CHAPTER 6: WASTEWATER

WASTEWATER INTRODUCTION

The municipal wastewater study area for Credit River Township is approximately its northern half, with the southern half of Credit River Township remaining rural residential. The municipal wastewater study area is designated as “Future Seneca Plant” in the 2040 Water Resources Management Plan.

Consistent with the Scott County Comprehensive Plan, the northern half of the Township is guided for Urban Expansion. The remaining area of the Township is guided as Rural Residential. The general boundary between these two designations is just south of the County Road 21 corridor. Generally, the land drains to the Credit River, which runs through the entire Township from south to north.

The need for a municipal wastewater collection system is based on one or more of the following criteria: health and safety concerns, environmental concerns, or growth. The general concern of the existing individual subsurface sewage treatment systems (SSTS) including Casey Addition, Creekwood Addition, Whitewood and the Country Court Addition may be both a health and safety concern, and with limited available data on the condition of the SSTS systems, an environmental concern may also exist.

In order to protect the health, safety and welfare of the community it will be necessary to extend municipal sanitary sewer and municipal water into Credit River Township within the planning period.

EXISTING SANITARY SEWER SYSTEM

At this time, there are no public sanitary sewers or lift stations connected to the Metropolitan disposal system. However, Credit River and Savage have been studying the extension of sanitary sewer into Credit River for over a decade. Future connection points to the Savage Trunk line are depicted in Figure 6-3. Prior to a connection being made to either of these locations, an intercommunity service agreement will be negotiated with the City of Savage.

Credit River Township currently operates three Community Septic Treatment Systems (CSTS) in the southern portion of the Township. The existing CSTS locations are shown below in Figure 6-1.
The remaining properties are currently served with Individual Subsurface Sewage Treatment Systems (SSTS). Scott County currently implements the SSTS program within Credit River Township. Although detailed information is not available, it is suspected that there are
several hundred homes with septic systems that are failing or are near failure. These areas, depicted as “Country Court, Casey, Whitewood, and Creekwood” on Figure 6-2 were subdivided in the 1960’s and 1970’s under Scott County planning and zoning prior to their current zoning ordinances being adopted. The lot sizes range from ¼ acre in the Casey Additions to approximately 1 acre in the Creekwood additions. Many of the properties do not have a backup septic site in the event that the primary systems fail.

MUNICIPAL WASTEWATER DISTRICTS

Based on the need for a public wastewater collection system and the anticipated future urban expansion, the Township has prepared a study to determine the feasibility of providing a wastewater collection system. Preliminary information regarding this study is provided in this chapter.

There are two major proposed wastewater sewer districts identified for the study area. Each defines the limit of service for a separate trunk system. These districts, west and east, were used to develop design flows and to determine cumulative design flows in each sewer segment.
There have been preliminary plans created in the western sewer district to install sewer in existing subdivisions closest to the proposed trunk line connection. These plans are to install sanitary sewer underneath the existing roadways within the subdivisions. To best utilize available funding, construction of the new systems is going to take place the same time the roads need to be reconstructed. Figure 6-4 and Figure 6-5 show the proposed sewer layout as well as approximate manhole locations in the Country Court subdivision and Casey...
subdivision respectively.

![Figure 6-3 - Credit River Township Sewer Districts with Planned Trunk Lines](image)

**Country Court Subdivision**

The Country Court subdivision is adjacent to the alignment of the future trunk for the west sewer district. Many of the existing lots are ¼ acre in size and do not have back up septic sites. The roads have been in dis-repair for close to a decade, and the Town is considering a series of capital improvement projects beginning in the year 2023 to install municipal utilities and reconstruct the streets.
The Casey subdivision was originally subdivided in the 1970’s. Many of the existing lots are ¼ acre in size and do not have back up septic sites. Some of the septic systems have already failed in this area, and replacement septic systems have been constructed in front yards or in areas that lack sufficient space. It is anticipated that a public improvement project to install municipal utilities and reconstruct the streets will be needed within the next 10 – 15 years.
WASTEWATER LAND USE AND POPULATION

The sizing of the wastewater collection facilities is dependent on the hydraulic capacity required for each part of the system. Municipal wastewater is generally a mixture of domestic sewage, commercial and industrial wastes, ground water infiltration and surface water inflow. With proper design and construction, ground water infiltration is reduced to a minor percentage of the total flow and surface water inflow is eliminated, leading to hydraulic discharges that depend predominantly on land use.

Since properly designed and constructed sanitary sewer pipes have long life expectancies, it is reasonable to assume that the full development population will be reached before pipe facility replacement becomes necessary. The pipe facilities shown on the Proposed Trunk Wastewater System Map, described in this chapter on the following page, support full development of the study area.
The Township’s Ultimate Land Use Plan in Chapter 2 was used to guide the trunk system development. In order to estimate the volume of wastewater flow anticipated, the Ultimate Land Use Plan was used to divide the Township into land use types.

The acreage summarized in the table below estimates the population and septic connections through this planning period.

<table>
<thead>
<tr>
<th>Western Connection Point</th>
<th>Total Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acres</strong></td>
<td><strong>Units</strong></td>
</tr>
<tr>
<td>2030</td>
<td>256.6</td>
</tr>
<tr>
<td>Septic Connections</td>
<td>Medium Density</td>
</tr>
<tr>
<td>Low Density</td>
<td>Total New Construction</td>
</tr>
<tr>
<td>Total 2030</td>
<td>0</td>
</tr>
<tr>
<td>2040</td>
<td>17.5</td>
</tr>
<tr>
<td>Septic Connections</td>
<td>Medium Density</td>
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<td>Low Density</td>
<td>Total New Construction</td>
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<tr>
<td>High Density</td>
<td>Total All 2040</td>
</tr>
<tr>
<td>Total New Planning Period</td>
<td>36.1</td>
</tr>
<tr>
<td>Total All Planning Period</td>
<td>292.7</td>
</tr>
</tbody>
</table>

Wastewater Design Criteria

Wastewater flows were calculated by determining the number of residential equivalent connections (RECs) within the wastewater study area and associated densities. Each REC was assumed to contribute 250 gallons of wastewater per day. The table below shows each land use RECs and the total number of RECs at full build out of the Township. The number of RECs was totaled at 771 with a corresponding wastewater flow to the Seneca Treatment Plant of 192,750 gallons per day for the planning period.
The table below indicates the estimated wastewater generation flows for Credit River Township in ten-year increments to the year 2040. The wastewater study area is not expected to be fully developed by the year 2040.

### Table 6-9 - Estimated Average Flow

<table>
<thead>
<tr>
<th>Year</th>
<th>Estimated Average Flow (GPD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>-</td>
</tr>
<tr>
<td>2020</td>
<td>-</td>
</tr>
<tr>
<td>2030</td>
<td>110,750</td>
</tr>
<tr>
<td>2040</td>
<td>192,750</td>
</tr>
</tbody>
</table>
Figure 6-10 - Development Staging Map
Inflow and Infiltration

Inflow and infiltration (I/I) is clear water that enters the sanitary sewer system. I/I can enter the sanitary sewer through a number of sources: pipe, manholes, sump pumps, and foundation drains.

The design and construction of new sewers and the connection of new and existing buildings to the sewer system in Credit River Township will meet the industry standards for tightness and minimize the entry of Infiltration and Inflow into the collection system.

Credit River Township standards will meet the state of Minnesota requirements. All new sewers will be designed and installed so leakage into the sewer is less than 100 gallons per day per inch- diameter per mile of sewer. To ensure compliance with this standard Credit River Township will require onsite construction observation during construction and verification testing prior to acceptance of the public improvements. Certification by a professional engineer that new facilities are installed in accordance with all specifications will also be required. Records of these certifications will be maintained by the Township.

To ensure that all municipal utilities are properly constructed and will meet all state, federal, and local requirements, Credit River Township has prepared an Engineering Manual that addresses the material and workmanship that will be required for all municipal improvements. The Engineering Manual was adopted by the Town Board in 2006. The Engineering Manual requires that all wastewater facilities be designed to conform to the "10 State Standards" and be constructed in accordance with City Engineers Association of Minnesota Standard Specification except as modified by specific Credit River Township requirements.

The connection of building laterals to the local sewer system will be permitted by the building department. A licensed plumber shall certify that the connection was made in accordance with the Building Code.

Maintenance Program

The Township will develop on ongoing sewer cleaning and inspection program as part of the routine maintenance of the collection system. I/I sources are often identified during inspection and include open and leaking sewer joints, cracked pipes, missing joint gaskets, pick holes in manhole covers, and offset manhole frames.

The Township will develop a procedure manual to ensure that I/I sources identified during the inspection program are corrected in a timely manner.
Ordinances

Credit River Township will adopt an ordinance that prohibits the connection of roof leaders, foundation drain tile, and sump pumps from new construction to the public wastewater collection system. The ordinances will require the disconnection of any roof leaders, foundation drain tile, or sump pumps currently connected to existing ISTS systems. The ordinance will also require that all foundation drains and clear water sump pumps be properly installed prior to issuance of a Certificate of Occupancy.

Credit River Township currently has ordinances that prohibit sump pump connections into its three Community Septic Treatment Systems. Further, the ordinance governing the systems prohibits daily discharges greater than 600 gallons per day as a weekly average or 450 gallons per day as a monthly average.

Scott County’s Subsurface Sewage Treatment Ordinance establishes the minimum standards and criteria for the design, location, installation, use, and maintenance of individual septic systems in Credit River Township.

Peak Trunk Wastewater System Design

The trunk wastewater system must be capable of handling not only the average flows, but also anticipated peak flows. These peak flows are obtained by multiplying average flows by a variable factor. This factor, called the Peak Flow Factor, generally decreases with increasing average flows. The Peak Flow Factors used in preparing this report were taken from the "10 State Standards" manual. These values are considered conservative and are widely used for planning purposes.

Wastewater Collection Full System Development

The full development trunk sanitary sewer system layout for Credit River Township is shown on the attached Proposed Trunk Sanitary Sewer map. This map shows the two main trunk sanitary sewer lines that will be needed for the wastewater study area.

The proposed trunk sanitary sewer alignments are preliminary and should be reviewed at the time of final design to ensure conformance with existing and proposed development. In most cases, the alignments closely follow main development corridors and natural drainage ways. In Credit River Township’s case, the main development corridor is County Road 27 and the natural drainage way is the Credit River. Future land use plans and utility feasibility studies in this area will determine actual utility corridors and may cause adjustment to the proposed alignments.
Metropolitan Disposal Facilities

The Metropolitan Council currently provides wastewater collection and treatment services to 2.75 million people in 403-110 communities, which represents about 95 percent of the seven-county metropolitan area’s population. The Council owns and operates the Metropolitan Disposal System (MDS). The MDS includes eight-nine wastewater treatment plants: Metropolitan, Empire, East Bethel, Blue Lake, Seneca, Eagles Point, Hastings, Rogers, and St. Croix Valley. It also includes approximately 610-632 miles of regional interceptors that connect flow from 5,000 miles of sewers owned by local communities. The system treats approximately 250 million gallons per day of wastewater from homes, industries, and commercial businesses. The system is operated through the Metropolitan Council’s Environmental Services Division (MCES).

The Seneca Plant is located in the northwestern part of Eagan. The plant treats wastewater from Bloomington, Burnsville, Eagan, and Savage, and parts of Apple Valley, Inver Grove Heights, Edina and Lakeville. The Seneca Plant has a capacity of 39 million gallons of wastewater daily, and discharges clean water to the Minnesota River. The river is impaired due to low oxygen levels; the Seneca Plant helps to offset that by adding oxygen to its clean water discharge.

The Metropolitan Council has indicated that Credit River Township’s capacity for wastewater collection and treatment is approximately 1.7 million gallons per day (average). This long-term wastewater service capacity closely matches the Township’s projected wastewater flow proposed to be generated in the municipal service area delineated in this comprehensive plan.

Savage Interceptor

The Savage Interceptor will ultimately serve the entire wastewater study area of Credit River Township. Currently Credit River Township is proposing two connections to the Savage Interceptor. One connection is near the County Road 27 and County Road 44 intersection and the other is along Hampshire Avenue, at the City of Savage / Credit River Township border.

Based on the proposed land uses, the Township should generally extend wastewater improvements from the north to the south in a phased sequence or staging. This staging concept does not envision development saturation within each area and is subject to modification. The Town Board has indicated that costs associated with the analysis and potential implementation of a municipal wastewater collection system will be recovered from benefiting properties, not from the public at large or from a general Township fund.
Individual Septic Systems

Currently Credit River Township relies exclusively on individual and community sewage treatment for wastewater disposal. The Ultimate Land Use Plan for Credit River Township shows that the southern portion of the Township will remain rural residential and will not have municipal water and wastewater services. In Credit River Township, the individual sewage treatment system permitting, inspection, and maintenance governing agency is Scott County. According to Scott County records, there are 1681 individual SSTS in Credit River Township.

In some of the northern developments the age and the concentration of homes result in a concern for the condition of the individual septic tank/disposal systems with regard to their location to lakes, wetlands, individual wells and property lines.

In these areas it is suspected that a number of systems are failing or are nonconforming systems. Reconstruction of existing systems may be limited based on the availability of adequate property, mottled soils, disturbed land and the general terrain. Construction of new ISTS systems may be both difficult and expensive. These specific areas of concern are the Casey Addition, Creekwood Addition and Country Court Addition.

Scott County has the responsibility for enforcement of the State's SSTS regulations by statute and rule. All individuals performing site evaluation, installation, inspection, and pumping/cleaning of individual sewage treatment systems must be licensed by the MPCA and maintain certification by the MPCA to perform such work. The owner of each individual sewage treatment system is responsible for properly maintaining their system. Scott County is responsible for the permitting and inspection of septic systems. The County maintains a septic tank pumping tracking system, issuing permits to State licensed pumpers and notifying system owners when it has been three years since their septic tanks were last inspected or pumped. If a property owner fails to properly maintain their septic system, the County continues to remind them. The County maintains a record of septic tank maintenance and uses this information to decide if a compliance inspection is needed if and when the property owner applies for certain types of permits. Maintenance records are also available at the County for review by prospective buyers of properties. Failure to properly maintain a septic tank can lead to system discharge or backup. The County requires failing systems to be corrected within ten months in accordance with State laws.
COMMUNITY SEPTIC SYSTEMS

Credit River Township is the owner and operator for Community Sewage Treatment Systems in the Township. Currently two developments in Credit River Township, Monterey Heights and South Passage, are operating a combined Community Sewage Treatment Systems. Two more developments, Territory and Stonebridge, are operating additional Community Sewage Treatment Systems (see Figure 6-1, Community Sewage Treatment System (CSTS) Location map). All four developments are located in the southern, Rural Residential Single-Family District.

All three systems have State Disposal Permits as issued from the Minnesota Pollution Control
Agency. A brief description of the systems is as follows:

**Monterey Heights/South Passage CSTS**

The Monterey Heights and South Passage CSTS has an average wet weather design flow of 23,400 gpd. Monterey Heights and South Passage consist of 29 and 20 homes respectively. Both developments are at full build-out. All homes have individual septic tanks and a septic tank effluent pumping (STEP) system which discharges water into a pressurized forcemain. The homes in Monterey Heights discharge water via a forcemain to the Monterey Heights wastewater treatment facility. The homes in South Passage discharge to the South Passage wastewater treatment facility. Water from both developments is treated by a recirculating gravel filter and disposed of in a bank of mounds (12 mounds for South Passage and 18 mounds for Monterey Heights).

**Stonebridge CSTS**

The Stonebridge CSTS has an average wet weather design flow of 14,000 gpd. The effluent from the homes STEP systems will be pumped through the force main to a 2,000-gallon septic tank followed by two 5,000-gallon recirculation tanks and a 3,000-gallon denitrification tank. The effluent is pumped from the final recirculation tank to one of three AdvanTex® AX100 pods. Textile blankets in the AdvanTex® pods provide surface area for microbes to colonize and grow, and the wastewater is then treated by the microbes as it percolates through the pods. The wastewater cycles through the pods at a 2.5:1 recirculation ratio to maximize the removal of organic matter and nutrients. Following recirculation, the water enters a 3,000-gallon de-nite tank dosing MicroC, adding carbon for proper “food” for denitrification microbes. The disposal system consists of three zones of six mounds each, with each mound designed to infiltrate 800 gallons per day. The system is designed for 32 homes and is fully built out.

**Territory CSTS**

The Credit River Township - Territory Wastewater Treatment Facility (Facility) is located in the NW 1/4 of SE 1/4 of Section 32, Township 114 North, Range 21 West, Credit River Township, Scott County, Minnesota. This is a Class C facility. The Facility serves the Credit River Township - Territory Housing Development consisting of System 1, System 2 & 3, System 7, and System 8.

Each wastewater treatment system (System 1, 2 & 3, 7, and 8) consists of a Septic Tank Effluent Pump (STEP) system at each home comprised of two septic tanks: one 1,250-gallon septic tank followed by a compartmented 2,000-gallon septic tank. In the second compartment of the second septic tank is a pumping chamber that pumps effluent through a two-inch force main to the associated systems main treatment components.
System 1 has an average wet weather (AWW) design flow of 13,500 gallons per day (gpd). This design flow is based on the connection of 30 homes at 450 gpd per home plus 1 Lodge (with daily flows equivalent to 7 single family homes) connected to the system. The Lodge is serviced by a 3,000-gallon and 1,500-gallon septic tank followed in series by a 3,000-gallon pump tank. The effluent from the homes and the lodge is pumped through the force main to a flow meter manhole followed by a 2,000-gallon influent septic tank, two 7,500-gallon recirculation tanks and then three Advantex AX100 recirculating textile media filters. Finally, effluent flows to one 3,000-gallon dosing tank where it is pumped to a three-section disposal system consisting of 6 mounds in each section for a total of 18 mounds. A network of 7 ground water monitoring wells exists at System 1 to monitor ground water flow and conditions at the site.

System 2 & 3 is one system that has an AWW design flow of 28,800 gpd. This design flow is based on the connection of 64 homes at 450 gpd per home. The effluent from the homes STEP systems will be pumped through the force main to a flow meter manhole followed by a 4,000-gallon septic tank, two 10,000-gallon recirculation tanks and then five Advantex AX100 recirculating textile media filters. Finally, effluent will flow to one 6,000-gallon dosing tank where it will be pumped to a six-section disposal system consisting of 6 mounds in each section for a total of 36 mounds. A network of 10 ground water monitoring wells has been installed around the System 2 & 3 to monitor ground water flow and conditions at the site.

System 7 has an AWW design flow of 15,300 gpd. This design flow is based on the connection of 34 homes at 450 gpd per home. The effluent from the homes STEP systems is pumped through the force main to a flow meter manhole followed by a 2,000-gallon septic tank, two 5,000-gallon recirculation tanks and then three Advantex AX100 recirculating textile media filters. Finally, effluent flows to one 3,000-gallon dosing tank where it is pumped to a three-section disposal system consisting of 6 mounds in each section for a total of 18 mounds. A network of 7 ground water monitoring wells has been installed around System 7 to monitor ground water flow and conditions at the site.

System 8 has an AWW design flow of 15,300 gpd. This design flow is based on the connection of 34 homes at 450 gpd per home. The effluent from the homes STEP systems is pumped through the force main to a flow meter manhole followed by a 2,000-gallon septic tank, two 5,000-gallon recirculation tanks and then three Advantex AX100 recirculating textile media filters. Finally, effluent flows to one 3,000-gallon dosing tank where it is pumped to a three-section disposal system consisting of 6 mounds in each section for a total of 18 mounds. A network of 3 ground water monitoring wells has been installed around System 8 to monitor ground water flow and conditions at the sites.

Certain collection systems in this housing development have the ability to be interconnected for maintenance and low flow situations. System 7 and System 8 are interconnected, and System 1 and System 2 & 3 are also interconnected. The operator is able to exercise a ball
valve to allow for independent or interconnection operation. A map of the interconnect points is on file at the MPCA.

There are no designed bypasses in the treatment system. This SOS permit authorizes no discharge to surface waters

Table 6-12 - # of Homes Connected to CSTS

<table>
<thead>
<tr>
<th>Community Septic Treatment System</th>
<th># of Homes Connected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Territory</td>
<td>112</td>
</tr>
<tr>
<td>Stonebridge</td>
<td>32</td>
</tr>
<tr>
<td>Monterey Heights / South Passage</td>
<td>49</td>
</tr>
<tr>
<td>Total</td>
<td>193</td>
</tr>
</tbody>
</table>

Credit River Township provides the inspection, monitoring, operating, and maintenance services of the Community Sewage Treatment Systems to ensure their compliance with Minnesota Pollution Control Agency’s Rule 7080. The Township has prepared Builders Guides and Homeowners Manuals for the residents involved with the Community Sewage Treatment System projects. The Township has also established an ordinance that controls how the homeowners are allowed to use the system. Scott County will not issue a Certificate of Occupancy for homes that are connected to a Community Sewage Treatment System unless an authorized Township representative has approved the tank inspection. An inspection form has also been prepared by the Township and all items on that form must be complete in order for the tank inspection to be approved. Copies of the State Disposal Permits are included in Appendix A-C.