Capital Improvement Program

Sandstone, Minnesota

SEH No. SANST 119217

March 21, 2012

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RE: Capital Improvement Program
Sandstone, Minnesota
SEH No. SANST 119217

Mr. Sam Griffith
City of Sandstone
119 Fourth Street
Sandstone, MN 55072

Dear Mr. Griffith:

Short Elliott Hendrickson Inc. (SEH®) is pleased to submit this report for the City's Capital Improvement Program.

The information within the report is the compilation of data and information we collected in the field and from City staff. The report presents our findings as well as some potential funding options.

Thank you for the opportunity to provide this service to the City of Sandstone. If you have any questions, please contact me at 651.490.2172.

Sincerely,

Gregory F. Anderson, PE
City Engineer

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Capital Improvement Program
Sandstone, Minnesota

SEH No. SANST 119217

March 21, 2012

I hereby certify that this report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

_____
Gregory F. Anderson, PE

Date: _____ Lic. No.: 26859

Reviewed by: _____ _____
Date

Short Elliott Hendrickson Inc.
3535 Vadnais Center Drive
St. Paul, MN 55110-5196
651.490.2000

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Capital Improvement Program

Prepared for City of Sandstone

1.0 Purpose of a Capital Improvement Program

A Capital Improvement Program is a comprehensive document whose purpose is to list major improvements necessary and desirable to meet the needs of the community over the near future. The program is established through the compiling of project needs and requests by the various Departments, Commissions, and the City Council. The Capital Improvement Program is a valuable tool which City officials can use to rank the priority of public improvement projects and determine the level and method of financing required each year to support these projects.

The objectives of a Capital Improvements Program are to:

- Anticipate major capital improvements so that large expenditures can be budgeted over a period of several years.
- Develop a realistic list of needs which relate to the ability to finance improvements, thereby minimizing the impact on tax rates.
- Implement the goals and objectives contained in the comprehensive plan.
- Enable proper scheduling of various projects and improvements, thereby allowing adequate time for detailed design and engineering of the projects, preparation of environmental impact statements, processing of grant applications, and exploring alternative methods of financing.
- Provide an opportunity for sound coordination between City departments, various units of special and general local government, and public utilities.
- Enable the local officials to focus their attention on the needs of the entire community, and to put in perspective, pressures from special interest groups, and proponents of special projects.
- Enable the local officials to forecast and anticipate needed maintenance projects so that the public's investment in the infrastructure can be preserved.

The Capital Improvement Program includes major expenditures of public funds, beyond maintenance and operating costs, for the acquisition or construction of a needed physical facility or projects. Salaries, supplies, equipment, and other overhead expenditures are considered maintenance and operational costs, and are provided for in the annual budget.

Replacement of obsolete/deteriorated equipment and non-annual maintenance projects where general funds cannot be allocated may become capital improvement projects.

2.0 Capital Improvement Fiscal Policy

2.1 General Policy

Sandstone Capital Improvement Program (CIP) reflects an assessment of the community's needs and its' ability to pay for major improvements. It is founded on the policy that reinvestment required for replacement, maintenance, or the increased efficiency of existing systems, shall have priority over investments for expansion of existing systems or the provision of new services when utilizing general obligation funding sources. The extension of new services and/or improvements shall be funded from revenues generated through impact or dedication fees.

2.2 Funding Priorities

Capital spending proposals will generally be funded on the following priority basis:

- Those projects necessary for contributing to the public health, safety and welfare.
- Those projects which will help to maintain an existing system.
- Those projects that will make an existing system more efficient.
- Those projects representing the expansion of an existing system for new service or completely new public facility or service.

2.3 Funding Principles

As a result, the following principles shall govern the implementation of the recommended Capital Improvements Program:

- The City will attempt to make all capital improvements in accordance with the adopted Capital Improvements Program.
- The City will develop a multi-year plan for Capital Improvements and update it annually.
- The City will coordinate development of the Capital Improvement Program with development of the annual operating budget. Future operating costs associated with new capital improvements will be projected and included in operating budget forecasts.
- The City will use inter-governmental assistance to finance only those capital improvements that are consistent with the Capital Improvements Program and City priorities, and who's operating and maintenance costs have been included in operating budget forecasts.
- The City will maintain all its capital assets at a level adequate to protect the City's investment and to minimize future maintenance and replacement costs.
- The City will identify the estimated costs and potential funding sources for each capital project proposal before it is submitted to council for approval.
- The City will consider the life cycle costs and utilize the most feasible method for all capital projects.

3.0 Project Financing Policy

3.1 Introduction

It has been and will continue to be the policy of the City Council that when public improvements are made, which are of special benefit to certain areas, special assessments will be levied for the benefits received. The procedures used by the City are those specified by Minnesota Statutes, Chapter 429, which provide that all, or a part of the cost of the improvements, may be assessed against benefiting properties in accordance with the benefits received. The statute, however, does not provide a guide as to how these benefits are

measured or how the costs are to be apportioned. The purpose of this general policy is to establish a consistent standard for the apportionment of special assessments.

3.2 Types Of Improvements

This policy shall relate to those public improvements allowable under Minnesota Statute 429. Generally, the improvements include: street and street lighting improvements; sanitary and water utility improvements; and storm sewer and drainage improvements.

This policy outlines how new construction, reconstruction, and major maintenance shall be financed under each type of project.

Project costs shall include: the construction costs; engineering; testing; permitting; legal; administrative; land or easement acquisition; fiscal; capitalized interest; data processing and publication fees.

3.3 Special Assessment Methods

Benefiting properties generally are assessed by one or a combination of four (4) methods: adjusted front foot; area; unit; and benefit appraisal. Generally, the nature of any improvement lends itself to a particular method. The four (4) methods are described as follows:

1. **Adjusted Front Foot Rate:** Used for roadway and utility projects when there are a variety of land uses and lot sizes abutting or within the benefiting area. Frontage is measured at the building setback line.

Assessments are determined by multiplying the adjusted frontage by the Council established assessment rate.

2. **Area Method:** Used for drainage and/or trunk utility improvements where there is a variety of land uses and parcel sizes within the benefiting area. Assessments are determined by multiplying the area change to times the gross area less wetland areas.
3. **Unit Method:** Used when the abutting property or benefiting area is homoge neous. Assessments are determined by multiplying the particular land use unit by the Council established assessment rates.
4. **Benefit Appraisal:** Used when property owners within the benefiting area indicate none of the above noted methods appear appropriate.

Corner lots are included in the benefiting area with the exception of single/two family dwellings. If the improvements are along the front lot line of the single/two family dwelling, the parcel shall be included in the benefiting area. If the improvements are along the side lot line of the single/two family dwelling, the parcel shall not be included in the benefiting area, unless the lot can be subdivided.

3.4 Financing Options

The City of Sandstone has various methods and options for financing necessary road improvements. Improvements can be financed by using existing funds or reserves, by additional property taxation, by special assessments or by the establishment of a road reconstruction program.

To pay for roadway improvements the most common method employed by cities is bonding. Listed below are some typical revenue sources.

- General property taxes
- Special Property tax assessments to benefiting property (as discussed above).
- Utility rates which include capital improvement components for maintenance and replacement and improvements
- The City also has a storm water utility that can be used to find storm water improvements.

3.5 Street Reconstruction Bonds

An alternative to typical revenue sources is street reconstruction bonds.

In 2002, the Legislature made a variety of changes in the powers of local governments to issue bonds and incur other forms of debt. A new subdivision 3b was added to Minnesota Statutes, Section 475.58 authorizing municipalities to issue bonds without a referendum under street reconstruction programs. Granting municipalities the authority to issue bonds under Minnesota Statutes, Chapter 475 for street reconstruction without regard to election requirements provides the city with the opportunity of financing this type of improvement without having to specially assess at least 20% of the project costs.

The law authorizes issuance of debt obligations without an election for reconstruction of streets, if the bonds are issued under a 5-year street reconstruction plan.

To qualify for the referendum exemption, the following qualifications must be met:

- The city council must approve the street reconstruction plan unanimously after a public hearing. The public hearing notice must be published in the official newspaper at least 10 days but not more than 28 days prior to the hearing.
- The plan must include the following:
  - The streets to be reconstructed
  - The estimated costs
  - Any planned reconstruction of other streets in the municipality over the next five years.
- Approval of the bond issuance must be made by a unanimous vote of the City Council.
- Issuance of the bonds is subject to referendum approval, if a petition signed by voters equal to 5% of the voters in the last general election is filed with the municipal clerk within 30 days of the public hearing.

Because these type of bonds are subject to the debt limits, even if they would be exempt under another law (e.g., because they were payable from special assessments) we recommend that the City consult their Financial Advisor, Bond Counsel, and City Attorney for analysis before contemplating or issuing this type of debt.

4.0 Project History

The City Council at its regular council meeting on December 21, 2011 authorized preparation of this CIP for proposed street and utility improvements and core facilities. The proposed street and utility improvement areas are based on the list provided by the City to SEH and dated December 22, 2011. Figure 1 shows the proposed Improvement Areas

4.1 Existing Conditions

Information regarding the City's underground water, sanitary sewer and storm sewer was gathered from City staff, People Service, televising tapes and available City records. Areas proposed for utility reconstruction were determined from the condition, age and history of the utility. The areas for proposed reconstruction were considered along with the pavement condition of the street to rank the priority of the improvement projects. Utility reconstruction should be continually considered during pavement management activities.

Figure 2 shows the projects with sanitary sewer improvements, Figure 3 shows the projects with water main improvements and Figure 4 shows the projects with storm sewer improvements. Figures 2, 3, and 4 can be found at the end of this report. The project areas identified by council and staff to review and include in this report are:

4.1.1 River Bluff Avenue – 4th Street to 5th Street and Alley South of 4th Street

This project area was identified by City staff as having sanitary sewer and water main concerns. A review of the televising logs for sanitary sewer, this area shows several root and joint issues, a few protruding taps and two segments of main with sections of missing pipe.

The existing sanitary sewer main is 8-inch clay tile pipe and runs from 5th Street to 4th Street in River Bluff Avenue, then west in 4th Street a half block to the alley between Park Avenue and River Bluff. The sanitary sewer main then flows south in the alley to the existing main along the north ditch of TH 123. The water main in River Bluff Avenue and in 4th Street is 4-inch cast iron pipe.

4th Street and River Bluff Avenue are urban section streets with bituminous pavement, concrete curb and gutter and storm sewer. The pavement and curb and gutter are in fair to good condition.

4.1.2 Pine Avenue – Highway 123 to Eagle Drive

Pine Avenue is a bituminous surface with areas of curb and gutter and ditches. The block between TH 123 and 1st Street has concrete curb and gutter on both sides of the street and storm sewer. The block between 1st Street and Division Street has curb and gutter on the west side of the street only. The rest of the project area is a rural section with ditches to convey storm water.

The pavement and curb and gutter is in good to fair condition, there are some drainage concerns with the ditches and storm sewer at the north end from Division Street to TH 123. The ditches south of Division Street to Eagle Drive are flat and often hold water. Standing water in ditches can cause several problems; infiltration into the sanitary sewer, stagnant water can allow mosquitoes to hatch and standing water can keep the subgrade below the road base wet and lead to pavement failures, which appear to be the case on a few stretches of Pine Avenue.

There is an 8-inch VCP sanitary sewer main in Pine Avenue that flows north from Division Street toward TH 123 and ultimately to the lift station in Robinson Park. This lift station pumps back down Pine Avenue via a 4-inch force main to the existing 15-inch gravity main at Washington Street. The existing 15-inch main is a trunk main serving most of the City and flows south in Pine Avenue to the Old WWTP (see Figure 2). The existing 15-inch main is in good condition. The City has no reported problems with the 4-inch force main. The existing 8-inch VCP main from Division Street to TH 123 was also televised on September 23, 2008. The televising report showed the pipe to be in fair condition with several cracks and a

significant root problem. The roots required the pipe to be cleaned prior to televising and one section needed the roots cut before the camera could even travel thru the pipe. The existing water main in Pine Avenue is 12-inch ductile iron pipe (DIP) and the City has had no reports of problems with it.

4.1.3 Court Avenue – Highway 123 to Minnesota Street

The pavement from TH 123 to 1st Street is in poor condition with many locations of low to medium severity cracking. The existing storm sewer system doesn't effectively drain the street area, which leads to standing water after rain events. The pavement from 1st Street to Minnesota Street is in good condition. There isn't storm sewer in this section of Court Avenue. Water from the hospital area flows out to Court Avenue and then over land towards Minnesota Street where it fans out and flows south and west causing some local flooding issues during large rain events.

The existing water main in Court Avenue, between 1st Street and TH 123, is 4 inch CIP (see Figure 3). The main connects to a 6 inch DIP in 1st Street and a 6 inch DIP in TH 123. The existing water main in Count Avenue, north of TH 123, is also a 6-inch main. The existing sanitary sewer in Court Avenue is clay tile and runs from 2nd Street north to TH 123. The City has reported root and some maintenance issues with this section of main.

4.1.4 Division Street – Pine Avenue to Palisade Avenue.

This block of Division Street is a bituminous rural section. The Lion's sliding hill is along the north side near Palisade. Palisade Avenue has curb and gutter. The pavement is in fair condition and the lack of curb and gutter causes some drainage issues. There is no sanitary sewer, water main or storm sewer in this block of Division Street according to the utility maps.

4.1.5 Jefferson Street – Pine Avenue to Palisade Avenue

This block of Jefferson Street is a bituminous, rural section. The lack of curb and gutter and poorly defined ditches causes drainage issues. The pavement is in fair condition. There is an 8-inch clay tile sanitary sewer in this block of Jefferson. There is no water main or storm sewer per the utility maps.

4.1.6 Minnesota Street – Grant to Pine Avenue

Minnesota Street from Grant to Pine Avenue currently is a bituminous surface without curb and gutter or defined ditches. The pavement is in fair to poor condition with some potholes and shoulder erosion near the intersection with Pine Avenue due to the grade of the street and lack of storm sewer.

This section of Minnesota Street currently does not have any sanitary sewer or water main in it. City staff should review the parcels along Minnesota Street in the project area to verify if future utility service will be needed prior to replacing the street surface.

4.1.7 Commercial Avenue – 3rd to 5th and 4th Street – Commercial to Court

Commercial Avenue and 4th Street in the project area are a bituminous, urban section with concrete curb and gutter with storm sewer in 4th Street between Commercial Avenue and Court Avenue. The curb and gutter was reviewed in 2011 for some spot repairs. After a field review it was recommended that all curb and gutter should be replaced in the downtown area for drainage and appearance concerns.

The storm sewer has experienced localized ponding in areas and doesn't appear to adequately serve the area. The existing storm main between Commercial and Court Avenues was televised on September 23, 2008 to verify its condition and identify any problems (Figure 4). The televising revealed a collapsed pipe in 4th Street and several offset pipe joints that impact flow and reduce capacity. The televising also showed a protruding connection in the block between Court and Park Avenues. This pipe protruded so far into the storm main that the camera could not pass. This pipe is also impacting flow and capacity in the main and is contributing to the upstream ponding.

There is an 8-inch DIP water main in Commercial Avenue that is in good condition. The project area is served by an 8-inch VCP sanitary sewer main in 4th Street. The City has no reported problems with this main. While the City has not had issues with this main, it might be prudent to replace this main during the project to avoid future issues with an old main under a new street pavement.

The existing water main in 4th Street is 4-inch CIP and has been identified for replacement with a 6-inch main for improved fire flow and pressures. The existing water main for Commercial Avenue is 8-inch DIP with no reported issues and can remain in place. The sanitary sewer in 4th Street is 8-inch clay tile. While no problems have been reported with this main, if the water main, storm sewer and street is being replaced it would make sense to replace the sanitary sewer at the same time to avoid the potential for issues with an existing main under a new street surface.

4.1.8 5th Street – Court Avenue to Park Avenue

This block of 5th street is a bituminous, urban section with concrete curb and gutter with storm sewer at each intersection. The pavement is in fair condition. There is no sanitary sewer on water main in this block of 5th Street.

4.1.9 6th Street – Court Avenue to Park Avenue

This block of 6th Street contains dual water mains. This presents problems with service and for maintenance and operation procedures. The house services are connected to one of the mains while the hydrants are connected to the other main. This section of 6th Street does not have any sanitary sewer or storm sewer. To replace the dual water mains, the entire street will need to be replaced.

4.1.10 Park Avenue – 5th Street to 3rd Street (TH 123)

Park Avenue between 5th Street and 3rd Street is currently a bituminous, urban section with concrete curb and gutter. The pavement is in fair to poor condition. The existing water main in this section of Park Avenue is 8-inch DIP without any reports of issues. There is storm sewer in this section, but no sanitary sewer.

4.1.11 8th Street – Commercial to alley between Court & Park

Sanitary sewer flow from the northwest portion of the City crosses under BNSF railroad tracks via a 15-inch PVC main installed as part of the 2002 Utility Improvements Project. The 15-inch main ends at a manhole just west of Angle Avenue where the main reduces back to an 8-inch pipe (see Figure 2).

The 2002 project also installed a 15-inch trunk main in the alley between Court and Park Avenues from 7th Street to TH 123. This leaves a potential bottleneck of several blocks of 8-inch main for the flow from the northwest portion of the city between Angle Avenue and 7th Street.

The existing water main in 8th Street is 8-inch DIP with no reports of issues from the City.

8th Street is currently a bituminous urban section between Angle Avenue and Park Street. The only storm sewers in place are three catch basins at the intersection with Commercial Avenue. The storm runoff flows via curb and gutter to these catch basins and is the conveyed north via an unknown sized pipe, north in the Commercial Avenue right-of-way (ROW) to an outlet. The existing pavement is in fair to poor condition in the project area.

4.1.12 Commercial Avenue – 7th Street to 8th Street

Commercial Avenue between 7th Street and 8th Street is a bituminous urban section with concrete curb and gutter and storm sewer. There is not sanitary sewer in this block of Commercial Avenue. The existing water main is 8-inch DIP with no reported issues. This project was on the Street repair list from the City, but not needing utility repairs.

4.1.13 Eagle Drive Drainage Improvements – Grant Avenue to Aspen Court

Eagle Drive is a bituminous, rural section road, the pavement is in good to fair condition. A significant portion of the City drains thru the Eagle Drive area on its way to Skunk Creek. During heavy rain events and during the spring melt, the Eagle Drive ditches fill up and sometimes water has covered the driving surface, which is a traffic hazard. As mentioned earlier, standing water in ditch is detrimental to the road subgrade and ultimately the pavement as well as potential I/I issues with sanitary sewer and aesthetic issues. In 2008 the City Council authorized a review of the drainage issues along Eagle Drive. The 2008 study identified three options to address the drainage concerns (Figure 5).

The existing water main in Eagle Drive is 8-inch DIP and there are no reports of issues with it from staff. A 12-inch clay pipe sanitary sewer runs in Eagle Drive from the Commercial Avenue ROW to Pine Avenue. Discussions with People Service identified this section of sanitary sewer, along with the upstream segment of this 12-inch main in Commercial Avenue and Eisenhower Street ROW's, as an area with I/I concerns/issues. The potential of localized flooding due to the drainage issues can lead to inflow thru manhole covers into the sewer. Also, the standing water in the ditches and high water table can lend to infiltration into the clay pipe sanitary sewer.

4.1.14 Sanitary Sewer Crossing Under Railroad – TH 23 to 5th Street

The sanitary sewer service for the area of town west of the railroad tracks, between Grouse Street and Jay Street, is provided by an 8-inch sanitary sewer main that runs from near the car wash, under TH 123 to near the former creamery building, then under the BNSF Railroad tracks to the alley south of 5th Street between Main Street and Commercial Avenue. The 8-inch main under the railroad tracks was televised in 2004 and found to be made up of different pipe materials. This sewer main section was also identified by People Service as having I/I issues.

4.1.15 Spring Street – Grouse Street to West 4th Street

An 8-inch sanitary sewer main services the homes along Grouse and Spring Streets and is clay pipe. Spring Street is a gravel rural road while the west 4th Street ROW is unimproved. This section of sewer main was identified for repairs by City staff and is an I/I area of concern according to People Service. This area of the City does not have any water main or storm sewer.

4.1.16 Jay Street – TH 23 to Golf Course

An 8-inch sanitary sewer main was installed near Jay Street as part of the construction of the mobile home park. It appears the 8-inch main is not in a platted ROW, but likely covered by a drainage and utility easement. There have been several maintenance issues with this main leading to concerns about the current condition of the main. A complete replacement of this main and service connections is likely the best option to address the concerns. There is not a City water main in this area of the City. All the homes are serve by a private well(s).

4.1.17 Lundorff Drive – North of TH 123

The Lundorff Drive Street and Utility Extension Report, dated September 30, 2005, reviewed the extension of streets and utilities to provide service to a future medical campus north of the current clinic and also serve the Free Church property along TH 23, south of Grouse Street.

Lundorff Drive currently extends north from TH 123 for about 450 feet as a bituminous rural street section. Lundorff Drive serves the existing clinic and dead-ends just north of the north clinic entrance.

The existing water main system in this portion of the City consists primarily of an 8-inch trunk main along the north side of TH 123, from the crossing of the BNSF tracks, out to the I-35 interchange. An 8-inch water main extends from the 8-inch main in the north ditch of TH 123 along Lundorff Drive to serve the clinic and dead-ends at the north end of Lundorff Drive. The existing sanitary sewer system serving the west side of the City consists of a 10-inch trunk main in the north ditch of TH 123, from the BNSF crossing, out to the I-35 interchange. An 8-inch sanitary sewer main extends north from the 10-inch trunk main in Lundorff Drive to serve the clinic.

The current storm sewer system on Lundorff Drive consists of overland flow to the ditches along Lundorff Drive. The ditches flow south to the north ditch of TH 123. A 36-inch CMP culvert crosses under Lundorff Drive at TH 123 to convey storm water west in the north TH 123 ditch.

4.1.18 Lundorff Drive – South of TH 123

The City of Sandstone Economic Development Authority (EDA) owns approximately 160 acres of land south of Skunk Creek known as the old airport site. In 2011 the EDA completed the purchase and platting of the 21 acre Grant Knowles Addition. The Grant Knowles Addition lies between the airport site and TH 123 and is platted to provide a direct road access from the airport site to TH 123.

A 10-inch clay sanitary sewer and an 8-inch DIP water main exist along the north ditch of TH 123 and could be a connection point for utility extensions into Grant Knowles and ultimately the airport site. At the south end of Quarry Place there is a sanitary sewer lift station and 12-inch DIP that could also be a connection point for utility extenuations into the airport site.

The only road access into the airport site is a narrow gravel road off of Old Military Road into the old airport site hanger and building area. An 80-foot roadway ROW for the extension of Lundorff Drive south of TH 123 was included in the Grant Knowles Addition and the old airport site. Crossing Skunk Creek will require permitting and special construction consideration.

4.1.19 I-35 Utility Crossing/Extension

In the mid 1970's, a 6-inch sanitary sewer force main and an 8-inch water main were extended west under Interstate 35 (I-35) to provide utility service to the area west of the I-35/TH 123 interchange. The sanitary sewer force main and water main were also extended south under County Road 61 to provide service to the SW quadrant of the interchange. Field investigation and pipe televising in 2004 verified the location of the mains. The field investigation also located missing sections of both the sewer force main and water main that would need to be completed prior to having the mains functional.

4.1.20 Sidewalk Extension

In 2004 the City adopted a sidewalk policy and created a sidewalk inventory. In 2006 and 2007 the City completed sidewalk repair projects that addressed replacement of damaged and missing walks throughout town. One item identified in the 2004 policy that is still to be addressed was the extension of a sidewalk from downtown to the Ashley Addition at the corner of Minnesota Street and TH 123. The Ashley Addition development houses Chris' Foods and potentially other future commercial development. Currently the sidewalk from the downtown area ends at 1st Street, both along TH 123 and along Commercial Avenue, which leaves several blocks where pedestrian traffic needs to be on the street to reach Chris' Foods.

5.0 Infiltration/Inflow (I/I)

This report is also charged with reviewing and commenting on Infiltration/Inflow (I/I) problems in the sanitary sewer system. The concern with significant I/I in the system is that I/I is essentially "clean" water (i.e. rain, snow melt, ground water, etc.) and doesn't need to be treated. Treating this water not only takes electricity and maintenance at the ponds, but also uses up capacity in the wastewater ponds that should be used to treat wastewater. A significant I/I issue can lead to a significant reduction in available capacity for additional wastewater flow.

A complete reduction in I/I is a very expensive effort and generally isn't practical. A certain amount of I/I will exist in a sanitary sewer system regardless of the effort to eliminate it, but a significant reduction (20 to 50%) is usually possible with little to moderate effort. The City of Sandstone has already taken some steps toward this by replacing manhole covers that had open holes and beginning a discussion on sump pump disconnection from the sanitary sewer system.

In addition to manhole cover replacement, televising existing mains and flow monitoring are other relatively inexpensive methods to help identify I/I sources. The city is taking another proactive step this year by cleaning and televising the 12- and 15-inch sanitary mains.

While working on this report, we met with Craige, your people service technician, Craige identified some areas of sanitary sewer main that could have I/I issues due to the terrain they exist in or condition of the pipes. These areas are listed below and are shown on Figure 2.

1. The existing 8-inch sanitary main running north of Rich's Bar to the County Maintenance Facility. Several stretches of this line are in low areas that are difficult to access for maintenance and the manholes are in low areas that could allow surface water to enter the manholes. This main is clay pipe. Clay pipe typically has shorter pipe lengths that require more joints and the joints are areas for tree roots to enter the pipe and cause problems. A televising report in 2002 showed roots in several joints.

2. The sewer main in the alley between Main Street and Commercial Avenue from 4th Street south to Lincoln, then east towards 2nd Street. This main is 8-inch clay pipe.
3. The sanitary main in Commercial Avenue from Washington to Jefferson Street, then east in Jefferson to Pine Avenue. This main is a 10-inch clay pipe.
4. The sanitary main in Eisenhower street from Old Military Road to Commercial Avenue, then south and east in Eagle Drive to Pine Avenue. This main is a 15-inch clay pipe.
5. The sanitary main in the alley between Park Avenue and Bluff Avenue from 5th Street south to the Robinson Park Lift Station. This main is included in the River Bluff Area project discussed in this report.
6. The sanitary main under the railroad tracks from the west side of the tracks near the creamery east to 5th Street near the funeral home. This main is included in the report.

Flow monitoring is an inexpensive and effective method to help locate I/I sources so they can be addressed. Flow monitoring consists of dividing the sanitary sewer system into manageable sub-basins. Then flow monitoring is generally done for a month during "dry" weather (January), then for another month during which at least two storms of at least one-inch of rain per hour during "wet" weather (summer). The "dry" weather helps establish a flow basin line, then the "wet" weather flow would show peaks for storm events to help locate the I/I sources.

6.0 Core Facilities

A City's core facilities include water production wells, water storage towers, trunk water mains, area lift stations, trunk sanitary sewer mains, water and sanitary sewer treatment facilities.

The expansion of core facilities will directly impact the City's water supply in form of supply, treatment, storage and distribution. The expansion of core facilities will also directly impact the City's wastewater system in the form of collection, transmission and treatment.

Improvements to the City's core facilities were discussed in the Trunk Utility Area Fees Report, dated April 6, 2005 and the wastewater core improvements were also reviewed in the Wastewater Treatment Facility Plan dated February 27, 2008. The core improvements to the sanitary sewer system identified in these reports include a Facility Plan Amendment/Non-Degradation Review, to review current and future wastewater improvements and permit issues at the wastewater treatment plant (WWTP), and an estimate for possible improvements at the WWTP. Estimated core impact costs are:

Facility Plan Amendment/Non Deg. Review*	$50,000
Pond/Plant Expansion	$17,100,000

* The 2008 Facility Plan indicated a need for a non-degradation review due to the plant discharge ultimately to the Kettle River which is a wild and scenic river.

The core improvements to the water system identified in the 2005 report included a well siting study, a new 500 gpm well, treatment at the new well and a new 250,000 gallon elevated tower. The City has completed the well siting study and a test well in 2008. The test well, drilled on City land near the proposed hospital site, indicated an ample water supply for a production well. Another improvement that has been discussed in recent years is a filter improvement project at the existing water plant in Robinson Park. Some piping repairs were completed on the filter in 2009. During the piping repair work, concerns about the pressure

filter tank were identified. Also, the filter media have not been serviced since the filter was installed. Estimated costs for these improvements are:

500 gpm well	$250,000
Treatment at the new well	$1,800,000
250,000 gallon tower	$950,000
Rehab existing filter*	$1,250,000

* Improvements: identified at the current water treatment plant include a new pressure filter, SCADA and controls upgrades, backwash system, roof and building repairs.

7.0 Proposed Improvements

7.1 River Bluff Avenue – 4th Street to 5th Street and Alley South of 4th Street

This project will consist of a complete replacement of the sanitary sewer main and services in River Bluff Avenue, 4th Street and the alley south of 4th Street to the manhole upstream of the Robinson Park Lift Station. The 4-inch water main in 4th Street and River Bluffs Avenue will be replaced with a 6-inch DIP with new services, hydrants and valves.

River Bluff Avenue and 4th Street will be reconstructed to a 32-foot wide urban section with new pavement and concrete curb and gutter. The existing storm sewer in this area will also be replaced.

The estimated cost for this project is $380,700.

7.2 Pine Avenue – Highway 123 to Eagle Drive

The total reconstruction of Pine Avenue from Division Street to TH 123 is proposed as an urban section with concrete curb and gutter, and replacement of the existing catch basins and storm outlets at the intersection of Pine Avenue ant TH 123. The pavement on the south part of Pine Avenue is in good to fair condition, we propose cleaning and regarding the ditches on both sides of Pine Avenue from Division Street south to Eagle Drive. Cleaning of existing culverts on Pine Avenue will help the drainage in the area.

Replacing the existing 8-inch VCP with 8-inch PVC pipe is proposed for this project since the existing 8-inch VCP is cracked and has a significant root problem. The 4-inch force main, 15-inch and 12-inch water main are in good condition, and the City did not have any reports of problems in the past with these pipes.

The estimated cost for this project is $590,000.

The estimated cost to reconstruct Pine Avenue from Division Street to Eagle Drive with curb and gutter and storm sewer as opposed to rebuilding the road as a rural section and cleaning the ditches is $450,000.

7.3 Court Avenue – Highway 123 to Minnesota Street

A 32-foot wide urban section is proposed for Court Avenue together with installing a 15-inch RCP storm sewer and catch basins to collect and carry the storm water off the street and connect it to the storm sewer system at the intersection of Court Avenue and 3rd Street (TH 123)

The existing water main and services are proposed to be replaced as part of the improvements from TH 123 to Division Street. Replacing the existing 4-inch CIP water main in the street with a 6-inch DIP water main will improve the fire flow significantly. The block of Court

Avenue between 2nd Street and 3rd Street has an 8-inch clay sanitary sewer main. Replacing this block of sanitary main and services is recommended as part of this project since the entire street is being reconstructed as well as the other mains.

The estimated cost for the above work is $435,000.

To address the drainage concerns at the intersection of Court Avenue and Minnesota, the existing storm sewer installed in Minnesota Street in 2006 will be extended up Court Avenue to the hospital driveway. Catch basins will be installed on both sides of Court Avenue to collect surface water before it flows down to the Minnesota Street intersection.

The estimated cost for drainage improvements at the south end of Court Avenue is $400,000.

7.4 Division Street – Pine Avenue to Palisade Avenue

This street project will consist of reclaiming the existing bituminous pavement and aggregate base in place and extending new concrete curb and gutter on both sides of Division Street from Palisade Avenue to just west of the Lion's sliding hill. The street will be repaved down to Pine Avenue. This project will be similar to the Division Street project completed in 2011 between Main Street and Court Avenue.

The estimated cost for this project is $185,000.

7.5 Jefferson Street – Pine Avenue to Palisade Avenue

This project will rebuild Jefferson Street as an urban section street with new pavement and curb and gutter. Similar to Division Street we would anticipate reclaiming the existing pavement and aggregate base in place, install new curb and gutter, and then place new bituminous pavement.

The existing 8-inch clay sanitary sewer will be replaced with 8-inch PVC main to avoid any possible future issues with the old sewer main under a new street.

The estimated cost for this project is $202,000.

7.6 Minnesota Street – Grant to Pine Avenue

These improvements consist of removal of existing pavement and widening Minnesota Street from Grant Avenue to Pine Avenue to standard City street width and installing concrete curb and gutter. Catch basins and storm sewer are proposed for Minnesota Street at the connection to Pine Avenue.

The City's standard street width is 32 feet. Minnesota Street is in the project area is 22 feet wide. We would recommend widening to 32-feet, the City Standard This widening will remove a large amount of trees currently along the existing pavement in the street ROW.. Minnesota Street west of the project area is 36-feet wide.

This section of Minnesota Street currently does not have any sanitary sewer or water main in it. City staff should review the parcels along Minnesota Street in the project area to verify if future utility service will be needed prior to replacing the street surface.

The estimated cost for this project is $240,000.

7.7 Commercial Avenue 3rd Street to 5th Street and 4th Street – Main Street to Court Avenue.

This project will be a complete replacement of the street pavement, curb and gutter, sidewalk and storm sewer.

Replacing the existing damaged storm sewer main in Commercial and 4th Street will help solve the ponding problems on Commercial Avenue. The existing water main in Commercial Avenue will not be replaced, it is an 8-inch DIP main and it is in good condition. This work will be combined with improving Commercial Avenue and 4th Street to new pavement, curb and gutter, and new sidewalk.

The estimated cost for this project is $592,000.

7.7.1 4th Street – Commercial Avenue to Court Avenue

Replacing the existing damaged storm sewer main in 4th Street from Commercial Avenue to Court Avenue with 18-inch RCP will help solve the problem of storm sewer ponding and will help drain the water more efficiently. This work will be combined with replacing pavement, concrete curb and gutter, and sidewalk on the same block.

Replacing the 4-inch CIP water main in 4th Street with 6-inch DIP will improve the fire flow for fire protection purposes and improve operation and maintenance capabilities of the system. Replacing the existing sanitary sewer main and services in 4th street is also recommended, since the entire street section is being replaced and to avoid the potential for future issues with an old sewer main under new street pavement.

The estimated cost for this project is $204,000.

7.8 5th Street – Court Avenue to Park Avenue

This project will replace the pavement surface and curb and gutter and include spot storm sewer improvements. There isn't sanitary sewer or water main to replace in this block.

The estimated cost for this project is $190,000.

7.9 6th Street – Court Avenue to Park Avenue

This project will replace the existing dual water mains in 6th Street a with an 8-inch DIP water main. The services, hydrants and valves will also be replaced. The entire pavement section and also the curb and gutter will be replaced as part of this project.

The estimated cost for this project is $260,000.

7.10 Park Avenue – 5th Street to 3rd Street (TH 123)

This project will rebuild Park Avenue as an urban section street with new pavement and curb and gutter. Similar to Division Street we would anticipate reclaiming the existing pavement and aggregate base in place, install new curb and gutter, and then place new bituminous pavement.

The estimated cost for this project is $310,000

7.11 8th Street – Commercial Avenue to Alley Between Court Avenue and Park Avenue

A 15-inch PVC sanitary sewer is proposed to connect 15-inch sanitary sewer under the BNSF railroad track near Angle Drive to the 15-inch sanitary sewer that runs in the alley between

Court Avenue and Park Avenue from TH 123 to 7th Street. The proposed 15-inch PVC will be installed along 8th Street to the manhole mid block between Park Avenue and Court Avenue, then replace the existing 8-inch VCP main from this manhole south to the existing manhole on 7th Street, mid block between Park Avenue and Court Avenue.

The existing pavement and curb and gutter will be removed and replaced with 32-foot wide urban section road with new concrete curb and gutter. The existing storm sewer in the intersection of Commercial Avenue will be replaced. The existing catch basins will be replaced with new structures. The storm main crossing 8th Street to the outlet to the north will be replaced with new structures. The storm main crossing 8th Street to the outlet to the north will be replaced based on the storm improvements from 6th Street this year and the Comprehensive Drainage Plan prepared in 2008.

The estimated cost for this project is $490,000.

7.12 Commercial Avenue – 7th Street to 8th Street

This project will rebuild Commercial Avenue as an urban section street with new pavement and curb and gutter. Similar to Division Street we would anticipate reclaiming the existing pavement and aggregate base in place, install new curb and gutter, and then place new bituminous pavement.

The estimated cost for this project is $150,000.

7.13 Eagle Drive Drainage Improvements – Grant Avenue to Aspen Court

The City reviewed options to address the drainage issues along Eagle Drive in 2008. Four options were proposed to address the drainage issues. The four options are shown on Figure 5. The four the options are described below:

7.13.1 Option #1

Replace the existing 15-inch culvert under Eagle Drive, just east of the former high school building, and re-grade the south ditch of Eagle Drive to convey the drainage west to the existing ditch along the east boundary of Block 1 of Jamies Addition (shown as ditch #1 on the attached figure). This option will create a deep ditch in some areas along Eagle Drive (6 feet deep or more). It will also require additional grading easements from Block 2 of Jamies Addition.

7.13.2 Option #1A

The same improvements as outlined in Option #1, except approximately 300-400 feet of RCP storm sewer will be installed in the deeper ditch cuts along Eagle Drive instead of the deep ditch to reduce the ditch depth and needed grading easements to the south.

7.13.3 Option #2

Replace the existing 15-inch culvert under Eagle Drive, just east of the former high school building, and re-grade the south ditch of Eagle Drive to convey the drainage west to proposed ditch alignment #5, along the west edge of Block 2 of Jamies Addition. A new ditch will be constructed along alignment #5 south to the Mn/DOT parcel. Ditch alignment #5 is proposed on the City parcel adjacent to Block 2 of Jamies Addition. Grading will need to be conducted on the Mn/DOT parcel to "daylight" this ditch. This work will require coordination with Mn/DOT and possibly a drainage easement as well.

7.13.4 Option #3

Replace the existing 15-inch culvert under Eagle Drive, just east of the former high school building, and re-grade the south ditch of Eagle Drive to convey the drainage west to proposed ditch alignment #6, along the east edge of Block 2 of Jamies Addition. A new ditch will be constructed along alignment #6 south into the Mn/DOT parcel. Ditch alignment #6 is proposed to be constructed on Block 2 of Jamies Addition with drainage easements needed from Block 2 of Jamies Addition and from the pit parcel to the east to construct the ditch. Grading will need to be conducted on the Mn/DOT parcel to "daylight" this ditch. This work will require coordination with Mn/DOT and possibly a drainage easement as well.

Estimated costs were prepared for the options, but do not include any costs for easement acquisition. The estimate costs are:

Option 1	$75,650
Option 1A	$104,500
Option 2	$86,500
Option 3	$88,500

The Sanitary sewer main in Eagle Drive is a 12-inch clay pipe. This section of sewer main was identified as an I/I concern area. Replacement of this sewer main could be accomplished via open cut or an internal lining of the pipe without disrupting the pavement. We are not aware that this section of pipe has been televised recently. If not already included, this section of sewer main should be included in this summer's cleaning and televising project. At that time a review of the television tape can be used to determine if slip lining is a possibility.

The estimated cost to replace the existing 12-inch sanitary main, services and a new street surface on Eagle Drive is $650,000. Once this main is televised, a slip lining cost can be prepared for comparison with the replacement option.

7.14 Sanitary Sewer Crossing Under Railroad – TH 23 – 5th Street

This project would be lining the existing sanitary sewer main in place using the existing manholes as access points. The existing pipe will be lined with a cured inplace liner that will result in a new internal pipe surface and eliminate inflow through any existing leaking joints.

Pipe lining is typically more expansive than open trench replacement. Factoring in surface restoration costs, pipe lining becomes more feasible. In this particular section of pipe, it would be difficult to open cut TH 23 and next to impossible to open cut the railroad tracks, so it makes it a good candidate for pipe lining. A large portion of the lining cost is the mobilization of the equipment, materials and labor to the project site. When considering a pipe lining project, economy of scale comes into play meaning to the project should encompass as many lining segments as possible to maximize the mobilization costs. So other I/I areas should be considered for lining if the City chooses to move this project forward.

The estimated cost for this project is $335,000.

7.15 Spring Street Grouse Street to West 4th Street

This project will replace the existing 8-inch clay sanitary sewer main and services in Spring Street from Grouse Street up to the west 4th Street right-of-way then east out to the manhole just west of TH 23. This main is clay pipe that can have root and I/I issues. Spring Street is a gravel surface and west 4th Street is unimproved so restoration costs will be low. There is not water main in this portion of the City. Prior to constructing this project, the City should

televise this main to verify its condition and also discuss the need for City water to be extended to this area of the City.

The estimated cost for the replacement of the sanitary sewer, services, and gravel road restoration is $112,000.

7.16 Jay Street – TH 23 to Golf Course

This project will replace the existing sanitary sewer main and services the serves the mole home park west of TH 23. The City has had difficulty cleaning and maintaining this main. Once the sewer main and services are replaced, the pavement surface will be restored.

The estimated cost for this project is $190,000.

7.17 Lundorff Drive – North of TH 123

The Lundorff Drive Street and Utility Extension Report, dated September 30, 2005, reviewed the extension of streets and utilities to provide service to a future medical campus north of the current clinic and also serve the Free Church property along TH 23, south of Grouse Street.

7.17.1 Sanitary Sewer

Sanitary sewer service to the project area will be gained by extending sanitary sewer from the 8-inch main in Lundorff Drive and from the dead-end main along the north side of TH 23 near the TH 23/TH 123 split.

Sanitary sewer in Lundorff Drive will be extended north from the existing manhole at the current north end of Lundorff Drive, to the proposed east/west street alignment.

New sanitary sewer will also be extended from the dead-end manhole along the north side of TH 23, just east of the TH 23/TH 123 split. The new 8-inch sanitary sewer main will be extended east along TH 23, then north in an existing City easement to the east/west street alignment. This extension will be significantly deeper than the sanitary sewer in Lundorff Drive and should provide gravity sanitary sewer access to the Free Church property and other areas north of the east/west street alignment.

The new sanitary sewer extension would consist of 8-inch diameter PVC pipe with precast, concrete manholes. 6-inch PVC commercial stubs would be extended to the right of way line for future service at locations identified with City staff.

7.17.2 Water Main

The route for the 12-inch water main identified in the Trunk Utility Area Fee Report would be from the existing 8-inch main in Main Street (TH 123) near 1st Street west past the fire hall under the BNSF tracks and TH 23. It would continue west along the section line to Lundorff Drive extended. The main would follow the extension of Lundorff Drive south to the current 8-inch dead-end main by the clinic. The ultimate route of the 12-inch loop would continue across TH 123 into the airport property.

It is anticipated that the water main will be installed by open trench methods with the exception of the crossing of the BNSF tracks and TH 23. The BNSF and TH 23 crossings will be installed in steel casings installed by jack/bore methods.

The new water main pipe will be 12-inch in diameter. 6-inch DIP service stubs will be installed out to the right-of-way line at locations for future service as identified with City staff.

7.17.3 Streets

Lundorff Drive will be extended north on the current alignment to the proposed east/west street. Lundorff Drive will be extended as an urban street with a width of 32 feet face-to-face with new concrete curb and gutter.

The new east/west street would also be constructed as an urban section street. It will generally follow the section line from the extension of Lundorff Drive east to TH 23. The east end of the proposed east/west street will veer north onto the Free Church property before its connection to TH 23. This shift of the alignment helps minimize wetland impacts and provide a 90-degree connection to TH 23 that provides optimal sight distance and meets MnDOT requirements. See Figure 4 for the proposed street alignments.

7.17.4 Storm Sewer

A new storm sewer system will be installed in the new streets to collect and convey storm runoff from the street right-of-way to a retention pond. The storm sewer system will be sized to handle a 10-year storm event and will consist of reinforced concrete pipe and precast concrete structures.

The storm sewer system included in this report was designed and sized for the new street and right-of-way areas only. Storm sewer improvements to accommodate future development(s) should be addressed as part of the future development(s) as they are proposed. It may be beneficial to prepare a hydrologic report for this areas of the City to identify the area's watershed.

The estimated cost for this project is $1,950,000. This cost does not include ROW or easement acquisition costs.

7.18 Lundorff Drive – South of TH 123

This project consists of the extension of a roadway and utilities approximately 2,300 feet south of Lundorff Drive and Highway 123 to provide service for future development.

7.18.1 Sanitary Sewer and Water Main

Sanitary sewer and water main utilities would be extended south to the proposed roadway termination point. An 8" sanitary sewer main would be installed in Lundorff Drive south from TH 123. Sewer service to lots south of Skunk Creek would require a sanitary sewer lift station. A force main would be installed by directional drilling across the creek. A 12" water main would be installed in Lundorff Drive to serve the adjacent properties. The creek crossing would require directional drilling of water main pipe across the creek. Utility service stubs would be provided to three lots north of Skunk Creek and two lots south of the Creek crossing. 6" Sanitary sewer service stubs would be extended to the right-of-way for future connection by developers. 4" DIP water main stubs for fire flow along with 2" copper water services for domestic water supply would be extended to the right-of-way for each proposed lot as identified with City staff.

7.18.2 Street

The proposed roadway will have two 13-foot lanes extending south of State Highway 23 across from Lundorff Drive for approximately 2,300 feet ending at a temporary cul-de-sac. The pavement design was based on a 10-ton roadway with strength to support potential heavy truck loading from industrial development. The road would require a 72-inch culvert crossing at Skunk Creek to serve parcels south of the creek.

7.18.3 Storm Sewer

Storm sewer will be installed to convey water to proposed retention ponds locations and also as pond overflows. Ditches along Lundorff Drive will collect and convey water to the storm sewer pipes. Storm sewer improvements included in this report are designed for the street and right-of-way. Storm sewer improvements to accommodate future lot development should be addressed as part of the future development as they are proposed. Ponds will be built for storm water retention. The pond areas identified in this report are sized for final development of the parcels.

The estimated cost for this project is $1,800,000

7.19 I-35 Utility Crossing/Extension

This project would install the missing sections of sanitary sewer force main and water main in the casings under I-35 and connect the mains. The mains would then be tested to ensure they would hold pressure and work under normal system conditions. Since the original lift station was never installed at the same time as the mains, a new lift station will need to be installed. Three potential locations were reviewed as part of the October 15, 2004 I-35 Utility Crossing Improvements report. Since only the Quality Home Center is the only parcel west of I-35 that is currently in the City limits, the location recommended for the lift station would be on the north side of County Road 61, approximately 300-feet west of the interchange. This location would provide direct sewer access to the areas in the NW interchange quadrant, including the Quality Home Center. The SW quadrant of the interchange currently is not in the City limits. At such time areas south of CR 61 annex into the City and require sewer service, a new casing and gravity main can then be extended under CR 61 to the south.

The estimated cost for this project is $265,000. The cost assumes the existing mains under I-35 will pass testing and can be used as City mains.

7.20 Sidewalk Extensions

As part of the sidewalk projects in 2006 and 2007 reviewed two routes to extend sidewalk from the "downtown" area of the City to Chris' Foods and surrounding area. One route followed TH 123 (Main Street) from 1st Street, south to Minnesota Street. The other route followed Commercial Avenue. From 1st Street to Washington Street, then west on Washington Street. From Washington Street the walk would run cross country along the east side of the Sandstone Community Church property. This route would require an easement from the church.

The estimated costs for this sidewalk extension is $120,000. This cost does not include easement costs or permitting costs with MnDOT.

8.0 I/I Issues

Six areas of the sanitary sewer system were identified through meetings with staff to be areas of I/I concerns. These project areas are shown on Figure 2. Areas 5 and 6 are included as part of other projects in this study. Areas 3 and 4 are assumed to be part of the large pipe sewer cleaning and televising project the City is undertaking this year. Areas 1 and 2 should also be cleaned and televised to review the pipe conditions. If some or all of this project is candidates for pipe lining, a larger lining project should considered other than just project 7.14. As mentioned earlier, a significant portion of a pipe lining project cost is the mobilization of the equipment and materials. Pipe lining costs vary depending on pipe material, pipe size,

accessibility to the manholes and location and size of the project. We would expect to see pipe lining costs of $50 – $120 per linear foot of pipe.

9.0 Conclusion and Recommendations

We recommend that the City consult their financial advisor, bond counsel, attorney and the citizens of the community to confirm and refine the Capital Improvement Plan scope, schedule and finance plan.

It is recommended that the City Council select and authorize which projects should be implemented in 2013. The council should consider ordering the Feasibility Study for the 2013 project.

Please note that the cost estimates, phasing and schedule are intended to be used for planning and budgeting purposes. The construction costs were based on 2011 bid prices. Annual adjustments should be made to the costs based on the ENR Construction Cost Index.

A Feasibility Report/Engineering Report should be completed before design and bidding of projects is authorized. A Feasibility Report/Engineering Report will better define the project scope and project costs.

List of Figures

Figure 1 – Improvement Areas
Figure 2 – Sanitary Sewer Improvement Areas
Figure 3 – Water Main Improvement Areas
Figure 4 – Storm Sewer Improvement Areas
Figure 5 – Eagle Drive Drainage Project Options

CITY OF SANDSTONE

Capital Improvement Plan

IMPROVEMENTS AREAS

Spring 2012

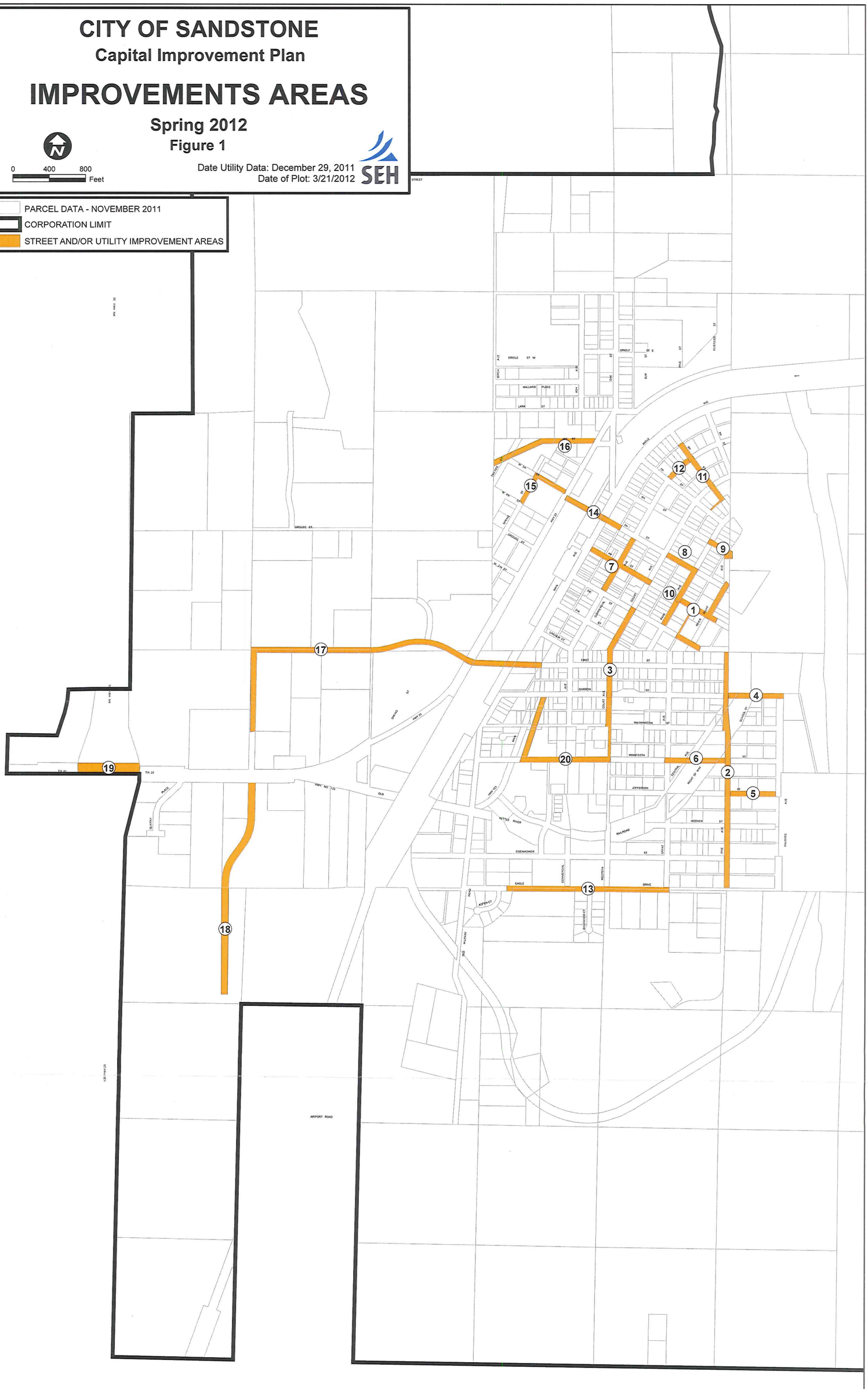
Figure 1

0 400 800 Feet

Date Utility Data: December 29, 2011
Date of Plot: 3/21/2012

SEH

PARCEL DATA - NOVEMBER 2011
CORPORATION LIMIT
STREET AND/OR UTILITY IMPROVEMENT AREAS



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CITY OF SANDSTONE

Capital Improvement Plan

SANITARY SEWER IMPROVEMENT AREAS

Spring 2012

Figure 2

0 400 800 Feet

Date Utility Data: December 29, 2011
Date of Plot: 3/21/2012

SEH

GRAVITY MAIN SIZE	FORCEMAIN SIZE
UNKNOWN	UNKNOWN
4	4
6	6
8	8
10	15
12	ABANDONED
15	

- MANHOLE
- REDUCER
- LAMP HOLE
- CHECK VALVE
- VALVE VAULT
- LIFT STATION
- MAIN PUMP STATION
- PARCEL DATA - NOVEMBER 2011
- STREET AND/OR UTILITY IMPROVEMENT AREAS
- AREAS OF I/I CONCERNS

100 LF 42" Steel Casing

Service

Service

Service

Service

6" to 4" Drop Elbow

6" PVC Service

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CITY OF SANDSTONE

Capital Improvement Plan

WATERMAIN IMPROVEMENT AREAS

Spring 2012

Figure 3

0 400 800 Feet

Date Utility Data: December 29, 2011
Date of Plot: 3/21/2012

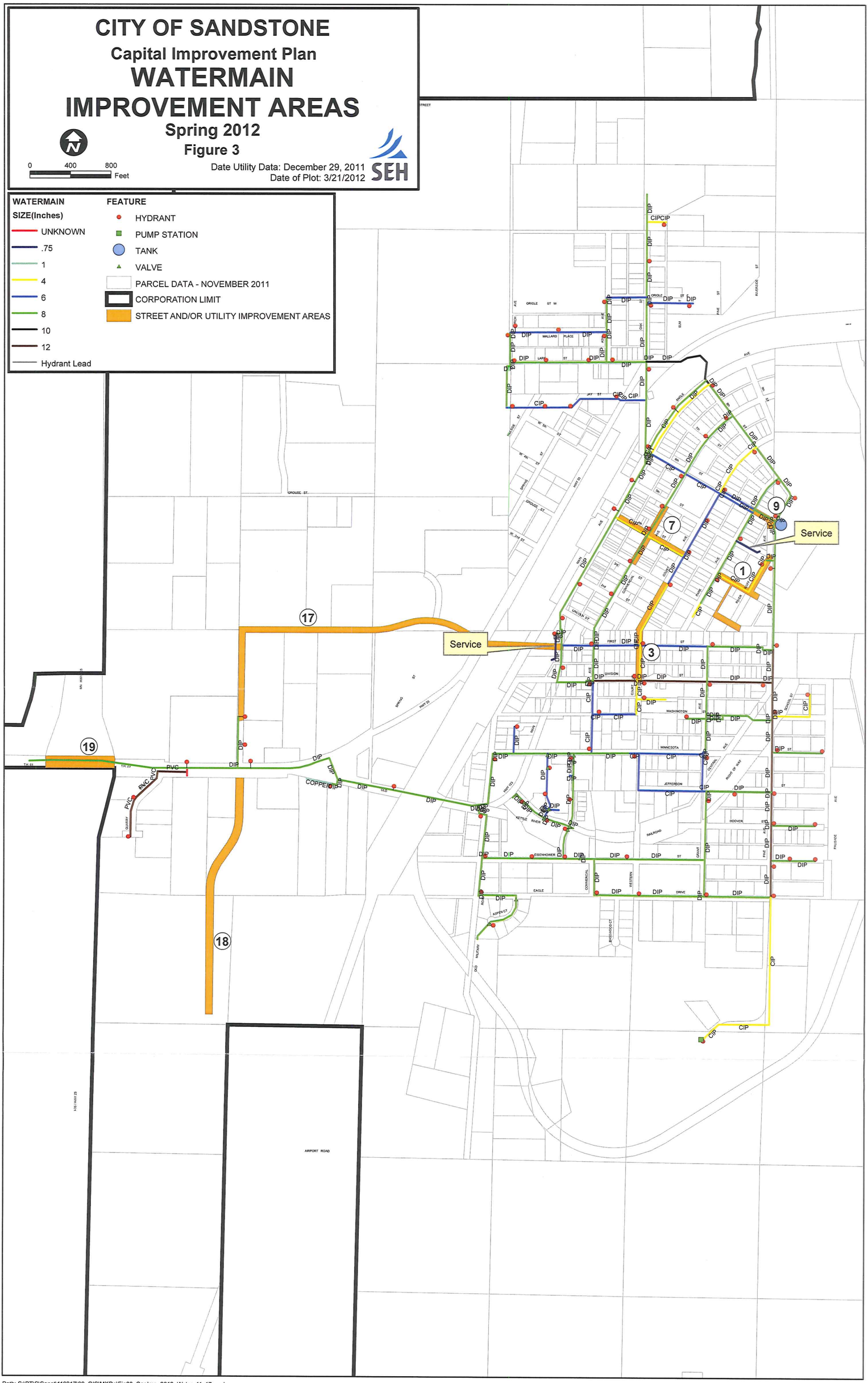
SEH

WATERMAIN SIZE(Inches)

- UNKNOWN
- .75
- 1
- 4
- 6
- 8
- 10
- 12
- Hydrant Lead

FEATURE

- HYDRANT
- PUMP STATION
- TANK
- VALVE
- PARCEL DATA - NOVEMBER 2011
- CORPORATION LIMIT
- STREET AND/OR UTILITY IMPROVEMENT AREAS



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CITY OF SANDSTONE

Capital Improvement Plan

STORM SEWER IMPROVEMENT AREAS

Spring 2012

Figure 4

0 350 700 Feet

Date Utility Data: December 29, 2011
Date of Plot: 3/21/2012

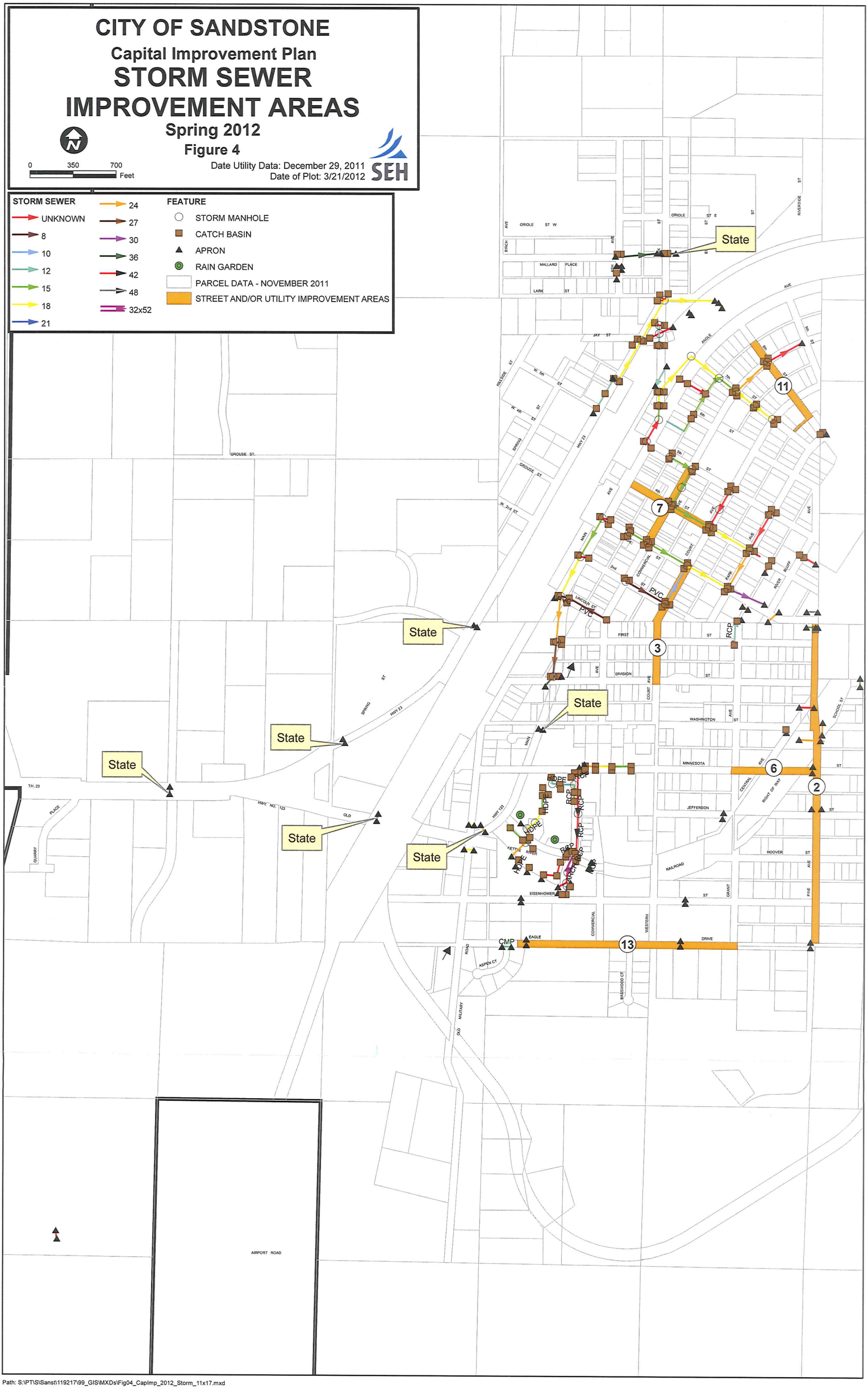
SEH

STORM SEWER

- UNKNOWN
- 8
- 10
- 12
- 15
- 18
- 21
- 24
- 27
- 30
- 36
- 42
- 48
- 32x52

FEATURE

- STORM MANHOLE
- CATCH BASIN
- APRON
- RAIN GARDEN
- PARCEL DATA - NOVEMBER 2011
- STREET AND/OR UTILITY IMPROVEMENT AREAS



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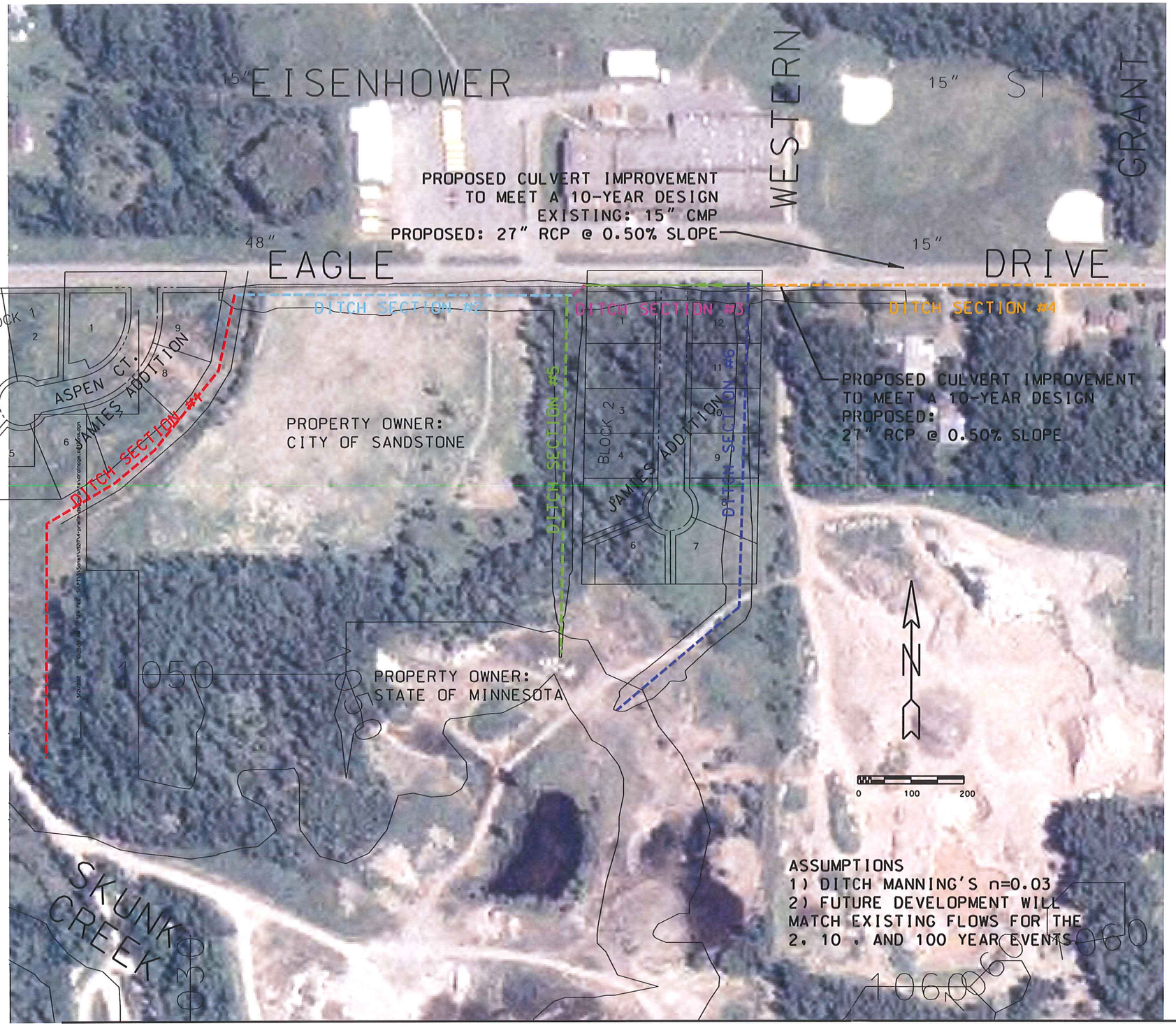

OPTION #1
DITCH SECTION #2, #3 & #4
DITCH SECTIONS #5 & #6 DO NOT APPLY FOR THIS OPTION

OPTION #1A
DITCH SECTION #2, #3 & 4
INCLUDES +/- 300 LF OF RCP PIPE
REDUCES IMPACTS TO ADJACENT PROPERTY
DUE TO DEPTH OF OPTION 1 AT ROAD HIGH POINT AND THE RESULTING SIDESLOPE CONSTRUCTION LIMITS.
DITCH SECTIONS #5 & #6 DO NOT APPLY FOR THIS OPTION

OPTION #2
DITCH SECTION #3, #4 & #5

DITCH SECTION #6 DOES NOT APPLY FOR THIS OPTION

OPTION #3
DITCH SECTION #4 & #6

DITCH SECTION #5 DOES NOT APPLY FOR THIS OPTION

SEH

PROPOSED MINIMUM DRAINAGE DITCH OPTIONS
EAGLE DRIVE DRAINAGE IMPROVEMENTS
SANDSTONE, MINNESOTA
FIGURE 5

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