



August 21, 2018

Revised January 23, 2019

Applicant's Representative
Joe Mahoney
Opus Development Company, LLC.
10350 Bren Road West
Minnetonka, MN 55343

Planning Manager
Glen Markegard
City of Bloomington
1800 West Old Shakopee Rd
Bloomington, MN 55431

RE: 6701 78th Street W Utility Permit / 78th Street Area Sanitary Flow Planning

Applicant and City of Bloomington,

The subject property has received a city code amendment, conditional use permit, rezoning, and approval of development plans from the City of Bloomington on 6/4/18 and 7/23/18. The proposed use is a 116 bed residential care facility, and 95 unit senior living facility and a 100 participant day care. The site is served by City of Edina water and sanitary utilities. Prior the site was a health club and tennis center and has been vacant since 2006. Review conducted by Bloomington and the developers engineer indicate the existing site is credited with 7 SAC units, and would generate 108 SAC units of flow. This letter serves to document conditions of permit approval for utility connection.

Subsequently the Developer and City of Bloomington provided historical flow information and the Met Council Approved a revised SAC determination. Revised SAC Credits total 51 SAC units, and the final proposal will generate 137 SAC units of flow for a total increase of 86 SAC units.

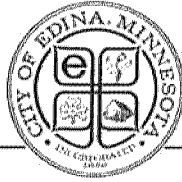
The City of Edina Sanitary and Water Utilities provide the core services of sanitation, public health and public safety through the removal of waste waters and the provision of waters for commercial and domestic use, and fire suppression at the least cost and risk while planning and building for service growth.

To confirm service availability, the developers engineer has requested a "Will Serve" letter from the City of Edina to confirm that system capacity is available and conditions of an expected utility connection permit. To confirm system capacity the City of Edina reviewed current system conditions described in the Comprehensive Plan and associated system reviews, and conducted a special review of the south trunk sanitary line. The attached report demonstrates limited capacity is available in the south trunk sewer. Edina is requesting close coordination of land use changes and potential future flow demand increase from the City of Bloomington on this line through the comprehensive planning process. Water capacity is available for the expected flow growth.

Intercommunity service in this area is covered under the attached Edina and Bloomington Water, Sanitary Sewer and Storm Sewer Agreement. The agreement describes conditions of intercommunity utility ownership, maintenance responsibility and connection permitting for the subject property. Both water and sewer mains serving the subject property are owned by the City of Edina and the application will be assessed fees and charges defined in Edina Code, Chapter 28, Article II. Stormwater charges defined in Chapter 28, Article III will not apply. Consistent with the preceding, the following conditions are required for utility connection for the subject property.

ENGINEERING DEPARTMENT

7450 Metro Boulevard • Edina, Minnesota 55439
www.EdinaMN.gov • 952-826-0371 • Fax 952-826-0392



1. Payment of Edina connection charges: An estimate of charges includes \$231,269.80 for Water and \$115,637.90 for Sewer. MCES SAC charges can be paid at building permit in Bloomington or through Edina, upon arrangement. Charges based on the revised net (137-51=) 86 net SAC units and current fee schedule are
 - Water @ \$2450/ unit = \$210,700
 - Sewer @ \$1500/ unit = \$129,000
2. A water conservation plan signed by a professional engineer must be provided, and structural conservation measures must be implemented to reduce indoor water use to mitigate resulting sewer demand growth and its associated risks.

Consistent with the scope of the project described above and the listed conditions, the City of Edina has capacity available to serve the proposed development for Sanitary and Water Utilities. Please feel free to contact me to discuss the topic.

Sincerely,

A handwritten signature in black ink, appearing to read "Ross Bintner".

Ross Bintner P.E.
Engineering Services Manager

CC: Chad Millner PE – City of Edina Director of Engineering
Scott Anderson – City of Bloomington Utilities Superintendent

Encl

Date of Determination: 01/16/19

Determination Expiration: 01/16/21

Please see the determination below.

Project Name: Bloomington Senior Housing
Project Address: 6701 West 78th Street
Suite #/Campus: N/A
City Name: Bloomington
Applicant: Huldah Gronvall, Opus Group

Special Notes: The original letter for this determination was dated September 10, 2018, letter reference 180910B8. The City will be charged SAC as determined below, instead of the units previously assigned. The redetermination is based on new information regarding the demo credit.

Charge Calculation:

Daycare: 10,303 sq. ft. @ 900 sq. ft. / SAC = 11.45
Office: 1447 sq. ft. @ 2400 sq. ft. / SAC = 0.60
Independent Living/Assisted Living/55+ Apartments (with washers in units):
4 - Studio Unit(s) x 1 resident / unit = 4.00
95 - 1-Bedroom Unit(s) x 1.5 residents / unit = 142.50
65 - 2-Bedroom Unit(s) x 2 residents / unit = 130.00
Total Residents: 276.50 residents @ 2.5 residents / SAC = 110.60
Nursing/Memory Care: 20 residents @ 2 residents / SAC = 10.00
Guest Suite: 2 unit(s) x 80% @ 1 unit / SAC = 1.60
Parking Garage: 54.00 fixture units @ 17 fixture units / SAC = 3.18

Total Charge: 137.43 or 137.00**Credit Calculation:**

Demolition 12/06 # 0610956
Fitness: 81,786 gross square feet @ 1600 sq. ft. / SAC = 51.12 or 51.00

Total Credit: 51.00**Net SAC:** 86.00 – or – **86 SAC Due**

The business information was provided to MCES by the applicant at this time. It is the City's responsibility to substantiate the business use and size at the time of the final inspection. If there is a change in use or size, a redetermination will need to be made. If you have any questions email me at: toni.janzig@metc.state.mn.us.

Thank you,

Toni Janzig

SAC Technician

Please visit our SAC website by going to:

<http://www.metrocouncil.org/SACprogram>



July 24, 2018

Opus Development Company, LLC
ATTN: Joe Mahoney
10350 Bren Road West
Minnetonka, MN 55343

RE: Case # PL201800191 – Rezoning from C-4(FH) to C-4(PD)(FH), PDP and FDP for a 186-unit residential care and senior living facility w/100 person day care, and a CUP for a residential care facility
6701 West 78th Street

Mr. Mahoney:

At its regular meeting of July 23, 2018, the City Council approved the Rezoning of 6701 West 78th Street from C-4(FH) to C-4(PD)(FH), a Conditional Use Permit for a residential care facility in the C-4 zoning district, and Preliminary and Final Development Plans for a four-story, 186-unit residential care and senior living facility with a 100-person day care (Case #PL201800191).

The approval is subject to conditions that must be satisfied prior to the issuance of a Grading, Footing, Foundation or Building Permit. While the conditions list includes selected City Code requirements of particular interest, the development must comply with all applicable local, state and federal codes.

1. Prior to Permit A Site Development Agreement, including all conditions of approval, must be executed by the applicant and the City and must be properly recorded by the applicant with proof of recording provided to the Director of Community Development.
2. Prior to Permit Access, circulation and parking plans must be approved by the City Engineer. The applicant must provide the Code-required quantity of parking or enter into a proof of parking agreement.
3. Prior to Permit A Nine Mile Creek Watershed District permit must be obtained and a copy submitted to the Engineering Division.
4. Prior to Permit Street modification agreement must be executed by the developer and the applicant and proof of filing be provided to the Manager of Building and Inspection.
5. Prior to Permit Bicycle parking spaces must be provided and located throughout the site as approved by the City Engineer.
6. Prior to Permit An erosion control surety must be provided (16.08(b)).
7. Prior to Permit Landscape plan must be revised to be Code Compliant, must be approved

- by the Planning Manager and landscape surety must be filed (Sec 19.52).
8. Prior to Permit Parking lot and site security lighting plans must be revised to satisfy the requirements of Section 21.301.07 of the City Code.
 9. Prior to Permit Building must be provided with an automatic fire sprinkler system as approved by the Fire Marshal (MN Bldg. Code Sec. 903, MN Rules Chapter 1306; MN State Fire Code Sec. 903).
 10. Prior to Permit Utility plan showing location of existing and proposed water main and fire hydrant locations must be approved by the Fire Marshal and Utilities Engineer (City Code Sec. 6.20, Minnesota State Fire Code Sec. 508).
 11. Prior to Permit Food service plans must be approved by the Environmental Health Division (City Code Sec. 14.360).
 12. Prior to Permit Revise sign plans to be Code compliant except for the deviation granted to reduce the freestanding sign setback along W. 78th St. from 20 feet from planned widened right of way to ten feet. Signs must be in compliance with the requirements of Chapter 19, Article X of the City Code and Uniform Design Plan.
 13. Prior to Permit Exterior building materials must be approved by the Planning Manager (Sec. 19.63.08).
 14. Prior to Permit Tier 2 Transportation Demand Management plan must be submitted (Sec. 21.301.09(b)(2)).
 15. Prior to Permit A National Pollutant Discharge Elimination System (NPDES) construction site permit and a Storm Water Pollution Prevention Plan (SWPPP) must be provided if greater than one acre is disturbed.
 16. Prior to Permit Storm Water Management Plan must be provided that demonstrates compliance with the City's Comprehensive Surface Water Management Plan. A maintenance plan must be signed by the property owners and must be filed of record with Hennepin County.
 17. Prior to Permit A Minnesota Pollution Control Agency (MPCA) Sanitary Sewer Extension or Modification Permit must be obtained or notification from the MPCA that this permit is not required must be submitted to the City.
 18. Prior to Permit A Minnesota Department of Health (MDH) watermain review and approval must be obtained or notification from MDH that this permit is not required must be submitted to the City.
 19. Prior to Permit Shore Area Permit must be obtained prior to any grading or development activity in the shore area of Nine Mile Creek (Sec. 19.87.04).
 20. Prior to Permit An odor control system meeting the approval of the Environmental Health Division must be provided.
 21. Prior to Permit An external grease interceptor must be provided if the proposed tenant will have food preparation and service that will produce fats, oils, grease or wax in excess of 100 mg/L. The external grease interceptor design must be approved by the Utilities Engineer. A grease interceptor maintenance agreement must be filed with the Utilities Division, if an external grease interceptor is installed.
 22. Prior to Permit A building permit for all required changes to accommodate the proposed use be obtained.

23. Prior to Permit Grading, Drainage, Utility and Erosion Control plans must be approved by the City Engineer.
24. Prior to C/O The developer must submit electronic utility as-builts to the Public Works Department prior to the issuance of the Certificate of Occupancy.
25. Prior to C/O A 10-foot sidewalk/bikeway easement must be provided by document along West 78th Street as approved by the City Engineer and proof of filing must be provided to the Manager of Building and Inspection.
26. Prior to C/O Sidewalk must be installed along West 78th Street behind the planned widened right-of-way at the developer's expense and private sidewalks must comply with City Code (Sections 21.301.04(b)(1) and (2)).
27. Prior to C/O Fire lanes must be posted as approved by the Fire Marshal (MN State Fire Code Sec. 503.3).
28. Prior to C/O Prior to occupancy, life safety requirements must be reviewed and approved by the Fire Marshal.
29. Prior to C/O A building security system for the residential care facility must be approved by the Bloomington Police Department (Sec. 21.302.23(d)(3)(E)).
30. Prior to C/O Buildings must meet the requirements of the Minnesota State Fire Code Appendix L (Emergency Responder Radio Coverage) adopted through City Ordinance to have approved radio coverage for emergency responders based upon the existing coverage levels of the public safety communication systems.
31. Ongoing All pickup and drop-off must occur on site and off public streets.
32. Ongoing Three foot high parking lot screening must be provided along W. 78th St. as approved by the Planning Manager (Sec. 19.52).
33. Ongoing Poured-in-place concrete curbs must be provided on the perimeter of parking lots and traffic islands (Sec 19.64).
34. Ongoing All trash and recyclable materials must be stored inside the principal building (Sec. 19.51).
35. Ongoing All rooftop equipment must be fully screened (Sec. 19.52.01).
36. Ongoing A uniform sign design must be submitted for approval by the Planning Manager (Section 19.109).
37. Ongoing Compliance with MN Rules Chapter 7030 Noise Pollution Control is required.
38. Ongoing The nonresidential space proposed as a day care must remain in nonresidential use.
39. Ongoing Alterations to utilities must be at the developer's expense.

Should you have any questions regarding this action, please contact Nick Johnson, Planner, at (952) 563-8925 or nmjohnson@BloomingtonMN.gov.

Sincerely,



Glen Markegard, AICP
Planning Manager

A G R E E M E N T

EDINA AND BLOOMINGTON
WATER, SANITARY SEWER AND STORM SEWER

This Agreement made and entered into the day and year set forth hereafter by and between the Village of Edina, a municipal corporation, and the City of Bloomington, a municipal corporation,

W I T N E S S E T H

WHEREAS, certain lands located north of I-494 and west of the Minneapolis Northfield and Southern Railway, Hennepin County, Minnesota, are in the City of Bloomington immediately South of the South boundary of the Village of Edina; and

WHEREAS, it would be mutually advantageous to the owners of said lands, and to the parties hereto, if said lands could be served with water, and sanitary sewer facilities through extensions from Edina facilities; and

WHEREAS, an agreement dated 13 August 1962, now exists whereby Bloomington serves certain lands in Edina in a similar manner to that described hereinafter;

NOW, THEREFORE, it is mutually agreed as follows:

1. That Edina grants to Bloomington, the right to serve said lands with water and sanitary sewer to be connected to facilities to be installed and situate in Edina and Edina agrees to provide water and sewer service to such lands as shall be so connected.
2. That all additional facilities in Bloomington to serve said lands, including water and sanitary sewer, will be constructed under the supervision of Bloomington at no cost to Edina; that the plans and specifications shall first be submitted to Edina for approval and must meet the standards of Edina.
3. That, it may be advantageous for certain storm sewers from Edina to outfall at Nine Mile Creek in Bloomington. Such storm sewers may be constructed by Edina through the above-described property located in Bloomington - under such conditions as are mutually agreed upon.

4. It is understood and agreed that all applications for utility services, including sewer and water, in said area, will be made to the proper Department in Edina. The parties agree that connections shall be made in accordance with regulations and ordinances of Edina, including volume limitation where applicable. Edina shall supply all water meters to be used in accordance with its existing policy and ordinances.

5. Edina will read and maintain all water meters and will bill all customers for services. Bloomington agrees to cooperate with Edina in the collection of the charges for such services. In accordance with the Village Code of the Village of Edina, the rates for services shall be fair and reasonable and shall, in no event, exceed 150% of the rates charged for similar service furnished in Edina.

6. Bloomington shall maintain all water and sanitary sewer utilities which are constructed in accordance with this Agreement and which are located in Bloomington. Edina shall reimburse Bloomington for maintenance costs for such facilities and shall pay the actual costs thereof except that such reimbursement shall not exceed 50% of the total billings for the calendar year. Such costs incurred by Bloomington in any year in excess of said 50%, and therefore not reimbursed by Edina, may be added to the costs incurred by Bloomington in any subsequent year or years and reimbursed up to said 50% limitation. Bloomington agrees to take such action as may be necessary, upon notice by Edina, to correct water leakage or infiltration in sanitary sewers. In the event such action is not taken, Edina may terminate service or, in the alternative, may make such repairs and may deduct the cost thereof from amounts to be paid in the future to Bloomington for maintenance of this system.

For the purpose of this Agreement, reasonable limits are defined as follows:

- a. Sewer infiltration - not to exceed ten gallons per hour per one hundred lineal foot of sewer main.

- b. Loss of water - not to exceed 10% of unaccounted for water as compared to metered flow.

7. That, whereas, the Village of Edina has entered into a contract with the City of Minneapolis relative to the interconnection of sanitary sewers in Edina with those of the City of Minneapolis and, Bloomington agrees to comply with all provisions of said Agreements relative to the use and maintenance of the sanitary sewer system in the same manner and to the same extent as Edina is bound to comply and agrees to conform with, abide by and enforce all laws, agreements and rules and regulations which Edina is bound by pursuant to the provisions of said Agreements.

8. It is expressly understood and agreed that Edina shall not be liable, except for a failure to exercise ordinary care, to Bloomington or to any person, firm, corporation or other entity for damage claimed as a result of the backing up of sewers in Bloomington or for reasonable interruptions in utility service provided however that Edina shall not discriminate against Bloomington in the event of any such interruption.

9. Bloomington agrees to indemnify and save Edina harmless from any and all claims or demands for damages arising out of the use, installation, maintenance and repair of such facilities located within the City of Bloomington, and will assume the defense of any actions arising therefrom in which Edina is made a party defendant.

IN WITNESS WHEREOF, the parties have hereunto set their hands and seals this 24th day of July, 1967.

CITY OF BLOOMINGTON

Wido A. Hall
City Clerk

Ed G. Hall
Mayor

Ed G. Hall
Manager

VILLAGE OF EDINA

Margaret E. Lallberg
Village Clerk

William C. Bickel
Mayor

William C. Bickel
Manager

Subscribed and sworn to before me this 20 day of November, 1967

Lois L. Strupp
Notary Public

LOIS L. STRUPP
Notary Public, Hennepin County, Minn.
My Commission Expires Sept. 2, 1970.



Village of Edina

4801 WEST FIFTIETH STREET • EDINA, MINNESOTA 55424

927-8861

24 July 1967

RESOLUTION APPROVING UTILITY INTERCONNECTION WITH BLOOMINGTON

BE IT RESOLVED by the Village Council of the Village of Edina that the Mayor and Village Manager are hereby authorized to enter into an agreement with the City of Bloomington to permit Bloomington to connect with the Village of Edina Sanitary Sewer and Watermain systems in the area west of the M.N. & S. Railroad and north of Interstate Highway 494.

(signed) ARTHUR C. BREDESEN, JR.
Mayor

ATTEST:

(signed) FLORENCE B. HALLBERG
Village Clerk

STATE OF MINNESOTA)
COUNTY OF HENNEPIN) SS
VILLAGE OF EDINA)

CERTIFICATE OF VILLAGE CLERK

I, the undersigned duly appointed and acting Village Clerk for the Village of Edina, County of Hennepin, Minnesota, do hereby certify that I have compared the attached and foregoing Resolution and that the same is a true and correct copy of a Resolution duly adopted by the Village of Edina Council at its Regular Meeting held Monday, August 7, 1967, and as recorded in the Minutes of said Regular Meeting.

WITNESS my hand and seal of said Village this twenty-eighth day of August, 1967.

Florence B. Hallberg
Village Clerk
Village of Edina

*Bill
Do you have
a copy of this
Resolution*



Technical Memorandum

To: Ross Bintner– City of Edina
From: Michael McKinney, Brandon Barnes, and Sarah Stratton – Barr Engineering Co.
Subject: Edina South Sanitary Sewer Capacity Evaluation
Date: August 17, 2018
Project: 23271653.00
c: Brian LeMon – Barr Engineering Co.

The purpose of this memo is to provide the City of Edina (City) with documentation of the results of Barr's analysis of the impact of planned redevelopment in the southwest portion of the City on its sanitary sewer system. Redevelopment within the city and portions of the City of Bloomington (Bloomington) which drain to Edina sanitary sewer are shown in Figure 1. The City is interested in knowing if existing infrastructure is capable of handling the projected increase in flows.

With redevelopment comes the need to evaluate and assess the capability of the existing sanitary sewer system to meet changing loads. This includes pipes near the redeveloping properties as well as those downstream, all the way to the municipal boundary. The City maintains their municipal XP-SWMM sanitary sewer model to reflect redevelopment within the City to evaluate if, when, and where modifications to the sanitary sewer system are required to meet current and future demands.

The City identified several areas in Edina and Bloomington that are redeveloping. Bloomington provided anticipated Sewer Availability Charge (SAC) values for those redevelopment parcels located in Bloomington but served by Edina sanitary sewer infrastructure (Figure 1). The City provided information relative to those redeveloping parcels located within Edina.

Barr estimated the magnitude of future inflows to the sanitary system based on the building areas and types of redevelopment provided by the City and Bloomington. Estimated inflows used to update the sanitary sewer model reflect existing inflow and planned development / redevelopment within Edina and the contributing portions of Bloomington.

This memorandum provides a summary of information provided by the cities, methodology used to update the model, and resulting available system capacity. The memorandum is divided into the following sections:

- Demand Planning
- Scenario Modeling Results
- Conclusions and Recommendations



To: Ross Bintner– City of Edina
From: Michael McKinney, Brandon Barnes, and Sarah Stratton – Barr Engineering Co.
Subject: Edina South Sanitary Sewer Capacity Evaluation
Date: August 17, 2018
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1.0 Demand Planning

For the purposes of demand planning, it was assumed that sewage inflows from all areas other than those identified as redeveloping in Figure 1 would remain at existing conditions. (i.e., only redevelopment in the four areas highlighted in Figure 1 is considered in this analysis). Barr evaluated available capacity for three levels of development density: low-, medium-, and high-density redevelopment. To evaluate the impact of redevelopment, Barr developed and evaluated model inflows for the four model scenarios shown below:

1. **Scenario 1 – Existing Conditions:** Edina XP-SWMM existing conditions model with no updated inflow data (Barr, 2017).
2. **Scenario 2 – Low-Density Redevelopment:** Scenario 1 with estimated inflow from anticipated redevelopment (low-density redevelopment).
3. **Scenario 3 – Medium-Density Redevelopment:** Scenario 1 with estimated inflow from anticipated redevelopment (medium-density redevelopment).
4. **Scenario 4 – High-Density Redevelopment:** Scenario 1 with estimated inflow from anticipated redevelopment (high-density redevelopment).

The following subsections document existing inflow and demand planning information provided by the cities of Edina and Bloomington and describe how data was incorporated into the XP-SWMM model.

1.1 Demand Planning Information from the City of Edina

The City identified three areas expected to redevelop within its city limits as shown in Figure 1: Lincoln Apartments, Edina High School, and the commercial and retail area southeast of the intersection of Cahill Road and West 70th Street (Cahill / 70th). Note that the fourth area identified on Figure 1 is in Bloomington and is addressed later in this subsection. The City also provided inflow estimates for the high-density redevelopment scenario for each area as summarized in Table 1. Specifically, the City provided the estimated high-density Sewer Availability Charge (SAC) for Lincoln Apartments and Edina High School, and an estimate of the living units per acre for parcels in the Cahill / 70th redevelopment area. Based on input from the City, Barr developed the low-density and medium-density inflow estimates outlined in Table 1. Based on the assumptions outlined in Table 1, final inflow values assigned to each redevelopment parcel for low-, medium-, and high-density redevelopment scenarios are summarized in Table 3. Redevelopment scenarios evaluated in this memorandum only consider redevelopment within the four areas highlighted in Figure 1. Other areas within the City are redeveloping and will ultimately further impact some of the pipe and lift station capacities in the MCES-129 sewershed. A combined analysis of the impacts of the redevelopment considered here occurring along with other redevelopment is not within the scope of this analysis but should be considered as those areas redevelop.

To: Ross Bintner– City of Edina
From: Michael McKinney, Brandon Barnes, and Sarah Stratton – Barr Engineering Co.
Subject: Edina South Sanitary Sewer Capacity Evaluation
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Table 1 Redevelopment inflow assumptions for Edina redevelopment areas.

Edina Redevelopment Area	Parcel(s)	Redevelopment Assumption		
		Low-Density	Medium-Density	High-Density
Lincoln Apartments ¹	053-3111721320002	107 SAC	160.5 SAC	214 SAC
Edina High School ¹	053-0511621230001	34 SAC	51 SAC	68 SAC
Cahill/70th ²	Multiple Parcels (18)	30 Units / Acre	50 Units / Acre	60 Units / Acre

- 1 High-Density average daily SAC units (SAC unit = 274 gallons per day) were provided by the City. Medium-density estimates were calculated as 75% of the high-density value, and low-density estimates were calculated as 50% of the high density value.
- 2 The low-, medium, and high-density values of 30, 50, and 60 units / acre (where "units" are living units and "acre" is the area of the parcel) were provided by the City for parcels in the Cahill / 70th redevelopment area. Final daily inflow values for each parcel were calculated as follows: (parcel area, acre) x (units / acre) x (2.5 residents per unit) x (75 gpd / resident). These assumptions are consistent with daily usage assumptions outlined in the Southeast Edina Sanitary Sewer study (Barr, 2017).

1.2 Sewer Availability Charge (SAC) values from the City of Bloomington

Bloomington identified and provided Sewer Availability Charge (SAC) values for existing parcels along West 78th Street that are connected to Edina sanitary sewer infrastructure. For the majority of these parcels, the City of Edina had previously provided existing metered inflow data which was incorporated into 2016-2017 model development (Barr, 2017). One parcel included in the data submittal had not been developed prior to the monitoring period evaluated in the previous City of Edina modeling effort, but does now contribute flow to Edina. For this reason, the SAC value for this property provided by Bloomington was added to the existing conditions model (Scenario 1) as outlined in Table 3.

1.3 Demand Planning Information from the City of Bloomington

Bloomington identified three parcels where redevelopment is expected along Creek Ridge Circle and West 78th Street (Creek Ridge / 78th) that will contribute increased flow and are connected to Edina sanitary sewer infrastructure (Figure 1). Bloomington provided high-density redevelopment values for each. Based on input from the City, Barr developed the low-density and medium-density inflow estimates in Table 2. Final inflow values assigned to each redevelopment parcel for low-, medium-, and high-density redevelopment scenarios are summarized in Table 3.

Table 2 Redevelopment inflow assumptions for Bloomington redevelopment areas.

Bloomington Redevelopment Area	Parcel	Redevelopment Assumption		
		Low-Density	Medium-Density	High-Density
Creek Ridge / 78th ¹	053-1711621210006	1.9 SAC	2.9 SAC	3.8 SAC
	053-1711621210004	45.5 SAC	68.2 SAC	90.9 SAC
	053-1711621210004	8.6 SAC	12.8 SAC	17.1 SAC

- 1 High-Density average daily SAC units (SAC unit = 274 gallons per day) were provided by the City of Bloomington. Medium-density estimates were calculated as 75% of the high-density value, and low-density estimates were calculated as 50% of the high density value.

To: Ross Bintner– City of Edina
From: Michael McKinney, Brandon Barnes, and Sarah Stratton – Barr Engineering Co.
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1.4 Final Inflows for Scenario Models

Various scenarios for existing and proposed inflow values assigned to parcels in the redevelopment areas are summarized in Table 3. Daily inflow values shown in Table 3 were used to evaluate the impact on the sanitary system.

To: Ross Blinnier- City of Edina
 From: Michael McKinney, Brandon Garner, and Sarah Stallon - Barr Engineering Co.
 Subject: Edina South Sanitary Sewer Capacity Evaluation
 Date: August 17, 2018
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Table 3 Final Redevelopment Inflow Values.

Municipality	Development Area	Parcel ID	Address	Manhole ID	Existing Address Inflow (gpd)	Redevelopment estimate flow Rate (gpd) ^{1,2}			Final Flow Rate for Model (gpd)			
						Low-Density	Medium-Density	High-Density	Scenario 1: Existing Conditions	Scenario 2: Low-Density	Scenario 3: Medium-Density	Scenario 4: High-Density
Edina	Lincoln Apartments	053-3111721320002	5901 STATE HWY NO 169	MH-2274	0	29,318	43,977	58,636	0	29,318	43,977	58,636
		053-0511621220001	6754 VALLEY VIEW RD	MH-2474	7,935	5,316	13,974	18,632	7,935	17,251	21,909	26,567
	Cahill/70th	053-0811621110005	5415 70TH ST W	MH-1201	1,555	4,453	7,422	8,907	1,555	4,453	7,422	8,907
		053-0811621110010	7017 AMUNDSON AVE	MH-1201	935	7,275	12,176	16,555	935	7,275	12,176	16,555
		053-0811621110019	7070 AMUNDSON AVE	MH-1202	956	5,287	8,811	10,573	956	5,287	8,811	10,573
		053-0811621110020	7100 AMUNDSON AVE	MH-1203	1,016	6,381	10,635	12,761	1,016	6,381	10,635	12,761
		053-0811621110024	7091 CAHILL RD	MH-1180	779	4,978	8,297	9,957	779	4,978	8,297	9,957
		053-0511621440001	5432 70TH ST W	MH-3440	3,618	3,351	5,585	6,702	3,618	3,351	5,585	6,702
		053-0511621440002	24 ADDRESS UNASSIGNED	MH-3440	0	724	1,206	1,448	0	724	1,206	1,448
		053-0511621440038	24 ADDRESS UNASSIGNED	MH-3443	0	2,097	3,495	4,194	0	2,097	3,495	4,194
		053-0511621440050	5420 70TH ST W	MH-3442	15	1,962	3,269	3,923	15	1,962	3,269	3,923
		053-0811621110093	24 ADDRESS UNASSIGNED	MH-1195	0	1,292	2,153	2,583	0	1,292	2,153	2,583
		053-0811621110094	5416 70TH ST W	MH-3442	1,322	3,863	6,438	7,725	1,322	3,863	6,438	7,725
		053-0811621110098	24 ADDRESS UNASSIGNED	MH-1201	0	8,751	14,584	17,501	0	8,751	14,584	17,501
		053-0811621110099	7075 AMUNDSON AVE	MH-1201	29,052	5,702	9,503	11,404	29,052	5,702	9,503	11,404
		053-0811621110017	24 ADDRESS UNASSIGNED	MH-3443	0	327	879	1,055	0	327	879	1,055
		053-0811621110018	5400 70TH ST W	MH-3443	2,796	8,007	13,346	16,015	2,796	8,007	13,346	16,015
		053-0811621110021	7079 AMUNDSON AVE	MH-1202	0	1,084	1,805	2,168	0	1,084	1,805	2,168
		053-0811621110022	7101 AMUNDSON AVE	MH-1195	1,127	20,523	34,204	41,045	1,127	20,523	34,204	41,045
		053-0811621110023	7125 CAHILL RD	MH-1195	0	22,382	37,303	44,764	0	22,382	37,303	44,764
		053-1711621210006	7807 CREEKRIDGE CIR	MH-3032	4,058 ³	521	781	1,041	4,658	5,179	5,439	5,699
	Creek Ridge/78th	053-1711621210004	6701 78TH ST W	MH-3033	0	12,453	18,680	24,907	0	12,453	18,680	24,907
		053-1711621210004	6701 78TH ST W	MH-3033	0	2,343	3,514	4,685	0	2,343	3,514	4,685

¹ Redevelopment flow rate estimates are the estimated additional inflow to the parcel and do not also include the existing flow rate.

² Final flow rate for model includes existing inflow for all development areas with the exception of Cahill / 70th. For Cahill / 70th, redevelopment inflows replace existing inflows.

³ Existing flow rate from this parcel did not exist during 2016-2017 modeling (Barr, 2017) because this parcel had not yet been developed. For this reason, the Bloomington SAC was included to represent existing flow from this development.

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2.0 Scenario Modeling Results

Four simulations were completed based on the scenarios discussed in Section 1.0. Inflows to the model were updated for each scenario based on the data shown in Table 3. The resulting impacts to the City sanitary system were evaluated for each of the redevelopment scenarios including those with updated inflows from Bloomington.

Remaining available pipe capacity (%) for the five scenarios are shown in Figure 2 through Figure 5. Peak flow rates for each scenario were calculated by peaking the average daily flow rate by the appropriate MCES peaking factor (Metropolitan Council, 2016), corrected to not peak (a) the portion of average daily flow attributed to inflow and infiltration (I/I), and (b) average outflow from two FilmTec facilities (located at 5400 Dewey Hill Road and 7200 Ohms Lane). Flow rates from the FilmTec facilities discharge at a near constant outflow rate and these outflow rates would not be impacted by a peak I/I event. For this reason, flow rates from the facilities were not peaked.

The remaining available capacity (%) was then calculated by comparing the corrected peak flow rate to the full flow rate of the pipe calculated using the Manning Equation. The remaining SAC units available in each pipe segment are shown in Figure 6 through Figure 9.

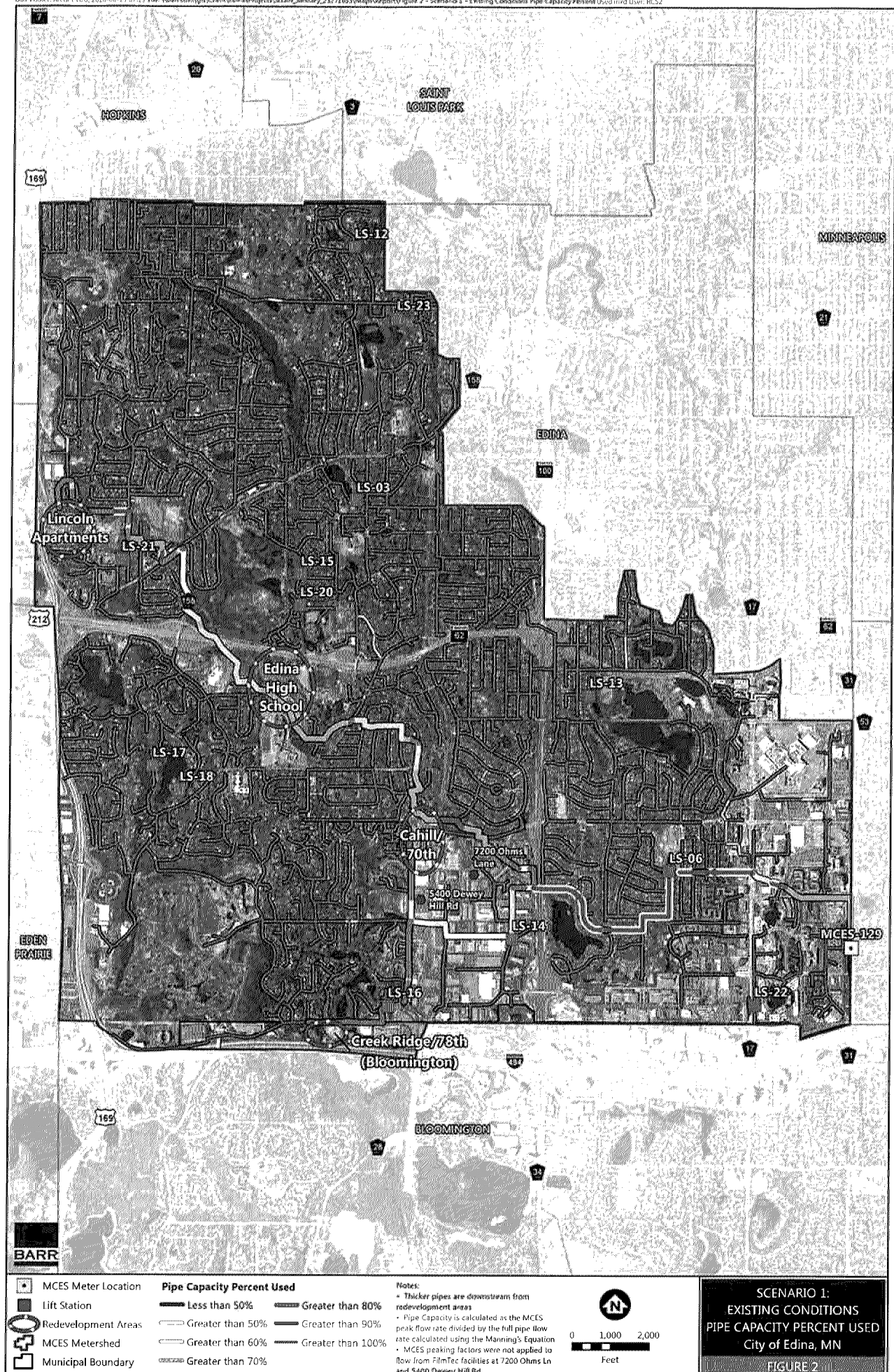
Table 4 shows results from the existing condition model simulation and each of the three redevelopment inflow simulations, and provides a summary of pipe capacity for each scenario.

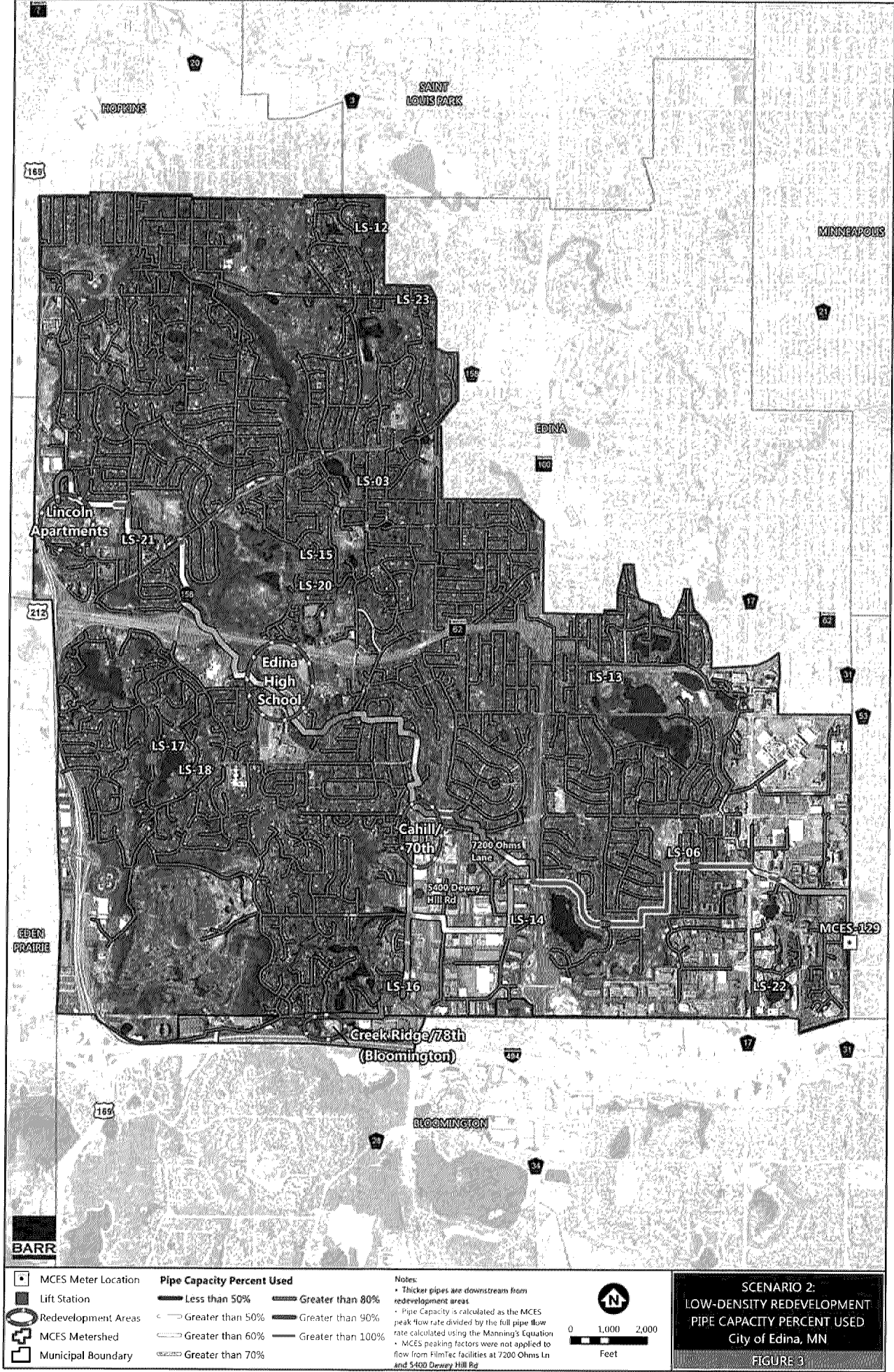
Table 4 Edina South Sanitary Sewer Capacity Evaluation Summary.

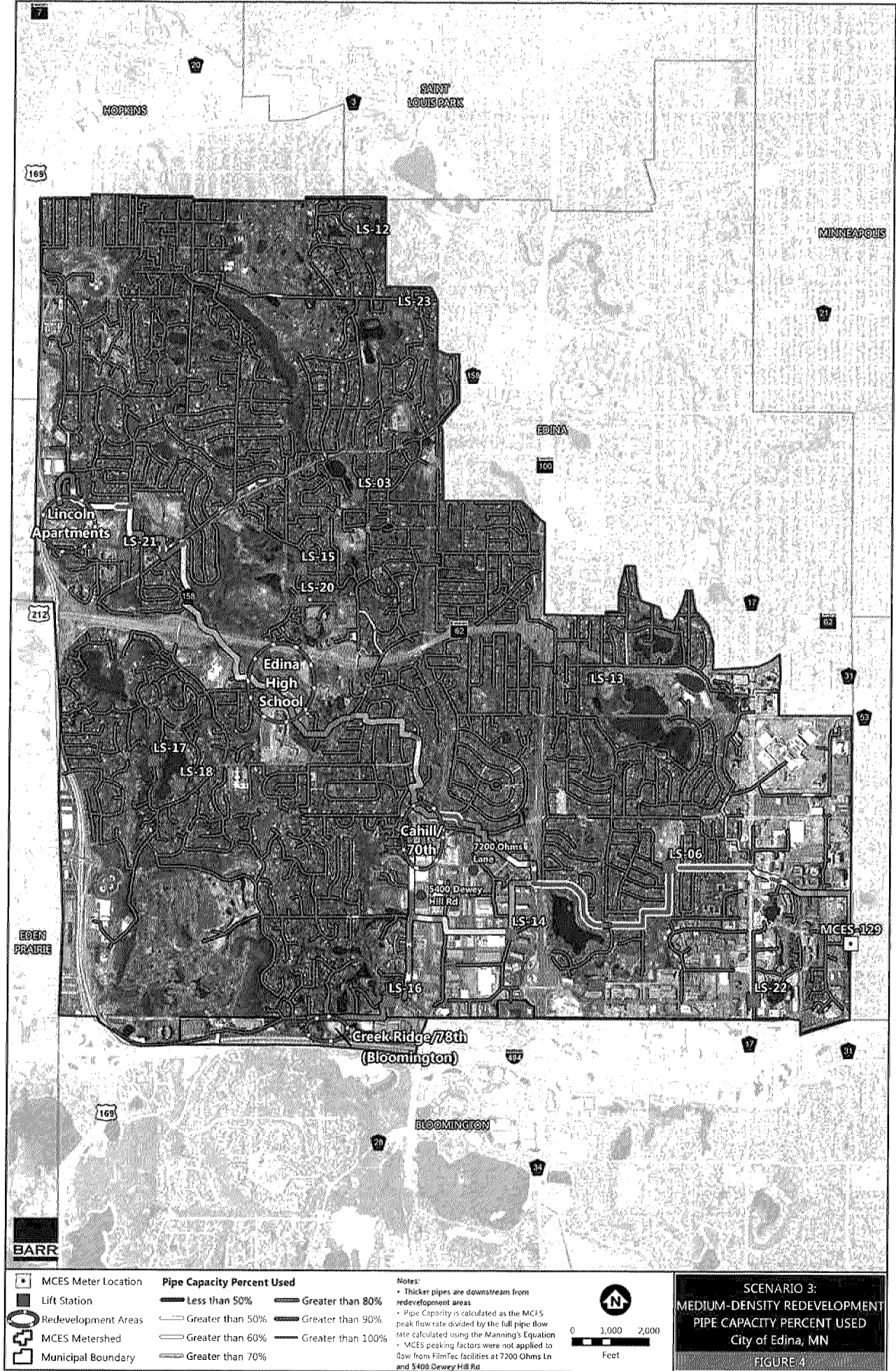
Scenario	Redevelopment Inflow ¹ (SAC)	Percentage (Number) of Pipes Greater Than... ²					
		50% Capacity	60% Capacity	70% Capacity	80% Capacity	90% Capacity	100% Capacity
Scenario 1: Existing Conditions	--	5.8% (212)	4.5% (163)	3.2% (118)	1.8% (65)	1.5% (55)	1.2% (43)
Scenario 2: Low-Density Redevelopment	436	6.1% (223)	4.9% (179)	3.9% (143)	2.5% (91)	1.6% (58)	1.3% (49)
Scenario 3: Medium-Density Redevelopment	799	6.3% (228)	5.3% (192)	4.1% (148)	2.9% (107)	1.7% (63)	1.4% (51)
Scenario 4: High-Density Redevelopment	1,029	6.3% (229)	5.4% (198)	4.4% (160)	3.2% (118)	2.1% (76)	1.6% (58)

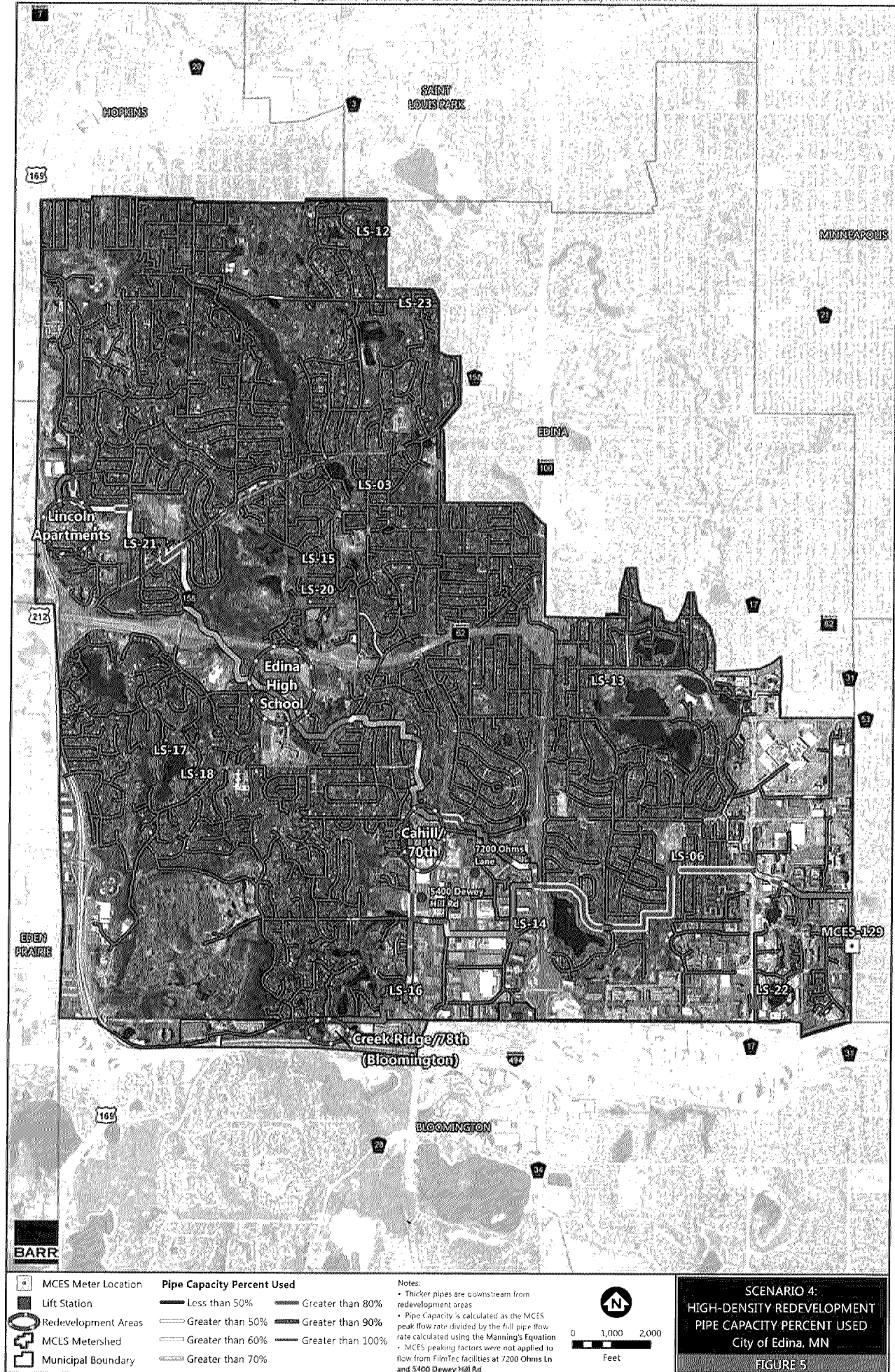
¹ Total redevelopment inflow added to the existing conditions model (Scenario 1).

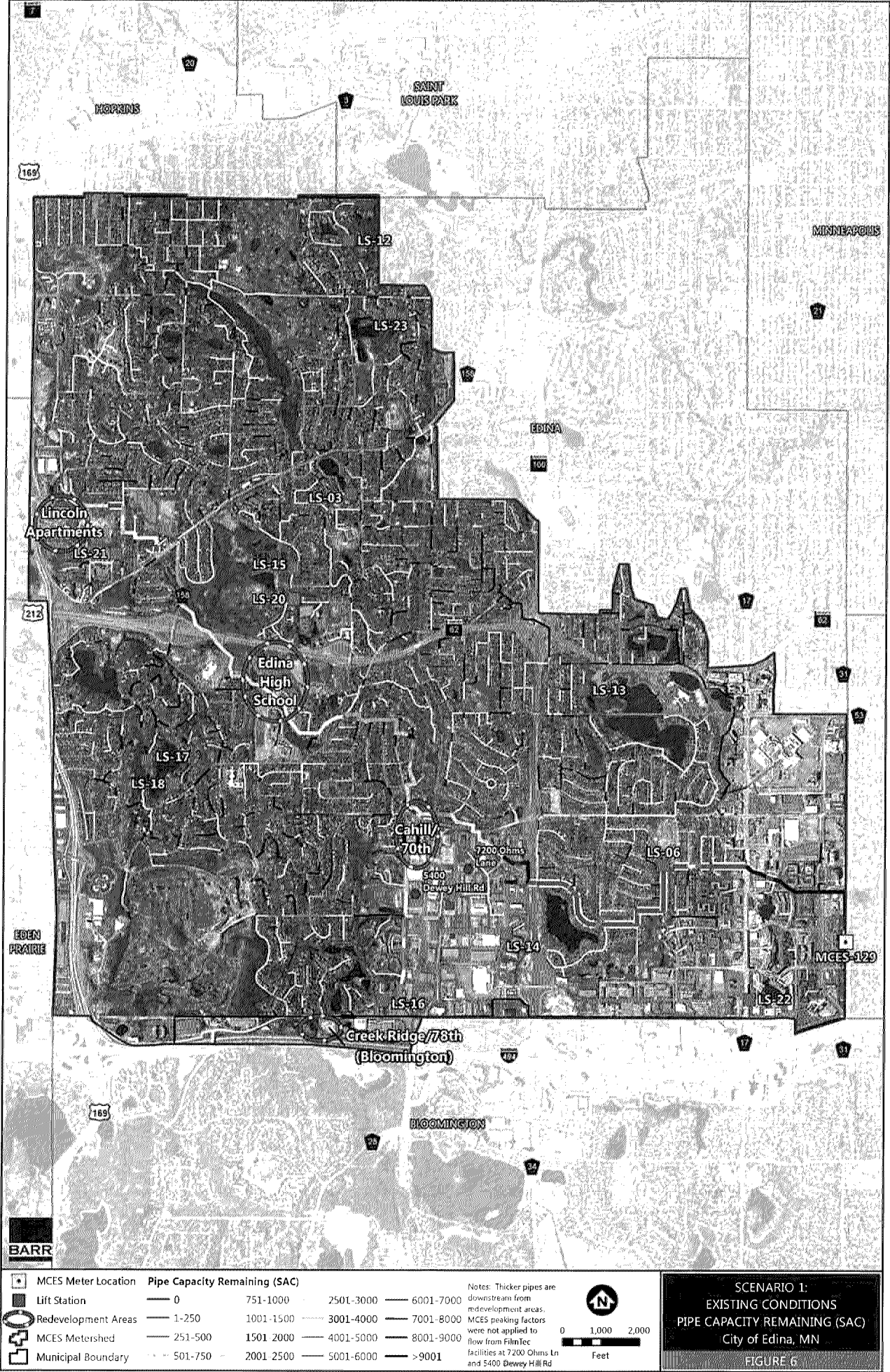
² Average pipe capacity utilized (%) of all pipes in the Southwestern Edina XP-SWMM model (3,634 pipe segments modeled).

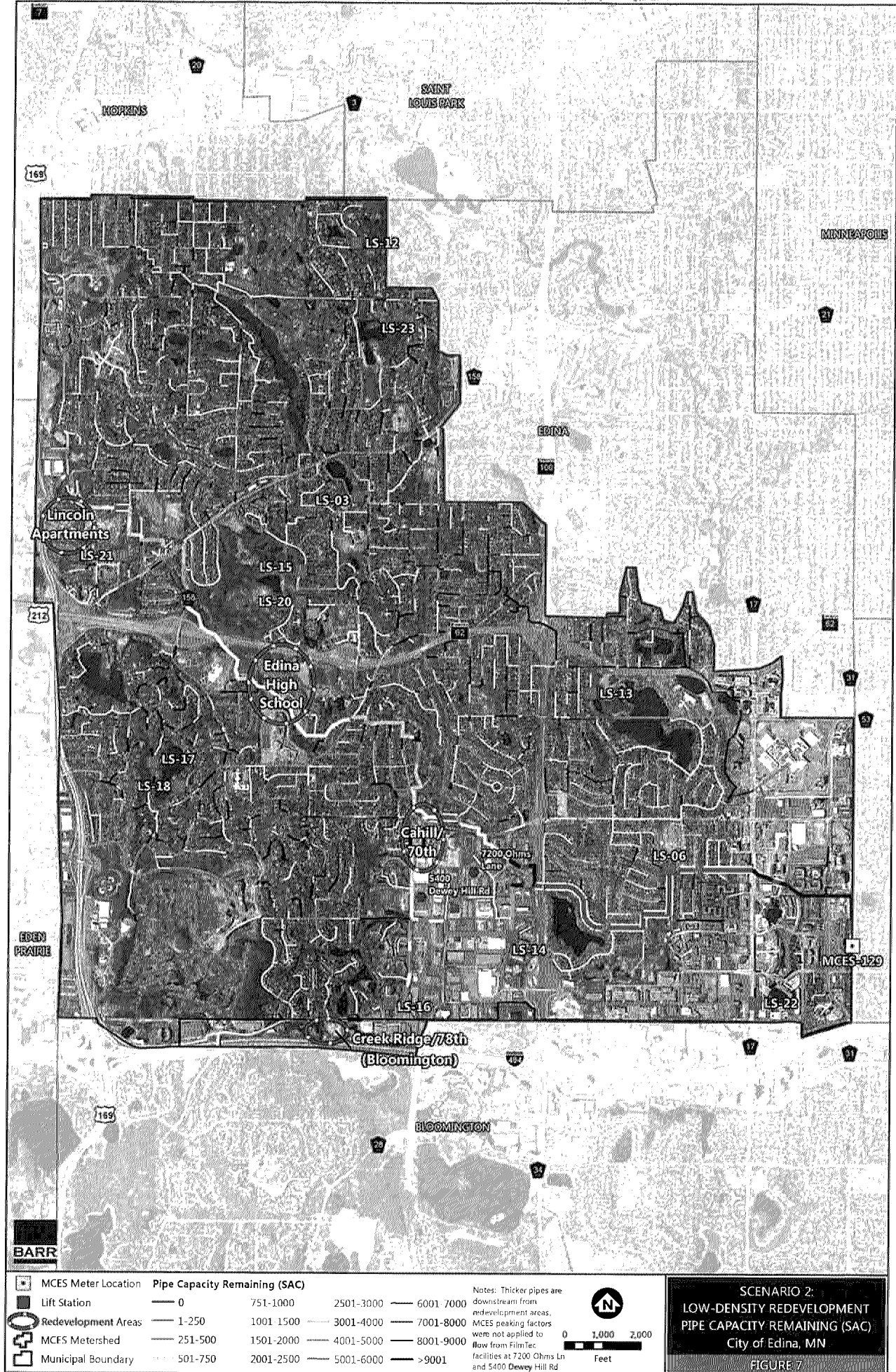


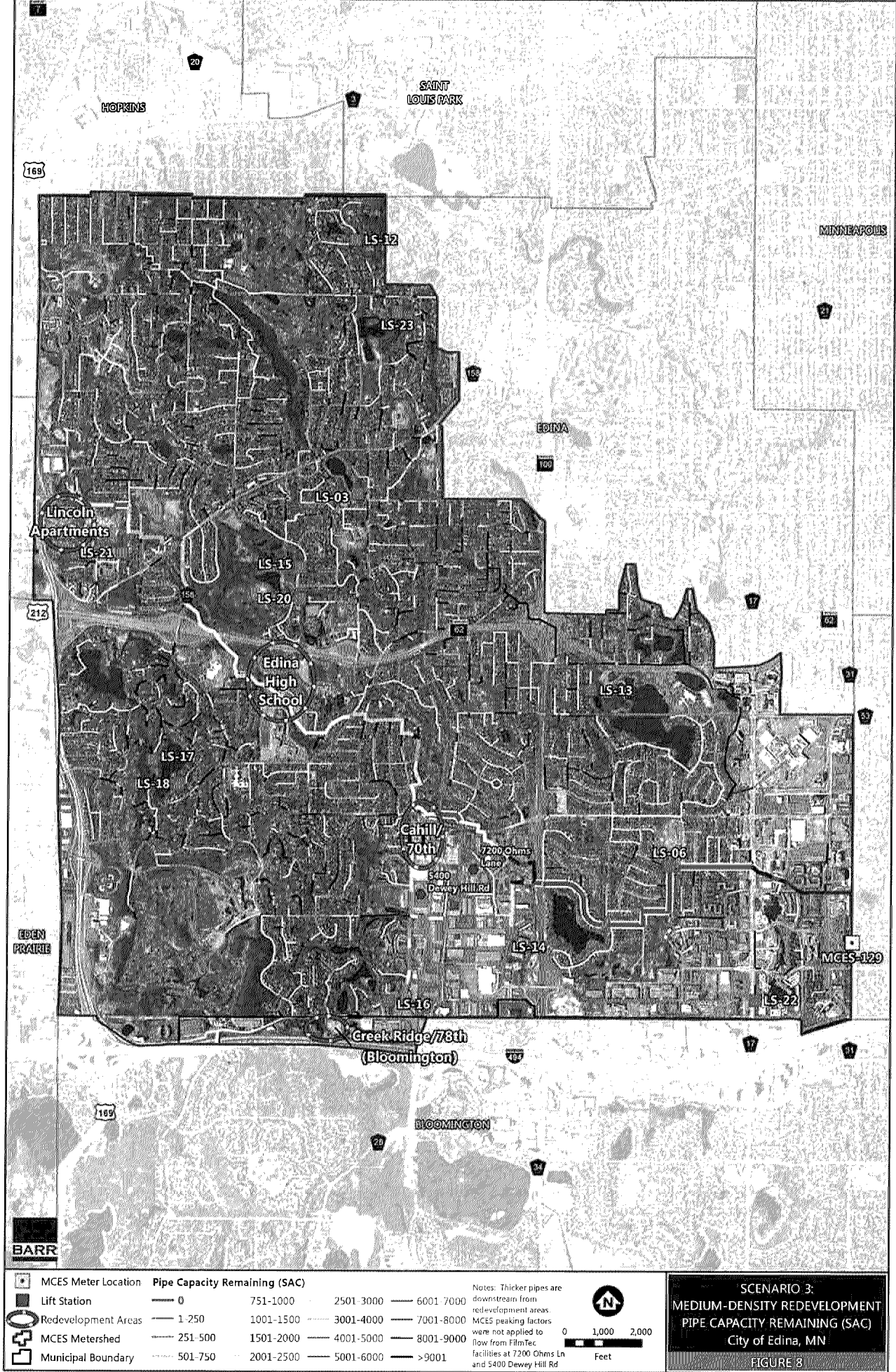


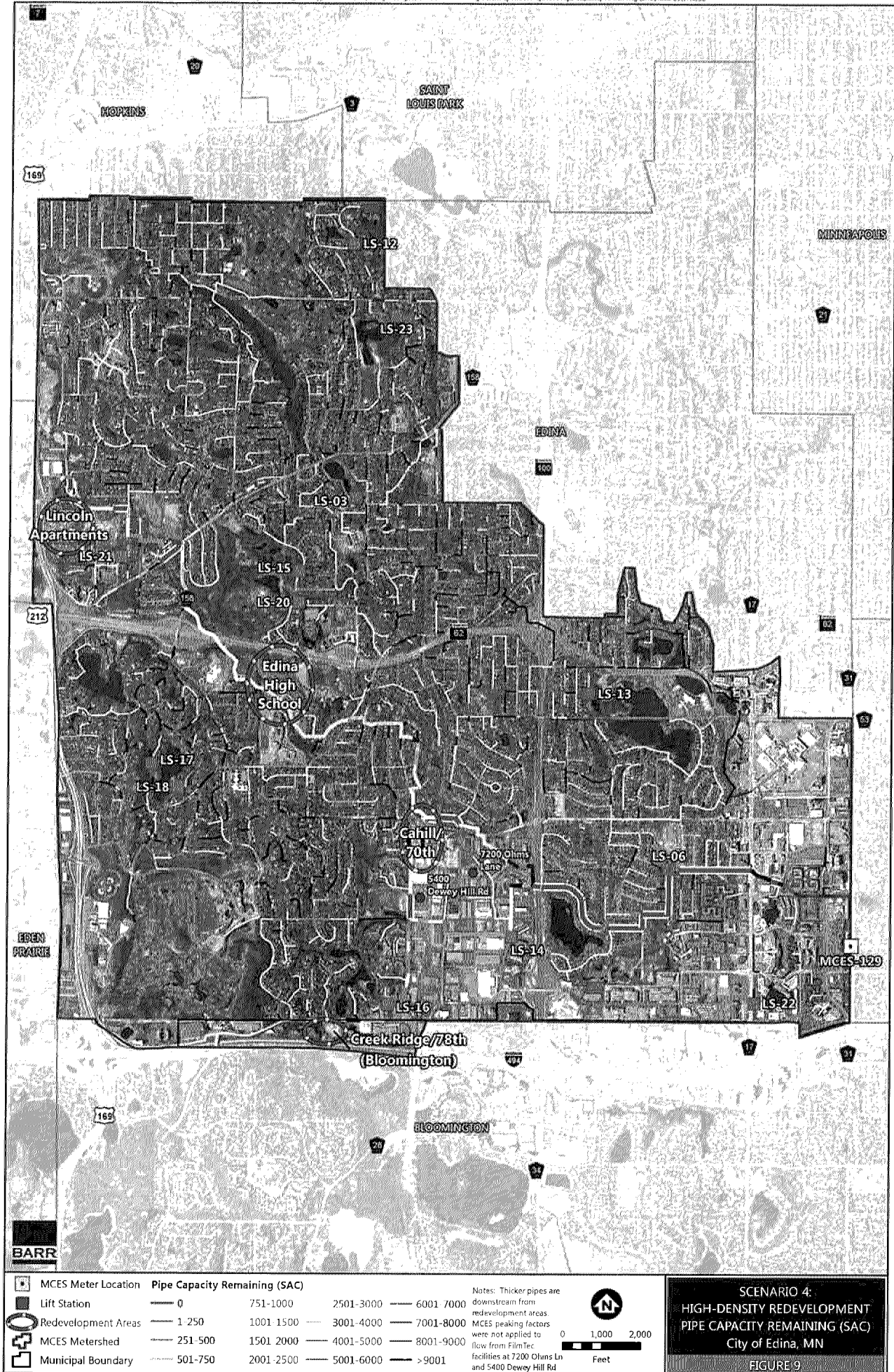












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3.0 Conclusions and Recommendations

The proposed redevelopment areas reduce available capacity in pipes to which they discharge. The main trunk lines flowing into LS-06 and from LS-06 to the MCEs-129 interceptor are already known to be at or over capacity based on MCEs peak flow methodology and the flows from redevelopment evaluated in this study add to the existing capacity issues. While the development proposed in Bloomington reduces the capacity of down-sewer pipes, none of the pipes exceed 80% capacity before reaching the existing over-capacity area upstream of LS-14.

The Lincoln Apartments and Cahill / 70th redevelopment areas (see Figure 1) cause the greatest reduction in capacity and should be carefully monitored as development proceeds. During certain development scenarios, these redevelopment areas cause pipes which are under capacity during existing conditions to become over-capacity (e.g., to go from 50% capacity during existing conditions to over 80% capacity). As a reminder, Figures 2 through 5 show capacity during peak flow conditions (using MCEs peaking methodology). Pipe capacity monitored in the field under normal flow conditions may not approach the situations modeled in redevelopment scenario unless monitored during a peak flow event including inflow and infiltration.

Possible areas of concern: The area immediately downstream of the proposed Lincoln Hill apartment redevelopment caused pipes to exceed 80% capacity during some redevelopment scenarios. Pipe segments in the vicinity of LS-14 increase significantly and should be monitored for potential problems. The trunk lines upstream of the major Highway 100 crossing exceed 80% capacity in several areas and should also be monitored.

References

Barr Engineering Co. (Barr). 2017. Southeast Edina Sanitary Sewer Study. Prepared for the City of Edina.

Metropolitan Council. 2016. 2016 Inflow & Infiltration Task Force Report.

<https://metro council.org/Wastewater-Water/Publications-And-Resources/WASTEWATER/Inflow-Infiltration/Inflow-Infiltration-Task-Force-Report,-2016.aspx>