

**City of Ramsey**  
**Agenda**  
**Public Works Committee**  
**Tuesday March 31, 2015**

**6:00 pm**

**Lake Itasca Room, 7550 Sunwood Drive NW**

**(please note: this meeting is rescheduled from the regular March 17, 2015 meeting)**

- 1. Call to Order**
- 2. Citizen Input**
- 3. Approve Agenda**
- 4. Approve Minutes**
  1. Approve Public Works Committee meeting minutes.
- 5. Committee Business**
  1. Consider Options for Addressing Stormwater Drainage Issues in Low Lying, Land Locked Areas
  2. Consider the Surface Water Management Plan Update
  3. Consider use of Sunwood Drive as Official Detour Route during Highway 10 & Armstrong Boulevard Interchange Construction
  4. Business Signage for Armstrong Interchange Detour
  5. Consider Street and Pedestrian Facility Lighting Plans - Center Street and Riverdale Drive
  6. Request Installation of Priority Street Light at Nowthen Blvd and Iodine Street
- 6. Committee/Staff Input**
- 7. Adjournment**

**Public Works Committee**

**4. 1.**

**Meeting Date:** 03/31/2015

**Submitted For:** Grant Riemer, Engineering/Public Works

**By:** MaryJo Warner, Engineering/Public Works

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**Title:**

Approve Public Works Committee meeting minutes.

**Purpose/Background:**

To review and approve the minutes of January 20, 2015.

**Timeframe:**

5 minutes.

**Observations/Alternatives:**

n/a

**Funding Source:**

n/a

**Recommendation:**

To approve meeting minutes.

**Action:**

Motion to approve meeting minutes of January 20, 2015.

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**Attachments**

Minutes

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**Form Review**

<b>Inbox</b>	<b>Reviewed By</b>	<b>Date</b>
Grant Riemer	MaryJo Warner	03/11/2015 08:28 AM
Kurt Ulrich	Kurt Ulrich	03/18/2015 05:30 PM
Form Started By: MaryJo Warner		Started On: 03/10/2015 04:02 PM
Final Approval Date: 03/18/2015		

**PUBLIC WORKS COMMITTEE  
CITY OF RAMSEY  
ANOKA COUNTY  
STATE OF MINNESOTA**

The Public Works Committee conducted a regular meeting on Tuesday, January 20, 2015 at the Ramsey Municipal Center, 7550 Sunwood Drive NW, Ramsey, Minnesota.

Members Present:     Chairperson Chris Riley  
                              Councilmember Jill Johns

Member Absent:       Councilmember Melody Shryock (Excused)

Also Present:          City Administrator Kurtis Ulrich  
                              Public Works Superintendent Grant Riemer  
                              City Engineer Bruce Westby  
                              Civil Engineer II Leonard Linton

**1.     CALL TO ORDER**

Chairperson Riley called the regular meeting of the Public Works Committee to order at 6:00 p.m.

**2.     CITIZEN INPUT**

There was none.

**3.     APPROVE AGENDA**

Motion by Councilmember Johns, seconded by Chairperson Riley, to approve the agenda, as presented.

Motion carried. Voting Yes: Chairperson Riley and Councilmember Johns. Voting No: None. Absent: Councilmember Shryock.

**4.     APPROVE MINUTES**

**4.01:  Approve November 18, 2014, Meeting Minutes**

Motion by Chairperson Riley, seconded by Councilmember Johns, to approve the following minutes:

Regular Meeting Minutes dated November 18, 2014

Motion carried. Voting Yes: Chairperson Riley and Councilmember Johns. Voting No: None. Absent: Councilmember Shryock.

## **5. COMMITTEE BUSINESS**

### **5.01: Nominate Chair and Vice-Chair for the Public Works Committee**

Councilmember Johns nominated Councilmember Chris Riley for Chairperson.

Motion by Councilmember Johns, seconded by Chairperson Riley, to nominate Councilmember Riley as Chair of the Public Works Committee.

Motion carried. Voting Yes: Chairperson Riley and Councilmember Johns. Voting No: None. Absent: Councilmember Shryock.

Motion by Chairperson Riley, seconded by Councilmember Johns, to nominate Councilmember Johns as Vice-Chair of the Public Works Committee.

Motion carried. Voting Yes: Chairperson Riley and Councilmember Johns. Voting No: None. Absent: Councilmember Shryock.

### **5.02: Consider Planning Commission Recommendation to Reconstruct a Temporary Cul-De-Sac on Feldspar Street in the Brookfield Subdivision**

City Planner Chris Anderson reviewed the staff report and explained this item came to the attention of the City through an application in progress to replat an existing outlot into one single family buildable lot. He noted there was a public meeting on January 8, 2015 where one resident expressed concerns on the existing conditions of the cul-de-sac. The Planning Commission had also expressed concern with the temporary cul-de-sac and its original construction. He explained because there are signs of deterioration, and the current configuration of curb and gutter is an issue with maintenance, the Planning Commission recommended the city make upgrades to bring the cul-de-sac up to design standards. The reconstruction of the cul-de-sac will be within its existing footprint. He noted this is the second request of this type of which the city has reviewed. He stated based on prior requests, it is evident that the use of an outlot and temporary easement is not the right tool to address turn around space at a dead end. Staff is working on a new policy that could accommodate a right of way and would require the roadway to be built to correct standards.

A resident in the audience noted this is larger than the proposed size.

Chairperson Riley explained the lot would not have been that large if it were built to the new standards right away. He questioned if this could be a dead end street and if the “wings” could be removed.

Public Works Superintendent Riemer responded they cannot be removed due to problems with school buses, garbage trucks and plowing.

Councilmember Johns confirmed whether the reduced size will work.

Public Works Superintendent Riemer answered staff can work with it.

A resident in the audience asked if the current homeowners would object to any of the changes.

Chairperson Riley replied they do not expect any objections since this would be an improvement.

Councilmember Johns questioned if changes will need to be made to the sidewalk coming down from the north.

City Planner Chris Anderson noted the sidewalk terminates at the extension and there is no intention to extend it at this time.

Councilmember Riley commended City Planner Westby's cost estimate and confirmed if he was comfortable with the cost.

City Planner Westby answered he is satisfied.

Motion by Councilmember Johns, seconded by Chairperson Riley, to recommend to the City Council that the City upgrade the temporary cul-de-sac to current construction standards within its existing footprint.

Motion carried. Voting Yes: Chairperson Riley and Councilmember Johns. Voting No: None. Absent: Councilmember Shryock.

### **5.03: Consider City of Anoka Request to Extend Sewer and Water to Serve Two City-owned Parcels**

City Engineer Westby reviewed the staff report and pointed out all costs will be assumed by the City of Anoka per this agreement. Each city will have the ability to maintain their own lines. He said it is prudent that this item moves forward quickly. It will be brought forward to the City Council on January 27<sup>th</sup>.

City Administrator Ulrich commented this utility extension to this site makes this site developable. Once the City of Ramsey provides utilities, the City doesn't have any control from a zoning perspective of how it gets developed. He stated the City of Anoka had mentioned in staff discussions that the Counseling Center currently located on Ferry Street could be a potential user of this parcel. He noted cities prefer to be cooperative and provide help when possible and then reciprocate when feasible. This item is brought forth for information. He noted this doesn't necessarily impact infrastructure.

Chairperson Riley clarified if the pipes would be able to handle whatever type of business this was used for.

City Engineer Westby answered an eight inch main is planned and would be sufficient for this parcel.

Councilmember Johns inquired whether this type of request arises frequently.

Public Works Superintendent Riemer responded it doesn't happen very frequently with the City of Ramsey. He said it is not unusual, and he knows of other cities that work together often.

Civil Engineer II Linton explained the trailer court that was there was on well and septic. This is not feasible for a development, and that is the reason for the request of city sewer and water.

Motion by Councilmember Johns, seconded by Chairperson Riley, to recommend that the City Council approve the draft JPA as it is written.

Motion carried. Voting Yes: Chairperson Riley and Councilmember Johns. Voting No: None. Absent: Councilmember Shryock.

#### **5.04: Update on 2015 Jarvis Street Reconstruction Plans and Estimated Costs**

City Engineer Westby reviewed the staff report and commented this is a case that was first presented on September 16, 2014. He noted the Elk River City Council has now approved a design that has a 36-foot wide street and two 12 foot-wide through lanes and two 6 foot wide on-road bike lanes. This brings the portion of the City of Ramsey's cost to \$920,305.50. With the changes, it is hopeful the Jarvis Street railroad crossing will be quiet zone eligible by January of 2016. Staff does support the design as proposed. He explained Elk River agreed to pay for the City of Ramsey's share of the costs with an interest-free payback time of three years.

Chairperson Riley asked if there are any concerns with the on road trail.

City Engineer Westby responded there are no major concerns with the proposal. There are repeat users of the trail, and they will know what to expect.

Councilmember Johns clarified this project is being moved up on the City of Ramsey's schedule to accommodate the City of Elk River's schedule.

City Engineer Westby confirmed that to be the case. He stated it does work well with the financial and construction schedule for the City of Ramsey.

City Administrator Ulrich mentioned he is pleased with the railroad quiet zone implementation. This will complete the quiet zones in the City.

Councilmember Johns inquired whether the City of Elk River is overseeing the project.

City Engineer Westby responded the City of Elk River is overseeing the project. They have been pulling the necessary permits.

Motion by Chairperson Riley, seconded by Councilmember Johns, to recommend that the City Council approve the City of Elk River's revised cost-share proposal.

Motion carried. Voting Yes: Chairperson Riley and Councilmember Johns. Voting No: None. Absent: Councilmember Shryock.

## **6. COMMITTEE / STAFF INPUT**

### **6.01: Update on Water Supply Planning Efforts**

City Engineer Westby reviewed the staff report. He also reviewed a PowerPoint presentation. He noted the City has a design capacity of 10.73 million gallons per day. The average daily consumption is 1.72 MGD. The highest has been 5.16 MGD. The city does have emergency capacity of 1.2 million gallons per day. He pointed out there is a storage capacity of 4 million gallons. Based on this, there should be sufficient capacity for years to come. He said no new wells are included in the 5-year CIP. He explained the staff has been informed that ground water can continue to be used for water supply needs and new wells may be allowable if staff can show that it is not cost effective to utilize surface water. He said cities around the metro are drilling new wells to meet their needs, but they are also being asked to consider surface water supply in place of, or in addition to, ground water supply.

City Engineer Westby noted the City has regional water supply partnerships with the Anoka County Municipal Wellhead Protection Group, the Anoka County Water Resources Management Task Force and the Northwest Metro Water Supply Work Group. Staff is planning to request Council authorization to formally joining the Anoka county Municipal Wellhead Protection Group. This group is composed of eight cities in the northern metro area. He explained the Anoka County Water Resources Management Task Force includes a group of representatives from across Anoka County, which meets regularly. The Northwest Metro Water Supply Group has been one of the stronger groups their goal is to provide guidance for local water supply systems and future regional investments, as far as alternatives to groundwater supply in the northwest area. He mentioned St. Cloud has tapped into the Mississippi River for water supply. He stated Staff believes the Ramsey area could be a good spot for a regional water treatment plant. The City of Ramsey is working to keep on top of the situation so that when improvements are needed, there will be direction and good partnering opportunities with other cities.

Chairperson Riley asked City Administrator Ulrich if he is in agreement with the status of the water supply efforts.

City Administrator Ulrich said he agrees. He added there was some indication from the DNR that if we wanted to consider another well, they may not approve. The DNR encouraged Staff to look at alternatives. He explained groundwater cannot be mixed with river water due to temperature and chemical differences. Either a groundwater system should be used exclusively, or surface water sources exclusively used. This effort must be regional or statewide in order to make it cost effective. It is not feasible for the City of Ramsey to spend large dollar amounts to build a large system to work with surface water. It may be better to apply for permits and see if

they are approved. He said the City is taking a very cooperative approach. He noted the City's growth demand is modest and progress is being made.

Chairperson Riley stated he appreciated the information because he understood that wells were not an option at all. He said he appreciated knowing there is a chance. While other cities are drilling new wells, he was wondering why the City of Ramsey was told not to. He commented it is good to understand the situation.

City Engineer Westby noted the groundwater option is almost as expensive as treatment for surface water because of the expense of pipes, and the cost of treating the water. He stated he would look into this option further.

Chairperson Riley asked if the City of Ramsey sits on one aquifer.

Civil Engineer II Linton explained Wisconsin and Iowa is all on one rock, and uses the name of The Tunnel City. He said what staff has experienced in drilling previous wells, is the rock that water is pulled from gets thinner while traveling north. There is less water to draw from as you go north. The geology changes as you go north from the city of Ramsey. This is why the DNR is encouraging the City of Ramsey to look at other options.

Chairperson Riley pointed out City Engineer Westby had mentioned St. Cloud draws from the Mississippi, and so does Minneapolis. He asked if there were any other cities that did the same.

City Engineer Westby replied he didn't think any other cities pulled from the Mississippi until around Minneapolis.

## **6.02: Historical Background on High Water Issues in Ramsey**

Civil Engineer II Linton explained this is an informational presentation. He stated the City of Ramsey is located on the Anoka Sand Plain and the soils are generally sandy which runs away quickly with moisture. Approximately 20% of the surface area in Ramsey is wetlands. Some are isolated pockets, and some connected by channels. Water levels generally stay the same, but depending on rainfall the levels can fluctuate. Where the drainage is not sufficient is where there will be overflowing, for the most part. He reviewed the staff report and explained the requirements of drainage construction. Most of the high water concerns have been from older developments that were built prior to storm water management standards were put in place.

Cassandra Miske, 17421 Gibbons Street NW, stated she lived in Ramsey in 2011 and there was more water in 2014. She noted she had water in her basement for weeks in 2014. She questioned what the percentage is of people that actually report flooding to the City.

City Engineer Westby answered that is hard to know.

Ms. Miske asked if staff seeks to talk with neighbors of a resident that is affected by high water, and try to determine from that if there are more people affected.

Civil Engineer II Linton responded in the past, staff would talk to any neighbors that are outside when they go to inspect a situation that was called in. Most of the reports are from isolated homeowners.

Ms. Miske mentioned another neighbor of hers had flooding and now they are foreclosing. The house across the street usually has flooding issues, but this year they didn't. All the neighbors she talked to said they didn't have any issues until the neighboring area was built. The holding pond floods quickly and is pushed into Ms. Miske's neighborhood.

City Engineer Westby noted there is no record of what the standards were or what the high water levels in the area were when it was a township. The wetlands in the area by Ms. Miske's neighborhood were constructed when Ramsey was a township.

Chairperson Riley pointed out the terrain across Ramsey is very flat. If the high water issue can be solved in one area, the next area gets filled up.

City Engineer Westby stated it is difficult to prioritize the areas and determine how to route the water. He said neighboring communities only need several hundred feet of pipe and they can route to a creek or lake. This is not possible with the City of Ramsey being a flat area.

Ms. Miske commented they have been in the house and have been through flooding in prior years, and now they are invested. She said she didn't really want to leave at this point.

Civil Engineer II Linton stated he visited the property of Ms. Miske this past summer. He confirmed the wetlands are full and do overflow. He said staff is preparing a presentation and discussion at the next meeting. Since the neighboring area was built without consideration for wetlands and ponds for run off, staff will have to discuss how this can be corrected.

#### **Other Staff Input/Updates:**

Chairperson Riley asked for an update on CSAH 5 and Alpine Drive.

City Engineer Westby responded it will stay in the state it is currently until spring. The weather became a factor and didn't allow the project to be completed. The contractor had several projects going on at once in the City and this is one that could not be completed.

Chairperson Riley inquired about the stop signs on Iodine Street and 146<sup>th</sup> Lane.

Public Works Superintendent Riemer replied they were put in two weeks ago.

City Administrator Ulrich raised the issue of Highway 10 and Armstrong Boulevard. He noted a JPA needs to be written and signed between the County and the City. He said he is hopeful the item can be brought to the Council on February 10. He stated he has not yet heard back from Coburns on their preferred schedule for construction, so Staff is moving forward with the one-year timeline.

Chairperson Riley inquired on the status of adding chargers in the garage for electric cars.

Public Works Superintendent Riemer responded the station is in, and it needs to be activated.

## **7. ADJOURNMENT**

Motion by Councilmember Johns, seconded by Chairperson Riley to adjourn the Public Works Committee meeting.

Motion carried. Voting Yes: Chairperson Riley, and Councilmember Johns. Voting No: None. Absent: Councilmember Shryock.

The regular meeting of the Public Works Committee adjourned at 7:30 p.m.

Respectfully submitted,

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Grant Riemer  
Public Works Superintendent

Drafted by Chris Moksnes  
*TimeSaver Off Site Secretarial, Inc.*

**Public Works Committee**

**5. 1.**

**Meeting Date:** 03/31/2015

**Submitted For:** Len Linton, Engineering/Public Works

**By:** Len Linton, Engineering/Public Works

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**Title:**

Consider Options for Addressing Stormwater Drainage Issues in Low Lying, Land Locked Areas

**Purpose/Background:**

The City received several reports of high water on properties in 2014. The residents came to the September 16, 2014 and October 21, 2014 Public Works Committee meetings. The motion was made by the committee and ratified by City Council to direct staff to update the comprehensive stormwater model and prepare a feasibility study for addressing the concerns.

Staff analyzed the drainage areas for three areas that reported flooding in 2014. The areas are listed with the highest priority first:

1. Gibbon Street north of 173<sup>rd</sup> Avenue
2. 162<sup>nd</sup> Lane West of Ramsey Boulevard
3. 156<sup>th</sup> Lane East of TH 47

There were several other property owners that contacted the City about standing water on their property during the 2014 spring snow melt. The three areas studied continued to experience high water long after the snow melt was finished. The other properties did not contact the City again.

The attachments to this case include a City map showing the location of all three (3) areas studied, a neighborhood map for each area with the properties that contacted the City highlighted and plan and profile maps for each area showing the drainage routes considered and the elevation changes along the maps. Large scale colored maps of each neighborhood will be available at the meeting. They are too large to include in the agenda. The attachments also include emails from the residents, a neighborhood survey from Gibbon Street prepared by a resident and the list of property owners that contacted the City in 2014.

The same process was used to analyze each area. Autocad Civil3D 2014 was used to create a surface model using the 2003 bare earth aerial topo points. The points were a product of the aerial mapping of the City completed in 2003. The vertical accuracy of the aerial mapping is adequate for preliminary analysis, it is not adequate for detailed design of projects. The surface was placed on the City base map. The drainage and utility easements were digitized and merged to show contiguous areas covered by easements. Alignments were created along easements down side lot lines and across the wetlands in the rear yards to evaluate drainage paths. Profiles were cut from the surface model along the alignments. A plan view and profile view sheets were created for each area.

A summary of each area is presented below:

**Gibbon Street north of 173<sup>rd</sup> Avenue**

The area was platted in 1974. Drainage and utility easements were recorded over some of the wetlands in the plat and over the County Ditch that runs across the north side of the plat. The ditch runs through wetlands that were not encumbered with drainage and utility easements. Gibbon Street is in the Deerwood Plat. The area to the west was platted in 1991 as Wildwood Acres. This plat provided drainage and utility easements over the wetlands in the plat. There are also drainage and utility easements along the lot lines from the ROW to the wetlands.

This area is relatively flat with minimum elevation change. The residents at 17421 Gibbon Street NW contacted the city about high water around their home and water coming into the basement. The home is a split level style with a 4 foot basement. The nearest wetland and easement recorded on the plat are on the north side of the next lot to the

north and extend onto the 2<sup>nd</sup> lot to the north. The address of the parcel with the majority of the wetland is 17511 Gibbon Street. There is a drainage and utility easement on the west side of Gibbon Street that connects to the easements on the Wildwood Acres plat. West of the Wildwood acres plat is an un-platted parcel. A County Ditch runs through this parcel. There is a drainage and utility easement on the west side of Gibbon Street across from the wetland at 17511 Gibbon Street. This easement also connects with the easements on Wildwood Acres.

Staff selected 2 alignments to evaluate, the first starts at 17421 Gibbon Street and runs west through drainage and utility easements, through Wildwood Acres, crossing Iguana Street and ending at the County Ditch. There is a stretch of approximately 500 feet at Iguana Street that is up to 10 feet higher than 17421 Gibbon Street. The grade slopes down to the west from the high point into the ditch. The grade drops below the beginning elevation 950 feet from the origin.

The second alignment starts at 17540 Gibbon Street, runs west then north across Wildwood Acres then crosses un-platted property before turning east and running across Deerwood along another County Ditch then runs south and east across more un-platted property following the ditch to the intersection with County Road 5, Nowthen Boulevard. This is a distance of 2.6 miles. The grade along the profile rises for approximately 500 feet then is level for another 1300 feet. The elevation drops below the beginning elevation 3500 feet from the origin.

### **162<sup>nd</sup> Lane West of Ramsey Blvd.**

This area is un-platted and does not have drainage and utility easements. The residents at 6855 162<sup>nd</sup> Lane NW contacted the City about the high water elevation in the adjacent wetland. There are a series of wetlands in the back yards north of this parcel. All of the surrounding area is higher than these wetlands.

Staff selected 3 alignments to evaluate. The first starts at the property, runs northwest along 162<sup>nd</sup> Lane, turns south on Jasper Street to 161<sup>st</sup> Lane then runs west to Olivine Street then runs southwest to County Ditch 66. The County ditch is slightly higher than the starting elevation. The remainder of the profile is up to 20 feet higher than the starting elevation. This alignment is 3700 feet long,

The second alignment starts at the property, runs southeast along 162<sup>nd</sup> Lane, turns south on Ramsey Boulevard and stays on Ramsey Boulevard to the Ditch 66 crossing. The County Ditch is approximately the same elevation as the starting point. This profile is up to 20 feet higher than the starting point.

The third alignment runs along the second alignment to Ramsey Boulevard, crosses Ramsey Boulevard then runs southeast along common lot lines towards County Ditch 66. The profile drops below the starting elevation approximately 1800 feet from the origin. This profile is up to 30 feet higher than the starting point.

### **156<sup>th</sup> Lane East of TH 47/St Francis Blvd.**

This area is platted and has some drainage and utility easements. The residents at 5220 156<sup>th</sup> Lane NW contacted the City about the level of the pond in their back yard. The ponding area did not have an outlet when the plat was recorded in 1973. A pipe was installed under TH 47 in 2003 to provide a stormwater outlet from a new subdivision. A pipe was also installed along 155<sup>th</sup> Lane and along lot lines from the wetland east of TH 47 to this pond. An outlet for this pond was installed with the Highlands at River Park Project in 2003. This pipe outlet is lower than the pipe installed with the Reilley Estates plat in 1978. The pond at 5220 156<sup>th</sup> Lane NW does drain; however, the water level has to be higher than the invert of the pipe downstream

The previous owners of the property came before the City Council in 2011 concerned about the proximity of the standing water to their drainfield. The City paid to have the drainfield relocated outside of the drainage easement. The water was contained in the drainage and utility easement in 2014.

Staff evaluated 2 alignments for lowering the invert of the existing pipe. The first would involve removing and replacing approximately 1100 feet of existing storm sewer pipe. The pipe is up to 15 feet deep, it is in easements across back yards; however, these yards are wooded and in some cases landscaped.

The second alignment considered starting where the pipe crosses 156<sup>th</sup> Lane, running east along 156<sup>th</sup> Lane to Juniper Woods drive then following Juniper Woods Drive to the intersection with the existing pipe. This would require 900 feet of pipe with up to 20 feet of cover. Open cutting for pipe installation would require reconstruction

of the street and would require closing the road for an extended period of time.

**Timeframe:**

Staff is presenting an overview of the concerns and potential solutions at this meeting. Detailed analysis will be undertaken as directed by City Council.

**Observations/Alternatives:**

Staff offers the following observations on each area:

Gibbon Street north of 173rd Avenue

This area is relatively flat. The affected area is lower than the potential overland drainage route. The northern route is a county ditch that was excavated through the wetlands prior to the Wetland Conservation Act being passed. Lowering the grade of the ditch to provide drainage to the Gibbon Street Properties would most likely result in draining the wetland which is not permitted.

The southerly route would require placing a pipe through an area that is up to 10 feet higher than the affected properties. The existing easements are not wide enough to support open trenching of a pipe. This route may also involve ditching through a wetland which is not permitted.

The Wetland Conservation Act may preclude acting on either of these alternatives. The City cleaned County Ditch 66 as part of a sanitary sewer extension project in 2007. Sheet piling weirs were required to be installed at regular intervals in the cleaned ditch. The tops of the weirs were set to maintain the existing wetland elevations. If the existing wetland levels are higher than the area to receive relief then the project is not feasible and other alternatives will need to be studied.

162nd Lane west of Ramsey Boulevard.

The affected property is in a natural depression and is surrounded by areas that are up to 20 or more feet higher. This area is un-platted. The westerly route and southerly routes are along road right of way. Open trenching of the pipe would require significant road reconstruction and would also require easements at the end of the routes across private property to discharge to the ditch. The initial review indicates the ditch elevation may be higher than the starting elevation for both of these routes.

The easterly route follows road right of way to Ramsey Boulevard then would require easements across private property and would include ditching of a wetland. The wetland rules would also apply any ditching required.

156th Lane east of TH 47

There is an existing storm sewer system that provides drainage for this area. The older part of the system was installed first, adjacent to the Rum River. The pond on the subject property was land-locked when the development was platted. A storm sewer outlet was installed when the property to the east was developed. The end of the new pipe had to be installed lower than the end of the existing pipe. This results in water standing in Woodland Green park and in the adjacent drainage and utility easements until the water rises to a point where it can flow through the system.

In all three instances it may be possible to directionally bore a pipe to provide drainage; however, the vertical difference between the starting point and ending point is very small and is close to the vertical tolerance available from directional bored pipe. Direction boring is best suited for pressure pipe situations or where there is adequate vertical relief between the start and the end of the pipe.

The father of the resident at 5220 156th Lane came forward with a proposal for installing an infiltration pit in the back yard to alleviate the flooding problem. The pond is normally wet every year. There are years such as 2011 and 2014 where the water level rises above the normal level. The presence of water every year indicates that the

groundwater level is close to the surface. It is staff's opinion that an infiltration pit will not work on this site because there is not any storage volume between the bottom of the pit and the top of the ground water.

The solution for any of these areas will be extensive and will set precedent for the City to follow in future years.

Staff contacted several of our neighboring cities and was informed that none of them have experienced such issues to the order of magnitude that Ramsey has, and that if they have they have usually been able to address the issue with minimal expense using gravity sewers or by pumping the water to a nearby location where the water can then be removed via storm sewer or culverts and ditches.

The only options that staff is aware of to effectively address such issues include installing gravity storm sewer to pipe the water to a lower elevation, installing storm sewer lift stations to pump the water to higher elevations where it can then flow by gravity via sewers or ditches to lower elevations, pumping the water using a portable pump and flexible hosing to another location where it can then flow by gravity via sewers or ditches to lower elevations, or promoting infiltration by constructing infiltration basins, ponds or trenches.

Attached is a copy of the drawing provided to staff by Mr. Full. While the use of such infiltration basins could be one of the more cost-effective means of removing standing surface water, not to mention the benefits that would be realized by helping to replenish our aquifers, this is not a viable option in most low-lying areas as the ground water is typically high and will not allow infiltration to occur. That said, such basins may be useful in other areas so staff will keep this as a tool in our tool box as they would be relatively inexpensive to construct and would assist in removing standing water in the spring when the ground is frozen as noted by Mr. Full. Staff estimates the cost to construct such a basin to be in the neighborhood of \$3,000, but this cost will depend on the amount of turf restoration that is needed due to the damage caused by the construction equipment, whether any clearing and grubbing is needed, and whether any soil borings are needed to determine the elevation of the groundwater, which is typically variable throughout the year.

Unfortunately, it is typically not an option to use a portable pump and hose to pump water elsewhere in Ramsey due to the relatively flat terrain and extensive distance between grade breaks. The other options typically require installing thousands of feet of sewer and purchasing numerous easement areas, and/or installing lift stations, all of which would cost well into the hundreds of thousands of dollars (or more) to complete per area.

Staff is not aware of any government sponsored programs aimed at assisting homeowners with enhancing their private sump pump/drain tile systems. Numerous property owners who have contacted staff in years past did not have back-up sump pumps in the event their primary pump failed, which resulted in their home being flooded. Private systems can also be enhanced by adding battery back-up in the event their power fails for an extended duration. Staff will continue to explore whether programs exist for assisting property owners with such system enhancements.

**Funding Source:**

Staff review of the the alternatives has been part of the routine assignments.

**Recommendation:**

Staff recommends bringing the information forward to the City Council for discussion at a future work session to discuss the precedent setting implications of moving forward with any of these projects.

**Action:**

No action is required, but staff would appreciate any feedback or direction on this matter that the Committee can offer.

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**Attachments**

Overall Map

Gibbon St

162nd Lane

156th Lane

Gibbon St Plan and Profile

162nd Lane Plan and Profile

156th Lane Plan and Profile

Miske Letter 102114

Resident Surveys

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### Form Review

<b>Inbox</b>	<b>Reviewed By</b>	<b>Date</b>
Bruce Westby	Bruce Westby	03/26/2015 03:04 PM
Grant Riemer	Grant Riemer	03/26/2015 03:43 PM
Kurt Ulrich	Kurt Ulrich	03/26/2015 04:24 PM
Form Started By: Len Linton		Started On: 03/25/2015 03:19 PM
Final Approval Date: 03/26/2015		

# City of Ramsey



## 2014 Flooding Concerns

### Legend

 Identified Properties

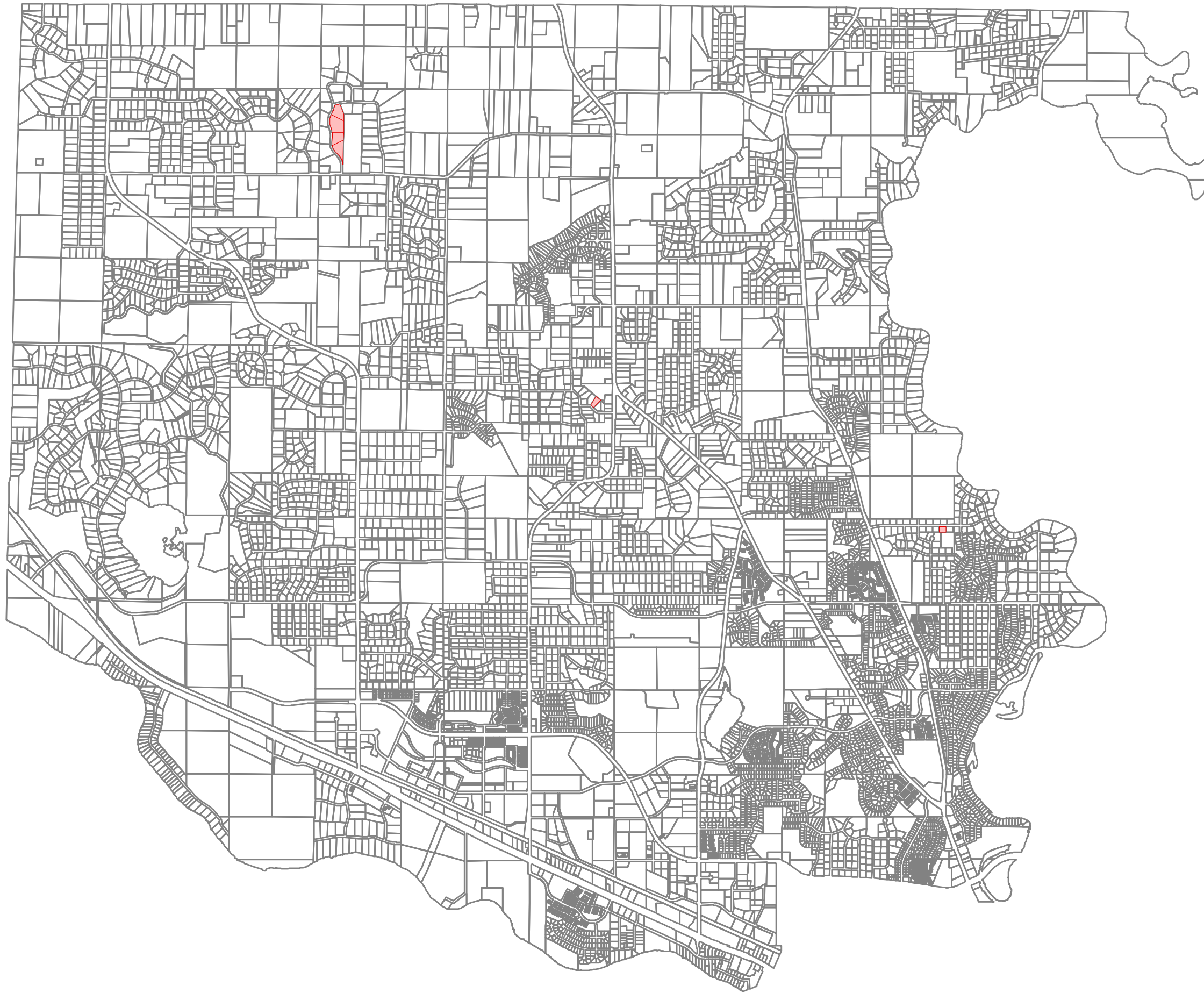


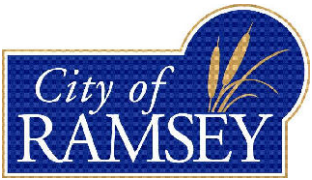
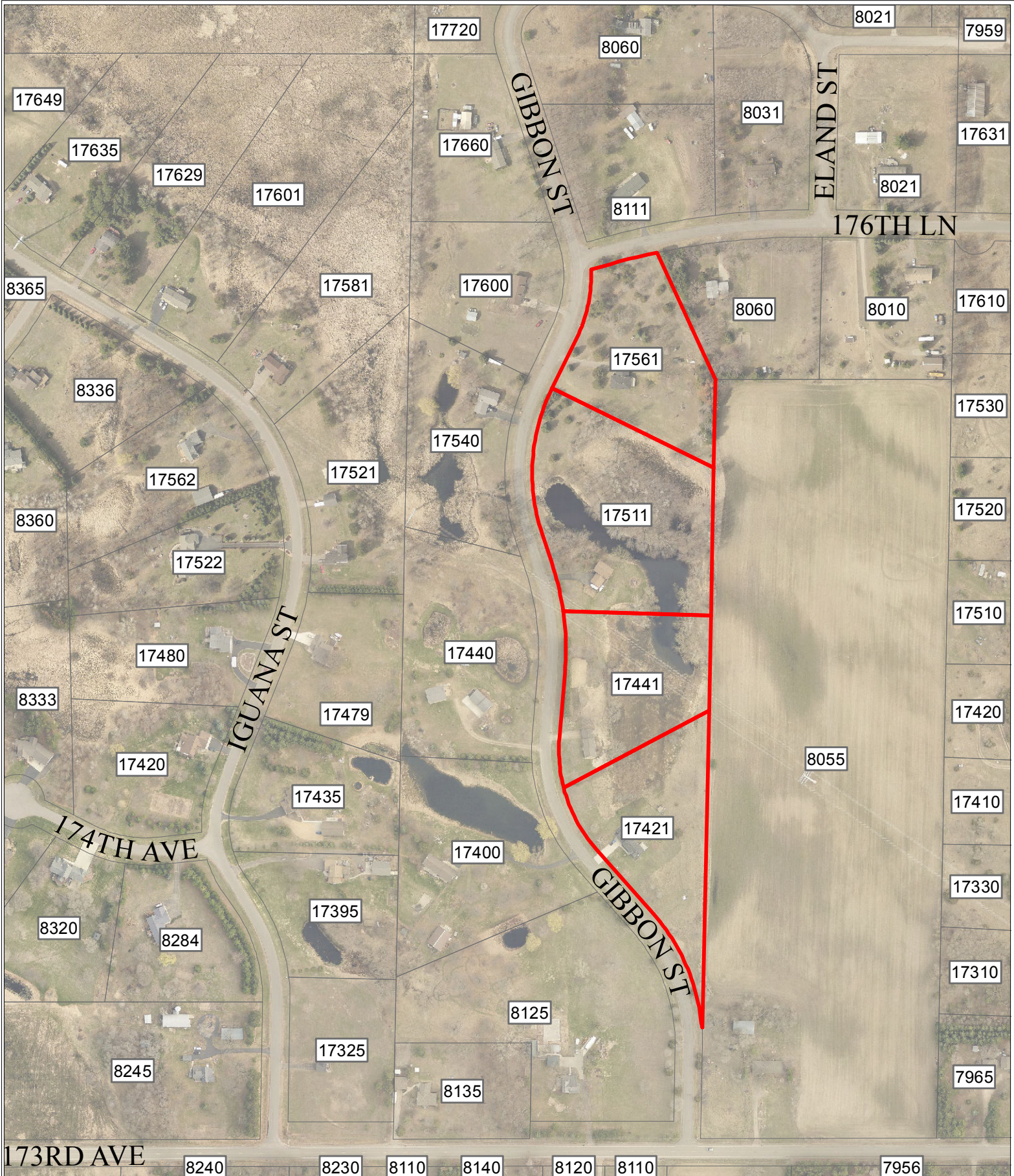
0 0.5 1 Miles

This map has been compiled using information gathered from various governmental offices and other sources and is to be used for reference purposes only. It is neither a legally recorded map nor a survey and is not intended for use as one. The Geographic Information System (GIS) data used to develop this map is not warranted by the City as being error-free.

The City does not represent that the GIS data can be used for exact measurement of distance or direction or precision in the depiction of geographic features. If errors or discrepancies are found, please contact (763) 427-1410.

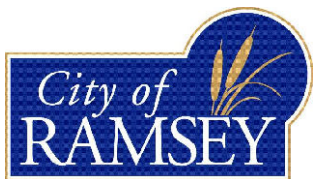
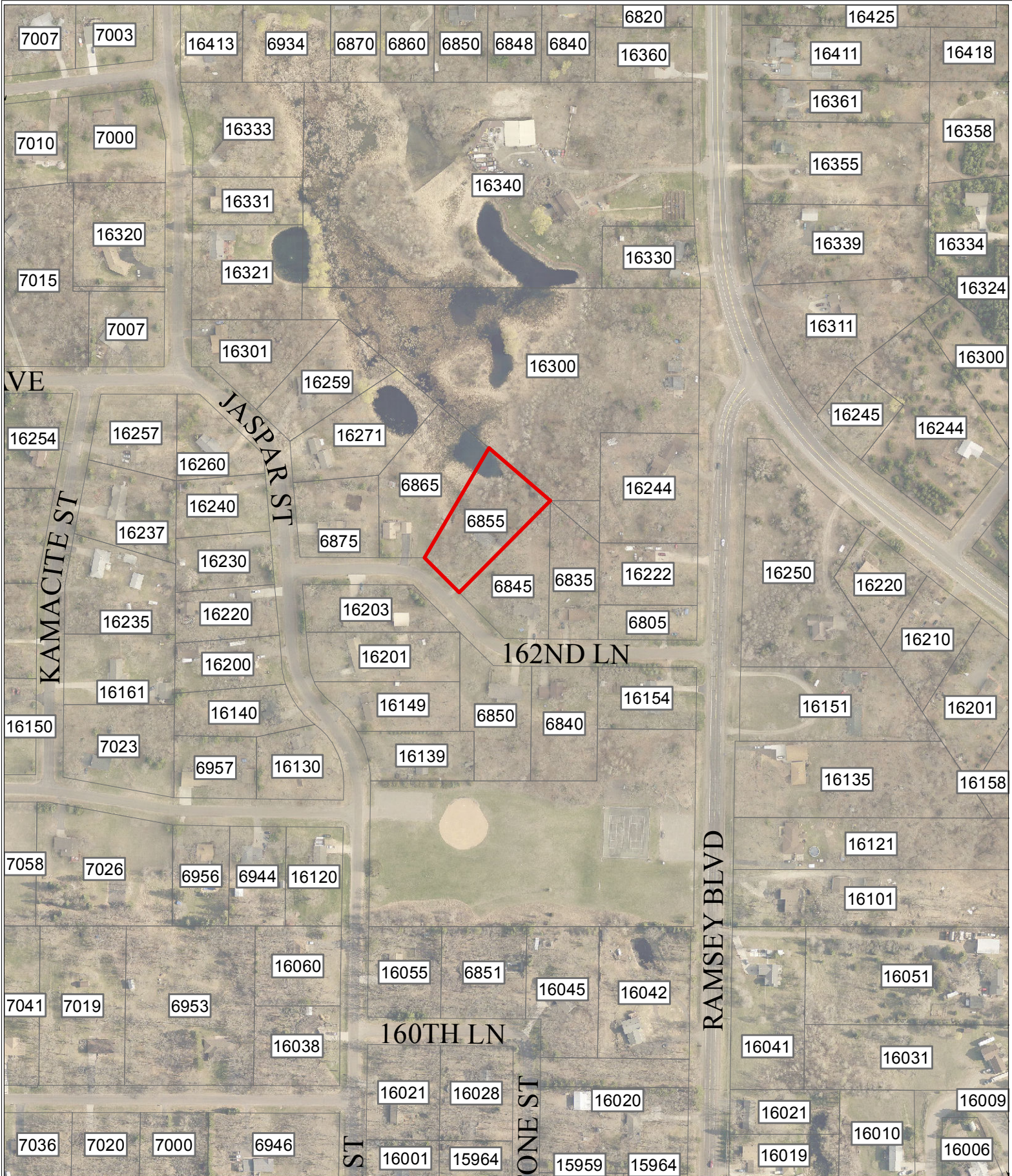
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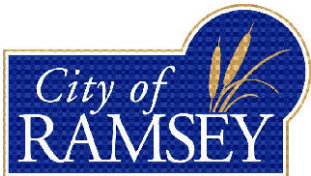
**Gibbon Street  
2014 Flooding Reports**

- Identified Properties
- Parcels



**162nd Lane  
2014 Flooding Reports**

- Identified Properties
- Parcels



**156th Lane  
2014 Flooding Reports**

- Identified Properties
- Parcels

# GIBBON STREET



**SUBJECT PROPERTIES**

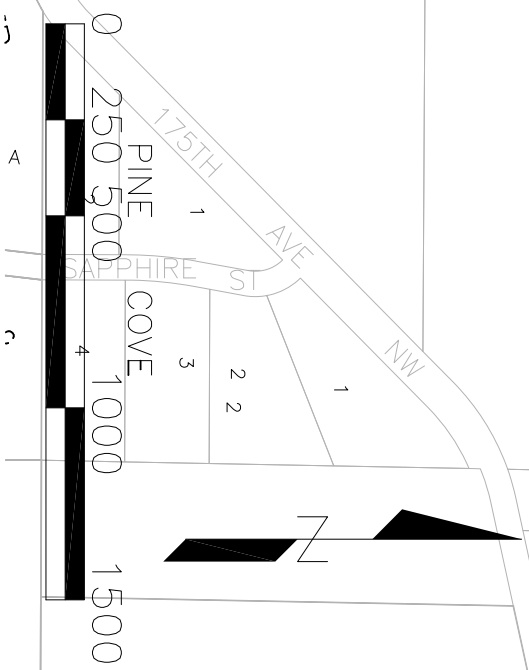
**EASEMENTS**

**EAST ALIGNMENT**

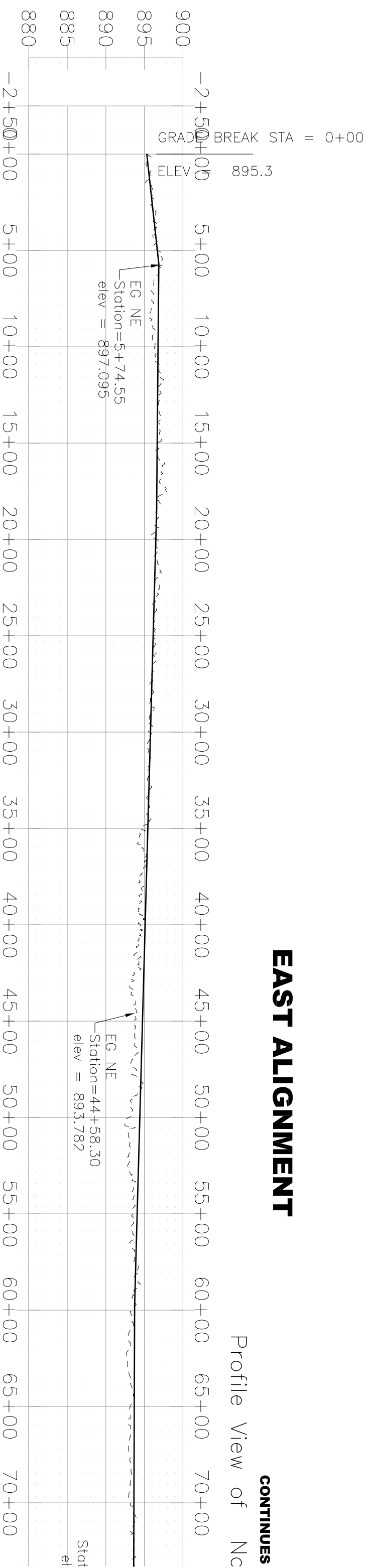
**EAST ALIGNMENT**

**CONTINUED FROM LOWER RIGHT**

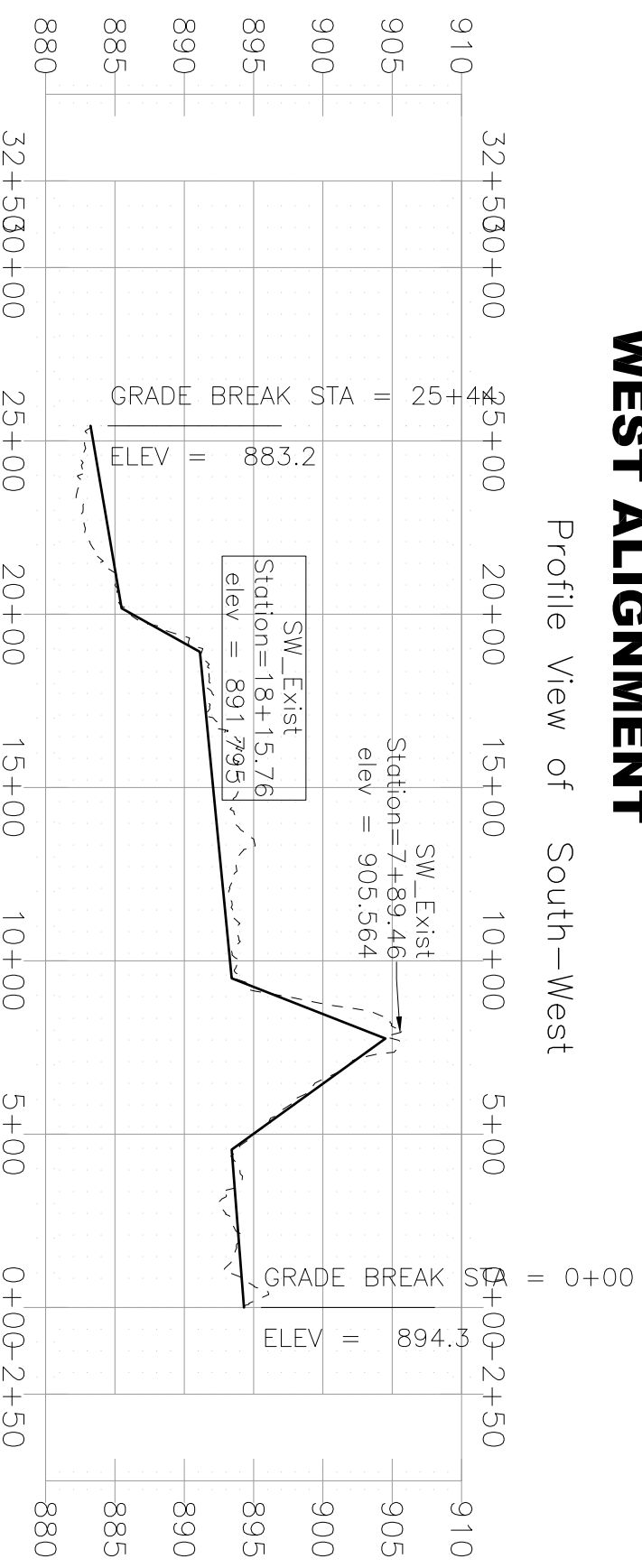
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# GIBBON STREET



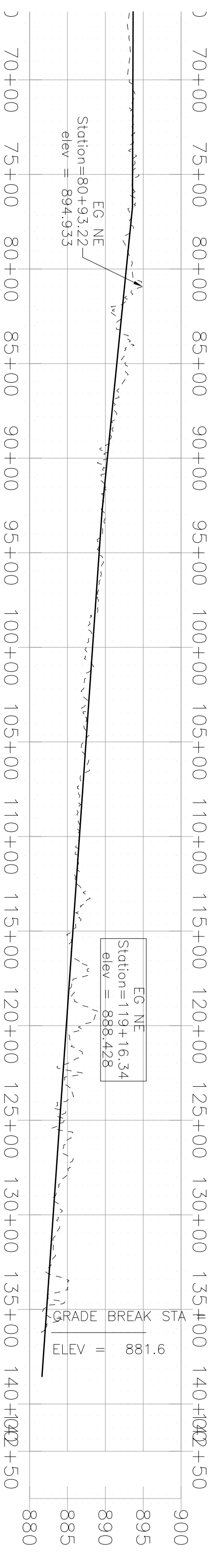
# WEST ALIGNMENT



# GIBBON STREET

## EAST ALIGNMENT (CONTINUED)

View of North-East



# 162nd Lane

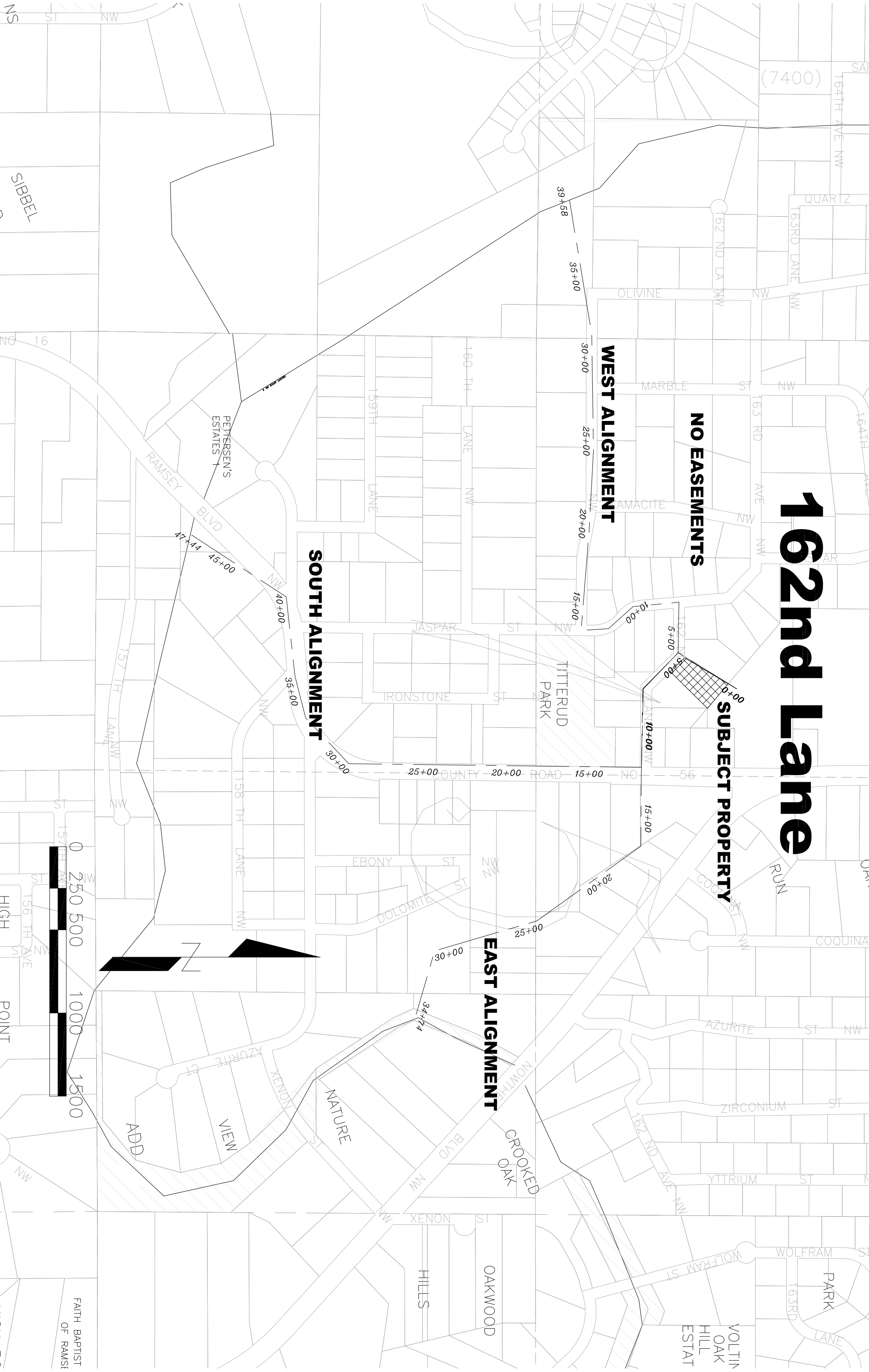
**NO EASEMENTS**

**SUBJECT PROPERTY**

**WEST ALIGNMENT**

**EAST ALIGNMENT**

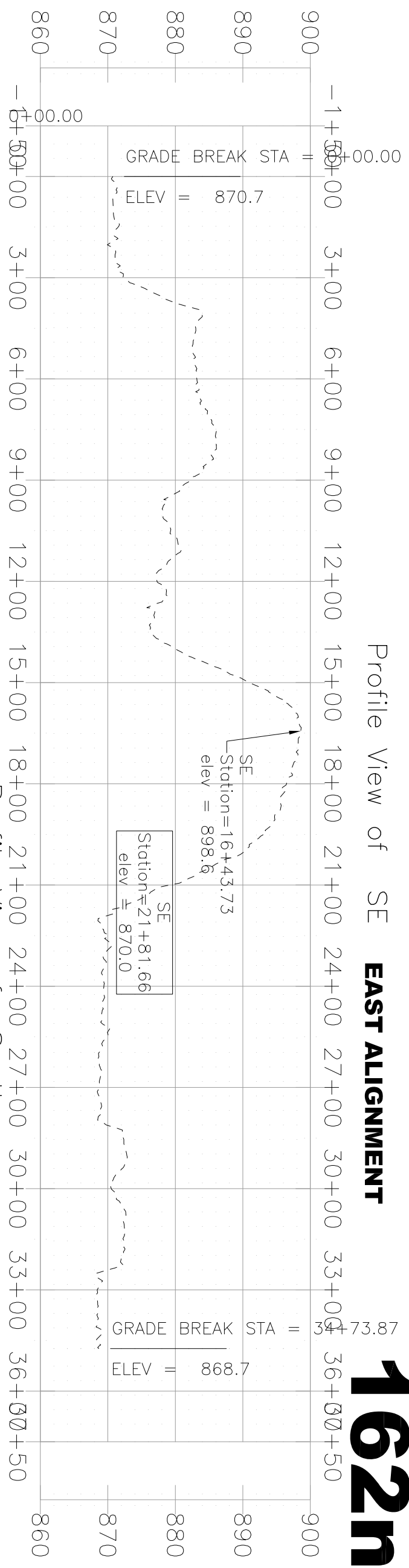
**SOUTH ALIGNMENT**



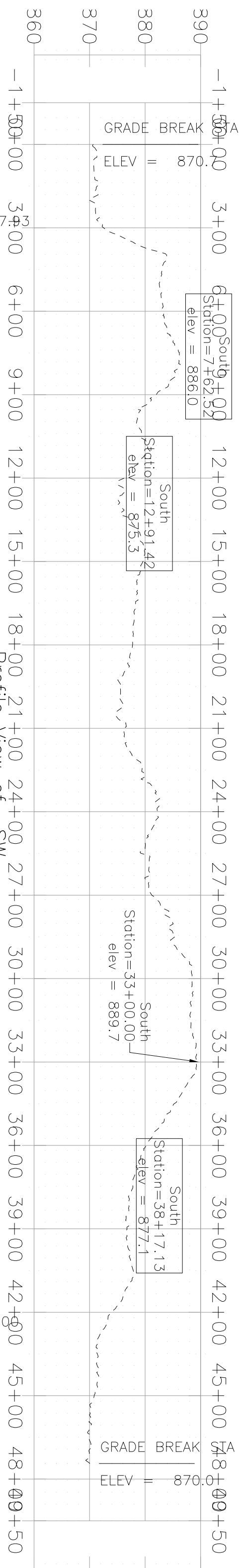
FAITH BAPTIST  
OF RAMSEY

Profile View of SE **EAST ALIGNMENT**

# 162nd Lane

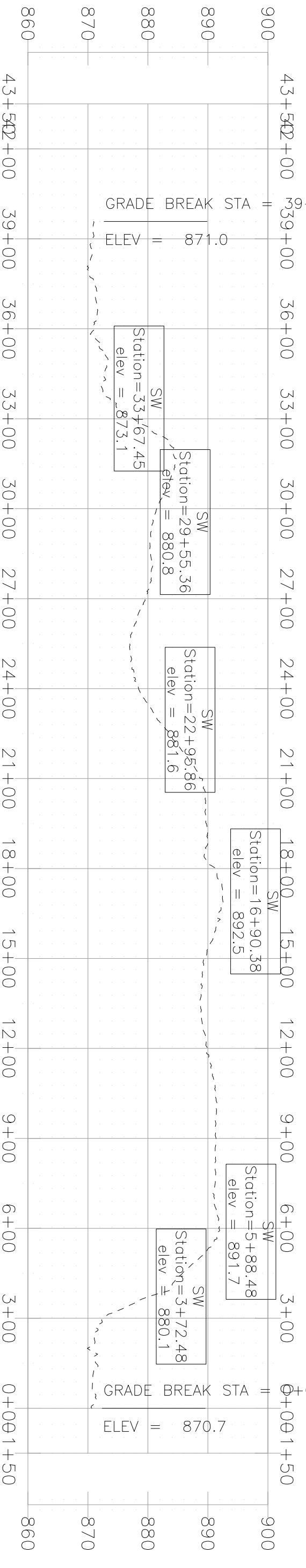


Profile View of South **SOUTH ALIGNMENT**



Profile View of SW

**WEST ALIGNMENT**

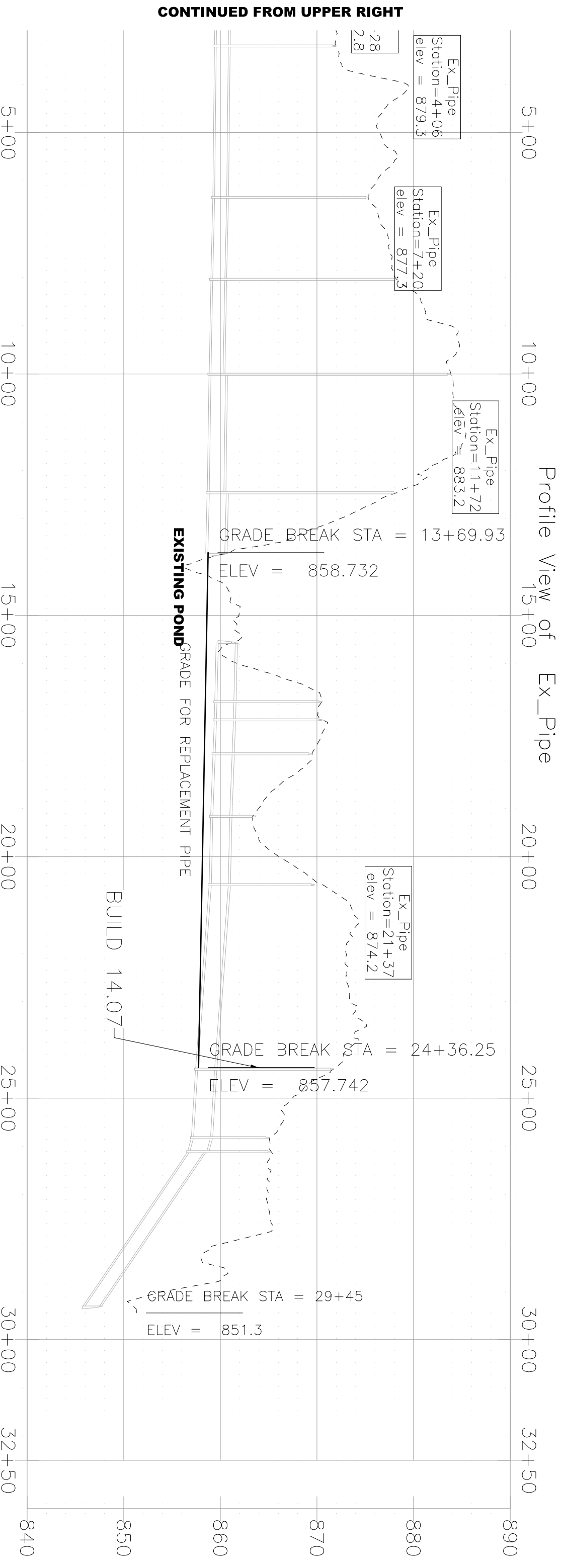
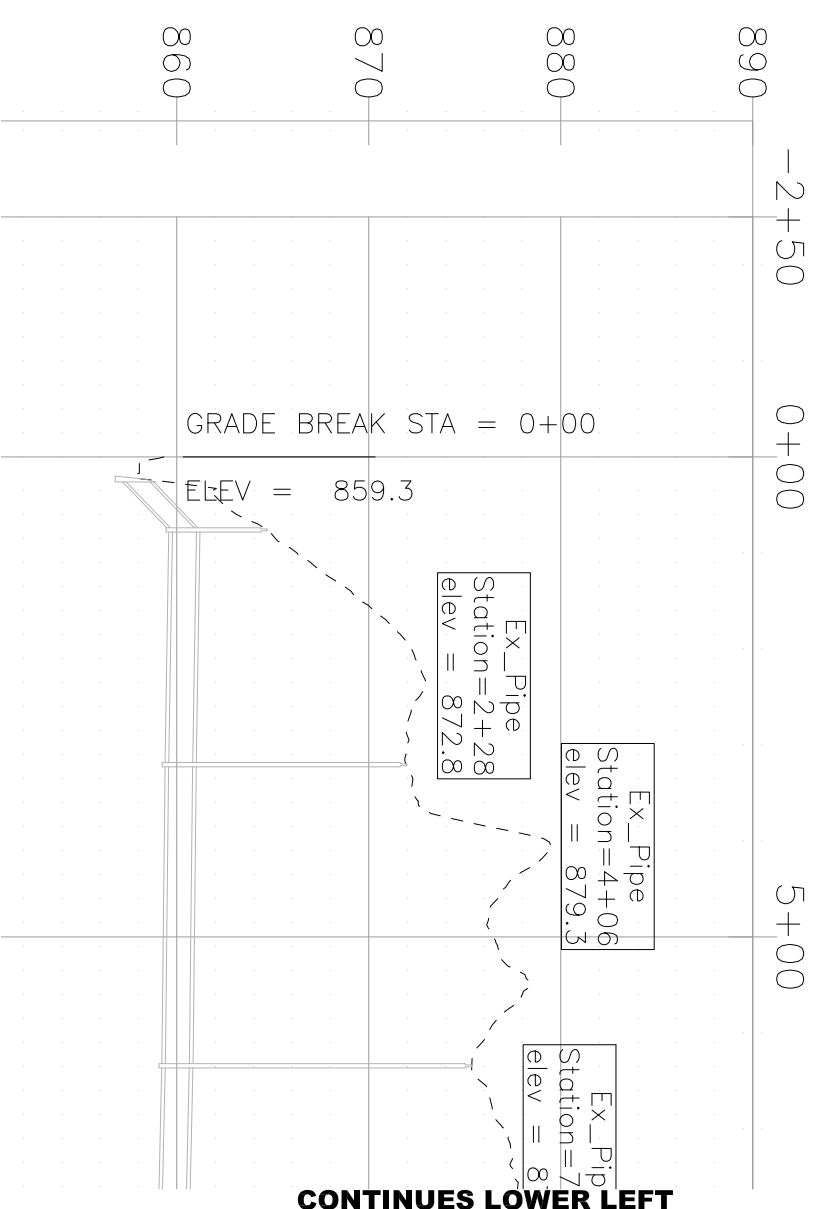


# 156th Lane



# 156th Lane

## PIPE ALIGNMENT

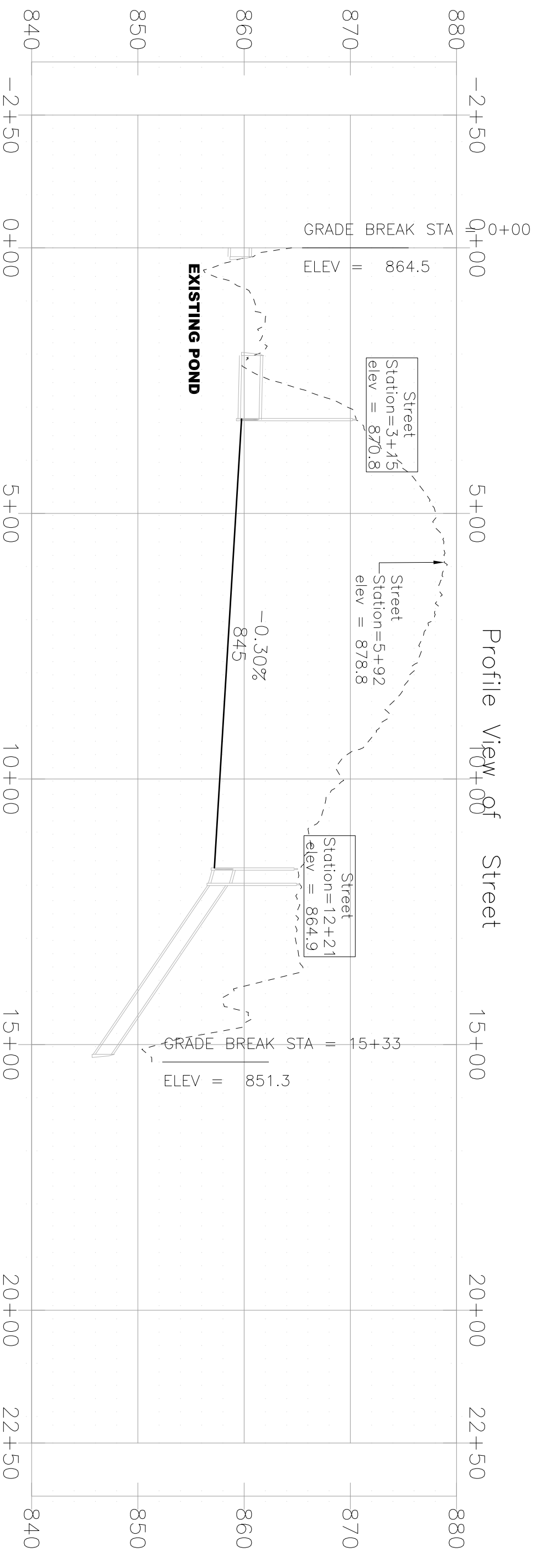


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CONTINUED FROM UPPER RIGHT

# 156th Lane

## PIPE ALIGNMENT



October 21, 2014

Members of the Public Works Committee,

In July of 2014, the residential area of Gibbon St experienced a large amount of flooding that continued relentlessly for a three week period. During this flooding, at least three homes were drastically affected, causing tens of thousands of dollars in damage to each home. One such home, residents of which were retired mid to late 70's couple, decided to since allow their home to enter into foreclosure. The other home was that of a couple who moved in just months prior, spending all of their income on their first home, and was simply devastated by their loss. For my personal home, in which I have resided for ten years, the basement in which my husband has been refinishing for years, alone by hand, during what little time he has off from work and his military duties, was destroyed. Approximately three years ago, we had a negligible amount of water enter the basement that did not result in any damage, again during a wetter than usual year. Additionally, as I was removing material from my home this year, it was apparent that this was not the first time our home had been affected by a flood. Insulation was trimmed up several inches off the floor, wood was covered with other pieces of wood to cover the water damage and mold was found behind certain areas of drywall. This was never disclosed to us prior to purchase. My neighbors found similar evidence in their home, which had also not been disclosed to them.

After the 2014 flooding, I asked my husband to contact the city engineers to seek their advice on what could be done regarding the storm water accumulating on our property. A city engineer came out to review the property a few weeks later, in which we were grateful. This engineer informed us, that the neighborhood to the parallel to ours is essentially designed to drain directly into our neighborhood and that the houses that experienced the flooding this year are affected with the runoff storm water from these neighborhoods. The engineer also stated that the city should be responsible for the correction of this drainage. We have paid our city taxes for years despite the fact that Gibbon St. benefits very little from the amenities offered from these taxes.

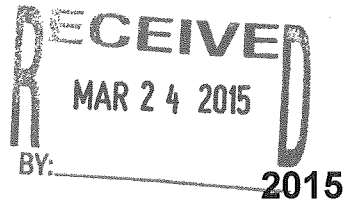
We, the affected residents are not naïve in thinking that that we are the only area affected by the amount of precipitation that fell this spring and summer and we do understand the financial planning and implementation difficulties associated with this type of project. However, we strongly request that the residential neighborhood of Gibbon St. be prioritized in this undertaking and that we remain informed of all developments. We only wish to never pass along the heartaches and troubles that we have experienced to the future residents of Gibbon St. We would love to stay and have Gibbon St. remain a great neighborhood and city in which to reside.

Thank you,

The Miske's



## Surface Water Survey – Gibbon Street



Name(s): MARK & AMBER PEDERSON  
 Email Address: Mark.pederson@alumni.augsburg.edu  
 Phone Number: 763-226-8321  
 Address: 1741 GIBBON STREET NW  
RAMSEY, MN 55303

Check box if the city may contact you regarding the information on this survey.

1. Approximately how many years have you resided on Gibbon Street? 1.5

2. How many times have you experienced excessive surface water/flooding anywhere on your property? 1

3. Has surface water or flooding caused any damage to your property (i.e. to the interior/exterior home, landscaping, sheds, etc.)? If yes, please describe the damage and estimated cost.

INTERIOR: CARPET HAD TO BE TAKEN OUT, SHEET ROCK NEEDS TO BE REPLACED  
DUE TO WATER ABSORPTION. ALL DOORS & FRAMES HAVE TO BE REPLACED DUE TO  
WARPING CAUSED BY WATER ABSORPTION. MOLDINGS HAD TO BE TAKEN OUT  
DUE TO WATER ABSORPTION.  
ESTIMATED COST: \$10,500.00

Please leave any additional observations or comments regarding surface water on Gibbon St. below:

\*This survey will be provided to the City of Ramsey Engineering Department and discussed at the March 17<sup>th</sup> Public Works Committee Meeting.



Surface Water Survey – Gibbon Street

RECEIVED  
MAR 24 2015  
BY: \_\_\_\_\_ 2015

Name(s): Douglas Paris  
Email Address: deparis@yahoo.com  
Phone Number: 763-226-6096  
Address: 17511 Gibbon St Ramsey MN

Check box if the city may contact you regarding the information on this survey.

1. Approximately how many years have you resided on Gibbon Street? 30 yrs

2. How many times have you experienced excessive surface water/flooding anywhere on your property? 12 yrs

3. Has surface water or flooding caused any damage to your property (i.e. to the interior/exterior home, landscaping, sheds, etc.)? If yes, please describe the damage and estimated cost.

surrounds house on 3 sides when  
bad so I put in drain tile to mitigate damage  
I own the water easement for this  
development

Please leave any additional observations or comments regarding surface water on Gibbon St. below:

\*This survey will be provided to the City of Ramsey Engineering Department and discussed at the March 17<sup>th</sup> Public Works Committee Meeting.



# Surface Water Survey – Gibbon Street

**RECEIVED**  
MAR 24 2015  
BY: \_\_\_\_\_ 2015

Name(s): Don Olson

Email Address: \_\_\_\_\_

Phone Number: 612-616-4607

Address: 17561 Gibbon St NW

Ramsey MN 55303

Check box if the city may contact you regarding the information on this survey.

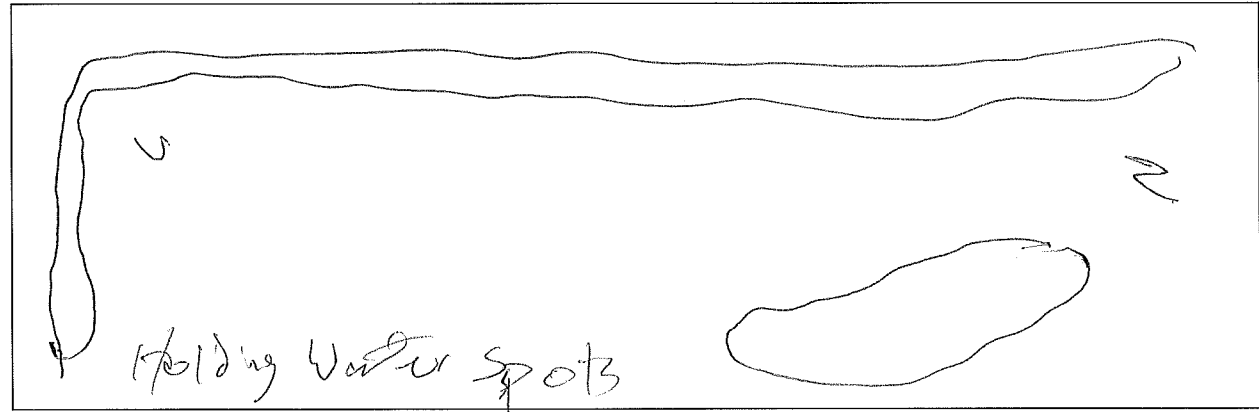
1. Approximately how many years have you resided on Gibbon Street? 6

2. How many times have you experienced excessive surface water/flooding anywhere on your property? 5

3. Has surface water or flooding caused any damage to your property (i.e. to the interior/exterior home, landscaping, sheds, etc.)? If yes, please describe the damage and estimated cost.

Sheds wet floors

Please leave any additional observations or comments regarding surface water on Gibbon St. below:



\*This survey will be provided to the City of Ramsey Engineering Department and discussed at the March 17<sup>th</sup> Public Works Committee Meeting.

**Public Works Committee**

5. 2.

**Meeting Date:** 03/31/2015

**Submitted For:** Len Linton, Engineering/Public Works

**By:** Len Linton, Engineering/Public Works

---

**Title:**

Consider the Surface Water Management Plan Update

**Purpose/Background:**

State Statute requires Cities to prepare a Surface Water Management Plan (SWMP). The City of Ramsey has prepared several plans since the law went into effect. The attached document represents the latest update to the Surface Water Management Plan for the City. The current plan was prepared in 2008 and was scheduled for updating in 2015.

The Lower Rum River Watershed Management Organization (LRRWMO) adopted their Third Generation Plan in 2012 which triggered the need to update Ramsey's Surface Water Management Plan. The Minnesota Pollution Control Agency issued a revised Municipal Separate Storm Sewer System (MS4) permit in 2013. The City applied to the LRRWMO for received an extension for updating the SWMP so that the revision would include the Third Generation and MS4 permit requirements.

The MS4 permit requires that the City have controls in place for regulating the discharge of stormwater. These controls include the SWMP, City Code and Best Management Practices (BMPs) to guide development. The BMPs are collected in a document called a Surface Water Pollution Prevention Plan (SWPPP). The SWPPP is being updated. The updated SWPPP will be included in the final SWMP before it is adopted by City Council.

The following paragraphs were in the case presented to the EPB.

The Lower Rum River Watershed Management Organization (LRRWMO) adopted their Third Generation Rules in 2012. The state regulations require that all local Storm Water Management Plans be updated within 2 years of adoption of revised Watershed Management Organization Plans. The Minnesota Pollution Control Agency was in the process of revising the Permit for the Municipal Small Separate Stormsewer Systems (MS4) and the Construction Stormwater Permit when the LRRWMO plan was adopted. The Cities of Ramsey, Anoka and Andover all applied for an extension of the deadline from the LRRWMO for revising their SWMPs until after the MS4 Permit was adopted so that required ordinance changes could be made once instead of several times. The extensions were approved.

The changes contained in the MS4 Permit, Construction Stormwater Permit and LRRWMO covered the following areas:

1. Lowering the size of a project requiring a permit from 5 acres to 1 acre.
2. Requiring infiltration on site of the first 1" of runoff from all new impervious surfaces.
3. Limiting discharge from the site for the 2 year, 10 year and 100 year storms to the existing rate for each storm.
4. Reducing the amount of Total Suspended Solids and Total Phosphorus in runoff leaving the site.

These goals can be achieved through the following measures:

1. Construction of infiltration or water reuse practices on site such as infiltration trenches, rain gardens, tree trenches or water re-use practices.
2. Constructing detention facilities that retain the peak flow and discharge it at a slower rate.
3. Construction of wet ponds that provide adequate time for settling of the Total Suspended Solids and Total Phosphorus and prevent resuspension with the next storm event.

**Timeframe:**

The SWMP was reviewed by the EPB at their March meeting. They were in general agreement with the content of the SWMP. The SWMP will be reviewed by the Public Works Committee tonight. It will be the subject of a Public Hearing before the Planning Commission at their April meeting, with particular emphasis on the changes to City Code related to land use. The Public Hearing is required when considering changes to City Code. The SWMP will be brought to the City Council at the April 21 meeting for review and approval.

The plan will be sent to the LRRWMO and the Metropolitan Council for concurrent review the first week of May. The LRRWMO has 60 days to review and approve the plan, the Metropolitan Council has 45 days for review. The document will be updated as necessary after the comments are received then brought back to City Council for adoption. This is anticipated to be the first meeting in August.

### **Observations/Alternatives:**

The City of Ramsey is bordered on the east by the Rum River and on the south by the Mississippi River. The City has many wetlands, lakes and streams within its borders. Managing the discharge of storm water from developed sites is a critical component of preserving the water quality of the wetlands, lakes, streams and rivers in and adjacent to the City. The Surface Water Management Plan provides a framework for allowing development while maintaining surface water quality.

The changes to the document include:

- Updating City Code references to the current system
- Updating the Stormwater management requirements for new construction
  - Infiltrate first 1" of runoff from new impervious surfaces
  - Provide rate control and water quality treatment for the 2, 10 and 100 year return events.
  - Provide reduction for Total Suspended Solids and Total Phosphorus concentrations in stormwater leaving the site.
  - Update the reference storms to use the Atlas 14 publication. The LRRWMO adopted use of the Atlas 14 and required the member cities to adopt this standard.
- Remove references to wetland buffers for new construction. The City completed a Wetland Management Plan with the 2008 SWMP. The implementation of the Wetland Management Plan was postponed by City Council Action.
- Update the Stormwater Models to include developments constructed after 2008 and use Atlas 14 for rainfall events.
- Update the tables and figures to include the new model results.

### **Funding Source:**

Staff has performed the update to the plan as part of their normal duties. The Stormwater Utility Fund covers part of staff salaries. The plan lists Capital Improvement Projects that will need to be brought back individually for review and approval.

### **Recommendation:**

Staff recommends the Committee approve the Surface Water Management Plan and forward it to City Council for approval.

### **Action:**

Motion to approve the Surface Water Management Plan and forward it to City Council for approval.

---

## **Attachments**

SWMP

---

## **Form Review**

**Inbox**

**Reviewed By**

**Date**

Bruce Westby  
Grant Riemer  
Kurt Ulrich  
Form Started By: Len Linton  
Final Approval Date: 03/26/2015

Bruce Westby  
Grant Riemer  
Kurt Ulrich

03/26/2015 02:02 PM  
03/26/2015 03:27 PM  
03/26/2015 04:13 PM  
Started On: 03/23/2015 02:41 PM

# **The City of Ramsey Surface Water Management Plan**

**Project 14-31  
March 20, 2015**

I hereby certify that this plan, specification, or 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.

## **PUBLIC WORKS COMMITTEE REVIEW**

By: \_\_\_\_\_

Leonard L. Linton, P.E.

Date: March 20, 2015

Registration

I hereby certify that this plan, specification or report was reviewed for Quality Control and Quality Assurance purposes and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

## **PUBLIC WORKS COMMITTEE REVIEW**

\_\_\_\_\_  
Bruce Westby, PE

Date: March 20, 2015

License No. 40116



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## **APPENDICES**

- Appendix A - Ramsey Stormwater Pollution Prevention Plan
- Appendix B - Comment Letters

## **I. PURPOSE OF PLAN**

The purpose of this Surface Water Management Plan (SWMP) is to promote, preserve and enhance the natural resources within the City of Ramsey. The City will protect water quality and unique and fragile environmentally sensitive land from adverse effects that can potentially be caused by poorly sited development or incompatible activities. The City proposes to accomplish this by regulating land disturbances and development activities.

This plan was originally prepared in 2008 by Bolton and Menk, Inc. (the “2008 Plan”). This document is intended to update the 2008 Plan as required (the “2015 Update”). The City has prepared the 2015 Update utilizing the 2008 baseline data prepared by Bolton and Menk.

Minnesota Rules Chapter 8410 (Metropolitan Area Local Water Management) requires specific elements to be addressed in local water management plans. The various chapters of this report are designed to address each element required under these rules. In addition, this plan follows the Metropolitan Council’s 2030 Water Resources Management Policy Plan requirements. At the time of drafting of this report, the Metropolitan Council was in the process of completing the 2040 Water Resources Policy Plan, which replaces the plan mentioned in this paragraph. As part of the City’s 2040 Comprehensive Plan Update, the City will review the need to update this document. IN 2002, the Minnesota Pollution Control Agency designated the City of Ramsey as a mandatory Municipally Separate Storm Sewer System (MS4) community needing to submit a National Pollutant Discharge Elimination System (NPDES) permit regulating its storm water runoff. As such, the City submitted a Storm Water Pollution Prevention Plan (SWPPP) with its permit application in 2003. The permit was reissued in 2006 and 2013. The City has update the SWPPP to meet the requirements of each reissue. Accordingly, an additional purpose of this SWMP is to control or eliminate storm water pollution. Key contributors to storm water pollution are soil erosion and sedimentation. The city-wide SWPPP incorporates ordinance changes that address erosion control, sedimentation associated with construction activities as well as illicit discharges to surface waters, all primary contributors of storm water pollution.

The City’s goal is to minimize conflicts and encourage compatibility between land disturbing activities, water quality and environmentally sensitive lands. This will be accomplished through detailed development ordinances, plan review standards and recommended pollution control procedures in an effort to strike a balance between urban growth and the protection of water quality and natural areas. This SWMP, in conjunction with the policies set forth in the City ordinances, establishes standards and specifications for conservation practices and planning activities to minimize storm water pollution, soil erosion and sedimentation.

This submittal is a culmination of research, mapping, land use analysis/planning and hydraulic design. The end product is a detailed design tool that can be used by the City of Ramsey in planning growth and infrastructure replacement. This summary report represents only a small part of the total work product created through the master planning process. The current City ordinances have also been revisited as part of this process, as they are the best means to implement the recommendations made in this report.

Following the approval of this SWMP by the Lower Rum River Watershed Management Organization (LRRWMO), the City will have administrative authority for the approved SWMP and ordinances. The City will also have the duty to enforce the SWMP and associated ordinances. The City places a high priority in improving impaired waters and intends to work with the LRRWMO and other agencies to achieve water quality goals by reducing the impact created by the City.

## II. EXECUTIVE SUMMARY

### A. Plan Purpose and Background

Storm water regulations have changed significantly since the original Comprehensive Storm Drainage Plan was approved in 1980 and the southeast growth area was revisited in 1997 and 2002. The plan was updated in 2008 and renamed the Storm Water Management Plan. The following is a listing of those regulatory changes:

1. 1982

The *Metropolitan Surface Water Management Act* was passed. The Act was originally included in Minnesota Statute Chapter 509. The Act was recreated and modified in 1990 and became Minnesota Statute 103B.205 to 103B.255.

Originally, the former State of Minnesota Water Resources Board oversaw implementation of the act. When that board was merged with two other boards to form the Minnesota Board of Water and Soil Resources in 1987, the Board of Water and Soil Resources assumed responsibility for the act. Forty-six watershed management organizations (36 joint powers Watershed Management Organizations and 10 Watershed Districts) were originally responsible for preparing plans to:

- protect, preserve, and use natural surface and groundwater storage and retention systems
- minimize public capital expenditures needed to correct flooding and water quality problems
- identify and plan for means to effectively protect and improve surface and groundwater quality
- establish more uniform local policies and official controls for surface and groundwater management
- prevent erosion of soil into surface water systems
- promote groundwater recharge
- protect and enhance fish and wildlife habitat and water recreational facilities
- secure the other benefits associated with the proper management of surface and groundwater <sup>1</sup>

2. 1985

The Lower Rum River Water Management Organization (LRRWMO) was formed to meet the requirements of the Metropolitan Surface Water Management Act.

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<sup>1</sup> Excerpt taken from the Minnesota Board of Water & Soil Resources Website:  
<http://www.bwsr.state.mn.us/watermgmt/metroareasurface.html>

3. 1987

The Federal Clean Water Act was amended to address storm water as a pollution source. This resulted in the EPA developing a NPDES Phase I permit that targeted Cities with populations in excess of 100,000. As a result, in 1991, Minneapolis and St. Paul were required to apply for permits. One permit requirement was the development of a city-wide Storm Water Pollution Prevention Plan (SWPPP) that included approximately 30 mandatory Best Management Practices (BMPs) addressing everything from education and good housekeeping for municipal operations to mandatory city ordinances.

4. 1991

The Minnesota Legislature passed the Wetlands Conservation Act (WCA). The WCA is administered according to Minnesota Rules Chapter 8420 to implement the purpose of the Act, which is to:

- Achieve no net loss in the quantity, quality, and biological diversity of Minnesota's existing wetlands
- Increase the quantity, quality and biological diversity of Minnesota wetlands by restoring or enhancing diminished or drained wetlands;
- Avoid direct and indirect impacts from activities that destroy or diminish the quantity, quality, or biological diversity of wetlands
- Replace wetland values where avoidance of activities is not feasible and prudent.<sup>2</sup>

5. 1992

The Board of Soil and Water Resources (BWSR) developed Minnesota Rules Chapter 8410. This set of rules consists of 18 parts that define the scope, general structure and content required for BWSR approval of a Local Surface Water Management Plan. The table of contents of this report and the content within each chapter has been structured to meet MN Rule 8410 as well as the specific requirements of the City of Ramsey.

6. 2003

NPDES Phase II, the second round of the 1987 Federal Clean Water Act amendment, targeted cities with populations over 10,000. The City submitted a permit application and SWPPP in accordance with MPCA deadlines.

The City finalized its most recent SWPPP in 2013. That SWPPP is attached in Appendix B to this report.

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<sup>2</sup> Excerpt taken from the University of Minnesota Duluth website:  
[http://www.d.umn.edu/fm/safety\\_envir/wetlands/pdf\\_pages/4.0%20Wetland%20Regulations.pdf](http://www.d.umn.edu/fm/safety_envir/wetlands/pdf_pages/4.0%20Wetland%20Regulations.pdf)

7. 2005

The Metropolitan Council has requirements for local governments to include local water management plans as part of their Comprehensive Plans. The Metropolitan Council does not have authority to set policy or administer local storm water regulations. This Surface Water Management Plan Update is designed to address current requirements governing local water management plans. The general boundary of the plan includes all property within the City limits of Ramsey. When accepted by all local, regional, state and federal agencies having jurisdiction, the City of Ramsey will be the sole responsible party for administering this plan.

8. 2012

The Lower Rum River Watershed Management Organization adopted their Third Generation Plan. The new plan requires infiltration for new and redeveloped sites, use of the Atlas-14 rainfall distributions and reductions in Total Suspended Solids (TSS) and Total Phosphorus (TP) for runoff discharged from new permitted projects.

**B. General Content of Required Local Plans**

This SWMP follows the general report structure listed in Minnesota Rules Chapter 8410.0170, the general requirements in Minnesota Statute sections 103B.205 - 103B.255, and the Metropolitan Council's requirements for local water management plans as adopted May 2005 as part of the Metropolitan Council's *Water Resources Management Plan*. As stated above, the City will update this plan subsequent to the adoption of the Metropolitan Council's 2040 Water Resources Policy Plan.

**C. Summary of the Goals, Problems, and Potential Solutions**

The general findings of this Surface Water Management Plan report are summarized as follows:

1. Ramsey is located in the Anoka Sand Plain. The area is well known for its highly permeable soil. As such, the runoff from significant rainfalls is generally reduced to the extent that the existing drainage network functions well with no significant flooding outside the Mississippi River, Rum River, Trott Brook, Ford Brook, County Ditch 43 and County Ditch 66 flood plains.

Because of the pervious nature of the Anoka Sand Plain, the City will need to review its development ordinances to mitigate the adverse effect that a significant increase in impervious surfacing and mass grading can have on runoff conditions. The addition of significant amounts of impervious surfaces and the reduced permeability associated with the soil compaction in mass grading without a reasonable attempt to restore or duplicate the current infiltration pattern could create very significant increases in runoff volumes and downstream flooding. This is especially true in the Trott Brook, D66, EMISS and WMISS watersheds (see Figure 9), where improvements in uppermost watershed limits must flow a significant distance to the ultimate watershed outlet. The longer flow path associated with each of these watersheds allows greater opportunities for peak flows from conventional detention ponds to coincide.

One solution to the problem of coincident peak flows is the use of low impact development techniques. There are a variety of low impact development

techniques. The current low-density residential developments in northern Ramsey are a close approximation of what a low impact development can be like. This area has a noticeably lesser storm water impact than that of either high-density residential developments or commercial/industrial developments.

However, Ramsey's land use plan creates a variety of land use types in which low-density residential is not planned for all areas of the community. With these development plans in mind to balance low impact development with the City's economic development goals, the City must consider other techniques to encourage maximized infiltration of storm water.

This report recommends modifying the current development ordinances to encourage infiltration and soil ripping of mass grading to compensate for lost infiltration conditions as well as requiring oversized retention ponding to mitigate and compensate for increases in runoff. Innovative solutions to the storm water runoff increases associated with the increase in impervious surface will be investigated and encouraged when deemed appropriate. Potential solutions include pervious pavements, rain gardens, infiltration basins and low impact development among others.

2. An integral part of this SWMP is updating the comprehensive storm water runoff modeling performed in 2008. The 2008 modeling effort captured the existing conditions throughout the entire city. This modeling includes:
  - a. Mapping out the small watersheds draining to general collection points such as low points in roadways and intersections, wetlands or ponds.
  - b. Estimating the runoff from the 2, 10 and 100-year rainfall events.
  - c. Routing the runoff through the existing system.

The existing system may be a pipe network, a pond, a wetland or a waterway. The modeling predicts the high water levels and flows associated with each rainfall event modeled.

This modeling provides a baseline for comparison purposes as new developments change the drainage pattern. With this modeling information, City staff can readily review the cumulative impacts of large developments for effects on the baseline conditions across the entire watershed.

Storm and Sanitary Analysis (SSA) software was used in the comprehensive modeling. This software is based on the industry standard EPASWMM process and the St. Vennant equations. The model can be used to input actual rainfall events from rain gauges and can model the transport of pollutants through the system. This will be very useful in evaluating the BMP measures to address future TMDLs.

3. Where the cumulative effect of regulated development is potential flooding, the recommended practice is the construction of retention ponds or detention basins, including infiltration, as a requirement of further development of the outlying growth areas. It is further recommended that the post construction peak outflows from new developments be limited to no more than the existing peak flow for the 2-, 10-, and 100-year storms. The Third Generation Lower Rum River Watershed Management Plan requires infiltration of the first 1" of runoff from new

impervious surfaces. This will better mitigate the cumulative effects of increased impervious surfacing and increased runoff volume from new developments.

Because the majority of the area is served by large stream/wetland complexes, regional ponding is not possible for a significant part of the city. Where they are possible, the creation of regional ponds is preferred because of the limited maintenance (compared to a multitude of individual development ponds) and the opportunity to control larger drainage areas. By contrast, a multitude of scattered ponds associated with each individual site development may be designed to reduce the peak outflow for its smaller area, by storing the excess runoff and releasing it at a lesser rate for a longer duration. This longer pond outflow duration may coincide with the reduced peak flows from other individual site ponds and create a larger combined peak flow than the original undeveloped condition. Hence, regional ponds are recommended where physically possible, because of the opportunity to control the runoff on a larger scale and ensure that the downstream system is not adversely impacted by uncoordinated development that meets a typical runoff ordinance. The greater control afforded by regional ponds may also reduce the flows to the downstream system and allow for decreased costs in downstream infrastructure improvements.

4. The proposed infiltration requirements and pond network is part of the goal of accommodating continued responsible growth. Revisions will be required as formal developer layouts are presented to the City. Although this plan forms a sound basis for future development, it is important to remain flexible in finding ways to manage runoff while still accommodating the continued development of the city.
5. The maps attached at the end of this report are for general illustration purposes. As part of the plan development, large scale maps and GIS compatible files have been prepared as part of the 2008 SWMP and updated with preparation of this plan. The GIS maps and files show more detailed information including watershed areas, proposed pond areas and storage volumes, estimated flow rates into and out of the proposed ponds for both the existing and developed conditions, proposed interconnecting pipe sizes between ponds, etc.
6. The City will pursue outside funding to help finance the recommended capital improvements described in this plan. Local financing will most likely come from a combination of storm sewer trunk fees and the City's storm water utility fund.  
  
Any determined storm water management charges or area charges to new developments should be reviewed on an annual basis to ensure that changes in land acquisition, construction cost, bonding cost, legal cost, etc. are included in the computed fee.
7. The 2008 SWMP included a complete wetland functions and values assessment as part of a greater wetlands management plan.

The wetland buffers recommended in the Wetlands Function assessment were approved by City Council when the 2008 SWMP was approved. Further review of the buffers by the City Council resulted in a policy decision to delay the implementation of the wetland buffers recommendations.

Wetlands are to be further protected by controlling discharges from developing areas. The proposed controls include pretreatment BMPs and runoff controls

designed to maintain the current hydrology and maintain or improve the current functions and values of the wetland.

**D. Amendments and Updates**

This report is intended for the coverage period to 2022. It should be considered as a working document that should be updated and amended in accordance with the procedures described in Section IX. Amendment will be needed as development progresses and actual new development data is integrated into the overall model.

The Minnesota Pollution Control Agency (MPCA) has not completed total maximum daily load (TMDL) studies for the impaired waters within the city boundaries of Ramsey (see Table 15 for the list), and is still completing the TMDL study of Lake Pepin (downstream from Ramsey). The Lake Pepin TMDL may have a major impact on all NPDES permittees in the metro area. The City of Ramsey is aware of the potential need to amend the local water management plan prior to 2022 based on the implications and requirements of the Lake Pepin TMDL and the TMDLs for the impaired waters within the city.

The City has updated the SWPPP in accordance with the reissuance of the MS4 permit in 2013.

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### III. REGULATORY REQUIREMENTS AFFECTING PLAN

The following is a brief summary of the primary Statutes and Rules governing storm water management in the 7-County metropolitan area. These requirements establish and control the content of this plan and cite objectives regarding surface water management:

#### A. Minnesota Rules Chapter 8410.0170

These rules outline the structure of a SWMP. Each SWMP must have the following at a minimum:

1. A purpose statement outlining the purposes of the water management programs required by MN Statute sections 103B.205 - 103B.255.
2. A section of water resource related agreements
3. A land and water resource inventory (required by part 8410.0060)
4. A section on the establishment of policies and goals
5. A section on assessment of problems
6. A section on corrective actions
7. A section on financial considerations
8. An implementation program discussing which components of the implementation program the City will prioritize
9. A section on the City's amendment procedures

This document is intended to meet these rules and hence each requirement is included.

#### B. Minnesota Statute 103B.235

This state law predates Minnesota Rule 8410 and includes additional requirements as follows:

1. Subdivision 1 - Requirement states that the City of Ramsey is required to submit a watershed management plan because it is within the 7-County metropolitan area.
2. Subdivision 2 - Contents states that the SWMP shall:
  - a. Describe existing and proposed physical environment and land use;
  - b. Define drainage areas and the volumes, rates, and paths of storm water runoff;
  - c. Identify areas and elevations for storm water storage adequate to meet performance standards established in the watershed plan;
  - d. Define water quantity and water quality protection methods adequate to meet performance standards established in the watershed plan;
  - e. Identify regulated areas; and
  - f. Set forth an implementation program, including a description of official controls and, as appropriate, a capital improvement program.
3. Subdivision 3 - Review states that, after consideration but before adoption by the governing body, the City shall submit its SWMP to the area water management

organization (WMO) for review for consistency with the watershed plan adopted pursuant to section [103B.231](#). The Lower Rum River Water Management Organization (LRRWMO) has WMO jurisdiction in Ramsey. According to the statute, the LRRWMO must approve or disapprove the plan or parts of the plan. The LRRWMO has 60 days to complete its review; provided, however, that the LRRWMO shall, as part of its review, take into account the comments submitted to it by the Metropolitan Council pursuant to subdivision 3a. If the WMO fails to complete its review within the prescribed period, the SWMP shall be deemed approved unless the City agrees to an extension.

- 3a. Subdivision 3a - Review by Metropolitan Council states that the City shall submit its SWMP to the Metropolitan Council for review and comment. The council shall have 45 days to review and comment upon the SWMP or parts of the plan with respect to consistency with the Metropolitan Council's comprehensive development guide for the metropolitan area. The Metropolitan Council's 45-day review period shall run concurrently with the 60-day review period by the LRRWMO. The Metropolitan Council shall submit its comments to the LRRWMO and shall send a copy of its comments to the City. If the Metropolitan Council fails to complete its review and make comments to the LRRWMO within the 45-day period, the LRRWMO shall complete its review as provided in subdivision 3 of State Statute 103B.235.
4. Subdivision 4 - Adoption and Implementation requires the City to adopt and implement its plan within 120 days after approval of the SWMP by the LRRWMO and to amend its official controls accordingly within 180 days.
5. Subdivision 5 - Amendments states that to the extent and in the manner required by the LRRWMO, all major amendments to the SWMP shall be submitted to the LRRWMO for review and approval in accordance with the provisions of State Statute 103B.235, subdivisions 3 and 3a for the review of plans. All minor amendments will be reviewed and approved by the City Council.

All of these required MS 103B.235 items are covered in this document.

### C. **Local Ordinances**

The City of Ramsey will administer and enforce the water resource-related ordinances under the direction and control of, and subject to the powers expressly reserved to, the City Council. Following approval of this SWMP and ordinances, the City shall have administrative authority for the approved SWMP and ordinances. The Applicant, permittee or any other person or political subdivision with an interest in the determination of the City's interpretation or application of these ordinances may file a written appeal to the City Council within fifteen (15) business days of said determination. Said appeal shall state the specific grounds upon which the appeal is based. Within thirty (30) days of the date of receipt of the appeal, the City shall schedule the appeal for a regular or special meeting of the City Council. The City Council shall make its decision to affirm, reverse, or remand the determination by adopting a resolution stating findings of fact.

**D. Total Maximum Daily Loads and Impaired Waters**

The 1987 amendment to the Federal Clean Water Act required all impaired waters to be corrected. In making rules to meet the 1987 Amendment, the Environmental Protection Agency (EPA) first set criteria to determine a list of impaired waters depending on the potential use of the water. The Minnesota Pollution Control Agency (MPCA) worked to set guidelines to establish intended uses for the waters of the state and then set acceptable water quality criteria. After testing to determine the water quality, waters failing to meet the water quality criteria are placed on the 303d Impaired Waters list that is submitted to the EPA. Table 15 in Section IV, page 16 of this report, lists the current (2006) MPCA 303d Impaired Waters in Ramsey. It should be noted that, as of 2007, only about 25% of the waters of the State of Minnesota had been tested. Hence, the impaired waters list is likely to increase in the Ramsey area.

The process to remedy the impairment includes establishing a Total Maximum Daily Load (TMDL) allocation to each contributor to the problem. A TMDL is a calculation that determines the allowable pollutant load that can be discharged into the impaired water so that the limited load will ensure that the water improves to levels where it is no longer impaired. The typical process is initiated by the MPCA and includes a series of stakeholder meetings to formulate viable solutions and mutually work out a reasonable allocation of acceptable pollutant loading.

**E. Specific Lakes and Streams with Water Quality Problems**

Since a TMDL study has not been completed for the known impaired waters in Ramsey and downstream from Ramsey (such as Lake Pepin), the City should identify the priority it places on addressing impaired waters and how the City intends to participate in the development or implementation of TMDL projects. The Rum River and Mississippi River watersheds are too large for the City of Ramsey to take the lead on the TMDL Stakeholder process for these two waters. It is recommended that the City volunteers to participate in the Stakeholder process for these waters. Through this SWMP, the City of Ramsey has the capability of modeling contaminant transport using the SSA model. The City will work with the LRRWMO and the MPCA to formulate a TMDL for the impaired Rogers Lake.

Once a TMDL study is completed for the impaired water, the City must include, in this SWMP and its City-wide SWPPP, an implementation strategy including funding mechanisms that will allow the implementation of the TMDL requirements. As MPCA completes its TMDL process for each impaired water, the implementation of the measures to meet the TMDL will immediately become a priority item for the City of Ramsey.

**F. Lower Rum River Water Management Organization**

The City of Ramsey entered into a Joint and Cooperative Agreement for the Establishment of the *Lower Rum River Watershed Management Organization to Plan, Control and Provide for the Development of the Lower Rum River Watershed* in June of 1995. The Minnesota Board of Water and Soil Resources officially signed the Findings of Fact, Conclusions and Order accepting the Second Generation Watershed Management Plan on August 26, 1998. The LRRWMO updated its plan in 2012. The LRRWMO's plan update will trigger the mandatory re-evaluation and potential need for an update of the City's SWMP within two years from the date the LRRWMO's plan is approved by

BWSR. Update of the City's SWMP was delayed to incorporate the requirements associated with the reissuance of the MS4 permit in 2013.

**G. NPDES Requirements**

In 1987, the US Congress amended the Clean Water Act to include storm water pollution and directed the Environmental Protection Agency (EPA) to initiate rulemaking. The first round of EPA rules were implemented in 1991 when NPDES Phase I permits were required for all cities exceeding 100,000 in population. Phase II was implemented in 2003 and targeted all cities with populations exceeding 10,000. The Minnesota Pollution Control Agency (MPCA) assumed responsibility for implementing the rules and issuing all Phase II permits. The City of Ramsey was required to submit a permit for its Municipally Separate Storm Sewer System (MS4) in March of 2003. The permit was reissued in 2006 and 2013. The permit required the City of Ramsey to meet six minimum storm water control measures as follows:

1. Public education and outreach
2. Public participation and involvement
3. Detection and elimination of illegal discharges
4. Control of large construction sites runoff
5. Post construction storm water management
6. Pollution prevention or housekeeping for municipal operations

To show that the City of Ramsey is committed to implementing its Phase II permit, it was required to submit a Storm Water Pollution Prevention Program (SWPPP), which is essentially a list of promised steps the City proposes to make to meet these minimum control measures. The promises are in the form of Best Management Practices (BMPs) to be implemented at specified times over the life of the permit.

In general, the NPDES storm water discharge permit program is designed to reduce adverse impacts to water quality. The primary targets of acceptable storm water management plans are urban runoff and construction runoff. This is because urban runoff carries pollutants from cars, lawn fertilizers, pesticide spills and other contaminants into our lakes, wetlands and streams without entering wastewater treatment systems. Construction runoff is often laden with sediment caused by large amounts of un-vegetated soil that is loosened by excavation and grading.

The MPCA mandates are intended to regulate these sources of continued environmental degradation. To comply with the NPDES permit requirements, the City's SWPPP was drafted to establish measurable goals using the Best Management Practice (BMP) approach and to be able to track performance and progress.

Erosion and sediment control measures must be included in the City-wide SWPPP. The minimum standard is the General Permit Authorization to Discharge Storm Water Associated With Construction Activity Under the National Pollutant Discharge Elimination System/State Disposal System Permit Program Permit MN R040000 (NPDES/SDS Permit) issued by the Minnesota Pollution Control Agency on August 1, 2013, as amended. Some components of the NPDES/SDS Permit include:

1. If land disturbing activity is taking place on a site where the soils are currently disturbed (e.g., a tilled agricultural site that is being developed), areas that will

not be disturbed as part of the development and areas that will not be disturbed according to the time frames and slopes specified in the NPDES General Construction permit Part IV.B.2, shall be seeded with temporary or permanent cover before commencing the proposed land disturbing activity.

2. Where one (1) or more acres of disturbed soil drain to a common location, a temporary (or permanent) sediment basin must be provided prior to the runoff leaving the site or entering surface waters. The basins must be designed and constructed according to the standards in the NPDES General Construction Permit Part III.B.
3. The Permittee or applicant must ensure final stabilization of the site in accordance with the NPDES General Construction Permit requirements. The site will be considered as having achieved final stabilization following submission of Certificate of Completion by the permittee or applicant, and inspection and approval by the City.

#### H. **Non-Degradation Rulemaking**

The MPCA is currently going through due process to update its non-degradation rulemaking effort and amend the state rules governing the non-degradation of waters (Minn. R. 7050.0180 and 7050.0185). Rules protecting Outstanding Resource Value Waters were adopted in 1984, while rules governing non-degradation of all waters were adopted in 1988. Since then, there have been many changes to the state and federal structure for water protection and to the understanding of water quality. The MPCA intends, with the assistance of a significant stakeholder effort, to thoroughly investigate the issues associated with non-degradation of waters, and to adopt rules that will address those concerns.

The MPCA has already taken the first steps in the rulemaking process by publishing two Requests for Comments regarding our intent to amend the current non-degradation rules. These Requests for Comments were published in the *State Register* on January 29, 2007, May 29, 2007 and February 25, 2013.<sup>3</sup>

This language was copied from the MPCA website in January 2015. The City of Ramsey will incorporate the non-degradation policies into this SWMP when they are formally adopted into the state rules.

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<sup>3</sup> Excerpt taken from MPCA website:  
<http://www.pca.state.mn.us/http://www.pca.state.mn.us/index.php/water/water-permits-and-rules/water-rulemaking/nondegradation-rulemaking.html>

#### IV. LAND AND WATER RESOURCES INVENTORY

Each plan must contain an inventory of water resource and physical factors affecting the water resources based on existing records and publications. If data publications and maps are available at a convenient central location, they may be included by reference. The plan must include a brief summary of the data and must identify where the publication can be obtained. The following subsections are required.

##### A. Precipitation

The state climatology office has records of all official rain gauges throughout Anoka County. The monthly precipitation totals and county-wide monthly averages for Anoka County are available online at:

<http://climate.umn.edu/HIDENannual/>

The two closest high-density rain gauges are:

1. No. 211785, Coon Creek
2. No. 217308, Saint Francis

Information is readily available from 1971 to the present. Over this time period, the aggregate annual precipitation ranged as follows:

Lowest annual precipitation..... 16.5 inches in 1976  
Highest Annual Precipitation..... 39.09 inches in 1983  
Average Annual Precipitation ..... 29.54 inches per year

The following is the average annual precipitation per decade:

1970s..... 26.8 inches per year  
1980s..... 29.9 inches per year  
1990s..... 31.2 inches per year  
2000s..... 29.6 inches per year  
2010s..... 29.2 inches per year

On the average, June is the wettest month, followed by July and May.

##### B. General Geology and Topographic Data

The City of Ramsey is nestled between the Rum and Mississippi Rivers and within 2 miles of the confluence of these rivers. The general terrain is relatively flat and is often called the Anoka Sand Plain. The elevations range from approximate elevation 920 feet above mean seal level in northwestern Ramsey to near 840 feet at the lower Rum River. The straight-line distance between these points is approximately 60,000 feet, making the average slope less than 1 percent. In general, the land slope is in the 2 to 5 percent range.

There are steep slopes within the shoreland protection zone of the Rum and Mississippi Rivers, as well as scattered locations throughout the City. From the aerial photographic contour map, the slopes near the rivers can be as high as 65 percent. A map showing the areas with slopes between 12 and 18 percent and separately showing the areas with slopes greater than 18 percent is attached as Figure 1.

Virtually all of the Ramsey city limits is within the Anoka Sand Plain, which consists of highly permeable soils. Figure 2 shows the general subsurface geology of aquifers in the vicinity of Ramsey. The Anoka Sand Plain is part of the undifferentiated drift (Layer 1). The Minnesota Department of Natural Resources and the Minnesota Geological Survey generated Figure 3 as part of the Regional Hydrogeologic Assessment for the Anoka Sand Plain.<sup>4</sup> Based on Figure 3, waterborne contaminants in the Ramsey area can reach upper aquifers within hours or months of release, necessitating additional care in regulating surface water contamination. The majority of Ramsey is rated with the highest geologic sensitivity to pollution in the uppermost aquifer.

The Board of Water and Soil Resources website indicates that Anoka County, though not participating in the official metropolitan groundwater planning process, has prepared a “groundwater protection assessment.” The county public health department coordinates the county groundwater planning and management activities.<sup>5</sup> However, there is no mention of the assessment on Anoka County Health and Environment Department website.

The City Wellhead Protection Plan was completed in the September of 2007. The final draft of Part 1 was accepted by all review agencies and City staff is currently working on Part 2. Figure 4 shows the 10-year capture zone (Well Head Protection Area, WHPA) as well as the Drinking Water Supply Management Area (DWSMA) for the seven municipal drinking water wells in Ramsey. Storm water infiltration will not be allowed inside these zones.

### C. Surface Water Resource Data

#### 1. Public Waters

A map of the public waters, streams, lakes, and public ditch systems established under Minnesota Statutes, chapter 103D or 103E, including the location of existing dams and control structures is shown in Figure 5. A map of the natural drainage routes is also attached as part of the Parks Map in Figure 6.

The Minnesota Department of Natural Resources (DNR) uses the U.S. Fish and Wildlife classification system (Circular 39) for wetlands and currently requires a permit for alteration of wetland types 3-5 which are 2.5 acres or larger. Ramsey City Code Section 117-124, Environmental Protection Overlay Districts includes provisions designed to further protect wetlands. . As stated previously, this section of code does not include required vegetative buffers for new developments around the perimeter of wetlands.

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<sup>4</sup> Minnesota [Dept. of Administration / Office of Geographic and Demographic Analysis / Land Management Information Center](http://www.lmic.state.mn.us/chouse/metadata/asp.html). Website: <http://www.lmic.state.mn.us/chouse/metadata/asp.html>

<sup>5</sup> <http://www.bwsr.state.mn.us/watermgmt/metrogroundwaterplans.html>

In addition to the protected waters list, the Mississippi River has a designated Critical Area Corridor and the Rum River is designated as a Wild & Scenic Outstanding Resource Value Water (see Figure 6 – Parks Map).

2. Shoreland

In order to control the development and utilization of shoreland along protected waters thereby preserving the water quality, natural characteristics, economic values and the general health, safety and welfare, the following waters in the city limits have been given a shoreland management classification. These protected waters within the city limits have been classified by the Commissioner of Natural Resources as follows:

**Natural Environment Lakes                      DNR I.D. #**

1.	Lake Eddy	2-109
2.	Itasca	2-110
3.	Rogers	2-104

**Recreational Development Lakes                      DNR I.D. #**

1.	Jeglens Marsh	2-111
2.	Peltzer Pond	2-112
3.	Grass (Sunfish)	2-113

**General Development Lakes                      DNR I.D. #**

1.	Ramsey Terrace Pond	2-114
2.	Magnesium Street Pond	2-116
3.	Industry Avenue Pond South	2-117
4.	Industry Avenue Pond North	2-118

**General Development Streams                      Locations**

1.	Trott Brook	Sections 1, 2, 3, 7, 8, 9, T32N, R25W
2.	Ford Brook	Sections 1 & 2, T32N, R25W

The above shorelands of the city are designated as a Shoreland Overlay District. The purpose of the Shoreland Overlay District is to control the utilization of shoreland areas and to preserve the quality and natural character of these protected waters within the City. The shoreland overlay districts are shown on the City's Mississippi/Rum River Overlay Districts Map. Boundaries of the overlay districts can be determined by scaling distances off the official environmental overlay map.

All wetlands on the National Wetlands Inventory map are shown on Figure 7. The National Wetlands Inventory Map is not all inclusive, wetlands exist in the

City of Ramsey that are not shown on the map. Each site proposed for development must be evaluated for wetlands as required in City Code.

Pretreatment of all storm water from new developments is required prior to discharge into any wetlands. Wetlands may be, and are currently being used for storm water storage for larger rainfall events. They may continue to be used for this purpose – even after upstream development, provided that:

1. There is acceptable Best Management Practice pretreatment of the runoff in accordance with the MPCA NPDES/SDS Construction Permit, Section III.D., Permanent Stormwater Management System.
2. The bounce from the normal water level to the high water level does not exceed two feet.

The Minnesota Wetland Conservation Act (WCA) requires the designated Local Governmental Unit (LGU) in charge of administering the WCA to generate a Notice of Wetland Conservation Act Decision for any impact to wetlands within the City of Ramsey. In all but minor decisions, the LGU will call for a Technical Evaluation Panel (TEP) review of the application or impact prior to issuing a decision. The LGU must give notice of proposed actions affecting wetlands to all of the following:

- a. The Minnesota Board of Water and Soil Resources
- b. The Soil and Water Conservation District
- c. The Minnesota Department of Natural Resources
- d. The Lower Rum River Watershed Management Organization
- e. The U.S. Army Corps of Engineers
- f. Interested citizens requesting notification of such actions

If a TEP meeting is required, all listed parties are invited to review the proposed action. However, it is not uncommon for a TEP meeting to consist of only a small contingent of this list, as some invitees may have no jurisdiction over the proposed action.

### 3. Watersheds

A general watershed map breaking the City of Ramsey into seven primary watersheds is attached as Figure 8. The naming convention for the nodes (i.e., pipes, channels, junctions, manholes, and ponds) is based on the county section and quadrant numbers and is described in Figure 9. The subsequent Figure Nos. 10 through 23 show the subwatersheds and drainage pattern within each of the separate primary watersheds. Storm water ponds, 100-year peak pond elevations and outfalls are also shown on these maps.

The City Storm Sewer infrastructure is also shown on the individual primary watershed maps. In the GIS database for these maps, the pipe network is color coded to reflect the various pipe sizes.

### 4. Flood Levels

Floodplains are covered by City of Ramsey Code Section City Code Chapter 117, Article II, Division 4, Subdivision III. A comprehensive map showing all of

the FEMA Flood Insurance Rate Map (FIRM) flood plains is attached as Figure 24. Flood studies have been performed for the following waterways:

- a. Mississippi River
- b. Rum River
- c. Trott Brook
- d. Ford Brook

Copies of the flood studies are available at the office of the City Engineer or online at the [FEMA Map Service Center](#). These studies have been incorporated into the Official Zoning Map in accordance with Ramsey City Code Section II Chapter 117, Article II, Division 4, Subdivision III... The Official Zoning Map is on file in the Office of the City Administrator and the City Zoning Administrator.

In addition to the flood levels predicted by the FEMA flood studies, Bolton & Menk performed a flood study of County Ditch 66 using the HEC-RAS stream modeling program. This information has been coordinated with the SSA modeling software and submitted to FEMA for agency acceptance as a flood plain elevation. The 100-year flood plain has been recorded on the map along with the FEMA data. The color-coded legend of Figure 24 helps to differentiate between the federally modeled floodplain and the unofficial City flood plain.

In addition to the flood map, Tables 1 through 7, located in the Tables Appendix of this report summarize the modeled 100-year flood levels and peak discharges of existing storm water ponds and natural depressions that correspond to the peak discharges of channel flow passing through the watershed.

After a detailed review of the new and available flood profile information, the results appear consistent and provide a reasonable hydraulic grade from the upper reaches of the various flood channels to the ultimate confluence with the Rum and/or Mississippi Rivers.

5. Water Quality Information

Section 303d of the Clean Water Act requires that each state submit a list of Impaired Waters. The MPCA website lists the impaired waters as officially designated in 2014. Table 15 lists the impaired waters found in Ramsey:

**Table 15**  
 303d Impaired Waters List Excerpt from MPCA

Name	Affected Use	Pollutant or Stressor	Year Designated	Target Start	Target Completion
Rogers Lake	Aquatic Recreation	Excess Nutrients	2006	2013	2017
Rum River	Aquatic Consumption	Mercury, FCA	1998	2008	2025
Mississippi River	Aquatic Consumption	Mercury, FCA	1998	2008	2025
	Aquatic Consumption	PCB, FCA	2002	2002	2025

The Minnesota DNR maintains a database on all Minnesota lakes. Some of this data is very limited or not available, while other lakes have been studied in great detail. To find the most current data on the lakes in Ramsey, access the [Lake Finder](#) on the DNR Website.

The WMO document has a list of monitoring locations. The [Anoka Conservation District](#) (ACD) has water quality information. The ACD has also published a water atlas.

6. Water Appropriations

Upon approval by all of the review authorities, the City's approved Wellhead Protection Plan will be incorporated into this plan by reference. At present, the draft includes all of the current municipal ground water appropriations. The City is considering obtaining surface water appropriations from the Mississippi River for a 20 MGD water treatment plant. The scope of the project will require Regional Participation. The City is working with the Metropolitan Council and other regional partners to explore a regional funding solution to locally operated surface water supply treatment plant. The water treatment plant is intended to supply water for the anticipated population growth of the City. When the new water treatment plant is approved and constructed, the existing City wells and permitted groundwater appropriations are planned to remain unchanged to be readily available as backup for water needs.

7. Soil Data

Ramsey City Code, Section 117-424 covers types of soil that are adequate for septic systems. According to Ramsey City Code, the City adopts the Anoka County Soil Survey, 1977 (Soil Survey) and supplemental operational soil surveys as its official soil survey and makes it a part of the City Code. The Anoka County soil survey map of the Ramsey area is attached as Figure 25. In general, the City of Ramsey has soils in SCS Hydrologic Soil Type A. Table 16 lists the recommended infiltration rates based on SCS hydrologic soil types.

**Table 16**  
Infiltration Rates per Soil Type

Hydrologic Soils Type	Infiltration Rate	Soil Texture
A	0.30 inches/hour	Sand, loamy sand, or sandy loam
B	0.15 inches/hour	Silt loam or loam
C	0.07 inches/hour	Sandy clay loam

*Source: Urban Hydrology for Small Watersheds (SCS, 1986), as amended, revised or supplemented.*

8. Land Use and Public Utility Services

Necessary land use and public utility services information is limited to information that existed at the time the plan or plan amendment was developed, including:

- a. A general map of existing land uses (Figure 26A);
- b. A general map showing anticipated land uses (Figure 26B); and
- c. A reference to the location of the metropolitan urban service area.

Land use is one of the primary mechanisms that affect flooding and water quality. As prairie and forested areas are converted to agricultural and urban uses, the volume and rate of storm water runoff increases. This increase in storm water runoff can cause a change in the bank full flow of area streams and conveyances. This can cause stream bank erosion and deterioration of the stream. In addition, increased area runoff can cause erosion in steep areas. The conversion of natural land cover also increases the amount of pollutants in storm water runoff such as the levels of pesticides and nutrients from agricultural land use, and trace metal concentrations from urban land use. Pollutant loading analysis has not been included within this report. This plan estimates the future land use throughout the study area in order to evaluate the drainage system needs.

Although pollutant concentrations may not vary greatly between land uses, pollutant loadings are a function of both runoff volume and concentration. The volume of runoff is directly related to the amount of impervious surface from a particular land use. For example, if a fictitious *Area A* has twice the runoff due to higher impervious land cover as *Area B* with the same pollutant concentration, *Area A* will have twice the pollutant loading. This is the basis for the major difference in water quality between residential and commercial land uses and affects surface water planning strategies for the different land uses. The Minnesota Land Cover Classification System (MLCCS) cover types for the Ramsey area are shown in Figure 26C.

9. Water-based Recreation Areas and Land Ownership

Figure 6 – Parks Map shows the location of all Parks and the location of all DNR public water accesses within the City of Ramsey.

10. Fish and Wildlife Habitat

The City of Ramsey has applied to the DNR for an updated list and description of the conclusions and recommendations of biological surveys or reconnaissance studies in December of 2014. Since this list is sensitive it is not included in this report, but is on file in the office of the City Engineer.

11. Unique Features and Scenic Areas

The Mississippi and Rum River Corridors within the City are unique and valuable local, state, regional and national resources. The rivers are an essential element in the local, regional, state and national transportation, sewer and water and recreational systems and serve important biological and ecological functions. The prevention and mitigation of irreversible damage to these resources and the preservation and enhancement of their natural, aesthetic, cultural and historic values is in furtherance of the health, safety and general welfare of the City. The Mississippi River Corridor Critical Area and the Rum River Scenic River are

protected under Ramsey City Code Chapter 117, Article II, Division 4, Subdivisions II and V Respectively. 2.

Ramsey City Code Section 117-252 regulates bluff land and river land development in order to protect and preserve the outstanding scenic, recreational, natural, historical, and scenic values of the Rum River in the city of Ramsey in a manner consistent with Minnesota Statutes, §104.31 - 104.40, Minnesota Regulations NR78-81, and the Management Plan for the Rum River (6 MCAR 1.2700 - 12720).

The City has an Environmental Policy Board that has been actively documenting and mapping the City's existing natural features, through a Natural Resources Inventory and a Wetland Functions and Values Assessment, including:

- a. Native prairie communities
- b. Woodlands
- c. Functions and values of wetlands
- d. Rare and endangered species
- e. Historic and heritage buildings and features

Their report, which may be found on the City website, is included in this document by reference. NEED TO ADD WEB PAGE

The Scenic River Land Use District is divided into two areas designated as the Urban Area Overlay District, or Rural Area Overlay District and are covered under City of Ramsey Code Section 117-254.

#### Pollutant Sources

The City of Ramsey has one closed landfill (the Anoka Regional Solid Waste Facility). The MPCA keeps the records. The City is not aware of any other landfills.

There was a high nitrate area east of Armstrong Boulevard between 158<sup>th</sup> Avenue and 161<sup>st</sup> Avenue that was attributed to agricultural activity. There was a hog farm west of TH47 at 157<sup>th</sup> Avenue. The City does not have any permitted wastewater discharges.

The City does not keep a list of storage tanks. These records are currently kept at the Anoka County Environmental Services office.

The MPCA "[What's in My Neighborhood?](#)" website lists known and potential sources for soil and groundwater contamination. The majority of the sites listed are Voluntary Investigation and Cleanup (VIC) sites. There are 215 sites listed in Ramsey. A text based search for Anoka County and Zip code 55303 will list over 600 permits; however, some of the addresses were in the Cities of Anoka or Andover which share a zip code with Ramsey. Additionally many sites had multiple permits at the same address.

These are listed in Table 17. **Table 17**  
Known or Potential Sources of Soil or Groundwater Contamination

Activity ID	Activity Name	Address	
VP20690	14140 Azurite	14140 Azurite St NW	Ramsey

Activity ID	Activity Name	Address	
VP24480	A1O0143 - Alpine Park	6600 Alpine Dr NW	Ramsey
MND985724061	Aca Management 367	5195 142nd Ave NW	Ramsey
MNR000058230	Accent Precision Wood Products	6250 McKinley St NW	Ramsey
MNR000118802	Accurate Auto Inc.	9716 Highway 10	Ramsey
MND982220089	Accurate Auto Inc.-Ramsey	9617 Highway 10 W	Ramsey
VP18690	Ace Solid Waste - Ramsey	6601 McKinley St NW	Ramsey
MND985702851	Adrien Mechanic Services	6021 Bunker Lake Blvd NW	Ramsey
MNR000079889	Aero Restoration & Repair Co	7101 143rd Ave NW Ste B	Ramsey
MNRNE35D6	All-Brite Graphics LLC - ISW	6320 Highway 10 NW	Ramsey
MNS000177972	Allina Health Ramsey Clinic	7231 Sunwood Dr NW	Ramsey
MNR000060970	Allina Medical Clinic - Ramsey - Alpine Drive	5300 Alpine Dr NW	Ramsey
MND985752047	Alloy Recovery Co Inc.	7060 142nd Ave NW	Ramsey
MNR000027722	Alpha Power & Technology	14000 Unity St	Ramsey
SA7044	Alsil Stephens Dump	See location description	Ramsey
MND089476451	Altron Inc.	6700 Bunker Lake Blvd NW	Ramsey
MNR000081067	Amtcor Precast Inc.	6640 Industry Ave	Ramsey
MND982071714	American Trade A Bus Inc.	14000 Sunfish Lake Blvd NW	Ramsey
MNR000078246	Anderson & Dahlen Inc.	6850 Sunwood Dr NW	Ramsey
MNR000015057	Anderson Wade	15031 Hematite St NW	Ramsey
SA7100	Anoka County State Hospital Demo Fill	See location description	Ramsey
SA7111	Anoka Municipal Regional Landfill	14730 Sunfish Lake Blvd NW	Ramsey

<b>Activity ID</b>	<b>Activity Name</b>	<b>Address</b>	
MND985705292	Anoka Ramsey Automotive - Hwy 10	6262 Highway 10 NW	Ramsey
MND985753730	Anoka Ramsey Dental	5300 153rd Ave NW Ste 3	Ramsey
MNR000032169	Anoka Ramsey Sport Center	6760 Highway 10 NW	Ramsey
MNS000177618	Anoka-Ramsey Dental	5400 140th Ave NW Ste 104	Ramsey
MNR000114918	AR Honing	6250 Bunker Lake Blvd NW Ste 219	Ramsey
MNS000143404	Arrow Components Corp	6230 McKinley St NW Ste A	Ramsey
3789	Auto Ranch	7665 Highway 10 NW	Ramsey
MN0000036038	Auto Truck Hydraulics	7445 Highway 10 NW Ste 3	Ramsey
MNR000115139	Automated EDM Inc.	6231 McKinley St NW	Ramsey
MNR000023234	B & A Cylinder Head - Ramsey	14165 Ramsey Blvd NW	Ramsey
MND985684406	B & D Auto	14966 Nowthen Blvd NW	Ramsey
MND982642936	B & D Repair - Ramsey	9451 Highway 10 NW	Ramsey
MNS000172445	B&K Swiss Inc.	14220 Basalt St NW	Ramsey
MNR000115022	Bailey Woodworking	6250 Bunker Lake Blvd NW Ste 216	Ramsey
MNR000101824	Baker White Inc.	6111 Highway 10 NW	Ramsey
MNS000131292	Barnett Family Dentistry	7962 Sunwood Dr NW Ste 200	Ramsey
VP4771	Barnett Olds #2	6415 Hwy 10 NW	Ramsey
MNS000178897	B-Brothers Auto	7103 Highway 10 NW	Ramsey
VP8482	BK Ramsey Site	7205 Hwy 10 NW	Ramsey
MND985709401	Blass Automotive	6100 Industry Ave	Ramsey
MND982212045	Blatz Automotive	7105 Highway 10 NW	Ramsey
MND985720952	Blue Line Collision Center	6260 Highway 10 NW	Ramsey

<b>Activity ID</b>	<b>Activity Name</b>	<b>Address</b>	
VP8481	BNSF R-O-W #2	See location description	Ramsey
MN0000380881	Boart Longyear Co - Anoka	6300 Industry Ave	Ramsey
MNR000064659	C & F Race Cars	7101 143rd Ave NW Ste P	Ramsey
VP18650	Cabinetry Concepts	14410 Azurite St	Ramsey
MNRNE35J5	Carbon Products/ Division of Graphel Corp - ISW	6251 McKinley St NW	Ramsey
MN0000043513	Champlin Towing	14300 Sunfish Lake Blvd NW	Ramsey
MNS000133942	Chips Tool Repair Inc.	6250 Bunker Lake Blvd Ste 206	Ramsey
MND985695808	Cjs Auto Repair	17600 Gibbon St NW	Ramsey
MNS000135558	Class C Components Inc.	6825 Sunwood Dr NW	Ramsey
MND985738293	Coated Abrasive Products Co	14059 Sunfish Lake Blvd	Ramsey
MNS000174011	Coborn's Pharmacy 33	7900 Sunwood Dr NW	Ramsey
MNS000118869	Collision 2000 Inc.	3345 Viking Blvd	Ramsey
MNR000042424	Command Tooling Systems	13931 Sunfish Lake Blvd NW	Ramsey
MND985680040	Commercial Asphalt Co - Plant 906	6640 141st Ave NW	Ramsey
MNS000141010	Concrete Masonry Unlimited	9411 Alpine Dr NW	Ramsey
MNR000033787	Connexus Energy	14601 Ramsey Blvd NW	Ramsey
MNRNE373P	Countryside Printing Inc. - ISW	6250 Bunker Lake Blvd NW Ste 113	Ramsey
MNS000186908	Courage Kenny Sports & Physical Therapy Center Ram	7231 Sunwood Dr NW Ste A	Ramsey
VP26500	CSAH 116 Reconstruction - ROW	6100 Industry Ave NW	Ramsey
VP25020	CTT Properties, LLC	6600 Sunwood Dr NW	Ramsey
MNS000140152	Cullinan Rigging & Erecting Inc.	6815 McKinley St NW	Ramsey
MN0000012450	D Cobey Co Inc.	9340 Highway 10 NW	Ramsey

<b>Activity ID</b>	<b>Activity Name</b>	<b>Address</b>	
MND006220719	Dahlheimer Beverage LLC	13554 Tungsten St NW	Ramsey
MND982640476	Danny's Trannys Inc.	14050 Basalt St NW	Ramsey
MNR000004036	Detail Tool & Engineering Inc.	6511 Industry Ave	Ramsey
MND985669936	Diamond Automotive Inc./ Auto Fitness & Service Ctr	7029 Highway 10 NW	Ramsey
MNS000141085	Diamond Graphics	14350 Azurite St NW	Ramsey
PW6124218640	Dickenson Diesel	NW Highway 10	Ramsey
MNR000119271	Die Concepts Inc.	13915 Radium St NW Ste F	Ramsey
MNR000077495	Digital Tool & Automation	6501 McKinley St NW	Ramsey
MNR000103978	Dynamic Group Inc. - Ramsey	13911 Unity St NW	Ramsey
MND985729847	E & L Machine	5944 168th Ln NW	Ramsey
MNS000168625	Eddy's Auto & Body Repair Inc.	6845 Highway 10 NW	Ramsey
MNR000076554	Egan Oil Co	500 Bunker Lake Blvd NW	Ramsey
MNR000013532	Erin Contracting	8050 147th Ave NW	Ramsey
MNR000119669	E-Z Auto Sales Inc.	7751 Highway 10 Ste 6	Ramsey
MNR000115501	Falcon Machine Inc.	7101 143rd Ave NW Ste N	Ramsey
MNR000060186	Ferrellgas - Anoka	7255 Highway 10 NW	Ramsey
MNR000100057	First Cut Products Inc.	6250 Bunker Lake Blvd NW Ste 104	Ramsey
MNNONGEN1170	Flavor Midwest Inc.	9459 Highway 10 NW	Ramsey
MN0000275925	Food N Fuel C15	13939 Saint Francis Blvd	Ramsey
MN0000196147	Galindo Electric	15645 Traprock St NW	Ramsey
MN0000083741	GEC Auto Service ink - Ramsey	7129 Highway 10 NW Site C	Ramsey
MND985722420	Gerdes Racing	7321 152nd St	Ramsey
MNS000177170	Gibbs Lawn	6300 Bunker Lake Blvd NW	Ramsey

<b>Activity ID</b>	<b>Activity Name</b>	<b>Address</b>	
MNR000080655	Gibbs Lawn - Radium Street	13915 Radium St NW Ste D	Ramsey
MNRNE39NX	Graphel Carbon Products ISW	6251 McKinley St NW	Ramsey
MNR000015867	H Ten Sports	8110 Highway 10 NW	Ramsey
VP26700	Harber Industries	6690 Sunwood Dr NW	Ramsey
MND985749530	Harold's Our Own Hardware	6000 167 Ave NW	Ramsey
MNRNE39BB	Health Care Marketing Inc. dba Perry Products ISW	6023 167th Ave NW	Ramsey
MNS000147306	Heartland Tire	7151 Riverdale Dr	Ramsey
MND982642894	Heichel Brian	6933 164th Ln NW	Ramsey
MN0000036061	Hi Tech Collision Frame	7445 Highway 10 NW Ste 2	Ramsey
3700	Hills Property	7443 Highway 10	Ramsey
MNR000066407	Hitech Motorsport Inc. - Ramsey	13915 Radium St NW Ste C	Ramsey
3473	Hi-Ten Sports Center	8110 Highway 10 NW	Ramsey
MNS000117358	Home Dame Brothers Painting	15621 Barium St NW	Ramsey
MNR000117317	Import Auto Sales Inc.	7443 Highway 10	Ramsey
MNR000115113	Intech Industries Inc.	7180 Sunwood Dr NW	Ramsey
MNR000051607	Integrity Tool & Engineering	6221 McKinley St NW	Ramsey
MNR000022061	Intercity Oil	6021 Highway 10 NW	Ramsey
MNR000076778	ISD 11 Ramsey Elementary	15000 Nowthen Blvd NW	Ramsey
MND985704634	Jac Auto Repair & Sales	6336 Highway 10 NW	Ramsey
MND985764141	Jacks Auto Repair	14290 Sunfish Lake Blvd NW	Ramsey
MNS000130245	JDI Signs & Graphics	6451 McKinley St NW Ste P	Ramsey
MNR000112235	JR Data Solutions Inc.	6250 Bunker Lake Blvd NW Ste 204	Ramsey

<b>Activity ID</b>	<b>Activity Name</b>	<b>Address</b>	
MN0000367144	Julian M Johnson Construction Corp	6191 140th Ave NW	Ramsey
MNR000078725	Just Precision Inc.	6250 Bunker Lake Blvd Ste 213	Ramsey
MND071773733	Kens Automotive	15415 St Francis Blvd	Ramsey
MNR000111534	Kit Masters Inc.	6250 Industry Ave NW Ste 211	Ramsey
MNS000214106	Kovar Sales	14047 Azurite St NW	Ramsey
MND985721208	Ksiazek Charles	15710 Juniper Ridge Dr NW	Ramsey
MND981535230	Lamey Dave	15940 Sodium St NW	Ramsey
MND981802390	Lano Equipment Inc.	6140 Highway 10 NW	Ramsey
MNR0534DB	Life Fitness Div of Brunswick Corp - SW	14150 Sunfish Lake Blvd NW	Ramsey
MN0000190736	Links At Northfork	9400 153rd Ave NW	Ramsey
A00002353	Listul Industries Inc. - SW	13900 Sunfish Lake Blvd NW	Ramsey
MNR000007898	Mach 5 Auto Service	7129 Highway 10 NW	Ramsey
MND985714658	Marshall Concrete Products Inc. - Ramsey	14141 Unity St NW	Ramsey
MNR000058859	Mat Inc.	6230 McKinley St NW Ste E	Ramsey
MND057087678	Mate Punch & Die Co	6400 Industry Ave	Ramsey
MND022705834	McKay's Auto Sales	6415 Highway 10 NW	Ramsey
MNS000191544	Metro Dentalcare - Ramsey	7600 Sunwood Dr NW	Ramsey
MNR000078980	Midwest Car Care - Ramsey	6745 Highway 10 NW	Ramsey
MNR000027802	Midwest Overhead Crane Corp	13900 Sunfish Lake Blvd NW	Ramsey
MN0000625962	Minnesota Sawdust & Shavings Co Inc.	14100 Jasper St NW	Ramsey
MNR000069252	Minnesota Tool & Die Works Inc.	6220 McKinley St NW	Ramsey

<b>Activity ID</b>	<b>Activity Name</b>	<b>Address</b>	
VP22410	Minnesota Waterjet	See location description	Ramsey
MNS000111344	Mississippi West Regional Park	13935 Traprock St NW	Ramsey
VP21480	MNDOT TH 10 & CTY RD 56	Ramsey Blvd & Hwy 10	Ramsey
MND982605495	MPCA Ramsey Municipal Center	15153 Nowthen Blvd NW	Ramsey
MNS000172833	Multisource Manufacturing LLC Ramsey	6690 Sunwood Dr NW	Ramsey
MND982613234	Noard Machine Tool Inc. - Anoka	6760 Highway 10 NW	Ramsey
MND008797938	Noons RV Center	7405 Highway 10 NW	Ramsey
MNR000069179	North Country Concrete	7040 143rd Ave NW	Ramsey
MN0069396	Northern Lights 2009-2010 Zone EF	Address Unknown	Ramsey
MNS000174284	Northwest Metro VA Clinic	7545 Civic Center Dr NW	Ramsey
MNU000661	Oak Terrace Mobile Home Park	6545 Highway 10 NW	Ramsey
MNR000016972	Oil Change Anywhere Inc.	14620 Fluorine St NW	Ramsey
MNS000138859	Oldcastle Precast Inc.	6820 143rd Ave NW	Ramsey
MNS000179796	Optimum Appliance & Recycling Center LLC	9539 Highway 10 W	Ramsey
MN0000998948	Outside Services Inc.	14140 Azurite St	Ramsey
MNS000107490	PACT Charter School - Ramsey	7250 Ramsey Pkwy E	Ramsey
MNR000119677	Park RV	9919 Highway 10 W	Ramsey
MND982212532	Pearsons Trucking Inc.	14050 Azurite Blvd	Ramsey
4542	Peck Construction	13900 Sunfish Lake Blvd NW	Ramsey
MNR000026880	Pine Ridge Pet Care - Ramsey	7245 Highway 10 NW	Ramsey
MNR000080648	Plateworks Inc. - Ramsey	6230 McKinley St NW Ste B	Ramsey
MNS000162735	Pleasureland RV Center	7900 Riverdale Dr	Ramsey

<b>Activity ID</b>	<b>Activity Name</b>	<b>Address</b>	
MN0068691	Prairie Meadows/Kelly Acres	Armstrong Blvd NW & Tiger St NW	Ramsey
MNR000023374	Pro Power Sports & Marine Inc.	6781 Highway 10 NW	Ramsey
MND985717925	Production Products Inc.	14161 Basalt St NW	Ramsey
VP15161	QDP and JBT Alliance Site (see Waste Management Site)	See location description	Ramsey
MNS000100776	Quail Manufacturing Co Inc.	6250 Bunker Lake Blvd NW Ste 222	Ramsey
MNS000147835	Qwest - Ramsey Garage	6651 141st Ave NW Ste 2	Ramsey
MNS000147546	Rain for Rent	9550 156th Ave NW	Ramsey
MNS000113290	Ramsey Brake & Exhaust Inc.	5143 179th Ln NW	Ramsey
MNR000013086	Ramsey city of Public Works	14100 Jasper St NW	Ramsey
MND985703941	Ramsey Dental Center	15243 Nowthen Blvd NW	Ramsey
MNS000177782	Ramsey Police Department	7550 Sunwood Dr NW	Ramsey
MND985677723	Ramsey Public Works Shop	St Francis Blvd & 142nd Ave	Ramsey
VP26860	Ramsey School Site	See location description	Ramsey
VP22580	Ramsey Vacant Land Parcel	See location description	Ramsey
MND985764968	Renolette Trucking	6100 Industry Ave Ste 201	Ramsey
MNS000210823	Residence - 9131 178th Ave	9131 178th Ave NW	Ramsey
4573	Rivenwick Village North	6897 139th Ln NW	Ramsey
3591	Rivenwick Village Outlot B	Riverdale Dr & Highway 10	Ramsey
MNS000123760	RJM General Paper Products Inc.	6650 143rd Ave NW	Ramsey
MND982219297	Rockford Autobody	14000 Basalt St NW	Ramsey
VP19380	Rotary Systems	Azurite St NW	Ramsey
MND985700012	Royal Concrete Pipe Ramsey	6640 Industry Ave	Ramsey
MND138781364	Rum River Hills Golf Club Inc.	16600 Saint Francis Blvd	Ramsey

<b>Activity ID</b>	<b>Activity Name</b>	<b>Address</b>	
MNR000109751	Sauter & Sons Inc.	6651 141st Ave NW Ste 2	Ramsey
MND099055691	Sauter & Sons Inc. - Azurite St	14050 Azurite St NW	Ramsey
VP19550	Senior Housing Parcel	County Road 116	Ramsey
MNR000059618	Shorewood RV Center	8390 Highway 10 NW	Ramsey
MNR000103952	Signature USA Inc.	8781 162nd Ln	Ramsey
MNR000078733	Simhof Manufacturing Tech	6250 Industry Ave Ste 112	Ramsey
A00022596	Solo Manufacturing Inc. - ISW	6230 McKinley St NW Ste C	Ramsey
MN0000341545	Sorby Jan	16301 Azurite St NW	Ramsey
MNR000080069	Specialized Coatings Inc.	6250 Bunker Lake Blvd NW Ste 214	Ramsey
MN0001025162	Spider Staging Corp	6250 Industry Ave Ste 108	Ramsey
VP19590	St. Anthony Gun Club	16128 Variolite St NW	Ramsey
VP18800	St. Paul Terminals - Ramsey	14050 Basalt St NW	Ramsey
MNR000055376	Star Auto Sales Inc.	7009 Highway 10 NW	Ramsey
MNR000023036	State Of Minnesota Weigh Scale	9225 Highway 10 NW	Ramsey
VP16770	Sunfish Business	See location description	Ramsey
MNR000017889	SuperAmerica 4508	14000 Saint Francis Blvd	Ramsey
MNR000004333	Superior Striping Inc.	14021 Basalt St NW	Ramsey
MNR000056010	Tech One Motorsports Inc.	6250 Industry Ave Ste 106	Ramsey
4270	The Lighthouse Bar And Grill	6937 Highway 10	Ramsey
MND985749522	Tim's RV Service	14050 Azurite St NW	Ramsey
MND922222135	Trade A Bus	Sunfish Blvd	Ramsey
MNR000056887	Utili Trax Contracting Partnership	6300 Industry Ave	Ramsey
MND982619983	Vance Brothers Inc.	14021 Azurite St NW	Ramsey

<b>Activity ID</b>	<b>Activity Name</b>	<b>Address</b>	
SA7043	Ve-Ve, Inc. Caustic Soaps	See location description	Ramsey
MN0065501	Vision-Ease LP dba Vision-Ease Lens	7000 Sunwood Dr NW	Ramsey
MNR000109900	V-Tech Motorsports Inc.	14000 Sunfish Lake Blvd Ste I	Ramsey
MNR000100792	Walser Outlet Center	7955 Riverdale Dr NW	Ramsey
VP5021	Waltek Inc. II	14310 Sunfish Lake Blvd	Ramsey
VP15160	Waste Management Site	Sunfish Lake Boulevard	Ramsey
MN0000234179	Welsh Engine Sales	6150 Highway 10 NW	Ramsey
MND985677970	Welsh Engine Sales	15443 Ramsey Blvd NW	Ramsey
VP31280	Wendell's Inc., Ramsey	6601 Bunker Lake Blvd NW	Ramsey
MN0000010769	Westside Auto Body	6140 1/2 NW Highway 10	Ramsey
VP20930	Wildlife Research Center	Azurite St	Ramsey
PW6124274140	Wuorio Truck Sales	9619 Highway 10 W	Ramsey
MNRNE35LF	Zero Zone Refrigeration - ISW	6151 140th Ave NW	Ramsey

**D. Design Requirements**

The Ramsey SWMP has a dual purpose: 1) It will serve as a guide for the construction of storm drainage facilities, and 2) It will provide a basis for a consistent approach to the preservation of lakes, wetlands, streams, and the Mississippi and Rum Rivers. The following issues have been incorporated into this plan:

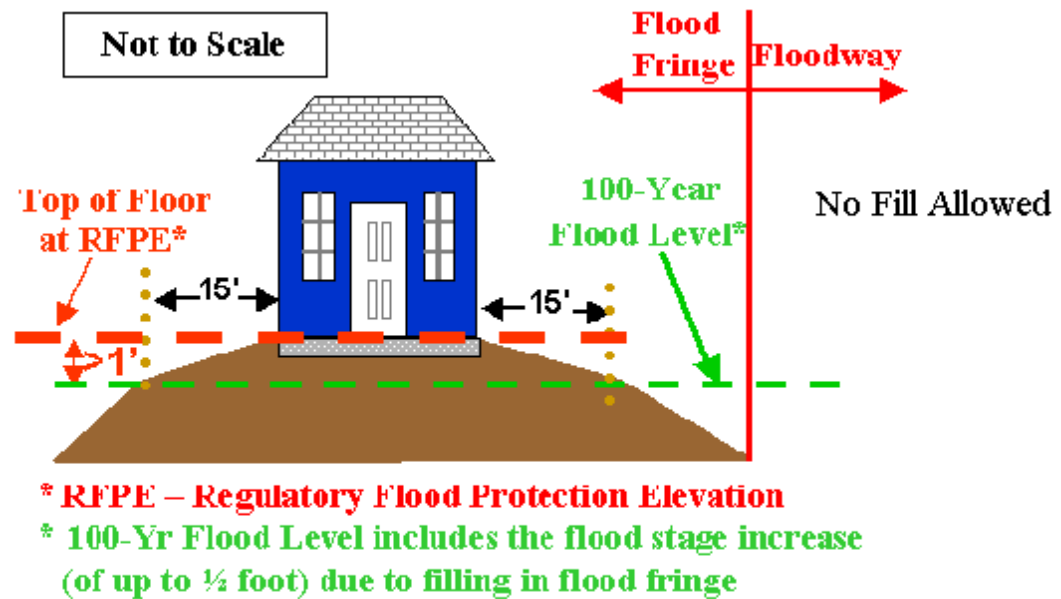
1. Division of the City into major watersheds based on contour maps, grading plans and natural topography
2. Determination of storm water runoff problems under current land use conditions
3. General layout and sizing of trunk storm sewers and open channels
4. Tributary areas, storage volumes, and high water levels of all existing ponding areas
5. Recommendations to accommodate the ultimate land use conditions
6. Recommendations for the revision of the current development ordinances
7. Recommendations for standard Operations and Maintenance procedures
8. Recommendations for specific construction site erosion control practices
9. Estimated construction and implementation costs of the SWMP
10. Recommendations for education of City residents, staff, and development community.

The primary function of an urban storm drainage system is to minimize economic loss and inconvenience due to periodic flooding of streets and other low-lying areas. Adequately designed storm drainage facilities provide flood control, minimize hazards and inconvenience associated with flooding, and protect or enhance water quality. The SWMP takes the entire drainage basin with future saturation development into consideration.

Wet water quality ponds upstream of dry regional infiltration basins (where possible) will help control the rate and the volume of storm water runoff. To provide flood protection for adjacent property, the design storm interval for ponding areas is a 100-year storm as compared to a 10-year storm for design of storm sewer piping. Any new residential, commercial, industrial and other habitable structures shall be constructed with the following low floor elevation: Elevation of the lowest opening of a structure shall be a minimum of 1 foot above the Emergency Overflow, or 2 feet above the HWL of the nearby pond or water body, whichever is higher. The area of a pond's HWL plus 1 foot of freeboard shall be contained entirely within an outlot that is owned and maintained by the City or within a drainage utility easement.

In areas adjacent to designated flood plains as mapped on a Flood Insurance Rate Map, the Regulatory Flood Protection Elevation (RFE) applies. The RFE is defined as the mapped 100-year flood elevation plus 1 foot. However, the LRRWMO requires that the low floor elevation of structures be 2 feet above the calculated flood elevation. Therefore, all structures, including accessory structures, must be elevated on fill so that the lowest floor including basement floor is 1ft above the Regulatory Flood Protection Elevation or 2 foot above the mapped 100-year flood elevation. The finished fill elevation for structures shall be no lower than the Regulatory Flood Protection Elevation and the fill shall extend at such elevation at least fifteen (15) feet beyond the outside limits of the structure erected thereon. The following drawing better defines the Regulatory Flood elevations.<sup>6</sup>

**The following exhibit applies only when fill is required to bring a structure at least two (2) feet above the 100-year flood level.**



*Minimum Standards for Structures in 100-year floodplain*

The numerous natural depressions found throughout Ramsey have been incorporated into the SWMP as ponding areas. The effective use of ponding areas enables the installation of outflow sewers with reduced capacities since the design storm duration is effectively increased over the total time required to fill and empty the ponding reservoirs. Storm sewers represent a sizable investment for the community and this investment can be more

<sup>6</sup> Taken from the Minnesota DNR website:  
[http://www.dnr.state.mn.us/waters/watermgmt\\_section/floodplain/rfpe.html](http://www.dnr.state.mn.us/waters/watermgmt_section/floodplain/rfpe.html)

efficiently utilized by ponding storm water in designated ponding areas and allowing smaller diameter pipes to be used as outfall lines.

Equally as important as flood control and cost considerations, is the use of ponding areas to:

1. Improve water quality;
2. Return storm water to the groundwater table;
3. Increase water amenities in developments for aesthetic, recreational and wildlife purposes.

For water quality ponds, the storage below the outlet is the most important consideration. The area and depth of the ponds may differ from the values presented here, storage below the outlet must be provided so that the prescribed pollutant loading of the system is not exceeded.

From time to time, local developers proposed enhancing required storm water ponds to also serve as an amenity for new development. Most frequently, this entails allowing the storm water pond to consistently maintain a certain level water. Amenity aspects are maximized by careful planning in the initial development of any residential or industrial area and by integrating the ponding system into an overall comprehensive SWMP. However, care should be given to make the developer responsible for the design water level to serve as the amenity above and beyond the base storm water requirements. If development plans show a permanent water level, it is strongly advised that the City include a provision in its development agreements making the developer and ultimately the subdivision or development area responsible for maintaining the water level. The City's review should include wording that specifically addresses water quality and hydraulics and not the permanent water level. The Anoka Sand Plain is known for its high infiltration capacity as well as its fluctuating water levels. The City of Ramsey should not be involved in maintaining or engineering water level maintenance.

The wildlife aspects of the ponding areas shall be maximized in design and the proper location of the trail system will allow good access to these areas for wildlife observation.

It is extremely important that each area be re-evaluated at the time of final design to confirm the criteria used in this study and to make any changes that a proposed development may dictate. Special consideration must be given to areas that develop differently than shown in the Comprehensive SWMP, especially when a higher runoff coefficient (higher impervious surface ratio) is likely to result from development.

All storm sewer facilities, especially those conveying large quantities of water at high velocities, shall be designed with efficient hydraulic characteristics. Special attention shall be given during final design to those lines that have extreme slopes and create high hydraulic heads.

The Best Management Practices (BMPs) recommended by the MPCA shall be followed wherever necessary or plausible. Before the City would enforce any of these BMPs, they first need to be adopted by ordinance on a case by case basis. This paragraph is not intended to be a blanket adoption of BMPs.

Rain gardens and infiltration basins are a viable alternative to storage ponds. These structures are encouraged by many review agencies as a way to mimic the original runoff conditions from a site. By incorporating infiltration, the basin provides volume and water quality management. A water quality basin does not need to have standing water, just a permanent “dead-pool” volume to meet the MPCA water quality requirements. The rain gardens and infiltration basins will assist in meeting MPCA regulations. However, rain gardens and infiltration basins are not recommended in a wellhead protection zone. Figure Nos. 3 and 4 show areas where rain gardens and infiltration may not be the best runoff management solution. City Policy adopted in conjunction with infiltration requirements of the LRRWMO Third Generation Plan permits infiltration in areas within the Drinking Water Supply Management Area (DWSMA), so long as it is not also within the 10-year capture zone.

**E. Storm Water Modeling**

**1. Runoff**

Storm water runoff is defined as that portion of precipitation, which flows over the ground surface during, and for a short time after, a storm. The quantity of runoff is dependent on the intensity of the storm, the length of storm, the amount of rainfall, the type of ground cover, and the slope of the ground surface.

The intensity of a storm is described by the amount of rainfall that occurs during a specific time interval. A specific rainfall amount occurring during a given time interval will statistically recur, on the average, at a certain frequency (usually measured in years). This is called a return frequency. A return frequency designates the average time span during which a single storm of a specific magnitude is likely to occur. For example, a 100-year rainfall event in Ramsey is that 24-hour rainfall amount (7.1 inches) that recurs, on the average, once in 100 years.

The degree of protection afforded by storm sewer facilities is determined by selecting a return frequency to be used for design based on good economic sense and current engineering practices. See section E.3 for further discussion.

**2. Hydrographs**

Storm sewer and associated detention basin design is typically based on hydrograph analysis. A hydrograph is graphical depiction of the time versus rate of runoff for a particular area. For example, if a rainstorm started at midnight, the first few minutes is spent with sprinkles and wetting the various surfaces. As the storm intensifies, the rainfall overwhelms the ability of the pavement and adjacent ground to absorb it, and water begins to runoff. At the peak of the storm, the water runs off at its greatest rate. Finally, as the storm passes, the runoff begins to slowly taper off. Figure 28 is an example of a typical runoff hydrograph.

The U.S. Soil Conservation Service (SCS) has performed extensive research in hydrograph analysis and developed a standard hydrograph. Technical Release No. 20 (SCS TR 20) describes a methodology that is generally accepted by the reviewing authorities and hydrologic engineers across the United States. The SCS procedure is based on a standard rainfall hydrograph that is modified by local parameters (i.e., rainfall, soil type, watershed size, watershed shape, the fall

across the watershed, etc.). Based on local conditions, the SCS hydrograph was used for development of the Ramsey storm water models in this plan.

A SCS 24-hour Type II storm distribution with 100-year intensity was used for the design of ponds and drainage systems. The Soil Conservation Service has determined from National Weather Bureau data that a Type II distribution is the storm event recommended for the upper-Midwestern United States.

The SCS hydrograph method is based on sound hydrologic theory and is commonly used to analyze runoff for the design and analysis of flows and water levels. The detailed modeling computations for this plan have been performed using the SSA Modeling Software as developed by Boss International, Inc.

### 3. Rainfall Probability

Rainfall amounts for hydrologic analyses should be based on:

NOAA Atlas 14: Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffrey Bonnin (2013). NOAA Atlas 14, Volume 8, Version 2, *Precipitation-Frequency Atlas of the United States, Midwestern States*. NOAA, National Weather Service, Silver Spring, MD.

More recent updates of these documents shall be used, if available.

The SCS National Engineering Handbook snowmelt data shows the 100-year, 10-day snowmelt event is 7.3 inches over 10 days.

### 4. Pond and Pipe Design Criteria

To provide reasonable protection of downstream facilities, analysis of flood levels, storage volumes and flow rates for water bodies and detention basins shall be based on the range of rainfall and snow melt durations producing the critical flood levels and discharges. This report recommends a 10-year frequency design for storm sewer pipe using the Rational Method<sup>7</sup>. It is further recommended that pond design be based on the greater of the 100-year, 24-hour frequency SCS rainfall event, or the 100-year, 10-day snowmelt event for overland drainage and pond storage design. In comparing the peak pond elevations for each of these events, the 100-year SCS rainfall event, with the assumption that the infiltration rate was negligible, created the highest peak pond elevations. Hence, throughout the remainder of this report, the peak 100-year pond rates are discussed for typical pond High Water Levels (HWL). These design criteria were selected for the analysis and design of the drainage system for this SWMP. In addition, a 10-inch, 24-hour rain event has also been modeled over the entire city to analyze all ponds, overflow drainage ways and natural channels to evaluate whether the emergency over flows (EOFs) function as intended.

Storm water detention facilities with peak discharge rates less than 2 cfs/40 acres are typically susceptible to high water levels during snowmelt conditions. Special consideration of the snowmelt condition becomes critical for areas, like the Anoka Sand Plain where infiltration dampens the effect of runoff from rainfall. These areas can accept high amounts of rainfall during the warm,

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<sup>7</sup> The Rational Method is markedly different than the SCS methodology in that it does not deal with runoff volumes, only flow rates. An explanation of the Rational Method is made later in this report.

summer months, but often remain frozen later in the season and are relatively impervious in the spring during the snowmelt. Hence, snowmelt runoff can be a greater flood hazard than a large summer rainfall due to the impermeable nature of frozen soil. Accordingly, final basin design must consider snowmelt conditions when sizing storage and outlet structures.

When rainfalls exceed the recommended 10-year storm sewer infrastructure design, the excess runoff will be accommodated by ponding in low spots in streets for short periods of time and outflow through overland drainage routes and/or EOFs. With proper planning, this short-term flooding and overland drainage should minimize damage to property that would occur if those facilities were not provided. Drainage routes and EOF locations should be protected and preserved either by ordinance or through recorded permanent easements. Where possible, storm water pond designs shall include an emergency overflow to provide an outlet one-foot below the lowest floor elevation of any adjacent structure for added safety.

The Rational Method is a flow rate design method that ignores volumes and assumes a peak flow to each pipe based on hydrologic parameters such as watershed area, time of concentration, and standard rainfall intensity curves. This design method requires the selection and/or computation of a time of concentration and a runoff coefficient. The time of concentration is the time required for the runoff from a storm to become established and for the flow from the most remote point (in time, not distance) of the drainage area to reach the design point. The time of concentration will vary with the slope and type of surface that the rain falls on. Rational Method design including design methodology and hydrologic references should be based on the Minnesota Department of Transportation Drainage Manual.

A minimum concentration time of fifteen minutes for residential areas and ten minutes for commercial/industrial areas shall be used for design of the trunk storm sewer systems. These minimum times shall be considered in the design of lateral systems. As the storm water runoff enters the system, the flow time in the storm sewer is then added to the concentration time and compared to the downstream drainage area concentration time. The maximum of these values is used downstream, which results in a longer concentration time and peak runoff rate as the flow moves downstream from the initial design point.

#### 5. Land Use Factors in Modeling (Runoff Coefficients)

The percentage of rainfall falling on an area that must be collected by a hydraulic facility is dependent on watershed variables such as soil permeability, ground slope, vegetation, surface depressions, type of development and antecedent rainfall. These factors are taken into consideration when selecting a runoff coefficient (C) for the Rational Method or a runoff curve number (CN) for use in SCS methodology.

Under ultimate (fully developed) conditions, the values of the coefficient will increase with increases in the amount of impervious surfaces caused by street surfacing, building construction, and grading.

The antecedent moisture condition (AMC) relates to the moisture content of the soil prior to a given storm event. Curve numbers based on land use can be

adjusted based on an assumed moisture condition. For purposes of the model, normal antecedent moisture condition (AMC II) was assumed. Curve number values can be adjusted for dry conditions (AMC I) or wet conditions (AMC III).

Curve numbers are also dependent on the type of soil in a given drainage area. Soil types are classified into four basic hydrologic groups as follows:

- Group A - Includes soils consisting of deep sand and aggregated silts.
- Group B - Includes sandy loam soils.
- Group C - Includes soils that are low in organic content and made up of clay loams and soils high in clay.
- Group D - Includes soils consisting of heavy plastic type clay soils.

Curve numbers that were assumed in the development of the model were based on the hydrologic soil group for each watershed based on the information contained in the County Soil Survey. Development plans shall consider post-development site soil conditions when choosing runoff curve numbers for final design.

Curve numbers (CN) are given in SCS TR-55. Average CN values for each land use type are used in the design of the storm drainage facilities in undeveloped areas. For the modeling of existing facilities, CN values were determined for each type of development and current zoned land use in each subwatershed. In general, the unpaved, non-wetland areas were modeled with curve numbers that most closely represent the Anoka Sand Plain. The curve numbers were then adjusted to reflect the percentage of impervious surfacing.

It should be noted that if land use changes to more or less impervious surfacing than the model, it will affect the model and updates may be needed.

## **V. GOALS AND POLICIES**

### **Problem Statement**

The increase in developed areas within the community, with its associated runoff and sediment-related pollutants will have an impact on wetlands and other water resources including the Rum River and Mississippi River.

### **Mission Statement**

The City of Ramsey, in cooperation with the LRRWMO, Anoka County, state and federal agencies, will prepare a watershed plan which will accommodate anticipated community development and redevelopment while providing clear direction to the developers for controlling the quality and quantity of storm water runoff and properly managing surface and groundwater resources and the physical habitat of existing wetlands, lakes and the Mississippi and Rum Rivers in a consistent fashion. The City is committed to a goal of no adverse impact to, and nondegradation of, its water resources.

### **Goals**

This plan identifies several specific goals to control the City's water resources planning and management functions. The goals of this plan were established in accordance with the purposes of the water management programs required by Sections 103B.201 to 103B.251.

### **Policies**

Each goal has several corresponding policies. A policy is a governing principle that provides the means for achieving established goals.

### **Standards**

Standards are an extension of the policies. They provide specific, detailed guidance regarding water management practices. Plan standards are included in the Implementation Program (Section VIII) of this document.

#### **A. Water Quantity**

The following runoff quantity goals and policies are considered part of this plan.

Goal 1: Control flooding and minimize public capital expenditures.

Policy 1.1: Natural storm water storage areas and manmade detention areas should be utilized to control flooding.

Policy 1.2: The storage capacity of the natural drainage system will be utilized to control rates of runoff. The City will jointly define and adhere to flow rates at municipal boundaries as established in this plan.

Policy 1.3: The City will pursue regional detention wherever targeted land acquisition opportunities arise.

Policy 1.4: All hydrologic studies will be based on standard hydrologic criteria and ultimate or anticipated development of the entire tributary drainage area.

- Policy 1.5: Major storm water facilities (i.e., ponds, pond outlet systems, and major conveyance systems) will be designed using a return period of 100 years.
- Policy 1.6: The peak outflow from all new developments shall be limited to the existing peak outflow for the 2-, 10- and 100-year SCS 24-hour rainfall events.
- Policy 1.7: All minor drainage system analyses and design (i.e., piped collection systems and minor conveyance systems) will be based on a return period of 10 years unless otherwise specified. The minor drainage system pipe will be sized using the full gravity flow capacity of the pipe. Pressure flow based on surcharging the upstream manhole or structure to near the street will not be allowed.
- Policy 1.8: Where plausible, detention facility design will include a paved access route or a “Netlon” or approved equal stabilized access route; and dedicated right-of-way, outlot access and/or drainage and utility easement for maintenance of the outlet structure and to the facility in general. Construction and long-term maintenance of these accesses will need to be negotiated on a case-by-case basis.
- Policy 1.9: Where plausible, fences will be restricted from crossing drainage and utility easements. The City will consider encroachment of fences; however, the Owner will be responsible for entering into an Encroachment Agreement to allow the City to remove obstructions for necessary maintenance and waives the City of any liability stemming from improvements within the easement.
- Policy 1.10: The design of storm water facilities will consider and identify location(s) of overflow(s) that prevent property damage to adjacent properties from extreme water levels.
- Policy 1.11: Minimum building elevations should be above designed designated flood levels. The minimum building floor elevation shall be two (2) feet above the 100-year level or 1-foot above the EOF. The 100-year level shall be on the highest 100-year level resulting from a single event analysis; the 100-year, 10-day snowmelt event; a multiple day runoff event analysis, or the critical event analysis. This will likely require that the City begin to require As-Built Certificates of Grading, a practice that is not currently required by the City.
- Policy 1.12: Landlocked runoff basins shall be sized to handle back-to-back 100-year Atlas14 24-hour rainfall events, the 10-inch SCS 24-hour rainfall event or the 100-year, 10-day snowmelt snow melt event, whichever produces the higher peak pond elevation (Landlocked HWL). The minimum building floor elevation around landlocked basins shall be two (2) feet above the Landlocked HWL.

Policy 1.13: Emergency overflows or outlets to drainage systems will be provided to any landlocked area if the available storm water storage capacity is inadequate to prevent flooding of residences and if the available downstream conveyance system capacity is adequate to accept additional flow.

Policy 1.14: The City will have standard hydrologic design criteria for all storm water systems to assure consistency.

Policy 1.15: The City will perform maintenance measures to assure proper function of the drainage system.

Policy 1.16: The City will adopt ordinances that control peak runoff consistent with standards and recommendations in the Minnesota Stormwater Manual.

**B. Water Quality**

Goal 2: Achieve water quality standards in City lakes, streams, rivers, and wetlands consistent with intended use and classification, which include quantifiable limits on specific pollutants (i.e., phosphorus, turbidity, excess nutrients, etc.). The City's ultimate goal is to meet the standards for the designated use of each water body.

Policy 2.1: The ranking system established by the LRRWMO shall dictate intended use and water quality standards.

Policy 2.2: Future outlets to DNR protected waters must first pass through a sediment pond/trap prior to discharging into the protected water body.

Policy 2.3: Phosphorus loading to a drainage system or water body will be reduced to the greatest practical extent through the use of Best Management Practices (BMPs).

Policy 2.4: All construction plans developed for the maintenance and/or improvement of water quality will include a detailed access and maintenance plan and shall require approval by the City.

Policy 2.5: A community education program relating to preserving and improving water quality will be developed and implemented.

Policy 2.6: All on-site waste water systems will be the responsibility of the owner.

Policy 2.7: A water quality plan outlining education programs, water quality monitoring needs, water quality modeling requirements, phosphorus budgets for subwatersheds, and any other water quality issues should be developed and implemented. The City-wide SWPPP and MS4 permit already addresses the education, monitoring, maintenance, good housekeeping, illicit discharges and construction erosion control.

- Policy 2.8: The LRRWMO and the City should take an active role in implementing the necessary policies to allow development of regional water quality ponds.
- Policy 2.9: The City will perform maintenance measures to minimize pollutant loadings to local water bodies.
- Policy 2.10: The City will adopt best management practices for development that will result in TSS and TP reductions of 90% and 60%, respectively.
- Policy 2.11: The City will adopt best management practices for redevelopment that will result in TSS and TP reductions consistent with the Minnesota Stormwater Manual.
- Policy 2.12: The City will integrate their Stormwater Pollution Prevention Plan into their local water management plan, in accordance with MPCA requirements and schedules.
- Policy 2.13: The City will revise its Stormwater Pollution Prevention Plan to include the required nondegradation information and summarize or integrate that information into its local water management plan when the nondegradation rules are finalized and become a mandatory part the Municipally Separate Storm Sewer System (MS4) permit.

**C. Recreation, Fish and Wildlife**

Goal 3: Protect and enhance water recreational facilities, fish and wildlife habitat.

Policy 3.1: Natural areas, wildlife habitat and wetlands to be protected during construction should be clearly marked and/or fenced in the field.

Policy 3.2: Buffer zones of natural vegetation are encouraged in privately-owned areas around existing ponds and wetlands located within current wildlife corridors to provide habitat for wildlife in accordance with the Wetland Management Plan.

Policy 3.3: The water level fluctuation of a wetland or pond shall be maintained consistent with the management function of the water body. Wetlands used for stormwater overflow purposes shall be limited to a maximum bounce of 2-feet between the NWL and HWL.

Policy 3: The City has already assessed the functions and values of all wetlands over ¼-acre in size. The City will not be updating this assessment as part of this update. When a logical time in the furtherance of future development warrants, likely coinciding with a future Comprehensive Plan Update, the City will consider updating this assessment. Policy 3.5: The City supports programs to control aquatic invasive species.

Policy 3.5: Activities related to recreation, fish and wildlife should be consistent with the Anoka County Regional Park objectives and the City's comprehensive plan.

Policy 3.6 The City supports the establishment of native vegetation around sedimentation ponds and wetlands following disturbance, and when new ponds are created whenever possible.

**D. Public Participation, Information and Education**

Goal 4: Increase public participation and knowledge in management of the water resources of the community.

Policy 4.1: The City must call an annual meeting to discuss its SWPPP as part of its MS4 permit. This opportunity will be used to discuss water resource issues affecting the City. The City will explore avenues to increase notification and publicity of this annual meeting. The City will consider holding a special meeting coinciding with major flooding events.

Policy 4.2: The City will utilize available resources and input from the public to address local water resources issues.

Policy 4.3: Citizen lake water quality monitoring is encouraged and supported by the City.

Policy 4.4: The City supports Anoka County's recreation and educational programs related to the water resources of the community.

Policy 4.5: The City will support natural environment programs in the public schools.

**E. Public Ditch System**

Goal 5: Maintain the current ditch system to convey water and maintain the current defined maximum flood levels to protect businesses and residences.

Policy 5.1: The City will continue to maintain public ditches to provide protection of private property and structures from flooding, provided that such maintenance is in accordance with the Minnesota Wetlands Conservation Act, Minnesota Statute 103E governing agricultural drainage, is acceptable to the U.S. Army Corps of Engineers, and does not adversely affect the value of wetlands or water quality.

Policy 5.2: With the exception of County Ditch 66 and County Ditch 43 which have been turned back to the City, Anoka County is recognized as having authority over all public ditches within the watershed in accordance with Minnesota Statute 103E.

**F. Groundwater**

Goal 6: Promote groundwater recharge and prevent contamination of the aquifers.

Policy 6.1: Anoka County is recognized as the lead agency regarding groundwater controls.

- Policy 6.2: Recharge areas identified by Anoka County shall be protected from adverse development and from potential contamination.
- Policy 6.3: Infiltration of the first 1.0-inches of runoff from new impervious areas will be required wherever the soils are appropriately permeable (i.e., hydraulic soil types A and B) to promote groundwater recharge and volume controls. This is subject to proximity to wellhead protection zones as noted earlier in this report whereby infiltration shall not be allowed within the 10-year capture zone.
- Policy 6.4: Whenever practical, ponds shall be designed as “wet ponds” with storage volume below the outlet to promote infiltration and/or groundwater recharge.
- Policy 6.5: The use of grassed waterways shall be encouraged to maximize infiltration. Proper grades shall be maintained or underdrain systems installed as part of an overall site plan to insure positive drainage.
- Policy 6.6: Any spring area should be identified in the field, denoted on maps by the City and protected from development within the watershed.
- Policy 6.7: The appropriate jurisdiction shall use both regulatory (ordinances, permits, etc.) and non-regulatory (Best Management Practices) tools to protect the land area within designated wellhead protection areas.

**G. Wetlands**

- Goal 7: Maintain the amount of wetland acreage and try to increase the wetland values within the watershed.
- Policy 7.1: Use and function of all wetlands greater than ¼-acre in size has been determined as part of the 2008 SWMP plan preparation.
- Policy 7.2: Restoration of poor quality wetlands shall be prioritized.
- Policy 7.3: The City or Anoka County shall identify areas that can be used for wetland mitigation.
- Policy 7.4: Wetland mitigation criteria will be established consistent with the Minnesota Wetland Conservation Act of 1991 and subsequent amendments and associated rules thereto (e.g., Minnesota Rule 8420), state and federal regulations, the LRRWMO and the needs of the City.
- Policy 7.5: Alteration of wetlands is discouraged unless for restoration. Alteration may be allowed on an individual basis if the alteration can be properly mitigated in accordance with the Wetland Conservation Act (WCA). Allowable alternatives must comply with WCA sequencing requirements including, in order, avoidance, minimization and mitigation. In general, it will

require a full Technical Evaluation Panel meeting and majority approval before any wetland impact is allowed.

Policy 7.6: Wetland banking opportunities will be pursued by the City and/or the LRRWMO in accordance with the Wetland Conservation Act.

Policy 7.7: The City has prepared, a Wetland Management Plan.

Policy 7.8: The use of native vegetation for buffers in undeveloped and previously developed areas is recommended.

## H. **Erosion Control**

Goal 8: Prevent soil erosion.

Policy 8.1: The City will protect natural vegetation to the greatest extent possible.

Policy 8.2: Soil erosion shall be prevented through the installation of erosion control practices in accordance with MPCA's Best Management Practices Handbook.

Policy 8.3: Topsoil stockpiled for reuse shall be protected from erosion.

Policy 8.4: It shall be the responsibility of the developer/contractor to keep streets and property adjacent to construction areas free from sediment carried by construction traffic at site entrances and access points, from sediment laden site runoff and blowing dust.

Policy 8.5: The MPCA Storm Water Permit Program for Construction Activities shall be followed.

Policy 8.6: The City has adopted an erosion and sediment control ordinance including provisions that are consistent with NPDES Construction Stormwater permit and its MS4 permit requirements.

## I. **Development Standards**

Goal 9: Residential Grading

Policy 9.1: Residential lots shall have a minimum surface slope of 2-percent in all directions. Lesser slopes, between 1-percent and 2-percent may be allowed with a certificate of grading.

Policy 9.2: In acknowledgement of historical consumption data, the City will require water conservation measures for new development such as, but not limited to four inches of topsoil shall be placed in the turf restoration areas of all new residential lots.

Policy 9.3 Where residential lots are newly graded and there is no immediate plan for new housing within the lot, the entire lot

shall be covered with 4-inches of topsoil and seeded in accordance with the following schedule:<sup>8</sup>

<u>Type of Slope</u>	<u>Time*</u>
Steeper than 3:1	7 days
10:1 to 3:1	14 days
Flatter than 10:1	21 days

\* The maximum time an area can remain open when the area is not actively being worked.

Policy 9.4 Bluff protection ordinances and shoreland protection ordinances shall govern steep sloped areas.

## J. **Regulatory Responsibility**

Goal 10: Recognize the regulatory authority of other local, state and federal entities.

Policy 10.1: The City is responsible for establishing and implementing a local permitting program for water resources management. For smaller projects, an administrative Grading Permit shall be sufficient. For larger projects, an Interim Use Permit (IUP) shall be required

Policy 10.2: Other governmental agencies with watershed management responsibility include:

- The Lower Rum River Watershed Management Organization (LRRWMO)
- Minnesota Department of Natural Resources (DNR)
- United States Army Corps of Engineers (USCOE)
- Minnesota Board of Water and Soil Resources (BWSR)
- Minnesota Pollution Control Agency (MPCA)

Policy 10.3: The WMO and the City will require a permit for certain activities, as described in this plan.

## K. **Finance**

Goal 11: Equitably finance water resources.

Policy 11.1: All developments should, to an extent determined by the City, provide land, funding, or a combination of both for management of local water resources, which includes development of regional facilities and planning studies.

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<sup>8</sup> Minnesota Pollution Control Agency, National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS), Application for General Storm-water Permit for Construction Activity (MN R100001)

- Policy 11.2: The City may establish a fee structure charged to developers for analyzing the impacts of the proposed development.
- Policy 11.3: The City has established a fee structure charged to developers for constructing capital improvements (i.e., trunk conveyance systems).
- Policy 11.4: The WMO should establish an equitable cost allocation formula for water resource project implementation that affects more than one unit of government.
- Policy 11.5: Grants may be sought by the City to fund watershed related projects.
- Policy 11.6: The City should investigate the feasibility of alternative funding sources, such as Ad Valorem Taxes, bond sales, and user charges (storm water utility).
- Policy 11.7: The City should encourage donations and in-kind contributions of public and private organizations and the school systems for plan implementation.
- Policy 11.8: The City shall investigate and evaluate other funding mechanisms that support implementation and enforcement.

**L. Records Management and Documentation**

Goal 12: The City shall preserve historic data, records, and files pertaining to the water resources of the LRRWMO.

- Policy 12.1: The City should develop a classification to be recorded for each new detention area, including the basis for the classification.
- Policy 12.2: Engineering calculations will be required in a standard format.
- Policy 12.3: Past studies will be documented and filed by the City.
- Policy 12.4: Immediately after extreme rainfall events, high water elevations should be noted and surveyed by the City.
- Policy 12.5: The City will develop a history of flooding and water quality problems by noting past events and recording current floods.
- Policy 12.6: The City will record changes in water quality, such as increased aquatic vegetation, changing thermal conditions, increased sedimentation, reduced fish numbers, and fish kills.
- Policy 12.7: The City will perform regular wet storage volume surveys of its stormwater quality ponds on a 10-year rotating basis. If the water quality storage volume is being lost to sedimentation, the City will clean out the pond to reestablish the design storage volume below the outlet and consequently reestablish the design residence time.
- Policy 12.8: The City will document all items/BMPs provided in the SWPPP and MS4 permit.

## **VI. ASSESSMENT OF PROBLEMS AND CORRECTIVE ACTIONS**

This section assesses the water-related problems in the City, prioritizes the problems and includes actions to adequately solve each identified problem.

The City held a public open house on July 11, 2007 to gather input on water resources-related problems in preparation of the original 2008 plan. A public notice was published in accordance with City policies. Four residents attended the open house. The feedback that was received was primarily associated with the desire to protect the City's natural beauty including wetlands, wildlife habitat and wildlife corridors. The primary concern was that continued and uncontrolled development would adversely impact the current environment. All attendees expressed satisfaction that the SWMP is intended to protect these features.

Throughout the course of completion of the 2008 plan and subsequent flooding events in 2011 and 2014, prior to this 2015 update, City staff compiled a list of nuisance flooding areas either noted by maintenance staff or by resident complaints.

Figure 9 highlights all known nuisance flooding areas.

### **A. Specific Lakes and Streams with Water Quality Problems**

Table 15 in Section IV, page 17 of this report, lists the current (2014) MPCA 303d Impaired Waters in Ramsey. There are also waters downstream of the City of Ramsey, such as Lake Pepin, that are impaired. The process to remedy the impairment includes establishing a Total Maximum Daily Load (TMDL) allocation to each contributor to the problem. A TMDL is a calculation that determines the allowable pollutant load that can be discharged into the impaired water so that the limited load will ensure that the water improves to levels where it is no longer impaired. The typical process is initiated by the MPCA and includes a series of stakeholder meetings to formulate viable solutions and mutually work out a reasonable allocation of acceptable pollutant loading.

Since a TMDL study has not been completed for these waters, the City should identify the priority it places on addressing impaired waters and how the City intends to participate in the development or implementation of TMDL projects. Furthermore, the City should volunteer to participate in the stakeholder process.

Once a TMDL study is completed for the impaired water, the City must include, in this SWMP and its City-wide SWPPP, an implementation strategy including funding mechanisms that will allow the implementation of the TMDL requirements. As MPCA completes its TMDL process for each impaired water, the implementation of the measures to meet the TMDL will immediately become a priority item for the City of Ramsey.

### **B. Flooding and Storm Water Rate Control Issues**

Figure 9 is a map of all flooding areas either noted by staff or associated with a resident complaint compiled between 1985 and 2014.

The lake levels in Lake Itasca are historically variable, and have ranged from elevation 863.24 to elevation 871.9 with an average water level of 867.7. The DNR protects the lake to its Ordinary High Water Level of 871.4. To protect the properties around the lake, an emergency overflow should be established above the DNR protected level of 871.4. The overflow may be in the form of a pipe to the south or southeast, or it may be a new outfall to the Mississippi River.

The storm water modeling performed for the area shows few opportunities for property damage associated with rainfall. Ponding areas having a potential for property damage are shown in red on Figures 10 through 23. The relatively low percentage of potential property damage is presumed to be attributed to the high permeability of the Anoka Sand Plain and proper storm sewer system design.

Because of the pervious nature of the Anoka Sand Plain, the City should be cognizant of the impact that a significant increase in impervious surfacing and mass grading can have on runoff conditions. The addition of significant amounts of impervious surfaces and the reduced permeability associated with the soil compaction in mass grading without a reasonable attempt to restore and duplicate the current infiltration pattern could create significant increases in runoff volumes and downstream flooding.

The City will review and modify its current development ordinances to encourage infiltration and require soil ripping of mass grading to compensate for lost infiltration conditions as well as requiring extended retention ponding to mitigate and compensate for increases in runoff. Innovative solutions to the storm water runoff volume increases associated with the increase in impervious surface will be investigated. Potential solutions include pervious pavements, rain gardens and infiltration basins among others.

Comprehensive storm water runoff modeling of the existing conditions throughout the entire City was completed as part of the 2008 plan. The modeling was updated in 2015 to reflect new development and incorporate the Atlas 14 runoff rates. This modeling will provide a baseline for comparison purposes as new developments change the drainage pattern. With this modeling information, City staff can readily review the cumulative impacts of large developments for effects on baseline conditions across the entire city.

SSA software was used in the comprehensive modeling. This software is based on the industry accepted EPA SWMM process and St. Venant equations. The model can be used to input actual rainfall events from rain gauges and can model the transport of pollutants through the system. This will be very useful in evaluating the BMP measures to address future TMDLs.

The 2008 plan addressed several previous flooding complaints the City had received over a number of years, beginning in 1980. It was determined in 2008 that several of these concerns were solved by later construction of storm sewer systems as the City developed. The areas that were not solved are shown on the flooding area map.

The City experienced high water levels in 2011 and 2014 caused by high snowfall over the winter and heavy spring rains. Staff logged the complaints received in each year. The lists were presented to the Public Works Committee for review.

The 2011 complaints sorted into three (3) categories, clean existing drainage ways and structures, water ponding outside of existing easements, and water ponding in existing easements. Where water was ponding in existing easements the action was homeowner education on the purpose of drainage and utility easements. The action where existing drainage was and structures needed cleaning was to add the work to the Public Works action list. The action where water was ponding outside of existing easements was a combination of performing a detailed study of each area using Consultant Pool and Staff resources. Cost estimates were generated from the studies and presented to the City Council. Several projects were selected for construction, the remainder were deemed infeasible at that time.

The 2014 complaints were also studied. Staff determined that the majority of these complaints would require additional study, these areas could not be drained without causing high water problems on downstream properties. The City wide storm water model is being used in the review of possible solutions to these problems. The Public Works Committee of the City Council has discussed stormwater ponding concerns several times in 2014 and 2015. Staff is preparing a feasibility study on potential solutions to be brought back to City Council for review.

**C. Impacts of Water Quality and Quantity Management Practices on Recreation Opportunities**

The current City ordinances together with the LRRWMO, County, regional, state and federal rules and laws are designed to protect the existing land and water resources within the City of Ramsey. The City believes that it can allow continued development while maintaining or improving its resources including water quality and recreation opportunities. With the implementation of this plan and the recommended policy and ordinance changes, the developers will be responsible for protecting water quality, mitigating the runoff quantity and ensuring that there will continue to be recreation opportunities in Ramsey. In addition, the City's Storm Water Pollution Prevention Plan is designed to educate the public to better protect the city's water resources, to implement temporary and permanent erosion and sediment controls for new developments, to ensure good housekeeping of the City's municipal operations, and to detect and eliminate illicit discharges.

**D. Impacts of Stormwater Discharges on Water Quality and Fish and Wildlife Resources**

As stated in C above, the current and proposed ordinances and the City's SWPPP are designed to protect the existing land and water resources within the City of Ramsey. This includes measures that are designed to maintain or improve the habitat of the fish and wildlife throughout the area.

**E. Impacts of Soil Erosion on Water Quality and Quantity**

As part of the City-wide SWPPP and MS4 permit, the City established an erosion and sediment control ordinance governing construction practices. The City will also evaluate existing erosion control problem areas that may not be associated with recent construction and formulate mitigation plans to rectify those issues. Given increased regulation of the typical causes of soil erosion and sediment transport, it is anticipated impacts of soil erosion on water quality in the Ramsey area will be greatly diminished.

The SWPPP and MS4 permit also call for the annual inspection of required structural BMPs (structural BMPs are physical devices designed to trap or filter pollutants from runoff or reduce runoff velocities; an example being silt fence). Maintenance is included in the City's annual budget to ensure that structural BMPs continue to work and provide the design storage needed to ensure continued flood mitigation.

**F. General Impact of Land Use Practices**

As stated in Section VI.B, increases in impervious surfacing will require mitigation to reduce the impacts related to change in permeability from the natural Anoka Sand Plain conditions. The preferred mitigation method is to encourage infiltration to duplicate the existing condition. In addition to infiltration, the City will consider low impact

alternatives and oversized regional retention basins to mitigate potential downstream flow changes.

The City also prepared a Wetland Management Plan along with this the 2008 SWMP that includes a function and value assessment of all wetlands in excess of ¼ acre in size.

Although the wetland buffer requirements were later rescinded by the City Council, the City gathered a great degree of quantitative data to help study the effects of furtherance of developed areas within the community. The City will continue to use this data as a baseline for analysis as well as to consider potential outcomes of development in close proximity to wetlands

#### Adequacy of Existing Regulatory Controls

The City of Ramsey believes it has adequate policies in place to self-regulate the anticipated growth without sacrificing its abundant water resources. In addition to its ordinances, the existing greater area regulatory controls of the LRRWMO, BWSR, the Metropolitan Council, the DNR, the U.S. Army Corps of Engineers, Anoka County, etc. are more than adequate to properly manage or mitigate adverse impacts on public waters and wetlands.

The City must rely on the regulatory authority of Anoka County, the LRRWMO and the regional, state, and federal plans to monitor and control the runoff entering the City from outside its jurisdiction. The City understands that it will also need to address issues brought to its attention by these outside regulating authorities.

The City is also concerned that the ordinance revisions, various permit fees and charges needed to finance the proposed changes will adversely affect development in Ramsey.

To ensure that Ramsey has an equal chance of attracting development, the City must rely on outside agencies and WMOs in the area to regionally enforce similar environmental requirements with comparable financing obligations.

#### G. **Adequacy of Programs**

The City of Ramsey believes that the BMPs promised in its City-wide SWPPP and MS4 permit are designed to adequately:

1. Limit soil erosion and water quality degradation
2. Maintain the tangible and intrinsic values of natural storage and retention systems
3. Maintain water level control structures

#### H. **Adequacy of Capital Improvement Programs**

The storm water improvements recommended in the City's 5-year Capital Improvement Program are designed to address and correct problems related to:

1. Runoff Quantity
2. Water Quality Management
3. Fish and Wildlife Habitat and Public Waters and Wetland Management
4. Recreational Opportunities

#### I. **Future Potential Problems**

The greatest potential for future problems with storm water planning is associated with the ever-growing impervious footprint that is inevitable with growth. As stated earlier, highly pervious nature of the Anoka Sand Plain means that the cumulative effect of development could result in drastically increased runoff volume and flow rates.

The recommended ordinance revisions are designed to:

1. Encourage infiltration and soil ripping of newly graded sites so that developed sites can adequately mimic unimproved site runoff and flow rates.
2. Limit post development runoff rates to the existing condition so that multiple developments do not cause cumulative increases in the downstream condition.

In addition, regional pond modifications are also recommended where plausible because of the economic and runoff management capabilities of larger scale hydrologic systems. By implementing the recommendations in the SWMP, these potential future problems are being anticipated and adequately addressed within the City of Ramsey. As stated earlier, the City must rely on the regulatory authority of Anoka County, the LRRWMO and the regional, state, and federal agencies to monitor and control the runoff entering the city from outside its jurisdiction. The City understands that it will also need to address issues brought to the attention by these outside regulating authorities.

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**VII. FINANCIAL CONSIDERATIONS**

Typically a Capital Improvement Program (CIP) is an itemized program for at least a five-year prospective period. The items and associated costs are subject to at least biennial review. The benefits include setting forth the schedule, timing, and details of specific contemplated capital improvements by year, together with their estimated cost, the need for each improvement, financial sources, and the financial effect that the improvements will have on the local government unit or watershed management organization.

The City recognizes that the detailed modeling exercise of the storm water system for the city laid out many areas of potential full pipes, inadequate flow structures, and potential flooding issues that will need to be constantly re-evaluated as more detailed information is available for the system and as the city grows. As this re-evaluation occurs, the CIP will need to be updated to reflect new projects.

**A. 5-year Capital Improvement Program**

The current 5-year Capital Improvement Program includes the following:

1.	Annual Sediment Pond Cleaning .....	\$125,000
2.	County Ditch 43 Cleaning .....	\$180,000
3.	COR Bunker Lake Boulevard (Armstrong Blvd to Ramsey Blvd) .....	\$560,000
4.	West Mississippi Outlet .....	\$680,000
5.		
6.	<u>Whispering Pines Estates Plat 2 Storm Sewer .....</u>	<u>\$330,000</u>
7.	<u>Annual Drainage Enhancements .....</u>	<u>\$675,000</u>
8.	<u>Stormwater Drainage Improvements –Treatment before discharge to River .....</u>	<u>\$410,000</u>
9.	<u>Storm Sewer South of Bunker Lake Boulevard -COR .....</u>	<u>\$250,000</u>
10.	<u>Garnet Street Reconstruction .....</u>	<u>\$198,000</u>
11.	<u>Reconstruction of Andrie Street/ 164<sup>th</sup> Avenue .....</u>	<u>\$1,020,600</u>
12.	<u>Reconstruction of Streets -Ford Brook Estates .....</u>	<u>\$237,600</u>
13.	<u>Alpine Drive Reconstruction .....</u>	<u>\$60,700</u>
14.	Reconstruction of Streets – Stanhope Terrace and North Forty .....	\$587,000
15.		
	<b>Total Current 5-year Plan Expenditures .....</b>	<b>\$5,389,500</b>

The financial impact of implementation of the proposed regulatory controls and programs identified in Section VI is anticipated to include the following:

16.	Adopting and Enforcing the SWMP Local Controls and Standards <sup>9</sup> .....	\$25,000/year
17.	SWPPP Annual Cost and Implementation <sup>10</sup> .....	\$100,000/year
18.	Current Five Year Capital Improvements .....	\$5,389,500
	<b>Total 5-year Financial Impact .....</b>	<b>\$6,014,500</b>

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<sup>9</sup> Estimated cost is based on one half-time employee at salaries (plus benefits) of \$50,000 per year.

<sup>10</sup> Estimated cost is based on two fulltime employees at salaries (plus benefits) of \$50,000 per year.

Although the cost associated with these recommendations can be financed locally, the City will pursue all opportunities for outside funding. Without outside financing the City will need to finance the adoption of, and enforcement of, the local controls and standards, implementation of the specified programs, and capital improvements recommended in this SWMP using one or more of the following:

1. Increasing the storm water development charges (storm water trunk fees)
2. Increasing the storm water utility fees
3. Increasing the general levy (within levy limits)
4. Creating a storm sewer assessment district
5. Accessing funds from other City projects and funds

The City increased the storm water trunk fees and storm water utility fees in 2015.

Outside funding is greatly desired as the impact of increasing these taxes, fees and charges will increase tax burden against homes and farmsteads, increase the utility burden for all parcels or postpone other necessary improvements currently scheduled in the City's Capital Improvement Plan.

The following are potential sources of outside funding that may be available to assist in the financing of the various storm water related issues:

1. Minnesota Clean Water Legacy funds
2. Clean Water Partnership Funds
3. Clean Water Act, Section 319 funds, administered by the MPCA
4. Minnesota Public Facilities Authority (PFA) grants and low interest loans

There is significant competition for these limited funding sources. If these sources are pursued by the City, it will likely involve innovative treatment technologies in addition to timely requests for funding.

The application deadlines for Section 319 and PFA funds are published annually by the State. The PFA prepares an annual Intended Use Plan for each program that lists the projects eligible to apply for loans. A written request must be submitted by the City to the PFA to place a project on the IUP for consideration. The City routinely monitors the deadlines for these programs.

#### **B. Local Financing Options**

Development Charges or Trunk Fees According to City of Ramsey Code section 117-618, anyone creating a new residential lot or a new nonresidential site plan must pay a storm water trunk fee as established by ordinance. Each year the fee is reviewed and approved as part of the City's overall fee ordinance. For residential property, the fee is a flat fee per residential unit. For nonresidential property (commercial / industrial), the trunk fee is calculated on a per acre basis. The monies collected are deposited in the Storm Water Management Fund and are only used to pay for storm drainage financing and improvements. Maintenance of the storm water system is paid for with utility revenue deposited into the Storm Water Utility Fund.

1. Increased Storm Water Utility Fees

According to City of Ramsey Code Section 58-194, the City may impose just and reasonable charges for the use and availability of storm sewer facilities. Rates and charges for the use and availability of the system shall be determined through the use of a Residential Equivalent Factor (“REF”). For the purposes of the Ramsey City Code, one REF is defined as the ratio of the average volume of surface water runoff coming from one acre of land and subjected to a particular use, to the average volume of runoff coming from one acre of land subjected to typical single-family residential use within the City during a standard five-year rainfall event. Rates and charges for the use and availability of the system shall be determined through the use of a Residential Equivalent Unit (“REU”). For the purposes of the Ramsey City Code, one REU is defined as the product of the acreage of a particular parcel multiplied by the REF. The REF shall be based on the relative runoff generated by any land use compared to the expected runoff from a typical half-acre single-family dwelling. This relationship shall be interpreted as a function of the percent of the total lot area that is impervious and shall be applied as determined in City of Ramsey Code.

The City Storm Sewer Utility fee is intended to finance infrastructure maintenance, upgrading, reconstruction and new construction serving previously developed areas. It is not typically used to finance retrofitting the existing system to accommodate new developments. Most cities require the developer to finance the entire new storm sewer system associated with the development. Then, once the new system is accepted and turned over to the City, the municipal maintenance funds (typically storm sewer utility funds) are used to maintain the new system.

2. **Increasing the General Levy**

If the City has not yet reached its levy limits, financing could come from increases in the general tax levy across Ramsey. This option is generally not favored because it may duplicate costs for property owners who have either directly or indirectly already financed their own developments. Unless tax expenditures for storm water needs can be uniformly spread to all properties, political opposition should be expected from entities that have already invested in storm water facilities.

3. **Creating a Storm Sewer Assessment District or Storm Water Tax District**

If a watershed is well defined and the greater majority of the property owners have a share in the benefit of the proposed storm sewer improvement, the City could form a storm water assessment district. When improvements or repairs are needed within the district, an advertisement hearing process is required similar to that used for assessments in Minnesota Statute 429. Many cities are not choosing this financing option because it can be cumbersome. Cities also find it difficult, on occasion, to legally prove the level of benefit associated with the assessment.

**C. Recommended Local Financing**

1. The cost of existing system retrofitting and maintenance projects should be borne by the Storm Sewer Utility fund as this is the primary focus of these funds.
2. The cost of new improvements in undeveloped land should be borne by the developer.

3. The cost of retrofitting the downstream system to accommodate new developments should be borne by newly established New Development Charges or Trunk Fees.
4. Increasing the general levy for storm sewer related costs is not recommended.
5. Creating a storm sewer assessment district is not recommended.

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## VIII. IMPLEMENTATION OF PRIORITIES AND PROGRAM

### A. Special Waters

According to the MPCA's Special Waters list (January 2004), special waters in the Ramsey area include:

1. The **Mississippi River** is considered part of the Mississippi River Corridor Critical Area (MRCCA) from the western borders of the cities of Ramsey and Dayton to Hastings. The cities of Ramsey and Dayton had previously also been included in the Wild and Scenic Designation until 2012, when these cities received an exemption from the Minnesota Legislature as these areas were also included in the MRCCA.
2. The **Rum River** is considered Scenic/Recreational from Highway 27 bridge in Onamia to Madison and Rice Streets in Anoka.

The City will meet State requirements for development near these waters as identified in the Minnesota Stormwater Manual by designing storm water basins using the sizing criteria described in [\*Design Calculations for Wet Detention Ponds\*](#), by William Walker Jr. The City will also encourage storm water practices that promote infiltration/filtration and decrease impervious areas (better site design and integrated stormwater management), where practical.

### B. City-wide SWPPP and MS4 Permit

The City-wide SWPPP, associated with its MS4 permit, is available on the City's website. The SWPPP was updated to reflect the 2013 re-issuance of the MS4 Permit. A copy of the SWPPP is attached in Appendix B.

### C. Implementation Schedule

In accordance with Minnesota Rule 8410.0010, the City of Ramsey must provide for the adoption of necessary regulatory controls, storm water design standards, education programs, data collection programs, and maintenance programs. This SWMP must clearly distinguish the City's responsibilities versus the responsibilities of the LRRWMO and Anoka County with respect to implementing each program element.

According to Minnesota Rule 8410, each organization plan must include a schedule for implementation by the organization, joint powers agreement members, and affected local units of government. All plan controls and programs to be implemented by the organization must be in effect within one year of plan adoption. All local plan controls and programs must be developed and in effect within two years of adoption of the last organization plan in the local unit of government.

Since this SWMP is an update to a previously accepted plan, most of the required programs have already been developed and coordinated with Anoka County and the LRRWMO.

### D. Capital Improvement Program

This SWMP must include a capital improvement program that identifies specific capital improvements necessary to implement the water resource management goals and policies of the organization. The 5-year Capital Improvement Program is discussed in Section VII of this report.

A Capital Improvement Program, or CIP, already exists and is updated on annually for a projected 5-year period. The CIP includes projects to implement the recommendations in this SWMP.

**E. Enforcement**

This SWMP must identify the procedure to be followed to enforce violations of the controls of the organization as well as those of the local unit of government.

The City uses a permitting process with a surety requirement for new developments. If the developer fails to follow the conditions of the permit, the City can call on the surety to ensure immediate rectification. The surety must be in the form of a Letter of Credit or Cash Escrow.

The City has adopted the following ordinances:

1. Erosion and Sediment Control Ordinance
2. Illicit Discharge Ordinance
3. Post Construction Storm Water Management Ordinance.

Each of these ordinances will be enforceable locally and will carry fines for failure to adhere to them. In addition, the MPCA can impose significant fines for pollution discharges associated with these ordinance controls as well as any unauthorized pollution discharge.

The City will amend its ordinance to include the enforcement of storm water ordinances as part of City Code Chapter 2, Article VII entitled Administrative Enforcement of Ordinance Violations. The City will have to adopt an ordinance to establish the rates and charges associated with administrative fines for storm water ordinance violations.

**F. Administration Process**

This SWMP must specify the administrative process and timelines for the submittal, review, and approval of local plans and variances by the organization.

Requirement 1: All communities need to include information on the types of best management practices to be used to improve storm water quality and quantity and the maintenance schedule for the best management practices (BMPs).

*Solution 1: The City's SWPPP, available on the City website, includes the mandatory list of BMPs together with an implementation timeline. All of the BMPs in the SWPPP and designed to improve storm water quality. The City's current development ordinances are designed to regulate storm water quantity in accordance with the LRRWMO requirements. Within a year after the acceptance of this plan, the City will review its ordinances controlling development to include the recommendations of this SWMP, chiefly the recommended runoff volume controls.*

Requirement 2: All communities need to include a Wetland Management Plan or a process and timeline to prepare a plan. The Wetland Management Plan should incorporate a function and value assessment for wetlands.

Pretreatment of storm water prior to discharge is required for discharge into all wetland types.

*Solution 2: The City has completed a MNRAM evaluation of all of wetlands within city limits and greater than ¼ acre in size. The report is available at the Municipal Center. The implementation of the plan was postponed by the*

**Requirement 3:** The City needs to include funding sources for the various required activities.

*Solution 3: The required funding sources are described in detail in Section VII of this SWMP.*

**Requirement 4:** The City needs to include activities to be undertaken along with numerical goals, strategies and timelines.

*Solution 4: The City's SWPPP, available on the City website and attached in Appendix B, includes BMPs describing the necessary activities, numerical goals, strategies and timelines.*

Table 18 is an implementation process list of the recommended actions, timing, responsible party, and the cost or funding sources which are presented for the City Council's consideration based upon the data compiled in this report. Actions are listed in order of priority, from highest to lowest.

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**Table 18**  
 Implementation Process List

Action	Timing	Responsible Party	Cost/Funding Source
Maintain and implement Capital Improvement Program.	On-going, updated on a 5-year period.	City of Ramsey	Storm water area charge and monthly storm water utility fee
A storm water maintenance program enforced to ensure the successful operation of the drainage system.	On-going.	City of Ramsey	Storm water area charge and monthly storm water utility fee
Corrective actions for storm water problem areas.	On-going, as problems come up.	City of Ramsey	Storm water area charge and monthly storm water utility fee
The erosion and sedimentation control criteria for new developments enforced.	On-going, as developments are submitted to the City for approval.	City of Ramsey	Funding by developer's fees and building permits
Low impact development/better site design for new developments encouraged.	On-going, as developments are submitted to the City for approval.	Developer's Engineers, City of Ramsey	City staff funding by developer's fees and building permits. Developers pay for design and construction of developments.
Conceptual regional Ponding areas established as described herein and made a part of the storm water management system.	On-going, as Developments are submitted to the City for approval. Right of first refusal purchasing at time of sale of property.	City of Ramsey	Cost sharing with Anoka County
Standard review procedures established to ensure all development within the City is in compliance with proper erosion control practices.	Currently in place. Update as necessary.	City of Ramsey	Funding by developer's fees and building permits
Detailed hydrologic analysis required during final design of all ponding areas.	Currently in place. Update as necessary.	Developer's Engineers, City of Ramsey	Developers pay for design and construction of developments. City staff funding by developer's fees and building permits.

Final high water levels governing building floor elevations adjacent to ponding areas and floodplains established as development occurs or when drainage facilities are constructed.	On-going.	Developer's Engineers, City of Ramsey	Developers pay for design and construction of developments. City staff funding by developer's fees and building permits.
Overflow routes established and maintained to provide relief during extreme storm conditions, which exceed design conditions.	On-going, as developments are submitted to the City for approval.	City of Ramsey	Developers pay for design and construction of overflow routes. City-conducted maintenance funded by developer's fees and building permits.
An education program for City residents, staff, and development community implemented.	On-going.	City of Ramsey	City of Ramsey, with help from LRRWMO, DNR, University of Minnesota Extension Service, SWCD, NRCS
Amendments to the SWMP adopted and implemented and the SWMP updated.	As warranted by future standards or regulations – by 2015 or earlier if needed.	City of Ramsey	Storm water area charge and monthly storm water utility fee
Regulate construction and land uses along the bluff, to prevent erosion.	On-going, as developments are submitted to the City for approval.	City of Ramsey	Funding by developer's fees and building permits
Encourage landowners to retain any areas of native vegetation, and to plant species native to the area, to protect and improve wildlife habitat and maintain the historic ecological role and appearance of the steeper riverbanks. The existing housing developments along steeper riverbanks have addressed retention of native vegetation in one of two ways: platting of the property in an outlot and deeding that to the City or	On-going, as developments are submitted to the City for approval.	Land Owners, Developers, City of Ramsey	Landowner, City of Ramsey, Future grant opportunities if they arise

through a conservation easement.			
Develop an implementation strategy for TMDLs.	Once TMDLs are formulated.	City of Ramsey, working with LRRWMO	LRRWMO, BWSR, DNR, etc.

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## **IX. AMENDMENT PROCEDURES**

This Updated SWMP extends to 2022. Amendments to the plan may be adopted and implemented as warranted by future standards or regulations. The City is aware that the Lower Rum River Watershed Management Organization will be updating its watershed management plan during the effective period of this plan which will trigger the mandatory re-evaluation and potential need for an update of this SWMP within two years from the date the watershed plan is approved by BWSR. The City will initiate any amendments by resolution of the City Council. The citizens of Ramsey, City Staff, the City Council, or any of the review authorities having jurisdiction may submit amendment requests.

The amendment request will be evaluated by City staff and a recommendation will be made to the City Council. If the Council deems the amendment necessary, it will order City staff and/or the City attorney to draft an amendment.

The draft amendment will be brought to the Council for review. If approved, the Council will pass a resolution calling for a hearing on the amendment. The amendment must be forwarded to each organization affected by the amendment. The proposed amendment will be published in the official city newspaper not less than 10 days before the hearing.

The hearing will be held in a public place, typically in the Council chambers at City hall. At the hearing, all interested citizens will be given the opportunity to submit a written statement or voice their opinion on the acceptability of the proposed amendment.

When all have been heard, the City Council will close the hearing and vote their decision on whether to pass a resolution accepting the amendment as written.

According to State Statute 103B.235, Subd. 5, Amendments, to the extent and in the manner required by the LRRWMO, all major amendments to the SWMP shall be submitted to the LRRWMO for review and approval in accordance with the provisions of State Statute 103B.235, subdivisions 3 and 3a for the review of plans. All major plan updates and amendments will be submitted to the Lower Rum River Watershed Management Organization and the Metropolitan Council simultaneously. All minor amendments will have a Public Hearing before the Planning Commission which will then recommend approval by the City Council. The City Council will review the amendments and approve or deny the changes.

## **X. SUMMARY AND RECOMMENDATIONS**

### **A. Summary**

The 2008 plan was prepared by Bolton & Menk, Inc. The technical analysis found within this 2015 update was prepared by Bolton & Menk, Inc. in 2008 and refreshed by City Staff in 2015.

The Ramsey SWMP has a dual purpose: it will serve as a guide for the construction of storm drainage facilities and provide a basis for a consistent approach to the preservation of lakes, wetlands, streams, and the Mississippi and Rum Rivers. The following issues have been incorporated into this plan:

1. Division of the City into major watersheds based on contour maps, grading plans and natural topography
2. Determination of storm water runoff under ultimate land use conditions
3. General layout and sizing of trunk storm sewers and open channels
4. Tributary areas, storage volumes, and high water levels of all existing ponding areas
5. Recommendations for the revision of the current development ordinances
6. Recommendations for standard Operations and Maintenance procedures
7. Recommendations for specific construction site erosion control practices
8. Estimated construction and implementation costs of the SWMP
9. Recommendations for education of City residents, staff, and development community.

The primary function of an urban storm drainage system is to minimize economic loss and inconvenience due to periodic flooding of streets and other low-lying areas. Adequately designed storm drainage facilities provide flood control, minimize hazards and inconvenience associated with flooding, and protect or enhance water quality. The SWMP takes the entire drainage basin with future saturation development into consideration.

Wet water quality ponds upstream or dry regional infiltration basins (where possible) will help control the rate and the volume of storm water runoff. To provide flood protection for adjacent property, the design storm interval for ponding areas with a known outfall is a 100-year storm as compared to a 10-year storm for design of storm sewer piping. For land locked ponds or wetlands, the design storm interval is a back-to-back 100-year storm or the 100-year, 10-day snow melt event, whichever is larger. Any new residential, commercial, industrial and other habitable structures shall be constructed with the following low floor elevation: Elevation of the lowest floor of a structure shall be a minimum of 1 foot above the Emergency Overflow, or 2 feet above the HWL of the nearby pond or waterbody, whichever is higher.

In areas adjacent to designated flood plains as mapped on a Flood Insurance Rate Map, the Regulatory Flood Protection Elevation (RFE) applies. The RFE is defined as the mapped 100-year flood elevation plus 1 foot. However, the LRRWMO requires that the lowest floor elevation be 2 feet above the calculated flood elevation. Therefore, all structures, including accessory structures, must be elevated on fill so that the lowest floor

including basement floor is at or above the Regulatory Flood Protection Elevation or 2 foot above the mapped 100-year flood elevation. The finished fill elevation for structures shall be no lower than the Regulatory Flood Protection Elevation and the fill shall extend at such elevation at least fifteen (15) feet beyond the outside limits of the structure erected thereon.

The area of a pond's HWL plus 1 foot of freeboard shall be contained entirely within an outlet that is owned and maintained by the City.

The numerous natural depressions found throughout Ramsey have been incorporated into the SWMP as ponding areas. Wetlands may be, and are currently being used for stormwater storage for larger rainfall events. They may continue to be used for this purpose – even after upstream development, provided that:

1. There is acceptable Best Management Practice pretreatment of the runoff in accordance with the MPCA NPDES/SDS Construction Permit, Section III.D., Permanent Stormwater Management System.
2. The bounce from the normal water level to the high water level does not exceed two feet.

The effective use of ponding areas enables the installation of outflow sewers with reduced capacities since the design storm duration is effectively increased over the total time required to fill and empty the ponding reservoirs. Storm sewers represent a sizable investment for the community and this investment can be more efficiently utilized by ponding storm water in designated ponding areas and allowing smaller diameter pipes to be used as outfall lines.

Equally as important as flood control and cost considerations, is the use of ponding areas to:

1. Improve water quality;
2. Return storm water to the groundwater table;

For water quality ponds, the storage below the outlet is the most important consideration. The area and depth of the ponds may differ from the values presented here, storage below the outlet must be provided so that the prescribed pollutant loading of the system is not exceeded.

The City will allow Developers to construct storm water ponds to serve a secondary purpose as a development amenity. However, the Developer shall be required to enter into a Development Agreement or Maintenance Agreement that outlines that the City will not take on maintenance obligations beyond basic storm water functions. If constructed as a water feature, the City will not guarantee water levels or water quality above basic storm water requirements.

The wildlife aspects of the ponding areas shall be maximized in design and the proper location of the trail system will allow good access to these areas for wildlife observation.

## **B. Model Results**

Odd numbered Figures from Figure 11 through Figure 23 are maps of critical SSA pond data superimposed on the most recent aerial photo of Ramsey. They are color coded to highlight whether the 100-year storm conditions as follows:

- Green – The pond functions properly and the peak elevation is fully contained within the pond
- Yellow – The peak pond elevation is above the emergency overflow spillway
- Red – The peak pond elevation may threaten structures

All red and yellow areas will be “ground truthed” to verify the condition depicted. These maps can be used to evaluate regional pond opportunities. In reviewing these maps, one can easily see where the current ponds or depressions are overtaxed for the 100-year event.

The following is a brief discussion of the opportunities and recommendations associated with each watershed:

#### Figures 11 & 12 – D43 Watershed

This is the Ditch 43 watershed. From Figure 11, it can be seen that this area is fully developed around a significant amount of existing wetlands. This leaves little opportunity to construct regional ponds.

The red areas on Figure 11 indicate ponds that are subject to flooding during the 100-year event. The yellow areas indicate that the emergency overflow is reached during a 100-year event. These ponds should be reviewed relative to the following:

- Should the outfall pipe be replaced with a larger one?
- Can the pond be enlarged?
- Can the overflow spillway be lowered?
- Can rain gardens be incorporated into the upstream watershed?
- Is the upstream watershed larger than allowed by the original design?
- Can some of the upstream watershed be diverted?

The two ponds in the southwestern part of the watershed that are highlighted in red, P26308 and P26310, appear to be infiltration ponds with no outlet pipe. Because our model conservatively assumes no infiltration, the threat of flooding from these ponds may be exaggerated. In comparing this area with the historic flooding map of Figure 9, there have been no reports of flooding in this area.

Pond P25454 appears to need a raised emergency overflow to the west in order to relieve potential flooding. Our model suggests that a 12-inch outfall culvert under Sunwood Drive with an inlet elevation of 866 will eliminate this threat from a 100-yr rainfall event.

Since the D43 watershed is comprised of a significant amount of wetland which acts as satisfactory runoff storage, no other significant designs are necessary with the exception of the localized flooding associated with the red highlighted ponds. Otherwise, upstream watershed review for infiltration/rain garden opportunities is recommended.

#### Figures 13 & 14 – D66 Watershed

This is the Ditch 66 watershed. It is nearly identical in nature to the D43 Watershed in build out and wetland storage. Hence, the recommendation is the same: review the highlighted ponds and determine if they need upgrading through either upstream infiltration practices, pond enlargement or increasing the outfall.

From Figure 13, only one pond, P22110 is a potential threat to structures. In reviewing Figure 9, no residential complaints have been made for this area and City Staff has not highlighted this area as a nuisance flooding area. It currently exists as a small natural depression that may have infiltration capacity. Our modeling conservatively assumes that no infiltration occurs and that relief is only provided by storage and the capacity of the outfall pipe. Hence, the potential threat to structures may be exaggerated. If this pond proves to be a problem, the pond storage could be increased or the existing 15" outfall could be increased to a 21" pipe with a lower pipe inlet elevation of 883 to adequately relieve the potential flooding.

The yellow coded ponds in Figure 13 highlight ponds that are immediately adjacent to large wetlands. With the exception of pond P09308, in the northwest part of the watershed, these ponds have emergency overflows directly to these wetlands and there is no concern for public welfare or property damage associated with these ponds. Pond P09308 is another infiltration basin with no historic complaints in the vicinity. Because our model conservatively assumes no infiltration, any threat of flooding from this pond may be exaggerated.

#### Figures 15 & 16 – EMISS Watershed

This is the Eastern Mississippi watershed. The majority of the northern part of this watershed is adequate in storage and functioning properly. Where there is undeveloped land, the SSA model can be used to recommend appropriate pipe sizing and ponding to ensure that it remains free of flooding.

The southern part is more commercialized and also more prone to flooding. However, there are no historic complaints of flooding in the area (see Figure 9).

If additional flood protection is needed in the southern EMISS watershed, there are some opportunities to correct the ponds that are modeled to be surcharged. From the aerial photograph, it appears that there are a few opportunities for expanding troubled ponds and the creation of additional ponding that may be constructed as backflow basins to relieve the flood prone ponds in the area. Those best opportunities are immediately adjacent to the railroad. These would be best incorporated into future development of this area. Otherwise, retrofitting rain gardens, infiltration basins, and as a last resort, increasing outfall pipes may be considered for nuisance ponds.

#### Figures 17 & 18 – GOLF Watershed

This watershed is currently functioning well. There is only one pond, P11320, in the watershed that is a potential threat to structures. It appears to be a roadside ditch infiltration basin pond. Again, conservatively ignoring infiltration may exaggerate the flooding potential of this pond. There is no history of complaints of flooding in this area. If flooding becomes a problem, it may only need minor grading to correct its emergency overflow spillway. Also, upstream watershed review for infiltration/rain garden opportunities may also suffice in correcting the problem.

The remaining yellow ponds appear to be in undeveloped areas and are probably natural depressions that fill and overflow.

For the few upstream areas that are not developed, careful retention, infiltration and outfall design review using the SSA model is the best way to accommodate continued development.

#### Figures 19 & 20 – MMISS Watershed

This watershed is only partially developed. The existing development is on the downstream end. The ponding areas within the developed part of the watershed are working well. As recommended earlier, infiltration and rain gardens should be incorporated into the upstream development where possible. The recommended ordinance changes should help ensure that this occurs.

#### Figures 21 & 22 – TROTT Watershed

This watershed is unique in that the majority of the area is currently designed as low impact development. The general nature of the Trott Brook watershed is that it is a linear wetland. The majority of the ponds are functioning well. City staff has noted that one area, near 179<sup>th</sup> Avenue and Azurite Street is a problem area (Figure 9). This area is also highlighted as a potential threat to structures in Figure 21. Regrading the roadside ditches or constructing a new outfall to relieve this area is recommended to alleviate the problem flooding in this area.

The remaining red highlighted pond and the only yellow highlighted pond in TROTT Watershed are infiltration areas with no historic complaints of flooding in the vicinity. Because our model conservatively assumes no infiltration, any threat of flooding from this pond may be exaggerated. If infiltration is not resolving the problem, the emergency overflow from this area should be regraded to protect the structures in the area.

#### Figures 23 & 24 – WMISS Watershed

This watershed includes the COR (former Ramsey Town Center) area. However, some ponds are indicated as being a threat. To ensure that this does not become a problem, we recommend using the SSA model to correct these potential problems as future expansion of the COR area occurs. The residential area to the northwest has several ponds that should be reviewed with the same considerations as the Trott and Ditch 43 watersheds.

Pond number P17306, located immediately west of 156<sup>th</sup> and Nutria, shows as a potential threat to structures and is in an area of property owner complaints. This appears to be a land locked infiltration pond that has very little infiltration capacity. The best solution to this pond is to provide an outfall to the west.

Pond P21210-E, immediately south of 151<sup>st</sup> Avenue and east of Rhinestone Street, is also shown as flooded. This is also an isolated infiltration with no outlet. The property owners in the vicinity of this pond have filed complaints of nuisance flooding in this area. Solutions for this pond include:

- Expanding the storage and working the pond invert to encourage infiltration
- Regrading to lower the existing emergency overflow channel
- Constructing a new piped outfall to serve the area.

There are two infiltration basins in the mid-eastern part of the watershed (Section 21 near 162<sup>nd</sup> Avenue and Zirconium Street that have been modeled to be either using the emergency spillway or a potential threat to structures. Although the peak elevation of these ponds may be exaggerated by neglecting infiltration in our model, nuisance flooding has been reported in the vicinity by area residents as shown in Figure 9. To alleviate this problem in Pond P21208, we recommend constructing an outlet culvert outlet under 161<sup>st</sup> Avenue may adequately address the problem flooding experienced there. The problem in Pond P21210, which is upstream from the residential nuisance flooding area, may be corrected by either expanding the infiltration basin storage or by

regrading the emergency overflow spillway at a lower elevation to alleviate the potential flooding threat.

We recommend that the undeveloped part of the WMISS watershed, lying immediately west of the COR, treated in a similar fashion as the COR. If a separate outfall can be created for this area, it could work in an almost identical fashion. If a separate outfall cannot be obtained, a large regional pond network is recommended. If the ponding alternative is taken, the regional pond network would need to store 100 percent of the runoff at a safe level prior to outletting into the COR system. This would ensure that the COR is not threatened by continued development upstream.

Finally, the Highway 10 corridor is appears to have some pond overflow problems that are only associated with using the ditches as storage. We believe that the best financial and hydrological solution to alleviate these problem areas is to coordinate with MNDOT on any future TH 10 improvements. Any improvements to TH 10 are likely to involve new corridor stormwater management and funding.

### General

Figures 30 through 34 are typical SSA output files for a single pipe/pond corridor. These are intended to illustrate the output potential of the model and software. If similar output files were created for every aspect of the entire system, this report would be too cumbersome. The 2008 Plan provided Geographic Information System (GIS) data that allows the City to model virtually any pipe, pond or ditch within Ramsey.

It is extremely important that each area be re-evaluated at the time of final design to confirm the criteria used in this study and to make any changes that a proposed development may dictate. Special consideration must be given to areas that develop differently than shown in the Comprehensive SWMP, especially when a higher runoff coefficient is likely to result from development.

All storm sewer facilities, especially those conveying large quantities of water at high velocities, should be designed with efficient hydraulic characteristics. Special attention should be given during final design to those lines that have extreme slopes and create high hydraulic heads.

The Best Management Practices (BMPs) recommended by the MPCA should be followed wherever necessary, but shall require adoption of an ordinance for enforcement of individual practice as a required standard...

## C. **Recommendations**

The following recommendations are presented for the City Council's consideration based upon the data compiled in this report:

1. The SWMP as presented herein should be adopted by the City of Ramsey.
2. The recommended corrections for flood prone areas should be made as described herein and made a part of the storm water management system, where feasible.
3. Standard review procedures should be established, where feasible, to ensure all development within the City is in compliance with proper erosion control practices.
4. Detailed hydrologic analysis should be required, where feasible, during final design of all new developments and ponding areas.

5. Final high water levels governing building elevations adjacent to ponding areas and floodplains should be established as development occurs or when drainage facilities are constructed.
6. Overflow routes should be established and maintained, where feasible, to provide relief during extreme storm conditions, which exceed design conditions.
7. An emergency overflow should be constructed for Lake Itasca to relieve the extreme fluctuation in lake levels of this isolated lake.
8. A storm water maintenance program should be enforced, where feasible, to ensure the successful operation of the drainage system.
9. The erosion and sedimentation control criteria for new developments should be enforced, where feasible.
10. An education program for City residents, staff, and development community should be implemented, where feasible.
11. Amendments to the plan should be adopted and implemented as warranted by future standards or regulations, where feasible.
12. That the plan should be updated in the year 2022 or earlier if needed and feasible.

The existing storm sewer system of the City of Ramsey is not adequate to handle the continued development around the presently developed area. If development continues, the existing system will need major improvement and enlargements to effectively serve the community without excessive flooding. The proposed infiltration and oversized ponding development scenario together with strategically located regional ponds presents one method of accommodating the present growth of Ramsey. However, this report and the proposed scenario is not necessarily the only method of accomplishing the goal of comprehensive storm water management.

Given this, it is imperative that this plan and the SSA model of the City is continually updated on a regular basis and compared to the baseline runoff of the existing conditions model to ensure that any adjustments in area developments continue to be coordinated. In addition, the proposed storm water development charges should be updated annually to ensure that the associated City costs are fully financed. In this manner, the plan can maintain its usefulness as a current document.

Finally, the EPA has initiated the NPDES Phase II requirements whereby cities with populations in excess of 10,000 people are required to apply for a Phase II permit. Some additional cities that are actually under 10,000 in population are also included. The City of Ramsey is a mandatory small MS4 community. One of the requirements of the NPDES permitting process is the existence of a storm water management plan.

As stated earlier, this report is predominantly based on information obtained from available topographic data, field verification of the watershed areas, “ground truthing” of modeled flood prone areas, and discussions with City staff relative to the historical flooding areas. Since the modeled existing system closely matches that described by observation, we feel that this plan has significant benefit as a planning and design tool. However, the quality and accuracy of this report could be further validated with more detailed survey data in the growth areas around the City.

## XI. ACRONYMS AND GLOSSARY

### A. Acronyms

<b>BMP</b>	- Best Management Practices
<b>BWSR</b>	- Minnesota Board of Water and Soil Resources
<b>DNR</b>	- Minnesota Department of Natural Resources
<b>EOF</b>	- Emergency Overflow
<b>EPA</b>	- United States Environmental Protection Agency
<b>EPB</b>	- Environmental Policy Board
<b>EQB</b>	- Minnesota Environmental Quality Board
<b>FEMA</b>	- Federal Emergency Management Agency
<b>FIRM</b>	- Flood Insurance Rate Map
<b>GIS</b>	- Geographic Information System
<b>GPS</b>	- Geographic Positioning System
<b>HWL</b>	- High Water Level, typically associated with the 100 year rainfall event
<b>IDF</b>	- Intensity-Duration-Frequency (for precipitation)
<b>LID</b>	- Low Impact Development
<b>LRRWMO</b>	- Lower Rum River Watershed Management Organization
<b>LUST</b>	- Leaking Underground Storage Tank
<b>MNDOT</b>	- Minnesota Department of Transportation
<b>MNRAM</b>	- Minnesota Routine Assessment Method
<b>MPCA</b>	- Minnesota Pollution Control Agency
<b>MS4</b>	- Municipal Separate Storm Sewer System
<b>MSWMP</b>	- Metropolitan Surface Water Management Program
<b>MUSA</b>	- Metropolitan Urban Services Area
<b>NOI</b>	- Notice of Intent (for coverage under the NPDES Permit Program)
<b>NPDES</b>	- National Pollutant Discharge Elimination System
<b>NPDES/SDS</b>	- The General Permit Authorization to Discharge Storm Water Associated with Construction Activity under the National Pollutant Discharge Elimination System/State Disposal System Permit Program. Administered by the MPCA
<b>NURP</b>	- Nationwide Urban Runoff Program
<b>NWL</b>	- Normal Water Level or Low Outlet Elevation
<b>SWCD</b>	- Soil and Water Conservation District
<b>SWMP</b>	- Surface Water Management Plan
<b>SWPPP</b>	- Storm Water Pollution Prevention Program
<b>TP</b>	- Total Phosphorus
<b>TEP</b>	- Technical Evaluation Panel, typically needed for WCA approval of wetland impacts
<b>TSS</b>	- Total Suspended Solids
<b>USEPA</b>	- United States Environmental Protection Agency
<b>UST</b>	- Underground Storage Tank
<b>WCA</b>	- The Minnesota Wetland Conservation Act and its subsequent Minnesota Rules 6115 and 8420.
<b>WD</b>	- Watershed District
<b>WMO</b>	- Watershed Management Organization

## B. Glossary

**100-Year Flood:** The flood reaching water levels or flow rates with a one-percent (1%) chance of occurring in any given year. On the average, a 100-year flood is statistically probable to occur only once in a 100-year period. A 100-year flood is synonymous with Base Flood, Regional or 1% Chance Flood.

**100-Year Storm Event:** The rainfall event having a total precipitation over a 24-hour period with a one-percent (1%) chance of occurring in any given year. On the average, a 100-year storm event is statistically probable to occur only once in a 100-year period. NOAA Atlas 14: Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffrey Bonnin (2013). NOAA Atlas 14, Volume 8, Version 2, *Precipitation-Frequency Atlas of the United States, Midwestern States*. NOAA, National Weather Service, Silver Spring, MD.**100-Year, 10-Day Snowmelt Event:** The storm event having a total precipitation over a 10-day period with a one-percent (1%) chance of occurring in any given year. On the average, a 100-year snowmelt event is statistically probable to occur only once in a 100-year period. The value for the Ramsey area is taken from the SCS National Engineering Handbook, which shows the 100-year, 10-day snowmelt event is 7.3 inches over 10 days.

**Agricultural Land:** Any land designated specifically for agricultural production. This may include row crops, pasture, hay land, orchards, or land used for horticultural purposes.

**Anaerobic:** Conditions either in water or soil where there is a lack of oxygen.

**Army Corps of Engineers (COE or USCOE):** The United States Army Corps of Engineers is a regulatory agency involved in design, permitting and construction projects related to or impacting navigable waters of the United States including lakes, waterways and wetlands.

**Aquatic Bench:** A 10- to 15-foot bench around the inside perimeter of a permanent pool that ranges from zero depth at the shore to 1-foot depth no less than 10-feet from the shore. Normally vegetated with emergent plants, the bench augments pollutant removal, provides habitat, conceals trash and water level drops, and enhances safety.

**Best Management Practice (BMP):** An action, procedure, or structural improvement designed to improve water quality. BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the State. BMPs also include treatment practices such as ponds, rain gardens, vegetated buffers and vegetated swales, treatment requirements, operating procedures, and practices to control runoff, spillage or leaks, or drainage from raw material storage.

**Buffer:** A vegetated area immediately adjacent to a wetland that is not mowed and/or managed. Buffers are ideally dominated by native vegetation and add to the ecological health of the wetland by adding habitat and assisting and filtering pollutants from surface water runoff.

**Buffer Strip:** An area of vegetated ground cover abutting a water body that is intended to remove sediment and other pollutants from runoff.

**BWSR:** Board of Water and Soil Resources. This is the lead regulatory agency that oversees Minnesota Statute 103B.205 to 103B.255, Minnesota Rule 8410 and the Minnesota Wetland Conservation Act.

**Circular 39:** A wetland classification system developed by United States Fish and Wildlife Service in 1956 that categorizes wetlands into eight types. This is the same classification system generally accepted by the State of Minnesota for wetland classification.

**Comprehensive Plan:** As defined in Minnesota Statutes 394.21, a Comprehensive Plan defines a City's the policies, statements, goals and interrelated plans for private and public land and water use, transportation and community facilities to assist in guiding future development and growth.

**Cowardin Classification:** A wetland classification system developed by the United States Fish and Wildlife Service in 1979. This system defines wetlands by a tiered system and is more detailed than the Circular 39 method. The Cowardin System is the classification System used in the National Wetlands Inventory.

**Design Storm:** A rainfall event of specified size and return frequency that is used to calculate the runoff volume and peak discharge rate to a BMP. In Ramsey, a 10-year design storm is 4.1-inches in 24-hours and a 100-year storm is 5.9-inches in 24-hours. If designing piped storm sewer, a 10-year design storm may also refer to an IDF curve used in the Rational Method of storm sewer design.

**Detention:** The temporary storage of runoff from rainfall and snowmelt events to control peak discharge rates and provide an opportunity for treatment to occur. Detention storage is typically designed in basins.

**Development:** The construction, installation or alteration of any structure, the extraction, clearing or other alteration of terrestrial or aquatic vegetation, land or the course, current or cross section of any water body or water course or division of land into two (2) or more parcels. See also re-development, new development and existing development.

**Drawdown:** The gradual reduction in water level typically due to the combined effect of infiltration and evaporation, but may be the result of human interference.

**Draining:** The removal of surface water or ground water.

**Drop Structure:** Placement of logs with a weir notch across a stream channel. Water flowing through the weir creates a plunge pool downstream of the structure and creates fish habitat.

**Easement:** A grant of one or more property rights by a property owner for use by the public, a corporation, or another person or entity.

**Emergency Overflow (EOF):** A hydraulic channel, swale, weir, etc. that provides an outlet from a pond or flooded area at an elevation below the point where property damage can occur.

**End of Pipe Control:** Water quality control technologies suited for the control of existing urban storm water at the point of storm sewer discharge to a receiving water. Due to typical space constraints, these technologies are usually designed to provide water **quality control rather than quantity control.**

**Erosion:** The wearing away of land surface and soil by the action of natural elements (wind and/or water).

**Eutrophication:** Process by which overabundance of nutrients in a waterbody lead to accelerated productivity and general decrease in water clarity and quality.

**Exfiltration:** The downward movement of runoff through the surface and into the subsoil.

**Existing Development:** A property or parcel of land that has previously been subject to development and no major changes are anticipated to the property in the near future.

**Exotic Species or Invasive Species:** Non-native plants or wild animals that can naturalize, have high propagation potential, are highly competitive for limiting factors, and cause displacement of, or otherwise threaten, native plants or native animals in their natural communities.

**Extended Detention:** A storm water design feature that provides for the gradual release of a volume of water (typically 0.25 to 1.0 inches per impervious acre) over a 12 to 48 hour time period. With proper design, the extended detention period allows for an increased settling of pollutants, and can protect channels from frequent flooding or scour.

**Extended Detention (ED) Ponds:** A conventional ED pond temporarily detains a portion of storm water runoff for a period of 12 to 48 hours after a storm using a fixed orifice. Such extended detention allows urban pollutants to settle out. ED ponds can be designed to be "dry" between storm events and thus do not have any permanent standing water or "wet" with a permanent pool of water. An enhanced ED pond is designed to prevent clogging and resuspension and provides greater flexibility in achieving target detention times. It may be equipped with plunge pools near the inlet, a micropool at the outlet, and utilize an adjustable reverse-sloped pipe at the ED control device. See also "wet pond" definition for diagram.

**Extended Detention Wetland:** A storm water wetland design alternative in which the total treatment volume is equally split between a shallow marsh and temporary detention of runoff above the marsh. After a storm, the normal pool of the shallow marsh may rise by up to two feet. The extra runoff is stored for up to 24 hours to allow pollutants to settle before being released downstream.

**Finished Floor Elevation:** The lowest elevation of the first floor or basement in a residential building or other structure that will or may be inhabited by a person or persons.

**Filtration Basin:** A treatment area designed to treat storm water by a process that physically removes particles from the water.

**Flood:** A temporary rise in stream flow or stage that results in inundation of the areas adjacent to the channel or water body.

**Flood Frequency:** The statistically determined average time period between events where a specific flood stage or discharge may be equaled or exceeded.

**Flood Fringe:** That portion of the 100-year floodplain outside of the floodway.

**Flood Obstruction:** Any dam, wharf, embankment, levee, dike, pile, abutment, projection, excavation, channel rectification, culvert, building, wire, fence, stockpile, refuse, fill, structure or matter in, along, across or projecting into any channel, watercourse or regulatory flood hazard area that may impede, retard or change the direction of the flow of water, either in itself or by catching or collecting debris carried by such water that may cause the flood level to rise and damage property or threaten life.

**Floodplain:** Floodplains are lowland areas adjoining lakes, wetlands, and rivers that are susceptible to inundation of water during a flood. For regulatory purposes, the floodplain is the area covered by the 100-year flood and it is usually divided into districts called the floodway and flood fringe. Areas where floodway and flood fringe have not been determined are called approximate study areas or general floodplain.

**Floodplain (General) Area:** The general floodplain area is determined using the best available data, in lieu of performing a detailed engineering study. These data may be from soils mapping, experienced high water profiles, aerial photographs of previous floods, or other appropriate sources. There are no associated published 100-year flood elevations with general floodplain delineations, unlike detailed study areas. General floodplain area is synonymous with approximate study area and unnumbered A-Zone.

**Flood Proofing:** A combination of structural provisions, changes or adjustments to properties and structures subject to flooding primarily for the reduction or elimination of flood damages to properties, water and sanitary facilities, structures and contents of buildings in a flood hazard area in accordance with the Minnesota State Building Code.

**Floodway:** The floodway is the channel of a river or other watercourse and the adjacent land areas which must remain open in order to discharge the 100-year flood.

**Forebay:** An extra storage area provided near an inlet of a pond or BMP to trap incoming sediments, reducing the amount that accumulates in a pond or BMP.

**Freeboard:** A factor of safety usually expressed in feet above a certain flood level. Freeboard compensates for the many unknown factors (e.g., waves, ice, debris, etc.) that may increase flood levels beyond the calculated level.

**Forbs:** Vegetation that does not consist of trees, grass or shrubs. Forbs are typically associated with flowering plants

**Geographic Information System (GIS):** Computer databases of georeferenced information on the cities various resources.

**Global Positioning System (GPS):** Network of satellites used to map and identify locations on the earth.

**Hydric Soil:** Soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part. Hydric soil is one of the three criteria that define wetlands

**Hydrophytic Vegetation:** Macrophytic plant life growing in water, soil, or a substrate that is at least periodically deficient in oxygen as a result of excessive water content.

**Hypereutropic:** A very nutrient-rich lake characterized by frequent and severe nuisance algae blooms and low transparency.

**Intensity-Duration-Frequency (IDF) Curve:** A graphical representation of the rainfall intensity versus time of concentration for an area. The IDF curve is typically used in the Rational Method of storm sewer design to determine design rainfall intensity in inches per hour. The following IDF curve is taken from the Minnesota Department of Transportation Drainage Manual and applies is used in the rational method of storm sewer design for the Ramsey Area.

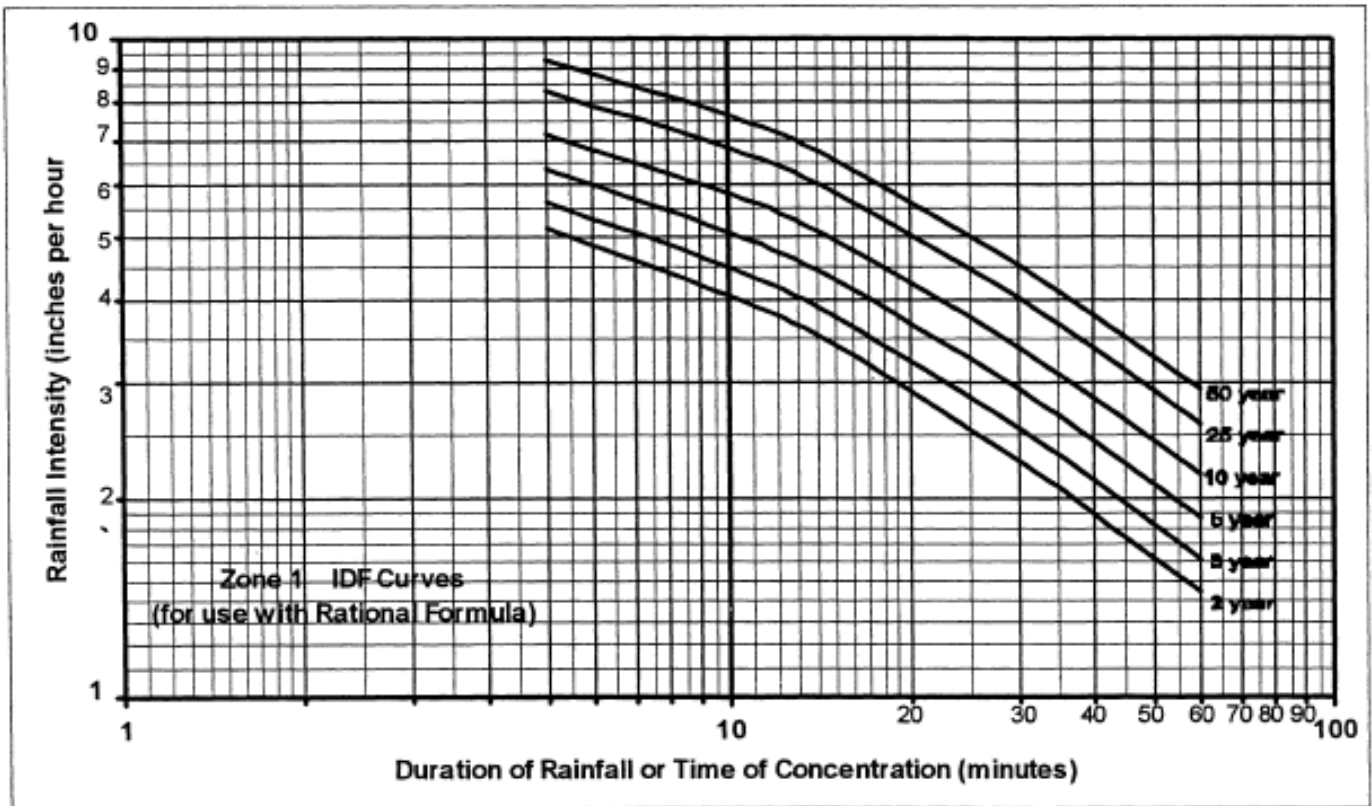


Figure 3.4 Zone 1 Southern Minnesota Rainfall Intensity - Duration - Frequency (IDF) Curves

**Impervious Surface:** The portion of the buildable parcel which has a covering which does not permit water to percolate into the natural soil. Impervious surface shall include, but not be limited to, buildings, all driveways and parking areas (whether paved or not), sidewalks, patios, swimming pools, tennis and basketball courts, covered decks, porches, and other structures. Open, uncovered decks are not considered impervious for the purposes of this ordinance. The use of patio blocks, paver bricks or class 5 gravel material are considered impervious surfaces as a majority of water runs-off the surface rather than being absorbed into natural soils underneath. Some exceptions to these conditions may include paver blocks or pavement systems engineered to be permeable with the underlying soils suitable for infiltration.

**Infiltration Basin:** An impoundment where incoming storm water runoff is stored until it gradually infiltrates into and through the soil of the basin floor.

**Infiltration Trench:** A conventional infiltration trench is a shallow, excavated trench that has been backfilled with stone to create an underground reservoir. Storm water runoff diverted into the trench gradually exfiltrates from the bottom of the trench into the subsoil and eventually into the water table. An enhanced infiltration trench has an extensive pretreatment system to remove sediment and oil. It requires an on-site geotechnical investigation to determine appropriate design and location.

**Infrastructure:** Public facilities and services, including transportation, storm water pipes, structures and ponds, water and sewer pipes and structures, telecommunications, recycling and solid waste disposal, parks and other public spaces, schools, police and fire protection, and health and welfare services.

**Integrated Management Practice (IMP):** A range of small-scale storm water controls or practices distributed throughout a site and intended to maintain flow patterns, filter pollutants and/or re-create or maintain existing site hydrology.

**Invasive Species or Exotic Species:** Non-native plants or wild animals that can naturalize, have high propagation potential, are highly competitive for limiting factors, and cause displacement of, or otherwise threaten, native plants or native animals in their natural communities.

**Landlocked High Water Level or Landlocked HWL:** The peak water level or high water level in a land locked basin. The HWL is the highest peak ponding elevation generated by the back-to-back 100-year SCS 24-hour rainfall events, the 10-inch SCS 24-hour rainfall event or the 100-year, 10-day snowmelt snow melt event.

**Local Government Unit (LGU):** Agency that has the primary responsibility of administering the Wetland Conservation Act. The City of Ramsey acts as LGU for all wetlands within the City limits and shares responsibility for basins that border adjacent municipalities.

**Lowest Floor:** The lowest floor of a structure, including basement.

**Low Impact Development (LID):** An approach to storm water management intended to protect water resources, reduce storm sewer infrastructure costs and provide a more attractive storm water management system. LID practices include infiltration systems, bioretention areas, rain barrels, green roofs, porous pavements and a long list of additional innovative storm water treatment practices.

**Mesotrophic:** Describes a lake of moderate photosynthetic productivity.

**MNRAM:** The Minnesota Routine Assessment Methodology as referenced by Minnesota Rules 8420. MNRAM is the primary tool used to assess wetland functions and values on a qualitative basis. MNRAM evaluates wetlands based on vegetation, wildlife habitat, water quality, flood and storm water attenuation, recreational opportunities, aesthetics, fishery habitat, groundwater interactions, and commercial use. The result of a MNRAM evaluation is a ranking of the wetland quality that can be used to monitor the wetland

changes over time and to set appropriate protection needs and techniques. The version referenced in this plan is Version 3.0.

**Monotypic:** Used to describe vegetation communities in which only one dominant species is present. Most often used to describe areas that are entirely dominated by reed canary grass or cattails.

**Navigable Waters:** Waters defined by the United States, 33 Code of Federal Regulations Section 329.4 as those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. The U.S. Army Corps of Engineers has Federal Jurisdiction over Navigable Waters.

**New Development:** Development of a property or portion thereof that is currently undeveloped property.

**NURP:** Nationwide Urban Runoff Program, a study by the U.S. Environmental Protection Agency. A key component of this program was to assess the effectiveness of urban runoff detention/retention basins (e.g., ponds) in removing pollutants from storm water runoff.

**Off-Line BMP:** A water quality facility designed to treat a portion of storm water (usually 0.5 to 1.0 inches per impervious acre) which has been diverted from a stream or storm drain.

**Off-Line Treatment:** A BMP system that is located outside of the stream channel or drainage path. A flow diverter is used to divert runoff from the channel and into the BMP for subsequent treatment.

**Ordinary High Water Level (OHWL or OHW):** The Minnesota DNR jurisdictional boundary of public waters and wetlands that is depicted by an elevation delineating the highest water level which has been maintained for a sufficient period of time to leave evidence upon the landscape, commonly that point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial. For watercourses, the ordinary high water level is the elevation of the top of the bank of the channel. For reservoirs and flowage, the ordinary high water level is the operating elevation of the normal summer pool. In Ramsey all of the lakes have an OHW established. For streams and waterways, the OHW is considered the top of bank. Areas below the OHW are under the jurisdiction of the Minnesota Department of Natural Resources and are not regulated by the Wetland Conservation Act.

**Permanent Pool:** A 3- to 10-foot deep pool in a storm water pond system that provides removal of urban pollutants through settling and biological uptake (also referred to as a wet pond).

**Porous Pavement:** An alternative to conventional pavement whereby runoff is diverted through a porous asphalt or concrete layer and into an underground stone reservoir. The stored runoff then gradually infiltrates into the subsoil.

**Protected Water:** Any water or wetland designated by the Minnesota Department of Natural Resources and identified by statute on the Protected Waters Inventory.

**Public Waters:** Those waters of the state identified as public waters or wetlands under Minnesota Statutes, Section 103G.005.

**Rational Method:** A method of estimating the peak runoff from a watershed that is based on the formula  $Q = CIA$ . Where:

- Q = peak flow rate in cubic feet per second
- C = a runoff coefficient based on the percentage of impervious surface, type of vegetative cover, and soil type
- I = rainfall intensity in inches per hour as determined from an area IDF curve
- A = watershed area in acres

**Reach:** A hydraulic engineering term to describe a longitudinal segment of a stream or river influenced by the natural or man-made obstruction. In an urban area, the segment of a stream or river between two consecutive bridge crossings or between two reservoirs would most typically constitute a reach.

**Redevelopment:** Any development including but not limited to rebuilding, renovation, revision, remodeling, reconstruction or redesign of or at an existing development.

**Regional Flood:** A flood which is representative of large floods known to have occurred generally in Minnesota and reasonably characteristics of what can be expected to occur on an average frequency in the magnitude of the 100-year recurrence interval. A regional flood is synonymous with the term "base flood" used in the Flood Insurance Study.

**Regulatory Flood Protection Elevation:** A point not less than one-foot above the water surface profile associated with the 100-year flood as determined by the use of the 100-year flood profile and surrounding technical data in the Flood Insurance Study plus any increase in flood heights attributable to encroachments on the floodplain. It is the minimum elevation the DNR requires Cities to regulate by ordinance.

**Retention:** The permanent storage of runoff from rainfall and snowmelt events with volume reduction coming from infiltration, evaporation or emergency release.

**Riprap:** A combination of large stone, cobbles and boulders used as an erosion control BMP. Riprap is typically used to line channels, stabilize banks, reduce runoff velocities, or filter out sediment.

**Runoff (Storm Water):** The overland and near surface flow from rainfall and snowmelt.

**Runoff Coefficient:** A measure of the rate of runoff that is statistically generated from a parcel of land that is based on the land use, percent of impervious surfacing, soil type and vegetative cover. The higher the coefficient, the higher the amount of runoff anticipated from the parcel. Rational method runoff coefficients range from 0.2 for meadow lands to 0.95 for paved surfaces.

**Runoff Conveyance:** Methods for safely conveying runoff to a BMP to minimize disruption of the stream network, and promote infiltration or filtering of the runoff.

**Runoff Pretreatment:** Techniques to capture or trap coarse sediments before they enter a BMP to preserve storage volumes or prevent clogging within the BMP. Examples include forebays and micropools for pond BMPs, and plunge pools, grass filter strips and filter fabric for infiltration BMPs.

**Sand Filter:** A technique for treating storm water, whereby the first flush of runoff is diverted into a self-contained bed of sand. The runoff is then strained through the sand, collected in underground pipes and returned back to the stream or channel.

**Sediment Forebay:** A storm water design feature that employs the use of a small settling basin to settle out incoming sediments before they are delivered to a storm water BMP. Often used full in tandem with infiltration devices, wet ponds or marshes.

**Sequencing:** The process used by the Local Government Unit to evaluate the necessity of an activity relative to its impact on a wetland. The party proposing the impact must demonstrate that the activity proposed complies with the following principles in descending order of priority.

1. Avoids direct or indirect impacts to the wetlands that may diminish or destroy them;
2. Minimizes the impact to the wetland by limiting the degree or magnitude of the wetland activity and its implementation;
3. Rectifies the impacts by repairing, rehabilitating, or restoring the affected wetland;
4. Reduces or eliminates the impact to the wetland over time by preservation and maintenance operations; and,
5. Replaces unavoidable wetland impacts to the wetland by restoring or, if wetland restoration opportunities are not reasonably available, creating substitute wetland areas having equal or greater public value as provided for under the Wetland Conservation Act.

**Shoreland:** Land located within the following distances from public waters:

1. One thousand feet from the ordinary high water level of a lake, pond, or flowage
2. Three hundred feet from a river or stream, or the landward extent of a floodplain designated by ordinance on a river or stream, whichever is greater.

The limits of shoreland may be reduced whenever the waters involved are bounded by topographic divides which extend landward from the waters for lesser distances and when approved by the Commissioner of the DNR.

**Short Circuiting:** The passage of runoff through a BMP in less than the theoretical or design treatment time. For example, a properly designed treatment pond will have the inlet and outlet pipes located as far apart (along the water flow path) as possible. A short circuiting pond would have the inlet very close to the outlet and the water coming into the pond would leave the pond much sooner than if it were able to travel through the entire pond.

**Storm Water Treatment:** The use of accepted BMPs to treat runoff including detention, retention, filtering or infiltration of a given volume of storm water to remove pollutants.

**Stream Buffer:** A variable width strip of vegetated land adjacent to a stream that is preserved from a disturbance and/or mowing to protect water quality and aquatic and terrestrial habitats. See also buffer strip.

**Structure:** Anything manufactured, built, constructed, erected, or a portion thereof which is normally attached to or positioned on land, whether temporary or permanent in character, including but not limited to buildings, fences, sheds, advertising signs, dog kennels, hard surface parking areas, boardwalks, playground equipment, concrete slabs.

**Shoreland Wetland Protection Zone:** The land located within 1,000 feet from the Ordinary High Water Elevation of a Protected Water, 500 feet from the Mississippi or Rum Rivers or the landward extent of the designated floodplain, and 300 feet from any stream designated in the shoreline management ordinance.

**Storm Water:** (See Runoff)

**Storm Water Treatment Pond:** Any waterbody that has been specifically created to remove sediment and nutrients and "treat" surface water runoff. Storm water ponds that were created from existing wetland are still regulated as jurisdictional wetlands. Storm water ponds created from upland areas are not wetland and are exempt from regulatory jurisdiction.

**Subwatershed:** A subdivision based on hydrology corresponding to a smaller drainage area within a larger watershed.

**Technical Evaluation Panel (TEP):** A panel of technical professionals from the Board of Water and Soil resources, the Anoka County SWCD, the LRRWMO and the LGU (City of Ramsey) at a minimum. This panel may also be expanded to include a Minnesota Department of Natural Resources representative, the U.S. Army Corps of Engineers and interested citizens requesting to participate in the wetland decision making process. Invitations to a TEP meeting are typically sent to all parties listed. The DNR, COE and interested citizens (if any) may elect not to attend. The TEP provides decision making support for the LGU for many wetland and regulatory issues.

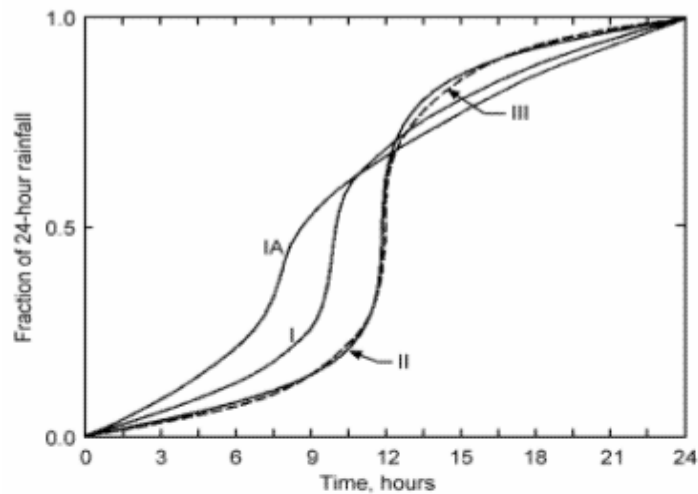
**Ten-Day Snow Melt Runoff with Type "C" Distribution (100-Year/10-day snow melt runoff):** A modeled runoff event that represents snowmelt conditions over a 10-day period for a return period snow depth of 100 years. The runoff event is simulated for a curve number (CN) of 100 which represents frozen soil conditions or where all surfaces are considered impervious. For some Ramsey the ten-day runoff event is critical event for identifying the high water level of the basin or water body because the Anoka Sand Plain typically reduces runoff under unfrozen conditions. The Type C distribution is similar in concept to the Type I and II distributions, and for this event, establishes the time distribution of runoff volume over the ten-day period.

**Treatment Volume (Vt):** The volume of storm water runoff that is treated within a BMP or IMP storm water treatment facility. Typically the volume is expressed in terms of inches of runoff per impervious acre.

**Type I, IA, II and III Storm Distributions - NRCS:** These storm types represent the time distribution of a 24-hour rainfall event for areas throughout the United States. The total storm depth is distributed according to the diagram in subpart A. Type II storms are more "flashy" (i.e., convective/thunderstorms) than a Type I or IA storm. Subpart B illustrates that all of Minnesota is within the Type II rainfall distribution area.

DRAFT

A. SCS 24-hour rainfall distributions (SCS, 1986):



B. Approximate geographic boundaries for SCS rainfall distributions (SCS, 1986):



**Underdrain:** Typically perforated plastic pipes installed on the bottom of a filtration of infiltration BMP, or sand filter. The under drain is used to collect and remove treated storm water that exceeds the water holding and/or infiltration capacity of the soil.

**Upland:** General term to describe any area that is not a wetland.

**Vegetated Filter Strip:** A vegetated section of land designed to accept runoff as overland sheet flow from upstream development. It may adopt any natural vegetated form, from grassy meadow to small forest. The dense vegetative cover facilitates pollutant removal. Vegetated filter strips cannot treat high velocity flows; therefore, they have generally been recommended for use in agriculture and low-density development. A filter strip can also be an enhanced natural buffer, whereby the removal capability of the natural buffer is improved through engineering and maintenance activities such as land grading or the installation of a level spreader. A filter strip differs from a grassed

swale in that a swale is a concave vegetated conveyance system, whereas a filter strip has a fairly level surface.

**Watershed:** A topographically defined area within which all runoff water drains to a point.

**Water Quality Volume:** A design volume of water as defined by the MPCA that is required to be treated from a new development site. The MPCA defines the water quality volume as 0.5-inches of runoff from all new impervious surfaces associated with the development in the watershed.

**Watershed-to-Lake Ratio:** The relative surface area of the contributing watershed to the surface area of the lake or water body. In terms of water quality, generally the smaller the watershed-to-lake ratio, the better the quality of the lake. For example a lake with a ratio of 4 to 1 means that the watershed is four times the size of the lake (i.e., 200 acres contributing to a 50 acre lake).

**Wetland:** Transitional land between terrestrial and aquatic systems where the water table is at or near the surface or the land is covered by shallow water. The jurisdictionally accepted definition of a wetland includes the following three characteristics:

1. Have a predominance of hydric soil
2. Be inundated or saturated within 1-foot of the surface for at least 5 percent of the growing season. The inundation refers to a single continuous episode.
3. Support a prevalence of hydrophytic vegetation typically adapted for life in saturated soils.

**Wetland Conservation Act (WCA):** In 1991 Minnesota adopted the initial Wetland Conservation Act (Minnesota Laws Chapter 354) to protect the states wetland resources. This act has been amended and updated periodically, typically under Minnesota Rule 8420, and is used by reference to the current program, as well as any future amendments.

**Wetland Delineation:** The process and procedure by which an area is determined a wetland or non-wetland including a determination of the wetland boundary based on the point where the non-wetland areas shift to wetlands or aquatic habitats.

**Wetland Mitigation:** Wetlands created to replace wetland areas destroyed or impacted by land disturbances.

**Wet Pond:** A conventional wet pond has a permanent pool of water for treating incoming storm water runoff and a live storage component for flood storage and additional water quality treatment detention.

# Tables

# Figures

# Appendix A

Ramsey City-wide  
Storm Water Pollution Prevention Plan

# **Appendix B**

Comment Letters

**Meeting Date:** 03/31/2015

**By:** Bruce Westby, Engineering/Public Works

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**Title:**

Consider use of Sunwood Drive as Official Detour Route during Highway 10 & Armstrong Boulevard Interchange Construction

**Purpose/Background:**

**Purpose:**

The purpose of this case is to consider whether it would be in the best interest of the City to relocate the officially designated detour route from Bunker Lake Boulevard to Sunwood Drive. This detour route will be signed as such to direct traffic between Armstrong Boulevard (CSAH 83) and Ramsey Boulevard (CSAH 56) during construction of the Highway 10 and Armstrong Boulevard Interchange.

**Background:**

Currently, Bunker Lake Boulevard is planned to be the official detour route as shown in the attached plan sheet from the plans that are currently out for bids. In recent discussions with Anoka County the City was informed that Anoka County may be open to considering relocating the officially designated detour route from Bunker Lake Boulevard to Sunwood Drive if the City were to present such a request in writing. However, County staff could make no guarantees that such a request would be granted, and they added that the City would likely be required to waive its rights to claim any damages against the County for damage to City streets resulting from any additional traffic due to the change in designation of the official detour route.

At this time, staff is simply requesting input on whether the Committee thinks such a request would be in the best interest of the City. If so, staff will prepare a letter requesting the change in designation and will present it to Anoka County for consideration. In the event the County would allow the change in designation, staff would then present the County's terms to the City Council for consideration of approval, including any required agreements, damage claim waivers, or requests for compensation if the change in detour route designation resulted in increased project costs. At this time staff does not anticipate any cost increase due to such a request.

**Timeframe:**

Staff estimates this case will take approximately 15 minutes to present and discuss.

**Observations/Alternatives:**

**Observations:**

Additional traffic will likely be generated along the route that is designated as the official detour route, particularly now that Armstrong Boulevard will be closed to traffic during most of the project. However, staff does not anticipate that the additional traffic will negatively impact use of the Sunwood Drive corridor, either for vehicular traffic or pedestrians. Relatively few pedestrian crossings exist along Sunwood Drive, with the majority of observed crossings occurring between Sapphire and Rhinestone Streets.

**Alternatives:**

Alternative #1 – Motion to recommend submittal of a letter to Anoka County requesting a change in designation for the official detour route from Bunker Lake Boulevard to Sunwood Drive between Armstrong Boulevard (CSAH 83) and Ramsey Boulevard (CSAH 56) during construction of the Highway 10 and Armstrong Boulevard Interchange.

Alternative #2 – Motion to recommend leaving the official detour route along Bunker Lake Boulevard as currently shown in the plans.

**Funding Source:**

No additional funding is required as related to this case, though additional funding may be requested by Anoka County which would be considered by the City Council at a future date.

**Recommendation:**

Staff does not have a recommendation on this item. It is staff’s opinion that the vast majority of drivers will select their own detour routes during construction of the interchange project based on their needs and preferences, not based on detour route signing.

**Action:**

Recommend or deny submittal of a letter to Anoka County requesting a change in designation for the official detour route from Bunker Lake Boulevard to Sunwood Drive between Armstrong Boulevard (CSAH 83) and Ramsey Boulevard (CSAH 56) during construction of the Highway 10 and Armstrong Boulevard Interchange.

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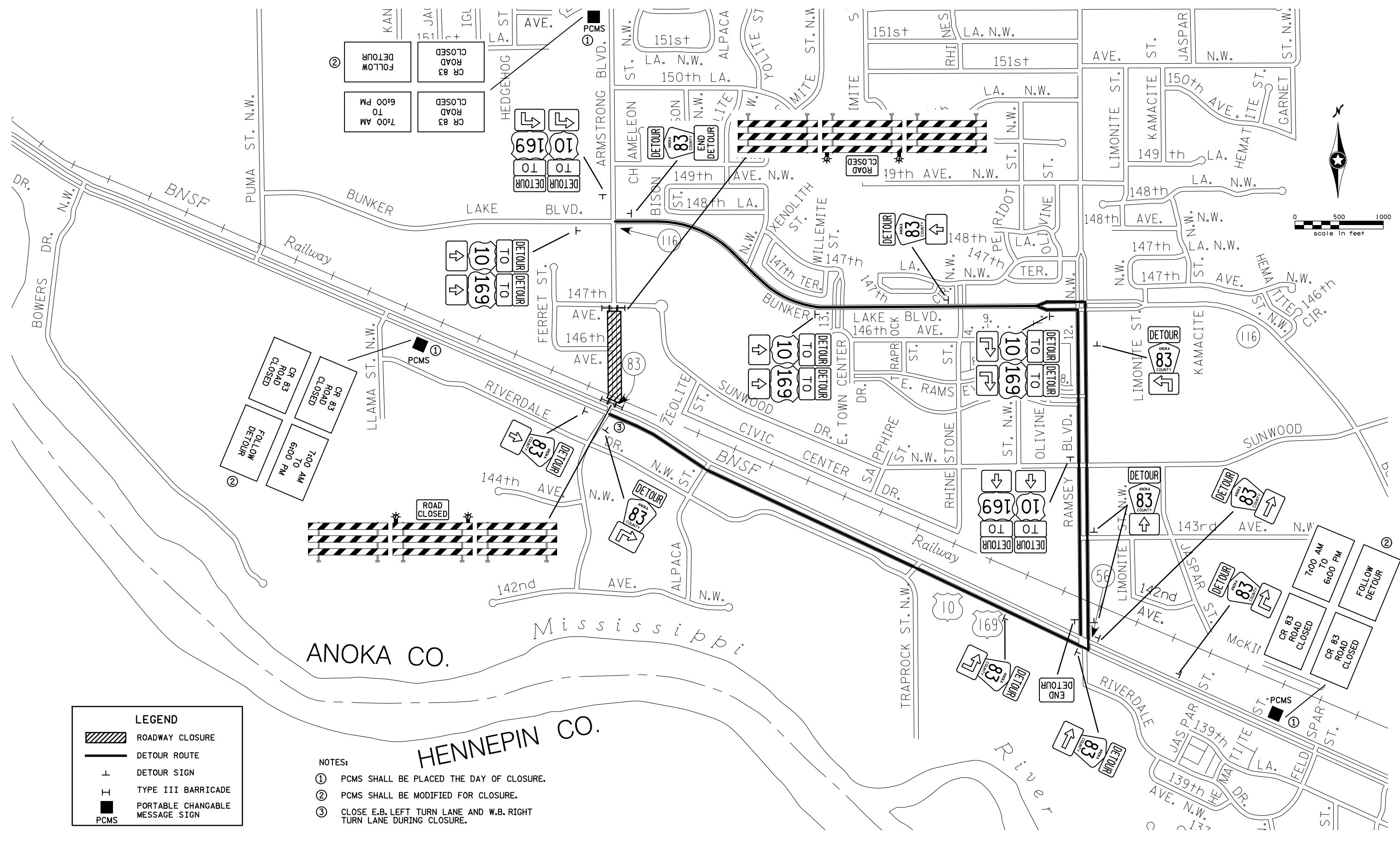
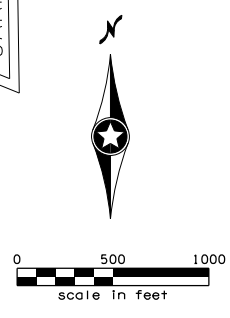
**Attachments**

Interchange Detour Plan

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**Form Review**

<b>Inbox</b>	<b>Reviewed By</b>	<b>Date</b>
Grant Riemer	Grant Riemer	03/26/2015 11:43 AM
Kurt Ulrich	Kurt Ulrich	03/26/2015 03:39 PM
Form Started By: Bruce Westby		Started On: 03/06/2015 07:28 AM
Final Approval Date: 03/26/2015		



**LEGEND**

	ROADWAY CLOSURE
	DETOUR ROUTE
	DETOUR SIGN
	TYPE III BARRICADE
	PORTABLE CHANGABLE MESSAGE SIGN
	PCMS

- NOTES:**
- ① PCMS SHALL BE PLACED THE DAY OF CLOSURE.
  - ② PCMS SHALL BE MODIFIED FOR CLOSURE.
  - ③ CLOSE E.B. LEFT TURN LANE AND W.B. RIGHT TURN LANE DURING CLOSURE.

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NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or 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.

Print Name: **CRAIG J. HASS**

*Craig J. Hass*

Date: **09-12-14** License #: **45039**

STATE PROJECT NO. 002-683-004  
 199-115-002

STATE PROJECT NO. 0202-95 (TH 10)

COUNTY PROJECT NO. 002-683-004

CITY PROJECT NO. 14-22

DRAWN BY S. MARTINS  
 DESIGNED BY D. SYMANIETZ  
 CHECKED BY C. HASS

COMM. NO. 0138259



**ANOKA COUNTY**

STAGING AND TRAFFIC CONTROL PLANS  
**T.H. 10 / C.S.A.H. 83 INTERCHANGE**  
 NIGHT CLOSURE DETOUR ROUTE

**SHEET 107 OF 586**

Meeting Date: 03/31/2015

By: Grant Riemer, Engineering/Public Works

**Title:**

Business Signage for Armstrong Interchange Detour

**Purpose/Background:**

One of the challenges during a large scale road construction project, such as the Armstrong Interchange, is the effect it has on motorists and their daily routines. When detours and road closures change motorist’s normal traffic patterns, local businesses are effected. Navigating construction zones can be difficult and finding your way to a local business can be a real challenge. Standard construction signage is normally a large arrow and a sign saying “Local Business Access”. This signage is adequate for people familiar with the area, but doesn’t provide enough information for most motorists. The City of Rogers dealt with a similar project with the Hwy 101 & County Road 144 Reconstruction. They were kind enough to share a couple of their ideas on how they attempted to minimize impacts to their business community located in the construction area.

**Timeframe:**

15 Minutes

**Observations/Alternatives:**

The city of Ramsey has faced a similar situation in the past with the construction of the Sunwood Dr Extension in the summer of 2012. In that case the city fabricated business access signs and placed them at the corners of Bunker Lk Blvd/ Armstrong Blvd and Zeolite St/ Bunker Lk Blvd, directing motorists to the Northstar Market Place and to businesses on the west side of Armstrong Blvd. In the case of the Armstrong Interchange Project, signs would only need to be placed at the Zeolite St/ Bunker Lk Blvd. intersection, because traffic will still have the option to access Sunwood Dr from Armstrong Blvd. PW still has all these signs in our inventory and could easily re-assemble them at little or no additional cost. The City of Rogers did basically the same thing with their signage, except they used one large sign with black text on a white background, instead of individual signs for each business. Again PW could fabricate this type of sign in house. The banner type sign that Rogers used works best were the motorist can view the sign from a stop condition, such as a T-intersection. This type of sign would be hard to read, if a vehicle is traveling at any reasonable speed. This type of banner sign would also fall under Sec. 117-465. of city code that limits the location of temporary signs and the duration that they can remain in place. The city council would need to provide written exceptions for their use, if their use violated city code. The PW department could not fabricate this type of sign and would need to contract out. The business access signage for the area south of Hwy 10 will be more of a challenge, because the intersection of Riverdale Dr and Armstrong Blvd will be closed. The businesses west of Armstrong Blvd (U.S. Bank and Shorewood RV) will only have access from Hwy 10 east bound at Llama St. Traffic east bound on Hwy 10 can enter at Llama St, but west bound traffic will have to travel 3000 ft to the west and make a u-turn and travel back to Llama St. The businesses east of the intersection of Armstrong Blvd/ Riverdale Dr have a more convenient detour route. Traffic east and west bound on Hwy 10 can enter at Traprock St to reach business destinations on the eastern half of Riverdale Dr.

Alternative #1 Follow Anoka County's recommended signage plan

Alternative #2 City to fabricate or purchase and install local business signs. Design and type based on committee discussion

**Funding Source:**

General Fund 0260-6489 Traffic Engineering

**Recommendation:**

Staff recommends alternative #2 City to fabricate or purchase and install local business access signs. Design and type of sign based on committee discussion

**Action:**

Motion to accept staff recommendation of alternative #2 City to fabricate or purchase and install local business access signs. Design and type of sign based on committee discussion or reject staff recommendation and motion to approve alternative based on committee discussion.

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**Attachments**

Sunwood Dr Detour Signage

Typical Detour Signage

Sign Banner

Rogers Business Sign

Staging and Traffic Control plan

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**Form Review**

**Inbox**

Kurt Ulrich

Form Started By: Grant Riemer

Final Approval Date: 03/26/2015

**Reviewed By**

Kurt Ulrich

**Date**

03/26/2015 10:49 AM

Started On: 03/20/2015 02:27 PM

LOCAL  
BUSINESS  
→

COBORN'S	
MCARDY'S MEXICAN RESTAURANT	ANYTIME FITNESS
FANTASTIC SAMS	CARIBOU COFFEE
TOTALLY TAN	L.A. HAIR
HANSEY EYE CLINIC	LITTLE DIAMOND
BARNETT FAMILY DENTISTRY	WISCONSIN DENTISTRY
STATE FARM INSURANCE	PANSEY'S
VERIZON WIRELESS	SUBWAY



LOCAL BUSINESS  
ACCESS

FOLLOW DETOUR

# Business Access

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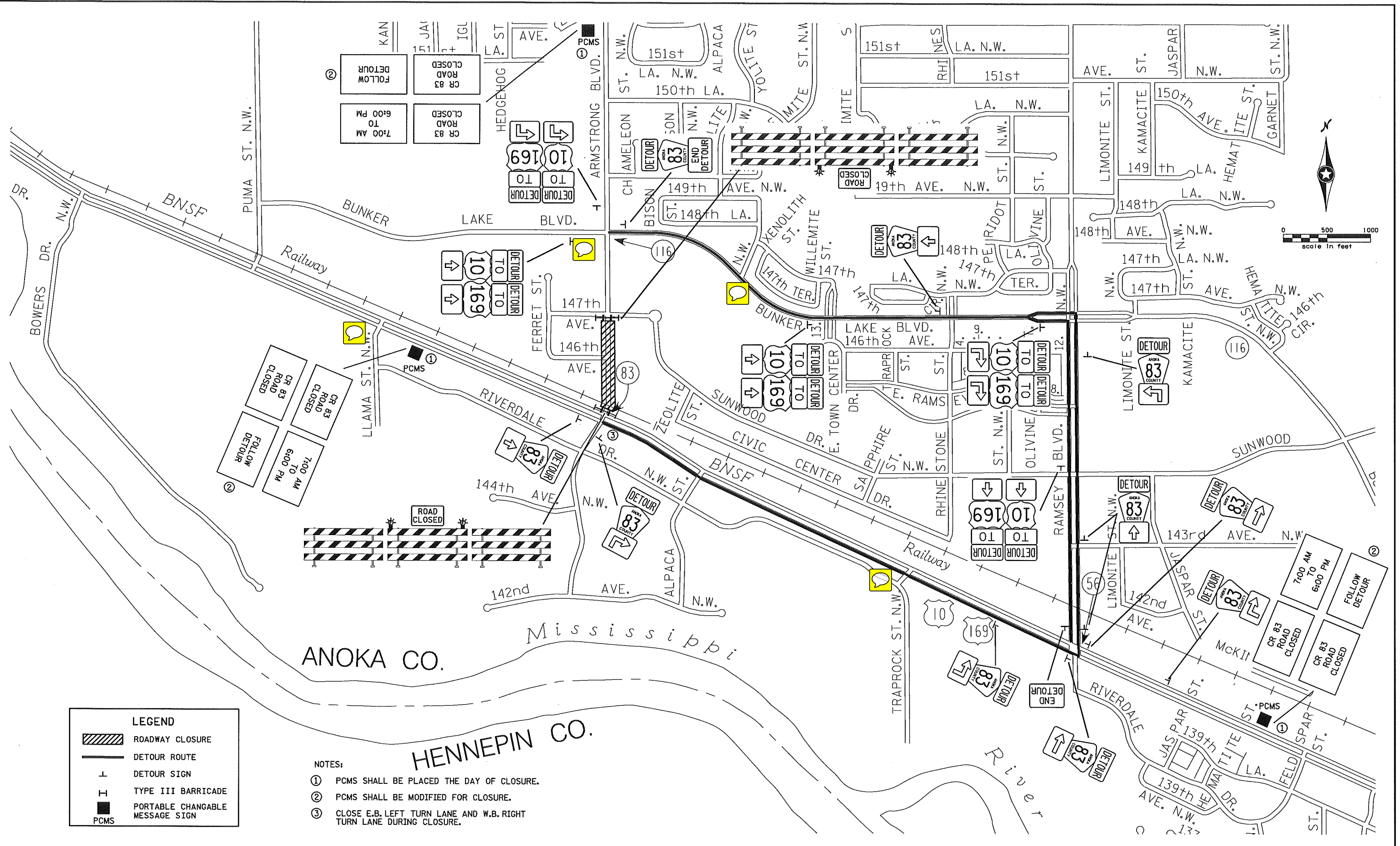


**Pet Food, Etc.** **Pebble Beach Tan** **Sporting Goods**

BUSINESS ACCESS →

ANYTIME FITNESS  
CUSTOM POOLS  
GREEN PLANET  
NORTH BALLETT  
PEBBLE BEACH TAN  
PET FOOD, ETC.  
QP PHOTOGRAPHY  
QUILTED TREASURES  
SCC KITCHEN BATH  
SPORTING GOODS INC  
TARGET SPORTS

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**LEGEND**

- ROADWAY CLOSURE
- DETOUR ROUTE
- DETOUR SIGN
- TYPE III BARRICADE
- PORTABLE CHANGABLE MESSAGE SIGN
- PCMS

- NOTES:**
- ① PCMS SHALL BE PLACED THE DAY OF CLOSURE.
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NO	DATE	BY	CHKD	APPR	REVISION
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I hereby certify that this plan, specification, or 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.

Print Name: **CRAIG J. HASS**

*Craig J. Hass*

Date: 09-12-14 License # 45039

STATE AID PROJECT NO. 002-683-004 199-115-002

DESIGNED BY S. MARTINS

STATE PROJECT NO. 0202-95 (TH 10)

CHECKED BY D. SYMANIETZ

COUNTY PROJECT NO. C. HASS

CITY PROJECT NO. COMM. NO. 0138259

**SRI** ENGINEERS PLANNERS DESIGNERS

Consulting Group, Inc.

**ANOKA COUNTY**

STAGING AND TRAFFIC CONTROL PLANS  
T.H. 10 / C.S.A.H. 83 INTERCHANGE  
NIGHT CLOSURE DETOUR ROUTE

**SHEET**  
107  
**OF**  
586

**Public Works Committee**

5. 5.

**Meeting Date:** 03/31/2015

**By:** Bruce Westby, Engineering/Public Works

**Title:**

Consider Street and Pedestrian Facility Lighting Plans - Center Street and Riverdale Drive

**Purpose/Background:**

**Purpose:**

The purpose of this case is to consider proposed street and pedestrian facility lighting plans for Center Street and Riverdale Drive.

**Background:**

Staff has been working with Connexus Energy to develop street and pedestrian facility lighting plans for both the Center Street and Riverdale Drive projects. Street and pedestrian facility lighting was not included in the construction plans as bid for either project, but staff believes street and pedestrian facility lighting is appropriate for both projects and is seeking input from the Public Works committee on the currently proposed designs attached to this case.

Riverdale Drive Lighting Plans

Connexus Energy has provided the City with a proposal including costs for 27 street lights with 135 watt LED shoebox style light fixtures mounted on 30-foot tall fiberglass poles, as well as 27 pedestrian facility lights with Traditionaire style 50 watt LED light fixtures on 14-foot tall fiberglass poles with 14 of these lights located along the 10-foot wide Mississippi River Trail that will be constructed along the south side of Riverdale Drive this spring, and the other 13 lights along the 10-foot wide City trail on the north side of Riverdale. This design would provide continuous lighting along the entire corridor that is being reconstructed and extended as part of the Riverdale Drive project that will be completed this spring.

A cost estimate for the street and pedestrian facility lights is attached.

Conduits for lighting were installed under each of the driveways and street intersections with the Riverdale Drive project so none of the existing infrastructure will be damaged.

Center Street Lighting Plans

Connexus Energy has provided the City with 3 proposals to date.

The first lighting proposal was submitted on October 3, 2014 and included 2 street lights at the intersection of Center Street and 145<sup>th</sup> Avenue NW with 135 watt LED shoebox style light fixtures mounted on 25-foot tall poles that match the pole and fixture styles along Sunwood Drive, and ten (10) 50 watt LED lights on 14-foot tall poles. Attached is a dated drawing showing this design. The estimated cost for this design was \$39,206.

The second lighting proposal was submitted on February 24, 2015 and included 2 street lights at the intersection of Center Street and 145<sup>th</sup> Avenue NW with 135 watt LED shoebox style light fixtures mounted on 25-foot tall poles that match the pole and fixture styles along Sunwood Drive, and eight (8) 50 watt LED lights on 14-foot tall poles. Attached is a dated drawing showing this design. City staff requested the revised design because the lighting levels between Sunwood Drive and 145<sup>th</sup> Avenue on the first proposal appeared to be excessive so two were removed. The estimated cost for this design was \$34,583.

The third lighting proposal was submitted on March 13, 2015 and included 2 street lights at the intersection of

Center Street and 145<sup>th</sup> Avenue NW with 135 watt LED shoebox style light fixtures mounted on 25-foot tall poles that match the pole and fixture styles along Sunwood Drive, and eight (8) 50 watt LED lights on 14-foot tall poles. Attached is a dated drawing showing this design. City staff requested that one of the lights between Sunwood Drive and 145<sup>th</sup> Avenue be moved to north of 145<sup>th</sup> Avenue to enhance the street lighting on the east side of Center Street between 145<sup>th</sup> Avenue and Ramsey Parkway. The estimated cost for this design is roughly \$35,000.

Conduits for lighting were installed under each of the driveways and street intersections with the Center Street project so none of the existing infrastructure will be damaged.

**Timeframe:**

Staff estimates this case will take approximately 20 minutes to present and discuss.

**Observations/Alternatives:**

**Observations:**

Staff requests input from the Public Works Committee on the proposed lighting levels along both of these corridors. Staff wishes to request City Council approval of the preferred designs for both projects on April 14<sup>th</sup> to allow construction of the lighting systems to be cost-effectively coordinated with the completion of both projects.

**Alternatives:**

Alternative #1 – Motion to recommend City Council approval of the Public Works Committee’s preferred lighting system for each project including: \_\_\_\_\_.

Alternative #2 – Motion of other.

**Funding Source:**

Funding for Center Street lighting will be paid from the TOD grant received from the Metropolitan Council. Funding for the lighting along Riverdale Drive will come from the City's Street Lighting Fund. These expenditures will need to be approved by the City Council on April 14<sup>th</sup>.

**Recommendation:**

Staff recommends alternative #1 based on the Public Works Committee's preferred design for each project.

**Action:**

Recommendation for City Council approval or denial of lighting systems for both projects.

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**Attachments**

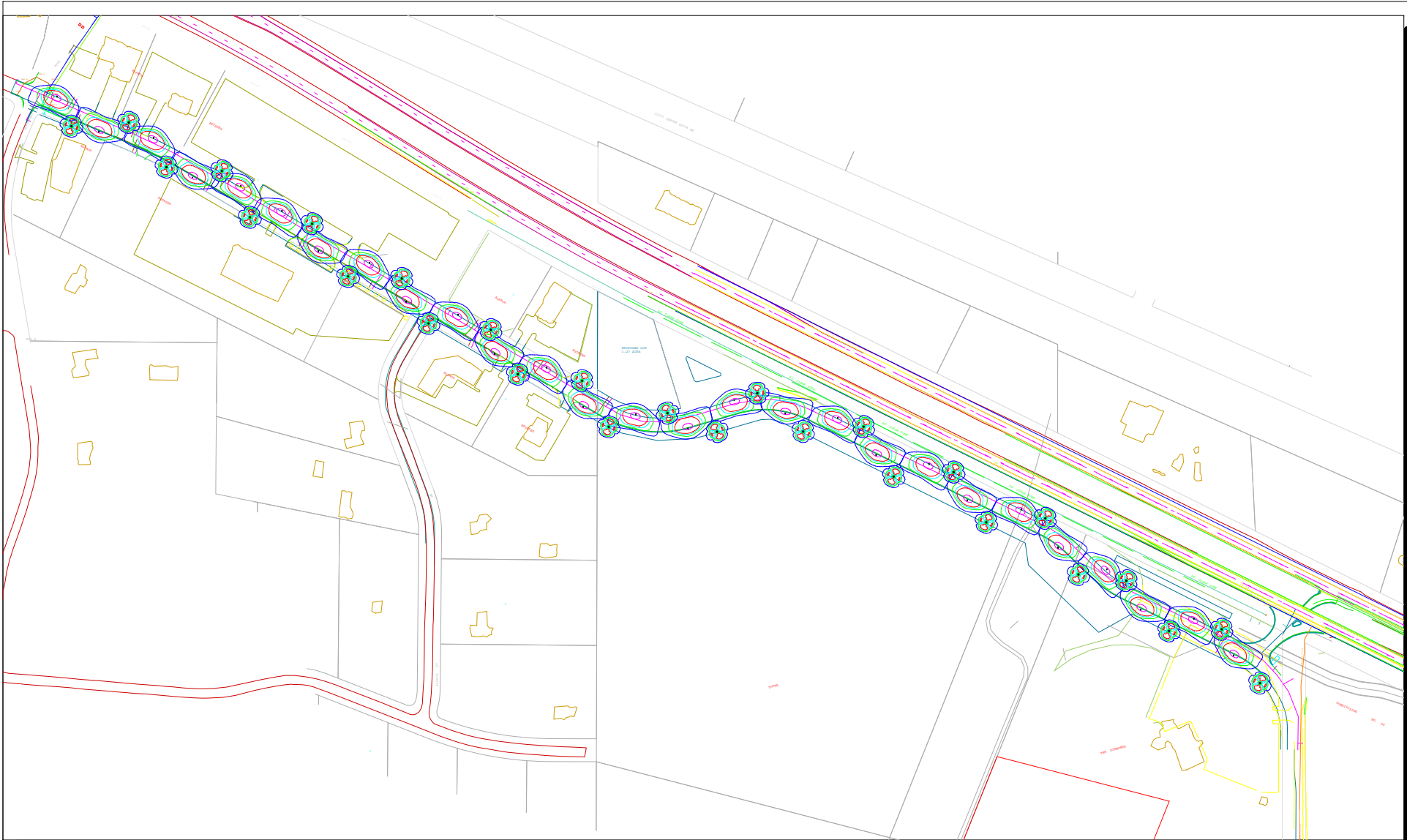
- [Riverdale Drive Lighting Proposal](#)
- [Riverdale Drive Lighting Cost Estimate](#)
- [Center St Proposal 10 03 14](#)
- [Center St Proposal 2 24 14](#)
- [Center St Proposal 3 12 15](#)

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**Form Review**

<b>Inbox</b>	<b>Reviewed By</b>	<b>Date</b>
Grant Riemer	Grant Riemer	03/26/2015 03:23 PM
Kurt Ulrich	Kurt Ulrich	03/26/2015 04:03 PM
Form Started By: Bruce Westby		Started On: 03/06/2015 07:32 AM
Final Approval Date: 03/26/2015		



RIVERDALE PEDESTRIAN LIGHTING  
27 TRADITIONAIRE LED  
FOR PEDESTRIAN LIGHTING  
INSTALLED IN CONJUNCTION  
WITH ROADWAY LIGHTING

CONNEXUS ENERGY  
DAN JOHNSON

763.323.4265  
DAN.JOHNSON@CONNEXUSENERGY.COM



Date:3/24/2015



14601 Ramsey Boulevard  
Ramsey, Minnesota 55303  
763-323-2600  
Fax: 763-506-9541  
1-800-642-1672  
www.connexusenergy.com  
info@connexusenergy.com

March 26, 2015

Bruce Westby  
City of Ramsey  
7550 Sunwood Dr NW  
Ramsey, MN 55303

Mr. Westby,

We have prepared the following preliminary layout and costs to install street lighting and pedestrian lighting along Riverdale Dr. from Armstrong to Traprock. Connexus Energy would install, retain ownership, and provide ongoing maintenance of the lights under our monthly energy and maintenance rate.

**Roadway Fixtures**

(27) 135 Watt LED Shoebox style lights on 30' fiberglass poles	at \$2,592 each
(1) Small Lighting Control Cabinet	at \$2,280
(8,250 feet) wire footage (estimated)	at \$6.65/foot
(230 feet) bore footage (estimated)	at \$9.90/foot
<b>Total for roadway fixtures</b>	<b>\$129,403.50</b>

**Pedestrian Fixtures**

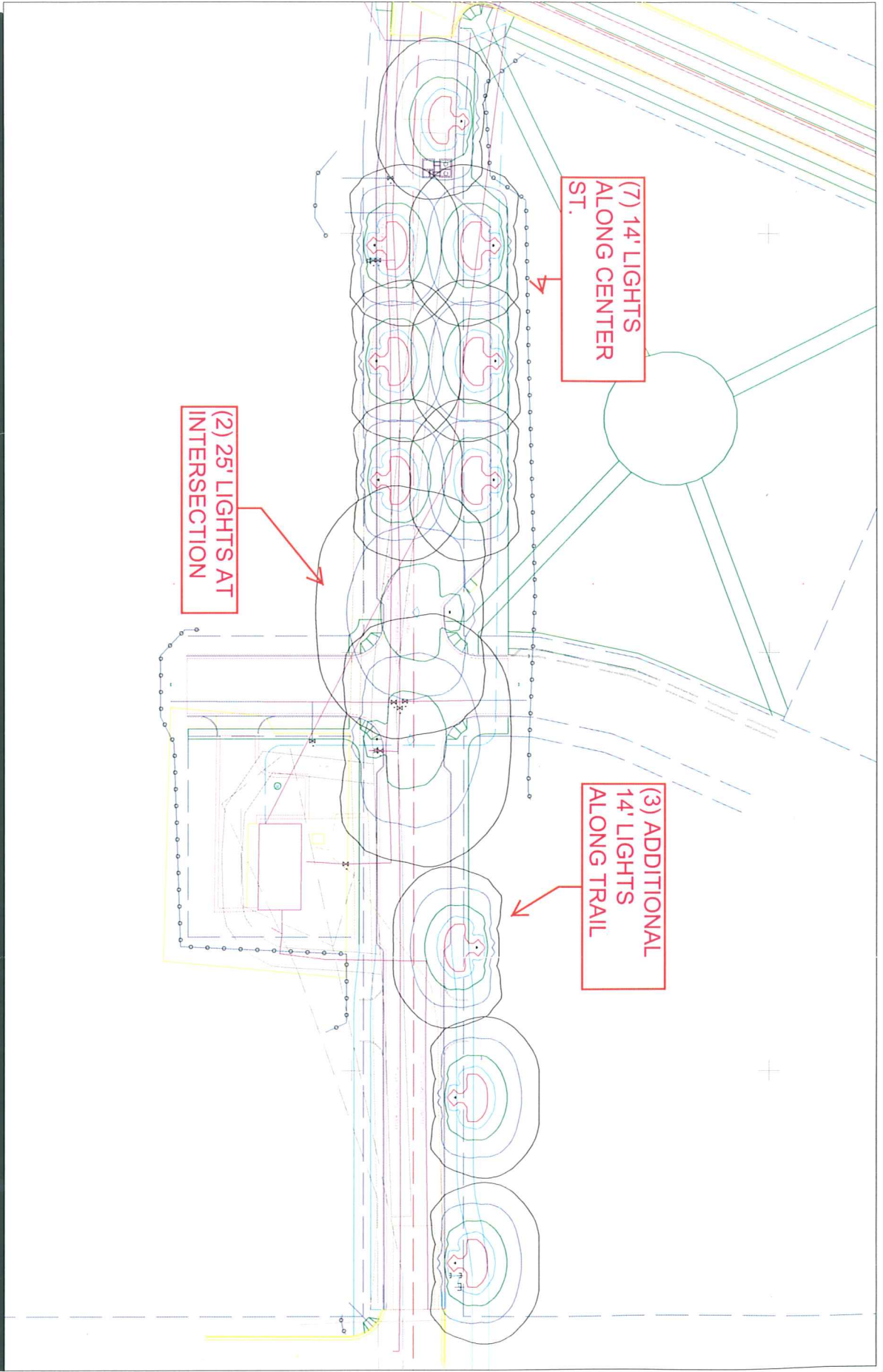
Traditionaire style LED lights on 14' fiberglass poles at \$1,351 each  
(272 feet north side, 396 feet south side) Additional footage at \$6.65/foot

<b>South side trail – 14 lights</b>	<b>\$21,547.40</b>
<b>North side trail – 13 lights</b>	<b>\$19,371.80</b>
<b>Permit administration fee (assumes Ramsey fee waived)</b>	<b>\$25</b>

The above estimate assumes installation at the same time. The exact amount of directional boring required unknown. Necessary directional boring will be charged at an additional \$9.90 per foot. All footage fees will be updated on installed measurements. The lights will be installed to utility specifications, will be unmetered, and will operate on a dusk-to-dawn schedule. If job site conditions beyond our control prevent normal installation procedures or if winter construction is required, additional charges may be applied. Although care will be taken to allow for minimal restoration, Connexus Energy will not be responsible for final restoration of groomed turf.

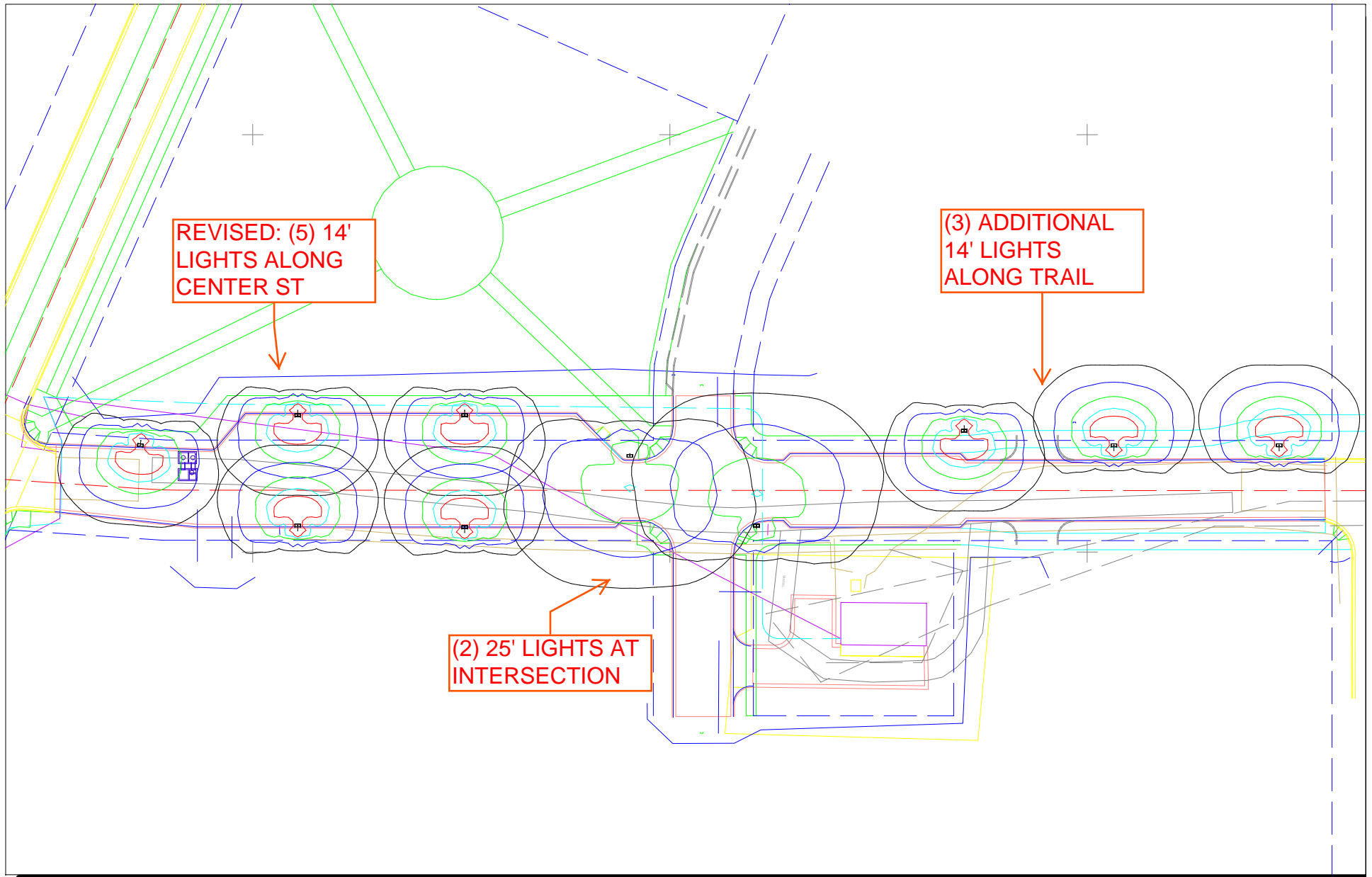
Sincerely,

Dan Johnson  
Distribution Designer



# CENTER ST, RAMSEY

10/3/2014

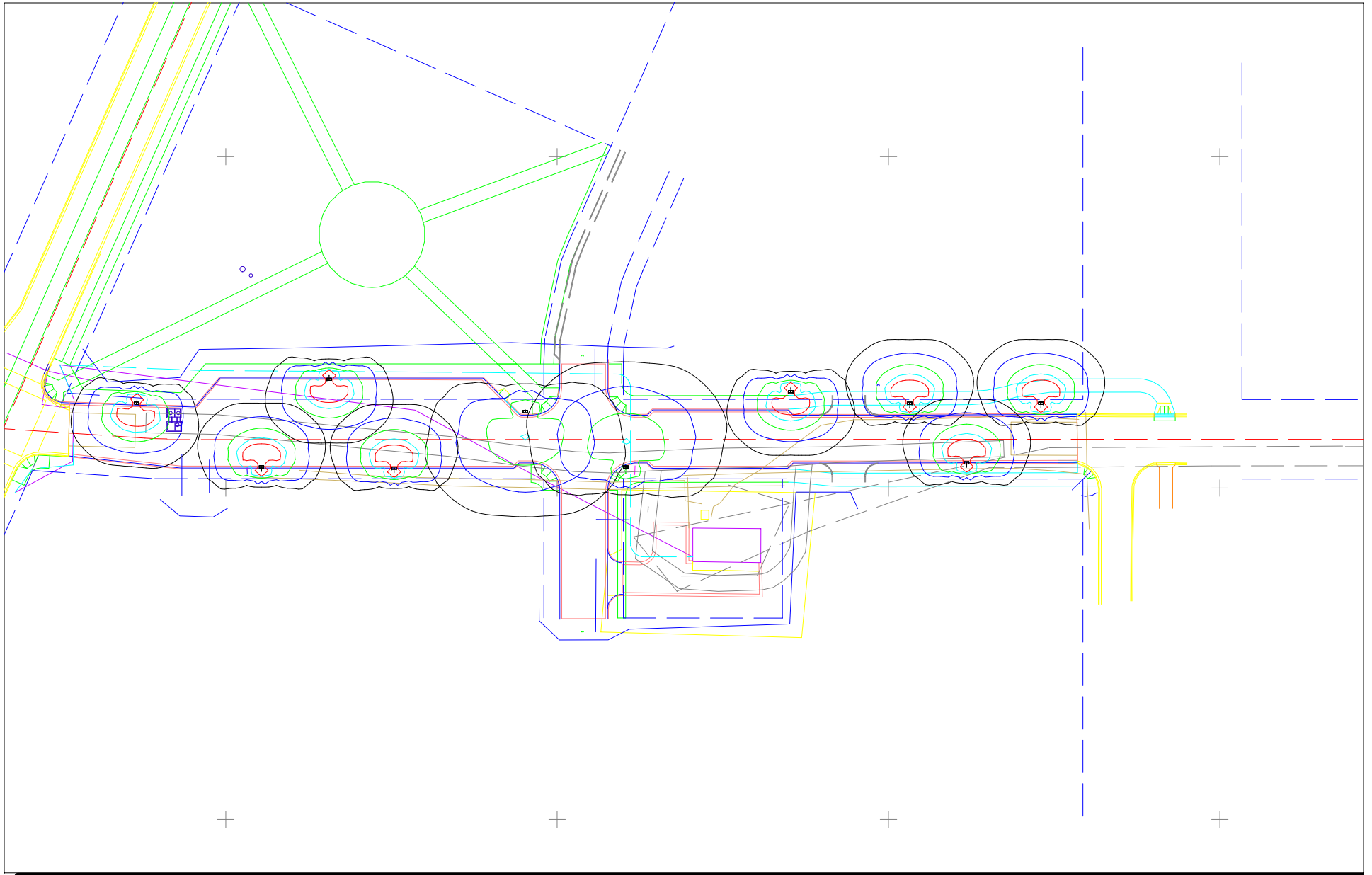


CENTER ST, RAMSEY - LIGHTING



REVISED TO REMOVE TWO LIGHTS PER CITY REQUEST

2/24/2015

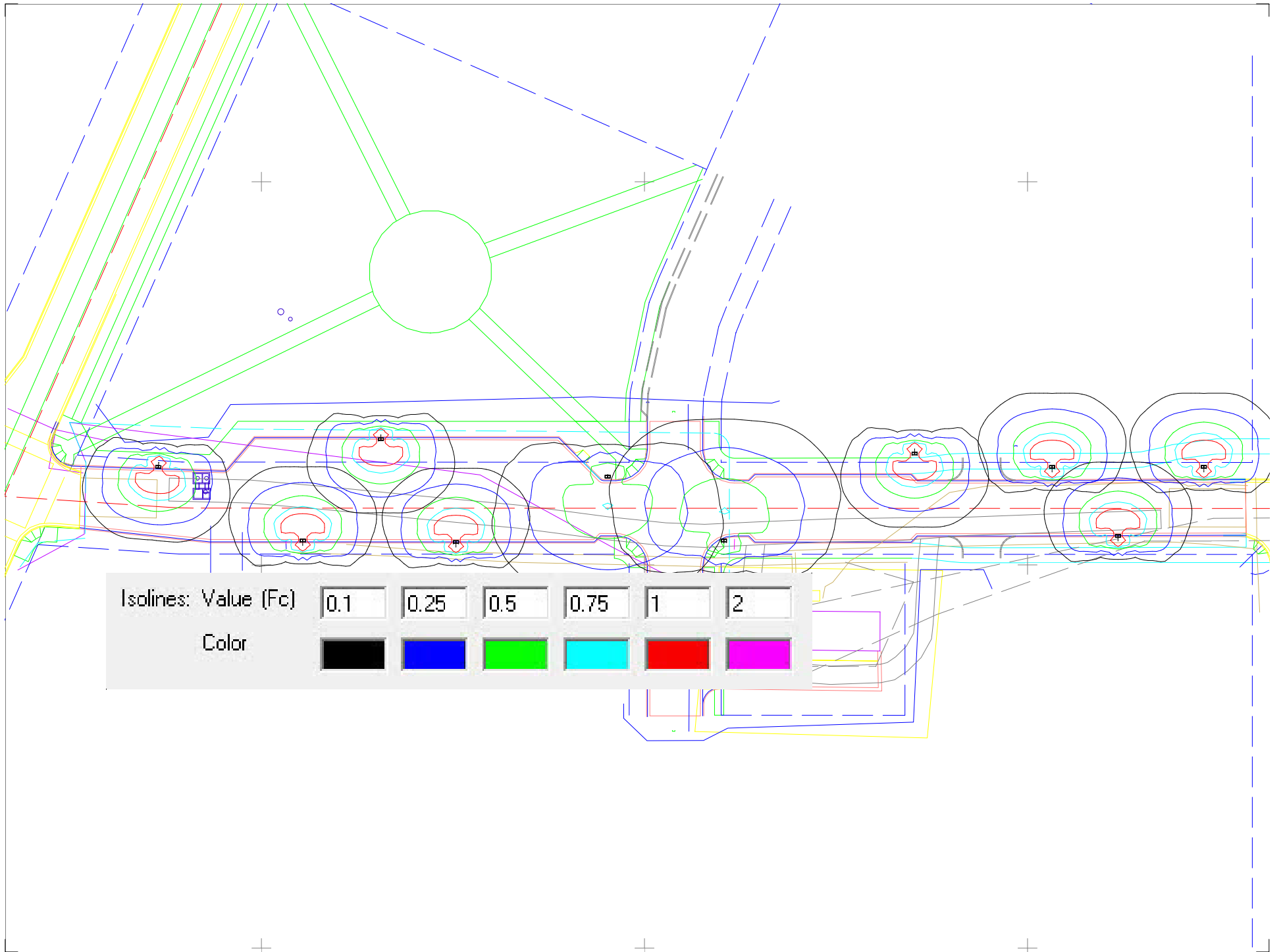


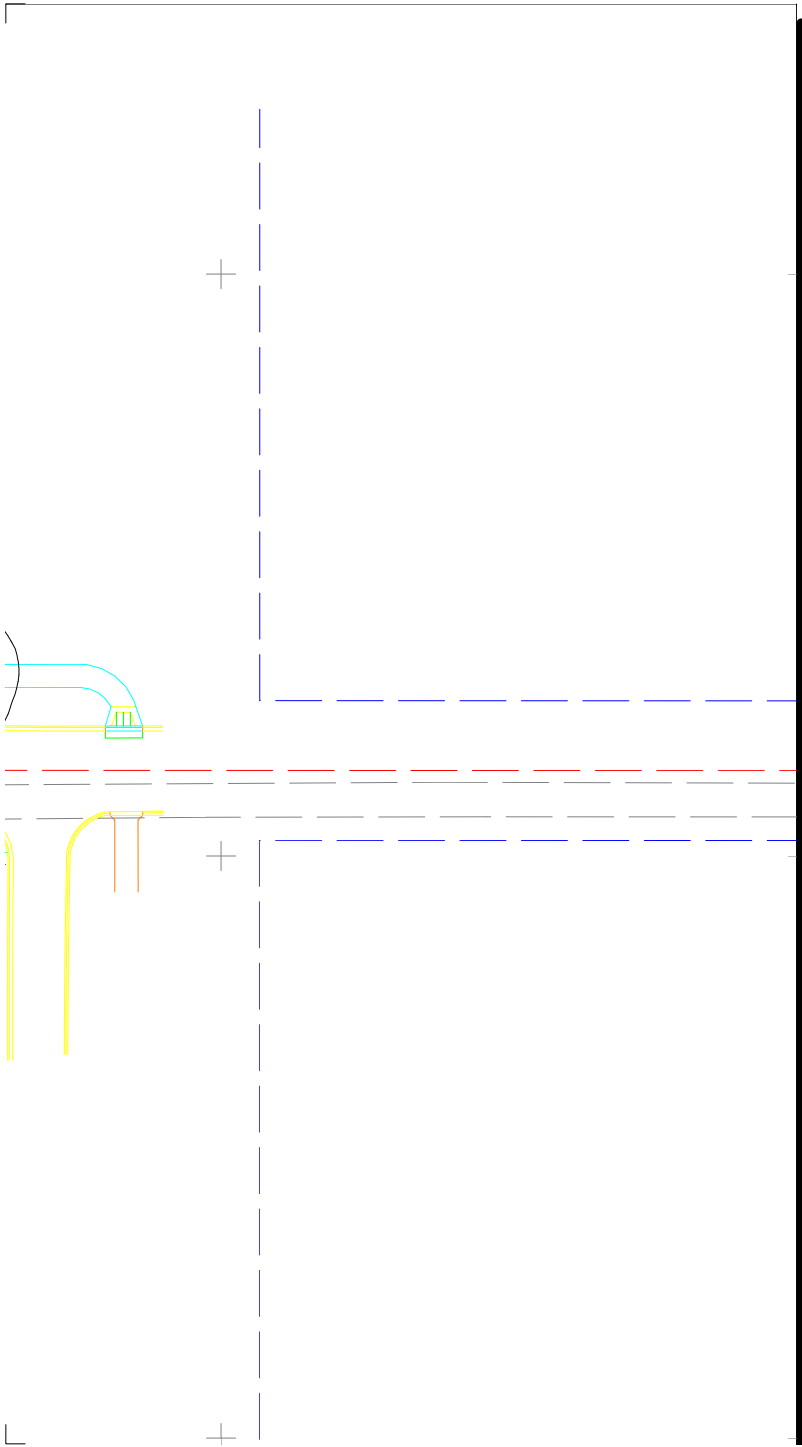
## CENTER ST, RAMSEY - LIGHTING

REVISED TO REARRANGE LIGHTS PER CITY REQUEST



3/12/2015







<b>Luminaire Schedule</b>	
<b>Qty</b>	<b>Label</b>
<b>8</b>	<b>GE454394</b>



	<b>Description</b>
	<b>EASM 50W Type IV</b>



**Public Works Committee**

5. 6.

**Meeting Date:** 03/31/2015

**By:** Grant Riemer, Engineering/Public Works

**Title:**

Request Installation of Priority Street Light at Nowthen Blvd and Iodine Street

**Purpose/Background:**

Under the City's current street lighting policy, priority street lights are to be located at intersections of all County and State trunk highways as well as the City's higher speed MSA streets. Priority lights are 150 watt high- pressure sodium luminaries which are mounted on either existing wooden poles or fiberglass standards with a cobra head style fixture. The City began the installation of priority lights during the mid-90s and budgeted \$25,000 each year for the installation of additional lights until all intersections eligible for priority lights had them in place. This goal was accomplished in 2006. In our CIP under "Priority D" street lighting we have \$15,000 budgeted for years 2014-2018. This fund is established to install additional street lights as future intersections are constructed, existing intersections are deemed to require more lighting, or for installation of lights in special locations. **Note:** Connexus Energy's policy is now to systematically replace all Cobra and Security lights with LED fixtures when they have any maintenance issues, such as a bad ballast or need bulb replacement. A decorative light will only be replaced if they can't repair it.

**Timeframe:**

10-15 minutes

**Observations/Alternatives:**

Currently the intersection of Nowthen Blvd and Iodine Street is lit with a residential style street lamp in the south west corner. There are several other intersections throughout the system lit in this manner, but the majority are lighted with the overhead "cobra" style light. With the addition of the shared entrance of Lord of Life and the Stoney River Assisted Living Center, turning movements at this intersection will increase. Staff feels that the improved lighting will increase safety at the intersection. The new light would consist of a Cobra Style LED light on a 14' arm. Total cost of the installation would be \$2,011. This cost includes the light, adding a transformer to the existing pole and required permits from Anoka County.

Alternative #1 - Do nothing and leave lighting at intersection as it is currently. (This alternative is not supported by staff)

Alternative #2- Install a LED priority street light on the north side of Nowthen Blvd near Iodine Street to the existing pole. (Staff supports this alternative)

**Funding Source:**

Cost center 9603-1730

**Recommendation:**

Staff Recommends alternative #2- Install a LED priority street light on the north side of Nowthen Blvd near Iodine Street to the existing pole.

**Action:**

Motion to accept staff recommendation of Alternative #2 Install a LED priority street light on the north side of Nowthen Blvd near Iodine Street to the existing pole, or a motion to accept alternative recommendation based on committee discussion.

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### Attachments

#### Light Pattern

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### Form Review

**Inbox**

Kurt Ulrich

Form Started By: Grant Riemer

Final Approval Date: 03/26/2015

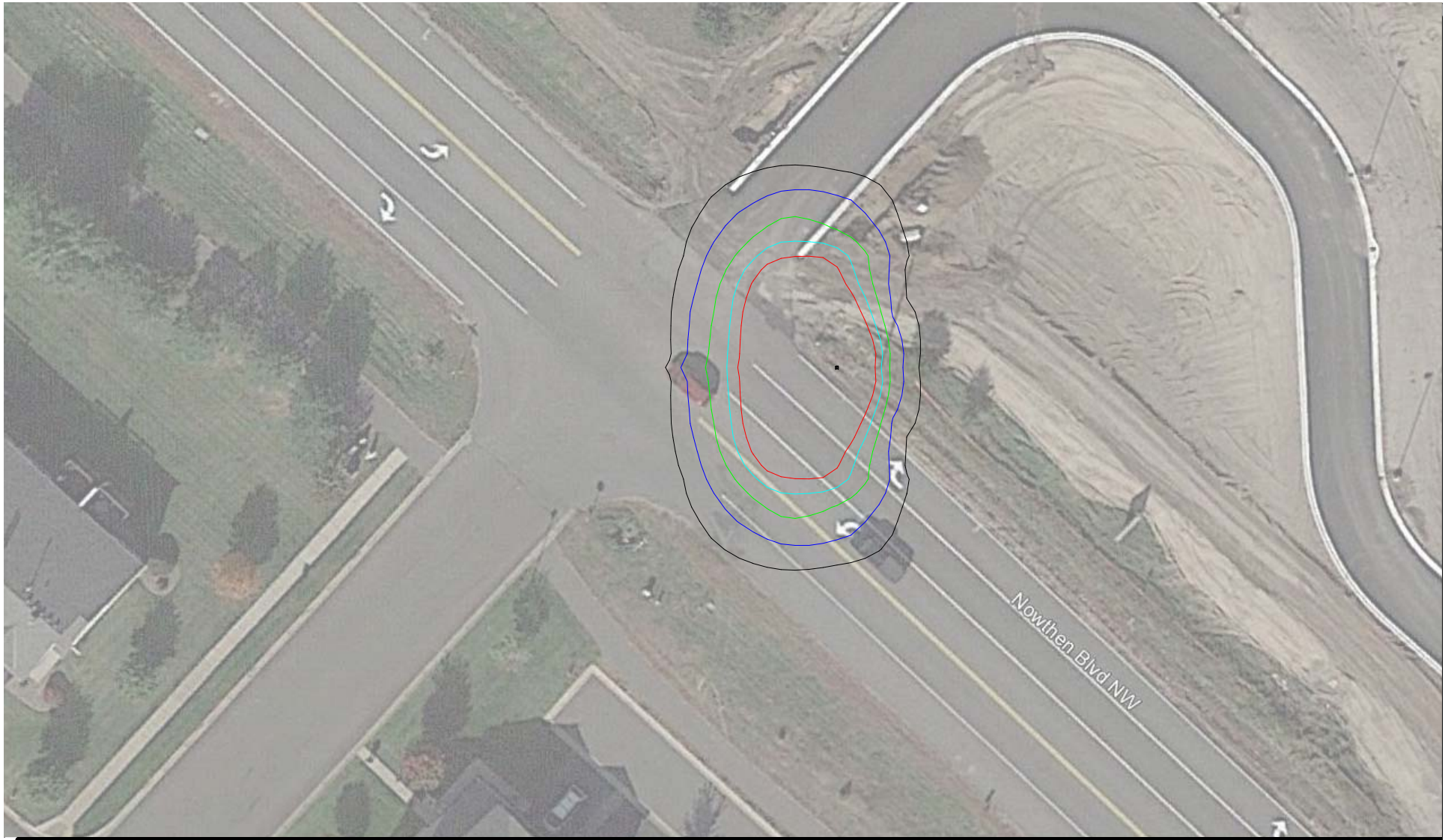
**Reviewed By**

Kurt Ulrich

**Date**

03/26/2015 10:45 AM

Started On: 02/19/2015 09:19 AM



**INSTALL LED COBRA STYLE LIGHT ON 14' ARM  
ON EXISTING POLE, ANGLED TOWARD INTERSECTION**

Date: 2/25/2015

