completed within 30 days; the actual inspection may be completed within any of the available timeslots for the property's zone
- As an alternative to scheduling an inspection, property owners may, at their expense, contract with a licensed plumber to have their sump pump inspected and the results of the inspection certified to the City within the same 30 days

# Sump Pump Inspections - Scheduling

- Each timeslot will be a two-hour block
- While it is anticipated that most inspections will take less than 15 minutes, some may take longer and it cannot be known ahead of time
- Inspections may be scheduled online
  - Property owners that schedule online will receive an email confirmation and a reminder email 48 hours prior to their inspection

# Property Owner Responsibilities

- An adult (18+ years old) representative of the property must be present for the duration of the inspection
- Dogs must be caged
- Sump pump must be accessible
- Property conditions must be safe for inspection personnel
- Failure to meet these responsibilities will be a violation of the Ordinance

# Inspection Results

- Representative of property owner will be made aware of the results of the sump pump inspection on-site
- If an email address is provided, a copy of the sump pump inspection report will be emailed
- Properties requiring further action will also be mailed a copy of the sump pump and/or smoke testing reports

# City Financing Assistance



# City Financing Program

- Property owners can petition to have the costs of any corrective work to be assessed to the property for 10 years at an interest rate of 3%
- Maximum of \$5,000
- Required Documentation
  - Certificate of Compliance
  - Receipts of payments made by property owner and/or invoices for amounts to be paid directly by City
- Costs of initial inspections by licensed plumber in lieu of City or City-contracted inspector not eligible



# Public Engagement

**DATES + DELIVERABLES**  
What you need to know.

**TIMELINE**

Month	Event
August	Smoke testing education
September	Smoke testing
October	October 1: City Council Meeting October 15: City Council Meeting October 16: First round of general education
November	November 1: First notice to zones to sign November 15: City Council Meeting November 16: First round of general education
December	November 1: Second notice to zones to sign
January	Inspections begin

**RE: SMOKE TESTING PUBLIC NOTICE**

Resident Name: \_\_\_\_\_

To All Residents and Occupants of the City of Redwood Falls

The city of Redwood Falls Utilities Department will be conducting smoke testing of the sanitary sewer system in upcoming months. This testing involves the opening and entering of manholes in the city of the testing will be to locate breaks and detect sources of where storm and other surface water enters the sanitary sewer system.

A special non-toxic smoke will be used in this testing. This smoke is safe for people and leaves no residuals or stains, and has no effect on plumbing, but not unpleasant, odor. Viability and odor are not a concern.

Because the plumbing appliances in your house system, some smoke may enter your home only if:

- Vents connected to your building's sewer system are not installed.
- Traps under sinks, tubs, basins, showers are not installed, or missing.
- Pipes, connections and seals of the wastewater system are damaged, defective, have plugs missing, or not installed.

All residents are advised that if traces of this smoke are detected in your home, it is an indication that gases and odors from the sewer system are entering your home. This is dangerous, as well as a health risk to the occupant. If you notice this, you may contact a member of the smoke testing crew.

The crew member will be able to help and correct the problem. Location, identification, and correction of the problem is the responsibility of the homeowner. Your cooperation will be appreciated.

The information gained from this testing will be used to help reduce the eventual cost to utility customers.

Should you have any questions on this matter, please contact the City of Redwood Falls at \_\_\_\_\_.

Sincerely,  
\_\_\_\_\_  
City of Redwood Falls

**HANDOUT/BROCHURE**  
Subtitle goes here.

**TITLE**  
Subtitle  
Body text... Um sum faccum sim facerrum quamet harum quiasimus, quaequam, occat. Os none lame ducipsum etur? Udae nienistubst liciti officid eligenda qui cultut et que ipsam nonet pro beatur aut quam fugias coneces eos volupti urepudaes albus volore in perspie ntiorem quae non commiat enis volorum dolo volupta quiduntis ideles.

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# Open House Tentatively Scheduled for December 5, 2019



Thank you!

