



Final Environmental Assessment

Safety and Drainage Improvements

REDWOOD FALLS
minnesota

Redwood Falls Municipal Airport (RWF)
Redwood Falls, Minnesota

June 2013



Federal Aviation Administration Great Lakes Region

Condensed Environmental Assessment

The Condensed Environmental Assessment (Condensed EA) is appropriate for Great Lakes Region airport projects when a project:

- Cannot be Categorically Excluded (CATEX),
- Does not have significant impacts, and
- A detailed Environmental Assessment (EA) is not needed.

Proper completion of this document will allow the Federal Aviation Administration (FAA), and/or State Block Grant States, to determine whether the Condensed EA is appropriate for the proposed project and to support a Finding of No Significant Impact (FONSI).

Resource guidance used in preparation of this form comes from the FAA's Order 1050.1E, "Environmental Impacts: Policies and Procedures" or subsequent revisions. This order incorporates the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA), as well as the US Department of Transportation's environmental regulations (including FAA Order 5050.4B or subsequent revisions), and other federal statutes and regulations. Accordingly, this form is intended to meet the Federal regulatory requirements of an EA.

This format is appropriate if the proposed project's involvement with, or impacts to, extraordinary circumstances are not notable in number or degree and do not rise to the level of a full EA.

Consult with an Environmental Specialist at the FAA to determine if this form is appropriate for your project.

To complete this form, the preparer should describe the proposed project and provide information on any potential impacts of the proposed project. It will be necessary for the preparer to have knowledge of the environmental features of the airport. Although some of this information may be obtained from the preparer's own observations, environmental studies or other research may be necessary. Complete consultation with applicable Federal, state, and local resource agencies responsible for protecting specially protected resources prior to submitting this form to the FAA.

This form is not meant to be a stand-alone document. Rather, it is intended to be used in conjunction with the applicable orders, laws, and guidance documents, and in consultation with the appropriate resource agencies.

An appendix that contains all the figures, correspondence, and completed studies (or executive summaries of completed studies) should accompany the completed Condensed EA when submitted to the FAA for final approval.

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Project Location:

Airport Name:	Redwood Falls Municipal Airport	Airport Identifier:	RWF		
Address:	500 Airport Road				
City:	Redwood Falls	County:	Redwood	State:	MN

Airport Sponsor Information:

Point of Contact:	James Doering				
Address:	333 Washington Street, PO Box 526				
City:	Redwood Falls	State:	MN	Zip Code:	56283
Telephone Number:	507.637.5755				
Email:	jdoering@ci.redwood-falls.mn.us				

Condensed EA Preparer Information:

Point of Contact:	Peter Langworthy, Bolton and Menk, Inc.				
Address:	12224 Nicollet Avenue				
City:	Burnsville	State:	MN	Zip Code:	55337
Telephone Number:	(952) 890-0509				
Email:	peterla@bolton-menk.com				

Identify all Attachments to this Condensed EA:

Include aerial photos, maps, plans, correspondence, and completed studies (or executive summaries)

Figure 1 – Project Location; Figure 2 – Proposed Actions; Figure 3 – Water Resources; Figure 4 – Relocation Parcel; Figure 5 – Salmon Property Appendix A – Airport Drainage Study, Preliminary Engineering Report; Appendix B – Section 106 Correspondence; Appendix C – Section 4(f) Documentation; Appendix D – Early Coordination Correspondence; Appendix E – US Fish and Wildlife Species Information; Appendix F – NRCS Coordination for Farmland Impacts; Appendix G – Wetland Investigation and Delineation Report; Appendix H – Agency Comments on Draft EA; Appendix I – Public Comments on Draft EA
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Part I - General Project Identification

PURPOSE AND NEED:

Describe the problem that the project will address and the goals of the project.

Purpose

The purpose of the proposed improvements at the Redwood Falls Municipal Airport (RWF) is to bring the airport into compliance with FAA and State requirements and environmental regulations. This will be achieved through land use control, elimination of airspace obstructions, improvements to the parallel taxiway, and stormwater management.

Need

RWF is a general aviation airport located in the City of Redwood Falls (Figure 1). The airport has two runways, Runway 12/30 (paved) and Runway 5/23 (turf). Runway 12/30 is 4,001 feet long by 100 feet wide with a partial paved parallel taxiway. Runway 5/23 is a turf crosswind runway that is 2,081 feet by 200 feet wide. RWF has approximately 9,800 operations a year and 17 based aircraft.

Airspace Obstructions - RWF has airspace obstructions that penetrate the Federal Aviation Regulation (FAR) Part 77 airspace surfaces for all runways. Runway 5 has a displaced threshold due to obstructions (light poles) within the approach. The FAR Part 77 *Safe, Efficient Use and Preservation of the Navigable Airspace* defines a set of imaginary airspace surfaces that surround an airport that include the primary, approach, transitional, horizontal and conical surfaces. These surface dimensions vary depending on the runway surface type, configuration, and approach type. FAA recommends airspace obstructions be lowered, removed or lighted.

Land Use Control - RWF currently does not have control for the entire Runway Protection Zone (RPZ) or Clear Zone (CZ) for Runway 5, Runway 12 and Runway 23. The FAA RPZ and the Mn/DOT Runway CZ are trapezoidal shaped areas centered on the runway centerline with the purpose of enhancing the protection of people and property on the ground. RPZ dimensions are defined by FAA Advisory Circular 150/5300-13 *Airport Design* as a function of the critical aircraft type and approach visibility minimums. CZ dimensions are defined by Mn/DOT Aeronautics rules and regulations for approach type and runway category. Both the FAA and Mn/DOT recommend that airport sponsors have sufficient property interest in the RPZ and CZ to ensure compatible land use.

RWF also does not own or control all of the area within the Building Restriction Line (BRL). The BRL defines the limits of development for structures, except facilities required by their function to be located near runways and taxiways. The FAA recommends that an airport sponsor have sufficient property interest in the BRL to ensure compatible land use.

Parallel Taxiway - Runway 12/30 has a full length parallel taxiway that is partially paved. The majority of the taxiway is turf. The turf taxiway surface is not consistently able to accommodate the weight of larger aircraft. In addition, it is closed during periods of high moisture saturation and during winter months. This requires a pilot to taxi an aircraft along the length of the runway to reach the end of Runway 12 for takeoff. It also requires a pilot to back-taxi on the runway to reach the Building Area after landing on the Runway 30 end. The runway is intended for aircraft takeoff and landing operations. Aircraft taxiing on the runway limits the use of the runway by other aircraft. In addition, the airport does not have air traffic control on the airfield. Therefore, pilots rely on visibility to maintain safe separation of operations. Reliance on visual contact is a common safety practice, but visibility from an airplane cockpit while on the ground is limited by

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the aircraft wing location, as well as windows that are designed to provide visibility at the elevation of the aircraft (i.e. to see other aircraft at the pilot's elevation while in flight).

Drainage - RWF is currently divided into three drainage areas (North, South and Northeast as depicted on Figure 1 in the airport Drainage Study included as **Appendix A**). The South Drainage Area is comprised of approximately 132 acres and is served by a 12-inch drain tile that is part of the County Ditch 48 system. The drain tile is in poor condition resulting in limited hydraulic capacity and is undersized for the drainage area. After significant rain events, there is standing water in areas west of the terminal/hangar area for extended period of time. This stresses/kills the grass and is a potential wildlife attractant.

PROPOSED ACTION (PREFERRED ALTERNATIVE):

Describe the preferred alternative in detail, including how the project fits into the airport layout plan.

The Proposed Action includes the following components (**Figure 2**):

Obstruction Removal - Obstructions will be cleared for the existing runway configuration to meet FAR Part 77 other-than-utility instrument requirements (34:1 approach slope – 34 feet horizontal, 1 foot vertical) for Runway 12/30 and visual utility requirements (20:1 approach slope) for Runway 5/23. The obstruction removal includes 12.7 acres of tree removal and the lowering/removal/mitigation of light poles within the Runway 5 approach to remove the displaced threshold currently in place. To be conservative, the proposed action includes tree removal rather than tree trimming. Tree trimming will be considered during development of the project and incorporated into the project as possible.

Land Use Control – Land control through acquisition or easements for 45.1 acres of land within the FAA RPZ, Mn/DOT CZ, airspace obstruction areas, and areas within the BRL. A planned future update to the airport land use and airspace zoning ordinance will also help protect area surrounding the airport from potential new airspace and land use hazards.

Parallel Taxiway - A 2,900' x 35' paved taxiway will be constructed to establish a paved full-length parallel taxiway for Runway 12/30. This will reduce runway occupancy time, increase safety and the efficiency of aircraft operations at RWF, and meet FAA recommendations for this airport.

Stormwater Management - A stormwater management system will be constructed to improve existing drainage conditions in the South Drainage Area and to meet NPDES requirements associated with the new impervious surfaces associated with the proposed parallel taxiway. This system will comply with requirements of FAA AC 150/5200-33B Hazardous Wildlife Attractants On or Near Airports for safety. A drainage basin as well as conveyance piping with discharge ultimately to County Ditch 54 is proposed. The conveyance system would be sized to be consistent with longer term development on the airport.

OTHER ALTERNATIVES CONSIDERED:

Describe alternatives considered, including the Do-Nothing Alternative

Alternatives that were considered included the following:

- Parallel Taxiway northeast of Runway 12/30 versus southwest

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- Drainage Basin and Outlet Locations

Further information is provided below regarding the assessment of these alternatives and selection of the preferred alternative.

Explain in detail the reason for eliminating each non-preferred alternative.

Taxiway Location – It would be possible to locate the parallel taxiway northeast of the primary runway as opposed to southwest. However, the southwest location is preferred for operational reasons. It will be on the same side of Runway 12/30 as the terminal and hangar areas and taxiing movements will thus eliminate the need to cross the primary runway. The northeast location for the parallel taxiway would not provide any significant benefits from an environmental perspective relative to the preferred southwest location.

Drainage Basin – Approximately 500 feet of the new taxiway (0.85 acre, in the northwest portion) will be within the North Watershed of the airport which recently had a stormwater treatment system developed which can effectively accommodate the new taxiway drainage, complying with applicable NPDES and FAA requirements. However, drainage from the remaining 1.4 acres of the new impervious taxiway surface will require treatment per NPDES requirements. Various options were reviewed to handle this rather than the construction of the proposed basin as identified on **Figure 2**. A drainage outlet to the north is not feasible because of the unstable ravine conditions that would convey the additional run off. The drainage outlet option to the west into an existing wetland complex is not feasible because the wetland grade is higher than the proposed basin elevation and because there is no existing drainage system readily available. The drainage outlet option to the southwest to an existing drainage serving an industrial area system is not feasible because of the grade difference from east to west. Additionally, this system is currently undersized.

AIRPORT DESCRIPTION:

Fill out the following information if the proposed project includes any changes to the existing airport design

	Existing		Proposed	
Runway:	<u>12/30</u>		<u>No change</u>	
Length:	<u>4,001</u>	ft.	<u>No change</u>	ft.
Width:	<u>100</u>	ft.	<u>No change</u>	ft.
Pavement Strength:	<u>32,000 lbs. (SW), 42,000 lbs. (DW)</u>		<u>No change</u>	
NAVAIDS:	<u>LPV/GPS, VOR, PAPI, MIRL,REIL</u>		<u>No change</u>	Federally Owned: No
Approach Minimums:	<u>280' MDA, 1 mile vis.</u>		<u>No change</u>	
Critical Aircraft (e.g. B-II) :	<u>B-II</u>		<u>No change</u>	
RPZ Area:	<u>1,000' x 500' x 700'</u>		<u>No change</u>	

	Existing		Proposed	
Runway:	<u>05/23</u>		<u>No change</u>	
Length:	<u>2,081</u>	ft.	<u>No change</u>	ft.
Width:	<u>200</u>	ft.	<u>No change</u>	ft.
Pavement Strength:	<u>N/A – Turf</u>		<u>No change</u>	

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NAVAIDS:	None	No change	Federally Owned: No
Approach Minimums:	N/A - Visual	No change	
Critical Aircraft (e.g. B-II) :	A-I (Small)	No change	
RPZ Area:	1,000' x 250' x 450'	No change	

Remarks: MN/DOT Clear Zone: 1,700' x 500' x 1010' (Runway 12/30, other-than-utility); 1,200' x 250' x 490' (Runway 5/23, utility). Approach slope: 34:1 (Runway 12/30 other-than-utility); 20:1 (Runway 5/23, utility).

LAND ACQUISITION:

Land Use Types	Amount (acres)	
	Permanent	Easement
Residential	3.0	
Commercial	0.0	
Agricultural	26.9	
Forest	8.7	
Wetlands	1,500 SF within Forest	
Other: Open/Grassed	4.5	
Other: Transportation	2.0	
TOTAL	45.1	

Remarks:

PROJECT SCHEDULE:

Discuss the proposed schedule for the project, including permits and construction.

2012 – Complete NEPA Process
 2013 – Acquire land for RPZ, Clear Zone for Runway 23, and for BRL for Runway 12/30
 2014 – Mitigate Runway 5/23, other Transitional FAR Part 77 obstructions
 2016 – Acquire land for RPZ, obstruction removal for Runway 12
 2017 – Mitigate Runway 12/30 FAR Part 77 obstructions
 2017 – Construct parallel taxiway, drainage improvements

AFFECTED ENVIRONMENT:

Succinctly describe existing environmental conditions of the potentially affected area.

As can be seen on **Figure 2**, the airport is surrounded by the following land uses and features:

- To the north: agricultural fields, rural residential housing, wooded ravine
- To the east: wooded ravine, agricultural fields, aggregate mining operations
- To the south: agricultural fields, truck and equipment sales, light industrial, State Highway 19,
- To the west: light industrial, agricultural fields, County Highway 101

The Redwood River is approximately one mile west-northwest of the northwest end of Runway 12/30. The Minnesota River is approximately 1.5 miles north-northeast of Runway 12/30. The confluence of these rivers is approximately 1.4 miles directly north of the northwest end of Runway 12/30. A steep,

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wooded ravine dropping down to the Minnesota River valley begins approximately 1,000 feet northeast of the Runway 12/30.

Further information regarding the affected environment is provided as appropriate under the respective environmental impact categories (e.g. Wetlands).

Part II – Environmental Consequences

Air Quality

	Yes	No
Is the project in an air quality nonattainment or maintenance area?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If Yes, is the:		
Project listed on Presumed to Conform List	<input type="checkbox"/>	<input type="checkbox"/>
Project accounted for in State Implementation Plan	<input type="checkbox"/>	<input type="checkbox"/>
Project emissions below applicable <i>de minimis</i> levels	<input type="checkbox"/>	<input type="checkbox"/>
Does the project require an air quality analysis?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Does the project require an air quality analysis for construction impacts?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Remarks: To meet NEPA requirements as defined in the *FAA Air Quality Handbook*, an air quality analysis is required at General Aviation airports with more than a total of 180,000 general aviation and air taxi annual operations. Existing and future RWF operational levels are substantially below this threshold. Neither the Proposed Action nor the No Build alternative will have air quality impacts.

Coastal Areas

	Yes	No
Is the project located in a Coastal Barrier Resource System?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is the project located in a Coastal Zone Management Program?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If Yes, Is a consistency finding required?	<input type="checkbox"/>	<input type="checkbox"/>

Remarks: The Proposed Action is not located in a Coastal Barrier Resource system as defined under the Coastal Barrier Resources Act of 1982 (amended by the Coastal Barrier Improvement Act of 1990). It is not in any Coastal Zones as defined under the Coastal Zone Management Act of 1972. Neither the Proposed Action nor the No Build alternative will have Coastal Area Impacts.

Compatible Land Use

	Yes	No
Will proposed action comply with local/regional development patterns for the area?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is the proposed project located near or will it create a wildlife hazard as defined in FAA Advisory Circular 150/5200-33, "Wildlife Hazards on or Near Airports"?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Has coordination with USDA Wildlife Services occurred?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is a Wildlife Assessment required?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Remarks: The project will enhance land use compatibility by providing Airport acquisition and control of land within the FAA Runway Protection Zones, Mn/DOT Runway Clear Zones, airspace obstruction areas, and areas within the Building Restriction Line (BRL).

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Property acquisition to obtain fee control over the Runway 12 Mn/DOT Clear Zone would include 13.2 acres northwest of River Road. A portion of the 12.4 acre portion of the Salmon property is enrolled in the Conservation Reserve Enhancement Program (CREP); a combination of the Federal Conservation Reserve Program (CRP) and the Minnesota Re-invest in Minnesota (RIM) program. In this instance the portion of the Salmon property in CREP includes a 15-year CRP contract dated July 5, 2000, expiring in 2015. The CRP is not eligible for renewal and upon expiration, the parcel reverts solely to the RIM program per the Perpetual Rim Conservation Easement held by the Minnesota Board of Water and Soil Resources (BWSR) dated September 28, 2000. A portion of the property is also under an existing aviation easement as depicted on Figure 5.

The property was enrolled in CRP under a Wetland Restoration practice. If alteration to the vegetation (tree topping or removal) on the property under easement would be proposed prior to expiration of the CRP contract, coordination with the USDA Farm Service Agency (FSA) would be required to ensure the alteration is suitable with the wetland restoration goals established for the site. If alteration to the vegetation on the property would be proposed after expiration of the CRP contract, coordination with the Redwood Soil and Water Conservation District (SWCD) would be required. The property is considered a grassland practice under the RIM program and tree removal is not opposed when maintaining grasslands. The current property owner performs routine burning to discourage encroachment of trees and other woody vegetation.

The Perpetual RIM Conservation Easement does not prohibit transfer of ownership, but the RIM easement and restrictions would remain with the property in perpetuity. If only a portion of the parcel were acquired, the perpetual easement would remain on both fragments of the original parcel. The property must always be kept with natural vegetative cover and the restored wetland area maintained. The remainder of the Salmon parcels, both within and outside of the Conservation Easement, would be allowed to continue under the respective easement and/or zoning restrictions. However, acquisition of a portion of the parcel could pose a challenge to the prescribed burning practices and limit recreational opportunities of the current owner.

If the City were unable to acquire the property in fee, an extension in the area of the existing aviation easement to include the outer portions of the Mn/DOT Clear Zone could provide alternative protection. The CREP property represents the majority of the property necessary to allow fee control over the Mn/DOT Clear Zone. Even without fee acquisition, the perpetual Conservation Easement requiring maintenance of natural vegetative cover would serve as a secondary protection against incompatible development.

The detention basins that would be used on the airport property will be 48-hour dry ponds so as not to attract water fowl or other birds, per FAA Advisory Circular 150/5200-33.

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Neither the Proposed Action nor the No Build alternative will have Compatible Land Use impacts.

Construction Impacts

Will construction of the proposed project:

- Increase ambient noise levels due to equipment operation
- Degrade local air quality due to dust, equipment exhaust, or burning debris
- Deteriorate water quality when erosion or pollutant runoff occur
- Disrupt off-site and local traffic patterns

Yes	No
X	
	X
	X
	X

Remarks:

The Proposed Action involves three construction elements: a) taxiway pavement, b) stormwater management enhancements (detention basin and conveyance), and c) tree trimming and/or removal. The work for first two of these elements will be typical for each respective type of project, and no abnormal conditions or impacts are anticipated. There will be some noise created by construction equipment, but this will be temporary in nature and will be typical of the type of construction involved. There will be some dust and equipment exhaust associated with the construction activities, but not at levels that will violate applicable regulations or significantly degrade local air quality conditions. There will be no on-site burning of debris.

More than one acre of land will be disturbed. Therefore, a National Pollutant Discharge Elimination System (NPDES) construction permit will be obtained, and associated Best Management Practices (BMPs) will be implemented during construction activities. If the work elements are constructed as separate projects, NPDES requirements and any other applicable construction-related regulatory requirements will be met for each element.

Tree removal activities in ravine areas have the potential to result in erosion and related impacts. City staff has consulted the DNR Southern Region Forester on the project (August 2012). Based on this consultation the following tree removal approach will be implemented:

- Remove only trees that are obstructions or are relatively close to penetrating airspace limits.
- Leave root systems in place during the removal of existing trees (i.e., no clearing and grubbing). Spray stumps with herbicide to restrict re-growth.
- Plant native grasses on the slopes around the stumps to further help hold soils in place.

City staff will coordinate further with DNR staff during the preparation of final plans and specifications for tree removal in the ravine area.

The No Action alternative does not involve construction and thus would have no impacts.

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Cultural Resources

Results of Research

Eligible or Listed Resources Present:	Yes	No
Archaeology		X
History/Architecture		X

Project Effect

No Historic Properties Affected	Yes	N/A	SHPO/FAA Approval Dates
	X		FAA – September 2012; SHPO October 6, 2012
No Adverse Effect			
Adverse Effect			

Completed Documentation

Historic Properties Short Report	Yes	N/A	SHPO/FAA Approval Dates
Historic Property Report	X		FAA – September 2012; SHPO October 6, 2012
Archaeological Records Check/ Review			
Archaeological Phase I Survey Report	X		FAA – September 2012; SHPO October 6, 2012
Archaeological Phase II Investigation Report			
Archaeological Phase III Data Recovery			
APE, Eligibility and Effect Determination	X		FAA – September 2012; SHPO October 6, 2012
Memorandum of Agreement			

Describe all efforts to document cultural resources using the categories outlined in the remarks box. Include any additional Section 106 work required, such as mitigation or deep trenching.

Remarks: **Area of Potential Effect (APE):** The APE is the area or areas an undertaking may directly or indirectly affect any historic resource, if such resources exist. The APE (**Appendix B**) for this project includes airport property, land proposed for acquisition, and all property within the viewshed (the area which the project may visually impact).

Coordination with Consulting Parties: In September 2011, the FAA sent the SHPO the APE for review. The SHPO concurred with the APE in a letter dated October 6, 2011 (**B**).

Archaeology: The archaeological field survey identified one isolated artifact (21RW0073) in the area where Pond C was proposed. The artifact was observed on the surface of an agricultural field. Four radial shovel tests did not identify any additional cultural resources. The artifact appears to be an isolated artifact, which is not eligible for listing on the National Register of Historic Places (NRHP). In addition, Pond C has been removed from the project.

Historic Properties: The Terminal Building, a North Memorial Air Care Building, two heavily modified T-Hangars, and a small moveable shed were reviewed to determine if any of the structures are eligible for listing on the NRHP. All of the buildings were constructed between the late 1970s to present except for the two T-Hangars. The T-Hangars were originally constructed in the late 1940s to early 1950s. They have been altered with the expansion of additional T-Hangars over the years and the replacement of a gabled roof. Due to the alterations, the T-Hangars no longer retain their historic character and were found not to be eligible for listing on the NRHP.

Documentation, Findings: The FAA has determined that a finding of No Historic Properties Affected is appropriate for this project (**Appendix B**). The SHPO Concurred with this finding.

Public Involvement: Notification of the No Historic Properties Affected finding was provided during

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the public involvement period for the Draft EA.

Department of Transportation Section 4(f)

Does the project area contain:	Yes	No
Publicly owned Park/Recreation Areas	X	
Wildlife and/or Waterfowl Refuges		X
Historic Properties		X

Completed Documentation

Individual Section 4(f) Evaluation		X
“De minimis” Impact	X	

FAA Approval

September 24, 2012 (Preliminary Finding)

Only to be used for the following circumstances:

- o Historic Properties: project includes No Adverse Effect Finding with SHPO/THPO concurrence
- o Parks, Recreation Areas, or Wildlife/Waterfowl Refuges: project will not adversely affect activities, features, and attributes of the property and the official with jurisdiction concurs with the finding

Refers to Section 4(f) of the Department of Transportation Act (now 49 USC § 303). Discuss De minimis impacts below. Individual Section 4(f) documentation must be separate Draft and Final documents.

Remarks: Two or three small trees will be removed adjacent to a City-owned trail along County Highway 101 west of the airport. The FAA has determined, in a preliminary Section 4(f) Finding (September 24, 2012), that the proposed federal action will not significantly affect the pedestrian/bike trail and therefore constitutes a *de minimis* Section 4(f) impact. The City has concurred with this determination in a letter dated September 26, 2012. The preliminary Section 4(f) Finding and the City’s concurrence letter are included in **Appendix C**. Opportunity for public and agency review and comment on this material was provided during the 30-day public comment period for this Environmental Assessment.

The No Action alternative would not impact any parks, recreation areas or wildlife/waterfowl refuges.

Ecological Resources

Biotic Resources

Describe the various types of flora (plants), fauna (fish, birds, reptiles, mammals, etc), and habitat located in the project area. Indicate if the project will have any impact on these species or their habitat.

Remarks: RWF is located in the Minnesota River Prairie Subsection of the North Central Glaciated Plains Ecological Section in the Minnesota DNR’s Ecological Land Classification Program. Pre-settlement vegetation was primarily tallgrass prairie, with many islands of wet prairie. Currently, agriculture is the dominant land use. DNR information indicates that upland prairie species to be common throughout most of the Subsection.

The airport is largely surrounded by cultivated cropland, roadways, and urban and/or residential development. The flora, fauna, and habitat associated with these areas are typical of such areas in this part of Minnesota. As is discussed further under the Wetlands heading, there is a series of wetlands bounded by the airport, urban development, and County State Aid Highway 101, and one wetland area just north of Runway 30. Based on information provided by the Minnesota Department of Natural

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resources, the wooded area northeast of RWF is a mesic hardwood forest which includes Bur Oak, Green Ash, Elm, and other common species.

The project is not anticipated to have significant impacts on flora, fauna, and their habitat. The trees that will be cleared for obstruction removal in the wooded area northeast of the airport will be a small percentage of the overall forest, generally in edge locations. The DNR's Regional Environmental Assessment Ecologist (Region 4, New Ulm), did not express concern with the proposed action based on the early coordination information provided (**Appendix D**, Agency Correspondence). The Natural Heritage Information Service (NHIS) review provided by the DNR concluded that the proposed action would not adversely affect any protected or known rare features (see **Appendix D**).

The No Action alternative would not have impacts to ecological resources.

Threatened or Endangered Species

- Is the project within the known range of any federal species?
- Does the project area contain any critical habitat?
- Is Section 7 formal consultation required for this action?
- Are there any State threatened or endangered species in the area?

Yes	No
<input type="checkbox"/>	X

Remarks:

Please refer to attached correspondence with the DNR indicating no adverse effects to rare species (**Appendix D**). Based on the US Fish and Wildlife Service website, there is only one federally listed Threatened, Endangered, Proposed, or Candidate species in Redwood County: Prairie Bush Clover (*Lespedeza leptostachya*, a Threatened Species, see **Appendix E**). The habitat for this species is damp to dry soils supporting tall grass prairie. The proposed project will not impact any open prairie areas. During early coordination activities, the US Department of Interior received preliminary project information including mapping and did not comment.

The area of the Salmon property that is in CREP easement (see Page 8) includes a wetland restoration. Potential habitat for the Prairie bush clover is limited in this area by the wet soils and lack of prescribed burning necessary to discourage competition by other vegetation. Regardless of the potential, the Proposed Action would not result in direct or indirect impacts to the Salmon property and the available habitat would remain as described above.

Energy and Natural Resources

- Will the project result in energy impacts during or after construction?
- Will demand exceed supply?
- Are scarce or unusual materials required for the proposed project?
- Will the project change existing aircraft fuel consumption?

Yes	No
<input type="checkbox"/>	X

Remarks:

Energy in the form of fuel will be consumed during construction and obstruction removal activities. Demand will not exceed supply. No significant impacts are anticipated. The project will not result in an increase in demand for energy or natural resources.

The No Action alternative would not have energy or natural resource impacts.

Environmental Justice (EJ)

	Yes	No
Are any EJ populations located within the project area?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Will the project result in adversely high or disproportionate impacts to the EJ population?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Remarks: Census data gives no indication of EJ populations in the project area. The project is not anticipated to have significant impacts to any surrounding residents or populations.

The No Action alternative would not have Environmental Justice impacts.

Farmland

	Yes	No
Will the project affect any Agricultural Lands?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is there any Prime Farmland (per NRCS) in the project area?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NRCS-CPA-1006 Form score: <input type="text" value="131"/>		

Remarks: Approximately five acres will potentially be converted to non-agricultural use with the project (stormwater detention basin). According to NRCS information, one of these acres is Prime and Unique Farmland. The completed NRCS-CPA-1006 Form is included in **Appendix F**. According to FAA guidance, if the NRCS-CPA-1006 Form score is less than 160, the project does not have the potential for adverse farmland impacts and no further evaluation is required.

The No Action alternative would not have Farmland impacts.

Floodplains

	Yes	No
Is the project located in a FEMA designated floodplain?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Attach the corresponding FEMA Flood Insurance Rate Map (FIRM) or other documentation in the appendix.

Remarks: Floodplain mapping presenting FEMA information is provided on **Figure 3**. Neither the Proposed Action nor the No Build alternative would have floodplain impacts.

Land and Water Conservation Fund Act Section 6(f)

	Yes	No
Are there areas acquired or improved with Land and Water Conservation Fund grant assistance?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Remarks: Neither the Proposed Action nor the No Build would impact 6(f) lands.

Light Emissions and Visual Effects

	Yes	No
Will the project result in airport-related lighting impacts?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Does the proposed project fit with the existing environment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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Remarks:

The Proposed Action is anticipated to include blue retro-reflective edge markers in the new paved taxiway, but may also include Medium Intensity Taxiway Lighting (MITL). This would bring airfield pavement lighting approximately 200 feet closer to potential receptors to the southwest, relative to the existing Runway 12/30 lighting. The land uses to the southwest are industrial and commercial. The closest receptor to potential lighting associated with the new taxiway is the Mn/DOT Truck Station approximately 1,400 feet to the southwest. Lighting impacts are not anticipated.

The proposed actions will not add new structures, equipment or other features inconsistent with the existing visual environment, architecture, historic or cultural setting, or land use planning for the community.

The No Build Alternative will not have Light Emission or Visual Effect impacts.

Noise

- Will the project change the current noise levels?
- Are there non-compatible land uses within the 65 DNL?
- Will the project create temporary (less than 180 days) noise impacts?
- Is a noise analysis required in accordance with FAA regulations?

Yes	No
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>

Remarks:

The project construction will involve temporary elevated noise levels typical to the required construction activities. These increases will be minor, temporary, and minimized through the use of best management practices (BMPs). The 65 DNL is assumed to be on the airport property due to the types and volumes of aircraft operations. Operational volumes at RWF are well below the thresholds requiring noise analysis according to Appendix A, Section 14.6 of FAA Order 1050.1E.

The No Build alternative would not have noise impacts.

Social Impacts

Will the proposed action result in the relocation people, businesses or farms?

Yes	No
<input checked="" type="checkbox"/>	<input type="checkbox"/>

Number of relocations: Residences: 1 Businesses: Farms: Other:

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Remarks:

The property acquisition in fee anticipated for the Proposed Action is depicted on **Figure 2**. This includes a total of 45.1 acres from 14 parcels. A breakdown of the acquisition areas by general land use type is summarized below in the table below.

Land Use Type	Number of Parcels Affected*	Total Acreage
Open Field/Drainage	2	4.5
Rural Residential	2	3.0
Agricultural Cropland	8	26.9
Wooded Ravine Area	3	8.7
Transportation	1	2.0

*Two parcels have two land use types affected.

There are three potential full acquisitions and the rest are partial acquisitions. Two of the full acquisitions are Open Field/Drainage, and one is Rural Residential.

There is only one relocation that could be required. The City may need to acquire one residential property in its entirety for the purposes of tree trimming or removal. This property is northwest of Runway 12 as depicted on **Figure 4**. It was initially envisioned that this would only be a partial acquisition, but pending further analysis and coordination with the homeowner, it may be a total acquisition. For the purposes of this EA evaluation, it was assumed that this would be a total acquisition.

The property is approximately 2.0 acres and is rural residential. If a full acquisition is required, the City will meet the requirements established in the Uniform Real Property Acquisition and Relocation Act of 1970, as amended, and as put forth in FAA Order 5100.37B (*Land Acquisition & Relocation Assistance for Airport Projects*) and FAA Advisory Circular 150/5100-17 (*Land Acquisition and Relocation for AIP-Assisted Projects*).

The No Build alternative would not have social impacts.

Socioeconomic Impacts

Will the proposed action result in:

- A change in business or economic activity in the project area
- An impact on local public service demands
- Induced/Secondary impacts

Yes	No
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>

Remarks:

Neither the Proposed Action nor the No Build alternative would have socioeconomic impacts.

Solid and Hazardous Waste

- Is there an Environmental Due Diligence Audit (EDDA) Phase I Report?
- If Yes, is EDDA Phase II required/completed
- If Yes, is EDDA Phase III required/completed
- Does the project require the use of land that may be contaminated?

Yes	No
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>

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Will the proposed project generate solid waste?

X	
----------	--

--	--

 If Yes, are local disposal facilities capable of handling the additional waste?

X	
----------	--

--	--

Remarks: A Phase I EDDA was prepared consistent with ASTM E1527-05 for the proposed acquisition areas. In addition, the MPCA website which tracks environmental contamination sites was consulted. No environmental contamination was identified for the acquisition areas or the other project areas. The EDDA process identified some minor debris in one of the acquisition areas in the wooded ravine northeast of Runway 23. This material will not require Phase II analysis. The EDDA recommended that this material be removed upon acquisition.

If the home on the property identified on Figure 4 is ultimately demolished (see discussion under Social Impacts heading), this work will comply with state and federal regulations that require the structure be inspected for hazardous materials such as asbestos, lead based paint, and other materials, and that these materials need to be disposed of consistently with applicable regulations.

The No Build alternative would not have solid or hazardous waste impacts.

Water Quality

Streams, Rivers, Watercourses & Jurisdictional Ditches

Are there Streams, Rivers, Watercourses or Ditches in/near the project area?

X	
----------	--

--	--

 Is there any Wild, Scenic or Recreational Rivers in/near the project area?

--	--

	X
--	----------

Other Waters

Are there any lakes or ponds in/near the project area?

--	--

	X
--	----------

 Are there other surface/below surface waters in/near the project area?

--	--

	X
--	----------

Remarks: Existing Conditions: County Ditch 52 (Crow Creek), which is approximately 2,500 feet south of airport property, receives some drainage from the airport property. The Minnesota River in the general vicinity of Redwood Falls is classified as Scenic in the DNR's Wild and Scenic Rivers Program. It is approximately 6,000 feet from the project area. This distance is not considered "near" the project area. The closest lake to RWF is Tiger Lake, approximately 0.5 mile to the east-northeast.

Proposed Drainage Improvements: The drainage improvements identified in this EA are based on analysis in *Airport Drainage Study for Redwood Falls, Preliminary Engineering Report*, Bolton & Menk, Inc., 2012. This study is attached as **Appendix A**. The existing drainage system serving the overall airport is depicted on Figure 1 of this study.

The grassed areas west of the Runway 12/30, north and south of Runway 5 is currently drained by a tile system which is in poor condition and is undersized. This leads to standing water after rain events for extended periods of time. This represents a wildlife-attraction concern.

The proposed drainage system improvements identified on **Figure 2** will reduce the ponding conditions in this portion of the airfield by replacing the existing non-functional drain tile. For the area south of Runway 5, a new inlet will direct drainage into the

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conveyance system. The proposed infiltration pond north of Runway 5 has sufficient capacity to treat runoff from the 1.4 acres of new impervious surface associated with the proposed taxiway not already treated by being in a watershed to the northwest with adequate treatment capacity. It will also reduce existing ponding after rain events north of Runway 5. It is sized to meet NPDES water quality standards as well as FAA requirements regarding timely drawdown.

To limit life cycle infrastructure investment requirements, the new drainage elements (basin and conveyance) identified on **Figure 2** will be designed consistently with anticipated future (20-year timeframe) improvements at RWF. These future improvements, which will result in 13 acres of new impervious surface, will include extending Runway 12/30 as well as substantial terminal and hanger improvements.

With the proposed surface water management system as identified on **Figure 2**, drainage from the new taxiway will be directed to the detention basin identified west of the intersection of Runway 12/30 and Runway 5/23. It will then be conveyed via new buried pipe as depicted on **Figure 2** to a new buried pipe running parallel to County Highway 1. This pipe will outlet to County Ditch 52.

County Ditch 52 serves a drainage area of 15.2 square miles and has approximate flows rates of 124 cubic feet per second (cfs), 413 cfs and 1,050 cfs for the 2-year, 10-year and 100-year storm events, respectively. County Ditch 52 discharges into County Ditch 22/Crow Creek, which serves a total drainage area of 33.6 square miles and ultimately discharges into the Minnesota River. The proposed airport outfall routing to County Ditch 52 is approximately 4.5 miles upstream of the Minnesota River outfall location. The proposed airport drainage system design will comply with all applicable regulatory requirements, and the resulting drainage to County Ditch 52 is not anticipated to have adverse water quality impacts.

The No Build alternative would not have water quality impacts.

Wetlands

Are there wetlands in/near the project area? Yes No

Total wetland area: 0.2 acre(s) Total wetland area impacted: 0 acres(s)

Wetland No.	Classification	Total Size (Acre)	Impacted Acres	Jurisdictional	Non-Jurisdictional	Comments
W3	PEMB (Type 2)		0.0	Undetermined	Undetermined	
W5	PEMB (Type 2)		0.0	Undetermined	Undetermined	
W6	PEMA (Type 1)		0.0	Undetermined	Undetermined	
1	PEMA (Type 1)	0.2	0.0	Undetermined	Undetermined	
2	PFOA (Type 1L)	N/A	0.0	Undetermined	Undetermined	
3	PFOA (Type 1L)	N/A	0.0	Undetermined	Undetermined	
4	PEMB (Type 2)	N/A	0.0	Undetermined	Undetermined	
5	PEMB (Type 2)	N/A	0.0	Undetermined	Undetermined	
6	PEMB (Type 2)	NA	0.0	Undetermined	Undetermined	

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Completed Documentation

	Yes	No
Wetland Delineation Report	x	
Conceptual Mitigation Plan (see remarks)	N/A	N/A
Mitigation Available	N/A	N/A

Individual Wetland Finding

Alternatives that will not result in any wetland impacts are not practicable because such avoidance would result in (Mark all that apply and explain):

	Yes	No
Substantial adverse impacts to adjacent homes, business or other improved properties;	N/A	N/A
Substantially increased project costs;	N/A	N/A
Unique engineering, maintenance, or safety problems;	N/A	N/A
Substantial adverse social, economic, or environmental impacts, or	N/A	N/A
The project not meeting the identified needs	N/A	N/A

Discuss measures to avoid, minimize, and mitigate wetland impacts. Make sure to include mitigation ratios.

Remarks:

Figure 3 depicts water resource information, including wetlands. The National Wetlands Inventory (NWI) shows four wetlands within Airport property. The area west of the runway intersection was subject to wetland delineated in 2006 and included identification of three seasonally flooded wetlands within Airport property as shown on **Figure 3**. Wetlands W5 and W6 are partially drained by an existing 6-inch drain tile that crosses under the cross-wind runway and connects to a pair of intakes to the east (part of the County Ditch 48 system).

Additional delineation work was conducted at the airport in 2011 to identify potential wetland habitat in the remainder of the airport. The resulting study, *Wetland Investigation and Delineation Report* (Bolton & Menk, Inc., November 2011) describes one wetland that was delineated and identified five other probable wetlands in the general project area. The *Wetland Investigation and Delineation Report* is provided as **Appendix G**. The five probable wetland areas were not formally delineated because the project activities (tree trimming and/or removal) will not result in loss of wetland habitat.

The proposed project would not result in filling in wetland habitat. Obstruction removal activities will occur in the areas of Wetland 2 and Wetland 3. Tree removal activities will be conducted during the winter season and will not include stump removal to avoid ground disturbance within the wetland.

Construction of the proposed stormwater facility improvements on the west side of the airport would avoid direct impacts to the existing wetlands. The two nearby wetlands (W5 and W6) are currently partially drained. The proposed stormwater basin would be only two or three feet deep and would not be expected to alter the hydrology of the nearby wetlands any further than existing conditions. The outlet from the proposed basin would be designed to avoid W5 as depicted on **Figure 3**.

Wetlands W5 and W6 are partially drained, seasonally flooded wetlands that typically do not contain standing water of substantial depth. The proposed detention basin will drain completely within 48 hours of the rain event per FAA requirements. The creation of the drainage basin in proximity to W5 and W6 is not anticipated to cause an unusual or unacceptable wildlife hazard.

The No Build alternative would not have wetland impacts.

Cumulative Impacts

When considered together with other past, present, and reasonably foreseeable future development projects on or off the airport, would the proposed project produce a cumulative effect on any of the environmental impact categories above?

Yes	No
<input type="checkbox"/>	<input checked="" type="checkbox"/>

Remarks:

The following projects have been constructed in recent years:

- Frontage road/drainage improvements at Trunk Highway 19 and County Highway 19
- Airport drainage improvements in watershed serving the northern portions of the airport, including large basins northwest and west of Runway 12
- Ponderosa Business Park development, approximately 15 acres, west of Runway 12, adjacent to County Highway 101
- Titan Machinery facility directly south of Trunk Highway 19, approximately 1/3 mile east of County Highway.

These projects will not interfere with the ability of regulatory requirements to be met for the Proposed Action as identified in this EA. When considered with these projects, the Proposed Action will not combine to create impacts meriting further NEPA review. The Proposed Action will not foreseeably limit the ability for future development in the larger project area to comply with applicable regulatory requirements. There are no known future projects which would combine with the Proposed Action to create significant environmental impacts.

Part III – Permits, Mitigation, Coordination and Public Involvement

PERMITS/MITIGATION

Permits

List all required permits for the proposed project & indicate if any problems are anticipated in obtaining the permit

Remarks: Stormwater: The project will require a National Pollutant Discharge Elimination System (NPDES) permit because the proposed actions will involve the disturbance of more than one acre of land.

Wetlands: Some of the tree clearing will take place within two probable wetland areas. These activities will not result in wetland loss, and thus a formal permit is not anticipated.

Mn/DOT Permits:

- Driveway Permit – Minnesota Rule 8810.4400
- Utility Accommodation Permit (long form permit TP-2525) – Minnesota Rule 8810.3300
- Work Within a Right-of-Way (long for permit TP-1723) – Minnesota Rule 8810.3300
- Aviation Clearance from Office of Aeronautics – Minnesota Rule 8800.1200
- Oversize and Overweight Permit – Minnesota Statute 169.80-169.87

Mitigation

Describe all mitigation measures for the proposed project. Include any impacts that cannot be mitigated or those that cannot be mitigated below threshold levels. Also, provide a description of any resources that must be avoided during construction.

Remarks: Construction: A construction NPDES permit will be obtained for the taxiway component of the project and associated best management practices will be used to mitigate potential impacts. Regarding tree removal in the ravine area northeast of Runway 23, mitigation will include leaving stumps of removed trees in place and planting native grasses on the slopes around the stumps to help hold soils in place. This mitigation approach is based on consultation with DNR Forestry staff, and further coordination with DNR will take place during the final design process.

Wetlands: Tree removal in probable wetland areas will take place during frozen ground conditions.

EARLY COORDINATION

List each agency coordinated with, the date coordination was sent, and if a response was received in the following table. Make sure to include a copy of the response in the appendix.

Resource Agency	Date ECL Sent	Date Response Received	Date Draft EA Sent	Date Response Received
Federal				
US Army Corps of Engineers, Regulatory Functions	July 18, 2011	August 9, 2011	October 23, 2012	
US Army Corps of Engineers, St. Paul District	July 18, 2011		October 23, 2012	

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US Environmental Protection Agency	July 18, 2011	July 26, 2011	October 23, 2012	November 5, 2012
US Fish and Wildlife Service	July 18, 2011		October 23, 2012	
Federal Aviation Administration	July 18, 2011		October 23, 2012	
US Department of Agriculture, Wildlife Services	July 18, 2011		October 23, 2012	
State				
MN Department of Agriculture	July 18, 2011		October 23, 2012	
MN Department of Commerce	July 18, 2011		October 23, 2012	
MN Department of Health	July 18, 2011		October 23, 2012	
MN Department of Natural Resources, Region 4 Environmental Assessment	July 18, 2011	August 5, 2011 telephone conversation	October 23, 2012	
MN Department of Natural Resources, Planning Director's Office	July 18, 2011		October 23, 2012	
MN Department of Natural Resources, NHIS Review	June 22, 2011	August 5, 2011	October 23, 2012	
MN Pollution Control Agency, Environmental Review Unit	July 18, 2011	August 30, 2011	October 23, 2012	November 21, 2012
MN Department of Transportation, Environmental Services	July 18, 2011	August 19, 2011 (District 8)	October 23, 2012	
Board of Water and Soil Resources	July 18, 2011		October 23, 2012	
State Archaeologist	July 18, 2011		October 23, 2012	
Minnesota Historical Society	July 18, 2011	August 10, 2011	October 23, 2012	
MN/DOT Aeronautics	July 18, 2011		October 23, 2012	
Local				
Redwood County, County Engineer	July 18, 2011		October 23, 2012	
Redwood County, Environmental Director	July 18, 2011		October 23, 2012	
Redwood Soil and Water Conservation District	July 18, 2011	August 2, 2011	October 23, 2012	
Honner Township	July 18, 2011		October 23, 2012	
Other				
Redwood Area Development Corporation	July 18, 2011		October 23, 2012	
Minnesota River Board	July 18, 2011		October 23, 2012	

Remarks: [Early coordination responses have been compiled and are found in Appendix D.](#) In general, the letters identified regulatory requirements which may or may not apply to this specific project.

[During the 30 day agency review period for the Draft EA, there were two agency comments as identified in the table above; from the US Environmental Protection Agency \(EPA\), and the Minnesota Pollution Control Agency \(MPCA\), respectively. These responses are included in Appendix H. They did not express concerns with the proposed action and do not require responses. The MPCA letter identified that state and federal](#)

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requirements regarding inspection of structures prior to demolition for hazardous materials and disposing these materials properly would need to be met if the home identified on **Figure 4** is ultimately demolished. Language has been added to this Final EA under the Solid and Hazardous Waste heading to include the information referenced in the MPCA's comment letter.

PUBLIC INVOLVEMENT

Some level of public involvement is encouraged for every Federal Action. **The level of public involvement should be commensurate with the proposed action.** Discuss any public involvement activities (legal notices, letters to affected property owners and residents, meetings, special purpose meetings, newspaper articles, etc.) for this project.

Remarks: On July 22, 2011 an early coordination information package was sent by the City of Redwood Falls to all property owners within one quarter mile of the airport. This package included a map of the proposed improvements as well as text providing background information and describing the project elements and the overall environmental review process. The cover letter requested that property owners contact the City and/or its consultant with comments, questions, or concerns. The City received two comments in this process. One from a business west of Runway 5 with a question regarding the allowable building height for a planned expansion. The other comment came from a homeowner directly north of Runway 12 expressing a preference for tree trimming as opposed to clearing on her property. In both of these cases the City Public Works Project Coordinator met with those making comments and addressed their issues to their satisfaction.

On November 1, 2012, the availability of the Draft EA was announced in the Redwood Gazette. This opened the 30 day public review period for the document and announced the availability of the Draft EA for review at the following locations: Redwood Falls Municipal Airport, Redwood Falls Public Library, and the Redwood Falls City Hall. In addition, a letter was sent to landowners whose property would be directly affected by the project, in the form of obstruction removal and/or land acquisition, notifying them of the availability of the document and the official comment period. Four public comments were received. They are included in **Appendix I**, along with responses to each. These comments all came from landowners whose properties are identified in the EA for fee acquisition (two total acquisitions, two partial). The responding landowners had comments or questions regarding the land acquisition process and/or whether or not land acquisition is necessary as identified in the EA. The City of Redwood Falls will provide ongoing communications with landowners regarding land acquisition schedules and procedures. Final determinations of the boundaries of acquisition, fee versus easement acquisition, and other acquisition issues will be made during the land acquisition phase of implementing the proposed action. This phase will include discussions between the City, FAA, MnDOT, and the applicable landowner as appropriate.

Public Controversy on Environmental Grounds

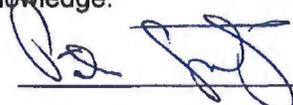
Is the project anticipated to involve substantial controversy concerning community and/or natural resource impacts?

Yes	No
<input type="checkbox"/>	<input checked="" type="checkbox"/>

Federal Aviation Administration – Great Lakes Region
Airport: Redwood Falls Municipal Airport Project: Safety and Drainage Improvements

Preparer Certification

I hereby certify that the information I have provided is complete and accurate, to the best of my knowledge:

 _____ 12/24/12 _____

Signature

Date

Peter Langworthy, Transportation Planner

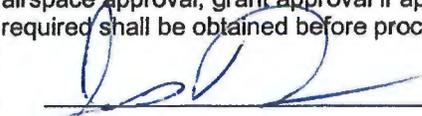
Bolton and Menk, Inc.

Printed Name and Title

Organization

Airport Sponsor Certification (may not be delegated to consultant)

I hereby certify that the information provided is complete and accurate to the best of my knowledge. I also recognize and agree that no construction activity, including but not limited to site preparation, demolition, or land disturbance, shall proceed for the above proposed project(s) until the FAA issues a final environmental decision for the proposed project(s) and until compliance with all other applicable FAA approval actions (e.g., ALP approval, airspace approval, grant approval if applicable) have occurred. All applicable Federal, State, and local permits required shall be obtained before proceeding with the proposed action.

 _____ 12-27-12 _____

Signature

Date

Jim Doering, Public Works Project Coordinator

City of Redwood Falls

Printed Name and Title

Organization

FAA Decision

Having reviewed the above information, certified by the responsible airport official, the proposed projects of development warrant environmental processing as indicated below:

- The proposed action has been found to qualify for a Condensed Environmental Assessment.
- The proposed development action exhibits conditions that require the preparation of a detailed Environmental Assessment.
- The proposed development action requires preparation of an Environmental Impact Statement.

This Environmental Assessment becomes a Federal document when signed/dated by the Responsible FAA Official.

 _____ 6/12/13 _____

Signature

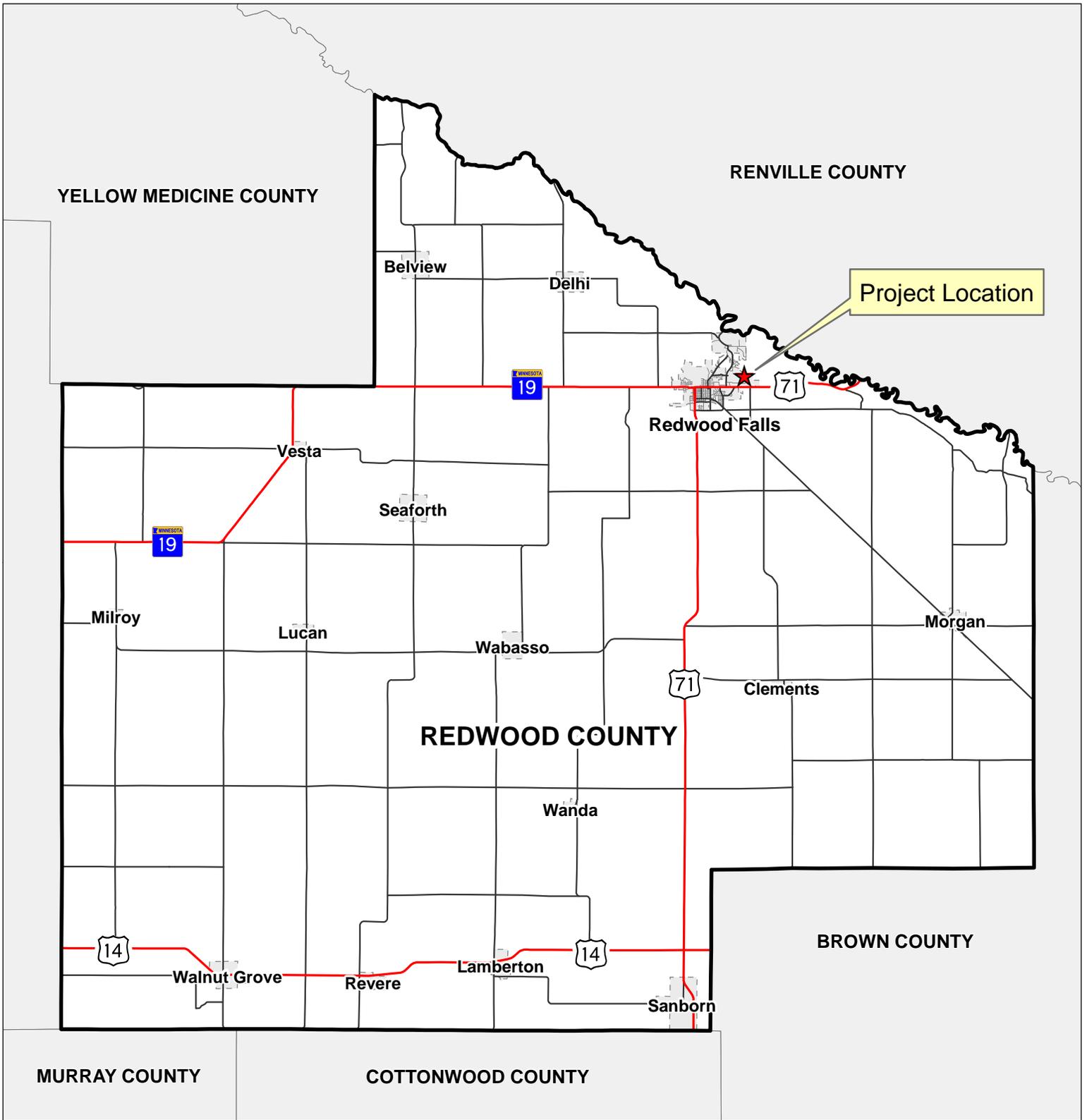
Date

Kandice Krull

as FAA Approving Official for the Federal Aviation Administration

Environmental Protection Specialist

FIGURES



Legend

- Project Location
- Local Road
- Major Road/Highway
- Principal Arterial
- County Boundary
- Municipal Boundary

Source: MnDNR, MnDOT



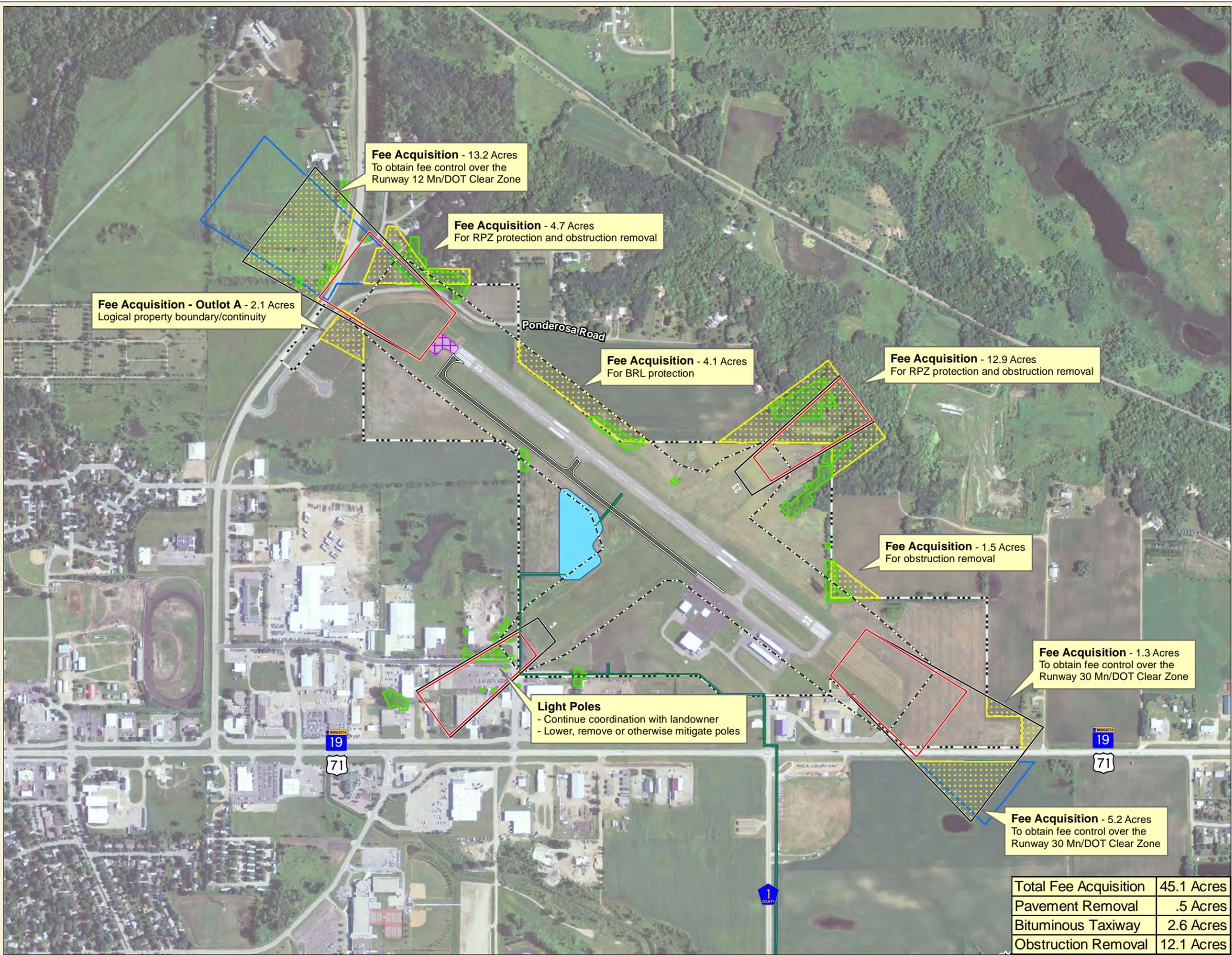
REDWOOD FALLS
minnesota

**Redwood Falls Municipal Airport
Condensed Environmental Assessment**

Project Location

Figure 1

June, 2012

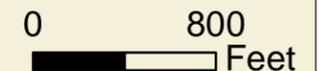


Legend

- Property Boundaries**
- Existing Airport Property
 - Existing Easement
- Proposed Actions**
- Bituminous Taxiway
 - Proposed Fee Acquisition *
 - Obstruction Removal
 - Detention Pond
 - Storm Water Conveyance
 - Pavement Removal
- Land Use Safety**
- Runway Protection Zone
 - Runway Clear Zone
 - 20' Building Restriction Line

* Some of the areas depicted as fee acquisition for obstruction removal may ultimately be aviation easement.

Source: MnGeo



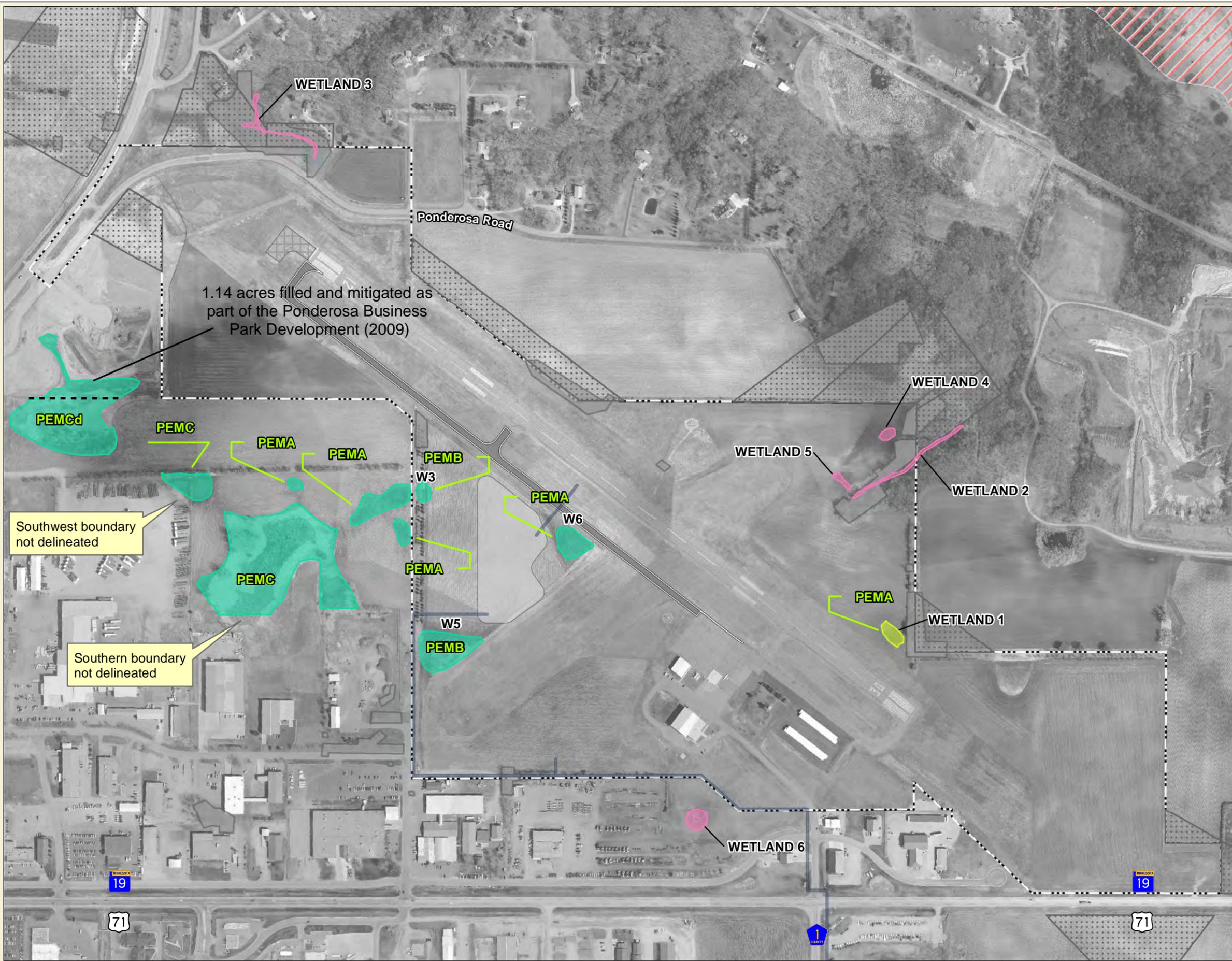
Total Fee Acquisition	45.1 Acres
Pavement Removal	.5 Acres
Bituminous Taxiway	2.6 Acres
Obstruction Removal	12.1 Acres

Project Map

Figure 2

September, 2012





Legend

Property Boundaries

Existing Airport Property

Water Resources

500-Year Floodplain

NWI Wetland

2005/2006 Delineated Wetland

2011 Delineated Wetland

2011 Probable Wetland

Proposed Actions*

Bituminous Taxiway

Proposed Fee Acquisition

Obstruction Removal

Detention Pond

Storm Water Conveyance

Pavement Removal

* Please refer to Figure 2 for clarification as needed

Source: LMIC, NWI



0 500
Feet

Water Resources

Figure 3

September, 2012





* It is possible that this will be a partial acquisition. However, for the purposes of the EA, a full acquisition is assumed.

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**Redwood Falls Municipal Airport
Condensed Environmental Assessment**

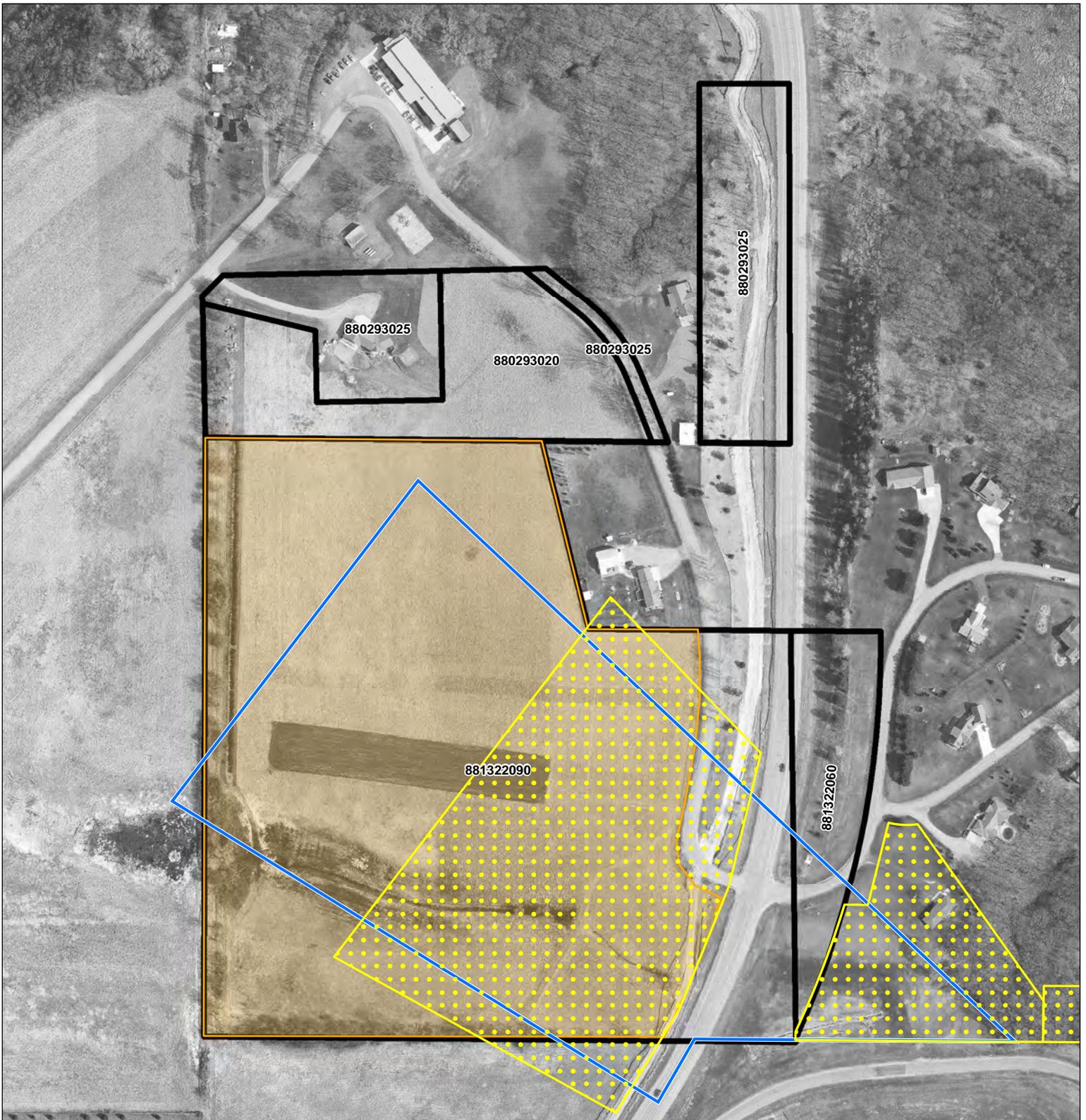
**Potential Relocation
Property**

Figure 4

June, 2012

Source: MnGEO, Redwood County





Legend

-  Salmon Property
-  Proposed Fee Acquisition
-  RIM Easement
-  Existing Aviation Easement

Source: MnDNR, MnGEO

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minnesota

**Redwood Falls
Municipal Airport
Condensed Environmental Assessment**

Salmon Property

Figure 5

April, 2013

APPENDICE A

Airport Drainage Study

Preliminary Engineering Report

Airport Drainage Study

Redwood Falls, Minnesota

Amended June 2012

REDWOOD FALLS
minnesota

Submitted by:

Bolton & Menk, Inc.

1960 Premier Drive

Mankato, MN 56001

P: 507-625-4171

F: 507-625-4177

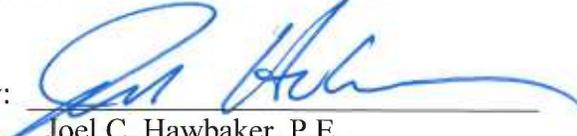
Preliminary Engineering Report

Airport Drainage Study
Redwood Falls, Minnesota

Amended June 2012

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

By:


Joel C. Hawbaker, P.E.
Registration No. 41396

Date:

6-6-2012



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- FIGURE NO. 2 - PHASE I - 5 - YEAR MASTER PLAN
- FIGURE NO. 3 - ULTIMATE - 20 - YEAR MASTER PLAN

EXHIBITS

- EXHIBIT NO. 1 - DETAILED PROJECT COST ESTIMATES

APPENDIX

- APPENDIX NO. 1 - HydroCAD MODEL RESULTS
- APPENDIX NO. 2 - 2007 OUTLET OPTIONS



INTRODUCTION

The City of Redwood Falls is considering making additional drainage improvements to the airport property. The City of Redwood Falls has a population over 5,000 and is required to follow the National Pollutant Discharge Elimination System (NPDES) Phase II permit requirements for Municipal Separate Storm Sewer Systems (MS4s). The NPDES Phase II permit process requires storm water treatment for any project that creates more than one acre of new impervious surfacing.

This report is an amendment to the 2007 *Preliminary Engineers Report Drainage Study* (Bolton & Menk, Inc.). In 2007, the City of Redwood Falls along with Area II Minnesota River Basin Project Inc. completed phase 1 of the airport drainage improvements within the North Watershed. These improvements included the construction of an infiltration pond on the north end of the main runway and an outlet control structure to reduce the peak flows to the ravine downstream of the pond outlet. Therefore, detailed discussions regarding drainage improvements to the North Watershed have been omitted from this amended drainage study report.

The existing outlet for the South Watershed area is a 12-inch tile that is part of the Redwood County Ditch No. 48 system. This outlet is in poor condition and is undersized for the drainage area it serves. The storm sewer outlet for the South Watershed area is to the south and ultimately to County Ditch No. 52. County Ditch No. 52 is not on the impaired water list.

The City of Redwood Falls has implemented a Storm Water Pollution Prevention Plan (SWPPP) to reduce the discharge of pollutants, to protect water quality and to satisfy the appropriate water quality requirements of the Clean Water Act (CWA). A Total Maximum Daily Load (TMDL) has been approved by the Minnesota Pollution Control Agency (MPCA) and the Federal EPA that requires the City of Redwood Falls to reduce its contribution of phosphorous by 30% based on the year 2000 levels. The MPCA is also requiring the City of Redwood Falls to treat runoff from all industrial areas and an airport is considered as an Industrial Use.

A SWPPP for industrial activities at the Redwood Falls Municipal Airport was prepared by the City and implemented in August, 2010. The SWPPP for the airport

incorporates the Federal Aviation Administration (FAA) guidance along with the General Permit requirements.

The Redwood Falls City Council has authorized Bolton & Menk, Inc. to amend the Airport Drainage Study dated January 2007 to support the 2012 Airport Environmental Assessment (EA). Portions of the costs for the improvements as described herein are proposed to be shared between the FAA and the City of Redwood Falls. Consideration for the proposed improvements has been initiated by the Airport Commission and City Council.

This report will present preliminary investigations, discoveries and design considerations for use in determining the engineering feasibility of the construction of the referenced work. In addition, preliminary project cost approximations will be presented for use in determining the financial feasibility of the proposed improvements. The scope of the proposed improvements includes storm sewer and retention pond construction. Proposed improvements described in this report for the 5-year scenario will be evaluated for environmental impacts in the EA.

EXISTING CONDITIONS

The general layout of the area includes various wetlands in the northwest area of the study boundary (see Figure 1) and some localized low spots in the southeast area of the study boundary. The area north of runway 12-30 drains north to multiple ravines.

Areas west of runway 12-30, north and south of runway 5 experience standing water after storm events for an extended period of time. Redwood County Ditch No. 48 provides the storm water outlet for the area. The 12-inch ditch tile for this area is in poor condition resulting in limited hydraulic capacity and is undersized for the drainage area it serves. The drainage patterns for the surrounding properties are proposed to remain unchanged. Approximately 39 acres of non-airport property has historically drained to the airport property and is included in the south watershed boundary (See Figure No. 1).

The area south of the primary runway (South Watershed) consists of approximately 132 acres. The South Watershed generally flows in the southeast direction. The area to the north of the turf crosswind runway, 5-23, drains to two separate wetlands and a localized low-point where it is drained by a 6-inch diameter tile

that is a part of the Redwood County Ditch No. 48 ditch system. The area between the crosswind runway and the airport terminal/hangar area drains to a centralized low-point where it is drained by two intakes connected to Ditch No. 48. The outlet from these two intakes is a 12-inch diameter tile flowing southeast and ultimately connects to the 12-inch diameter County Ditch No. 52 tile. The remaining portion of the South Watershed drains in the direction of the intersection of T.H. 19/71 & C.S.A.H. No. 1 where it is collected into the storm sewer system that was constructed as a part of the T.H. 19/71 Frontage Road Improvement project in 2003. Storm water treatment ponds were constructed as a part of the Frontage Road Improvements in the northwest and northeast quadrants of the intersection of T.H. 19/71 & C.S.A.H. No. 1 (See Figure No. 1). The outlets for these ponds are connected to the existing 12-inch diameter Ditch No. 48 tile that drains to the southeast.

REVIEW OF OUTLET OPTIONS NO. 1 - 3

In 2007, the City of Redwood Falls along with Area II Minnesota River Basin Project Inc. completed Phase 1 of the airport drainage improvements. The existing Airport South Watershed drainage is currently served by an aging tile drainage system which is undersized and hydraulically deficient. Discharge outlet improvements are required to support airport safety improvements as well as to improve drainage conditions in the west-southwest portions of the airfield. Regarding the new impervious surface (taxiway) generally north of the crosswind runway, a drainage outlet to the north is not feasible because of the unstable ravine conditions that would convey the additional run off and that run off would be redirected from the historical trend. The drainage outlet option to the west into an existing wetland complex is not feasible based upon the wetland grade is higher than the proposed pond elevation and because there is no existing drainage system readily available. The drainage outlet option to the southwest to an existing drainage system is not feasible because of the grade difference from east to west. Additionally, the drainage system southwest of the airport is within a heavily developed setting and the system is in need of upsizing.

The prior 2007 drainage report¹ included three South Watershed outlet options (No. 1 – No. 3) for the City’s consideration. A brief description for each of the outlet options, summarized from the 2007 report, are provided below:

- Outlet option No. 1 proposes an outfall to be constructed along the eastern ditch of C.S.A.H. No. 1. The outfall pipe would discharge into County Ditch No.52.
 - Project cost: \$1,618,000
 - Maintains existing drainage patterns
 - Could be constructed in existing ROW
 - Construction corridor is not fully developed
- Outlet option No. 2 proposes an outfall to be constructed south of T.H. No. 71. The outfall pipe would discharge into a branch of County Ditch No. 52.
 - Project cost:\$1,659,000
 - Maintains existing drainage patterns
 - Additional ROW/Easements may be required
 - Construction corridor is not fully developed
- Outlet Option No. 3 proposes an outfall to be constructed along an existing ravine located to the NE of the airport. The outfall pipe would discharge into an unnamed Minnesota River tributary.
 - Project cost:\$1,853,000
 - Does not maintain existing drainage patterns
 - Difficult to construct within a ravine.
 - Additional ROW/Easements may be required
 - Construction corridor is substantially developed

It is our recommendation that Option No.1 provides the best viable drainage improvement option for the City’s airport based upon the following:

- Option No. 1 will require less easement/right-of-way consideration as compared to Option No. 2.
- The construction route is less developed for Option No. 1 when compared to Option No. 2.

¹ *Redwood Falls Airport Drainage Study, Preliminary Engineering Report, 2007, Bolton & Menk, Inc. Preliminary Engineering Report BMI Project No. T41.103023*

- Unlike Option No. 3, Option No. 1 maintains existing drainage patterns.

The City of Redwood Falls prefers the development of drainage Option No. 1.

PROPOSED IMPROVEMENTS

Drainage improvements at the airport are proposed to help manage the storm water quality and rate at which the water discharges from the site. The proposed improvements in and around the airport need to meet the applicable Federal Aviation Administration (FAA) Advisory Circular requirements, Minnesota Pollution Control Agency (MPCA) requirements, Redwood Falls Municipal Airport SWPPP requirements and the City of Redwood Falls SWPPP requirements. The drainage areas in this report were analyzed using the existing watershed plus airport property improvements as included in the current 5-year airport improvement plan evaluated in the EA. Proposed 5-year airport improvements in the EA include the following:

- Construct full parallel taxiway
- Acquire land for airport safety improvements
- Remove natural-growth drainage obstructions
- Construct necessary drainage improvements

The 20-year airport master plan was also analyzed to take into consideration the affects of the ultimate drainage improvements. Proposed 20-year airport master plan and ultimate improvements include the following:

- Terminal and hangar area expansion
- Runway 12-30 extension

The Best Management Practice (BMP) chosen for this application is proposed to be infiltration basins. Based on the Minnesota Storm Water Manual, infiltration basins have an average total phosphorous removal rate of 65% and a maximum total phosphorous removal rate of 90%. Based on this information and the drainage study, the infiltration basins will meet the requirements of the FAA, MPCA, Airport SWPPP and City of Redwood Falls MS4s SWPPP.

All infiltration ponds for this drainage study are proposed to drain completely within 48 hours (See Attached HydroCAD models). This will meet the requirements of

the Federal Aviation Administration (FAA) Advisory Circular 150/5200-33B *Hazardous Wildlife Attractions On or Near Airports* and reduce the attraction of waterfowl and wildlife attractions to these areas. In order to meet the required FAA's draw-down requirements, pond bottoms will be constructed with a 4-inch to 6-inch underdrain pipe network. The existing soil matrix infiltration characteristics can vary widely and would recommend site specific porosity test to be performed prior to construction. The infiltration velocity may be higher than the assumed number but the rate of flow will be governed by the size of the outlet tile. The proposed ponds have been designed for a 100-year storm event (5.9-inches of rain over a 24 hour period of time). The proposed HydroCAD models are included in this report as appendices. These ponds will also be designed to meet MPCA's water quality requirements.

SOUTH WATERSHED OVERVIEW

For the purpose of this drainage study, the South Watershed was analyzed using the 20-year master plan improvements considering the planned 5-year improvements evaluated in the EA. The 5-year improvements are depicted on Figure 2, and the 20-year improvements are depicted on Figure 3. The South Watershed consists of approximately 132 acres. Of this total, approximately 93 acres are located within the airport property boundary and 39 acres are located outside of the airport property boundary. The study assumes that storm water management improvements will be constructed off of airport property should any land change occur to the 39 acre area.

Approximately 1.4 acres of new impervious surface will be created in the South Watershed as a result of the construction of the full bituminous parallel taxiway. Since the proposed taxiway construction will create an additional impervious surface of more than 1 acre, storm water quality measures are required to be constructed along with a viable outlet. The new pond (60P) is proposed to be constructed south of the runway 12-30 and west of the turf crosswind runway, as shown on Figure No. 2. Pond 60P will be sized for the 5-year improvements, which includes the parallel taxiway, but the outlet will be sized to accommodate the 20-year master plan drainage improvements in order to provide a viable drainage outlet for current and future improvements while keeping future additional construction costs to a minimum.

The South Watershed is proposed to be discharged via a new outlet pipe constructed along County Road No. 1 as shown on Figures No. 2 & 3. Below is a detailed discussion of the South Watershed and ultimate drainage improvements.

The 20-year airport master plan for this area includes extending the primary runway 12-30. Improvements also include terminal and hangar improvements as shown on Figure No. 3. All totaled, these improvements will create over 13 acres of new impervious surface. Therefore in the future an additional storm water treatment pond (Pond 25P) will be required near the terminal/hangar area (See Figure No. 3). Areas on the west and east sides of the cross wind turf runway 5-23 shall be reserved at this time for future storm water management improvements. Figure No.3 shows the location and approximate size of the future storm water treatment ponds.

Pond 60P is proposed to be located south of the primary runway 12-30 and north of the cross wind turf runway 5-23 (See Figure 2). Two sub-watersheds drain to Pond 60P: 60S and 70S. Sub-watershed 60S is proposed to include a portion of the bituminous parallel taxiway. Sub-watershed 60S is primarily existing agricultural area. Sub-watershed 70S is proposed to have a bituminous parallel taxiway constructed through it and the area between the taxiway and the runway 12-30 is proposed to be routed to Pond 60P with a culvert extending through the taxiway and into the pond as Depicted on Figure 2.

Sub-watershed 20S is proposed to have future hangars constructed within the watershed. The outlet for this area (20P) will be a storm sewer main extending from the airport access road routed along the common property line between the airport and the City's industrial park (See Figure No. 3). Sub-watershed 21S is located between the runway 12-30 and the proposed parallel bituminous taxiway on the south side of the cross wind turf runway 5-23. The outlet for this area will be a culvert extending from the taxiway and into sub-watershed 20S and ultimately to the common outlet pipe constructed along the common property line.

Pond 25P is proposed to be located immediately west of the airport access road (See Figure No.3). Two sub-watersheds drain to Pond 25P. Sub-watershed 25S consists of existing industrial property along with airport building and pavement areas. Sub-watershed 25S drains directly to proposed pond 25P. Sub-watershed 30S is proposed to

remain unchanged. Sub-watershed 30S drains from the east to the west to a localized low-point on the east side of the airport access road. A 36-inch diameter culvert is proposed to be constructed from the east side of the access road and outlet into Pond 25P (See Figure No. 3). Pond 25P is proposed to be an infiltration pond meeting the requirements of the FAA and the water quality requirements of the MPCA.

The existing outlet for the South Watershed area is a 12-inch tile that is part of the Redwood County Ditch No. 48 system. This outlet is in poor condition, hydraulically deficient, and is undersized for the drainage area it serves. The poor drainage conditions allows for standing water for long periods of time which stresses/kills the existing grassed areas while attracting wildlife; therefore, it is proposed to construct a new drainage outlet network. The existing 12-inch diameter tile has inadequate capacity to provide airport drainage in compliance with FAA AC 150/5200-33B.

SOUTH WATERSHED -PHASE I (EA WORK)

The first phase of Outlet Option No. 1 includes constructing a storm sewer outlet pipe that parallels C.S.A.H. No. 1 on the east side. The purpose of Phase I improvements would be to serve the existing and 5-year airport improvements drainage needs, considering future 20-year development. In this option, Pond 60P drains south to the southwest corner of the existing airport property, turns east paralleling the south airport property line to Airport Road where it is proposed to connect to a manhole. Existing ponding in sub-drainage area 20S would be reduced through an inlet directing drainage to the 24" east-west pipe along the southern boundary of the airport as depicted on Figure 2. From the manhole referenced above, the combined 36-inch diameter outlet would then continue south to T.H. 19/71.

At the intersection of T.H. 19/71 & C.S.A.H. No. 1, the proposed 54-inch outlet pipe would continue south 2,300-feet on the east side of C.S.A.H. No. 1 to County Ditch No. 52 (See Figure No. 2).

Mn/DOT may have future plans to improve T.H. 19/71 to an urban section with curb and gutter on both sides. At this time it is assumed that Mn/DOT would construct a storm water treatment pond and complete a Mn/DOT outlet to Ditch No. 52. No

provisions have been included to accommodate storm water flow from areas other than airport property.

SUMMARY OF PROBABLE APPROXIMATION OF PROJECT COSTS:

Included herein is a summary of the estimated items of work as identified in this report along with their associated approximate cost (See Exhibit No. 1). The estimate is a probable approximation of the project cost based upon current, average, municipal bidding prices and is subject to variations based on several conditions including: construction bidding environment, construction time period, scope of work, economic conditions, inflation and unforeseen items of work not identified in this report. It is recommended that the City include a reasonable contingency to compensate for variations in construction bidding, interim financing, etc. The summary of the estimated project costs is as follows:

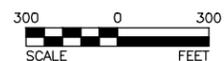
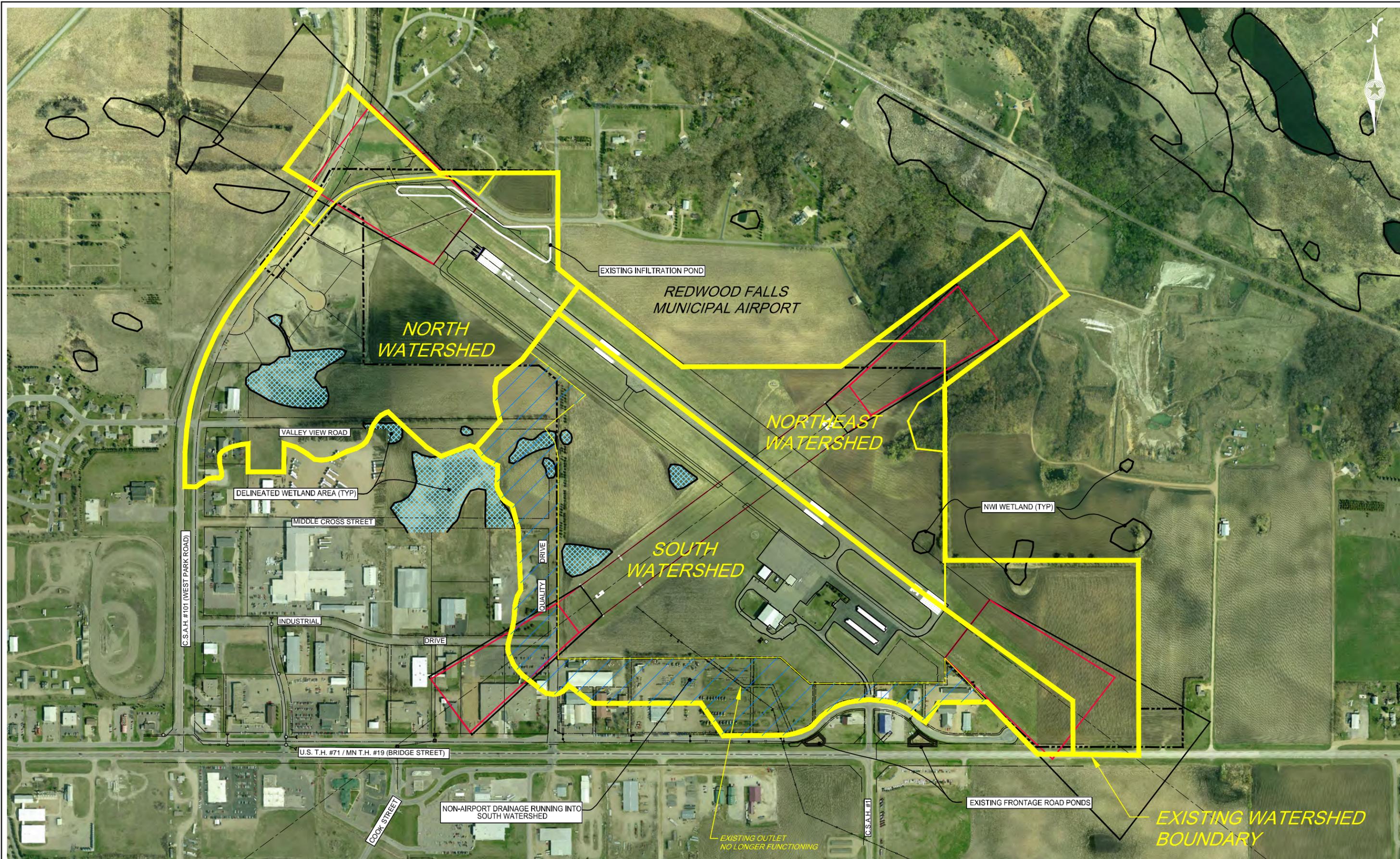
EXISTING WATERSHED + 5-YEAR MASTER PLAN AIRPORT PROPERTY IMPROVEMENTS

South Watershed – Outlet Option No.1 = \$1,832,430

The proposed project may be funded by two possible sources; City of Redwood Falls and the Federal Aviation Administration (FAA).

DISCUSSIONS AND RECOMMENDATIONS

Option No. 1 as described in this report is the recommended outlet improvement option. The proposed Outlet Option No. 1 (54-inch outlet pipe along C.R. No. 1 to County Ditch No. 52) improvements are feasible from an engineering perspective and are practical for meeting the needs of the airport and the City. If the proposed improvements are determined to be financially feasible, it is recommended that the City secures Mn/DOT Aeronautics and/or Federal Aviation Administration approval and funding of the drainage improvement site layout. After approval from these agencies it is recommended that the City proceed with the wetland mitigation procedures, property acquisition and authorize the preparation of construction plans and specifications and proceed to advertise the proposed work for competitive bids.



BOLTON & MENK, INC.
 Consulting Engineers & Surveyors
 MANKATO, MN FAIRMONT, MN SLEEPY EYE, MN WILLMAR, MN BURNSVILLE, MN
 CHASKA, MN RAMSEY, MN MAPLEWOOD, MN BRAINERD, MN AMES, IA

CITY OF REDWOOD FALLS, MINNESOTA
 AIRPORT AREA DRAINAGE STUDY – JUNE 2012

EXISTING CONDITIONS

FIGURE
 1



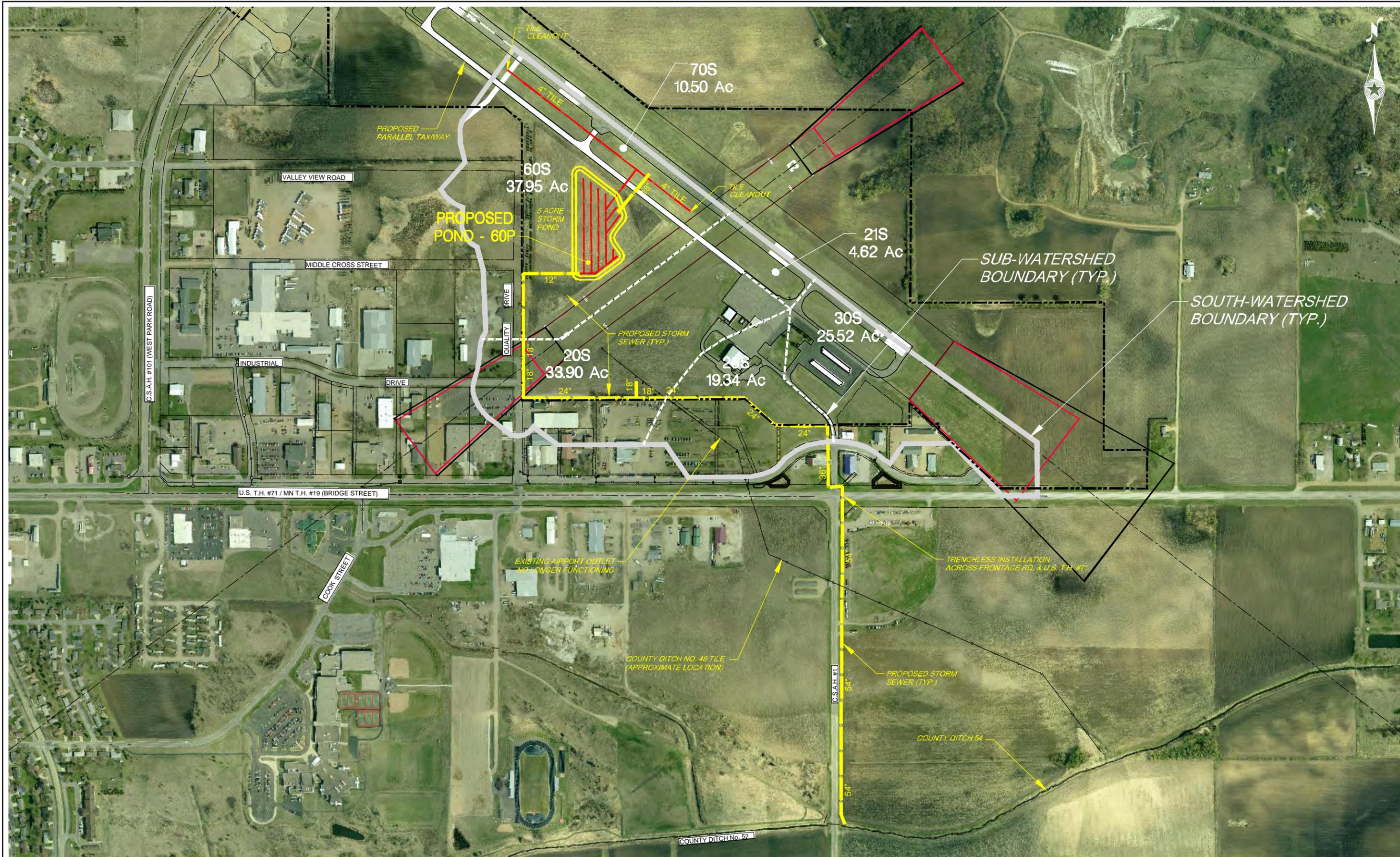
FIGURE NO. 1 - EXISTING CONDITIONS



FIGURE NO. 2 - PHASE I - 5 - YEAR MASTER PLAN

SOUTH WATERSHED

PROPOSED STORM SEWER OUTLET NO. 1



BOLTON & MENK, INC.
 Consulting Engineers & Surveyors
 MANKATO, MN FAIRMONT, MN SLEEPY EYE, MN WILLMAR, MN BURNSVILLE, MN
 CHASKA, MN RAMSEY, MN MAPLEWOOD, MN BRAINERD, MN AMES, IA

CITY OF REDWOOD FALLS, MINNESOTA
 AIRPORT AREA DRAINAGE STUDY - JUNE 2012
SOUTH WATERSHED - PHASE 1 - 5 YEAR
 PROPOSED STORM SEWER OUTLET No. 1

FIGURE
2



FIGURE NO. 3 - ULTIMATE - 20 - YEAR MASTER PLAN

SOUTH WATERSHED

PROPOSED STORM SEWER OUTLET NO. 1





BOLTON & MENK, INC.
Consulting Engineers & Surveyors
MANKATO, MN FAIRMONT, MN SLEEPY EYE, MN WILLMAR, MN BURNSVILLE, MN
CHASKA, MN RAMSEY, MN MAPLEWOOD, MN BRAINERD, MN AMES, IA

CITY OF REDWOOD FALLS, MINNESOTA
AIRPORT AREA DRAINAGE STUDY
SOUTH WATERSHED - PHASE II - 20 YEAR
PROPOSED STORM SEWER OUTLET No. 1

FIGURE
3

**EXHIBIT NO. 1 - DETAILED PROJECT COST
ESTIMATES**

PHASE I - 5 – YEAR MASTER PLAN

PROPOSED STORM SEWER OUTLET NO. 1

PRELIMINARY PROJECT COST ESTIMATE

**EXISTING CONDITIONS + AIRPORT PROPERTY + NON AIRPORT PROPERTY IMPROVEMENTS
AIRPORT DRAINAGE STUDY - 2012 AMENDMENT
REDWOOD FALLS, MINNESOTA**

EXHIBIT #1

OPTION 1 - 5 YEAR MASTER DRAINAGE PLAN

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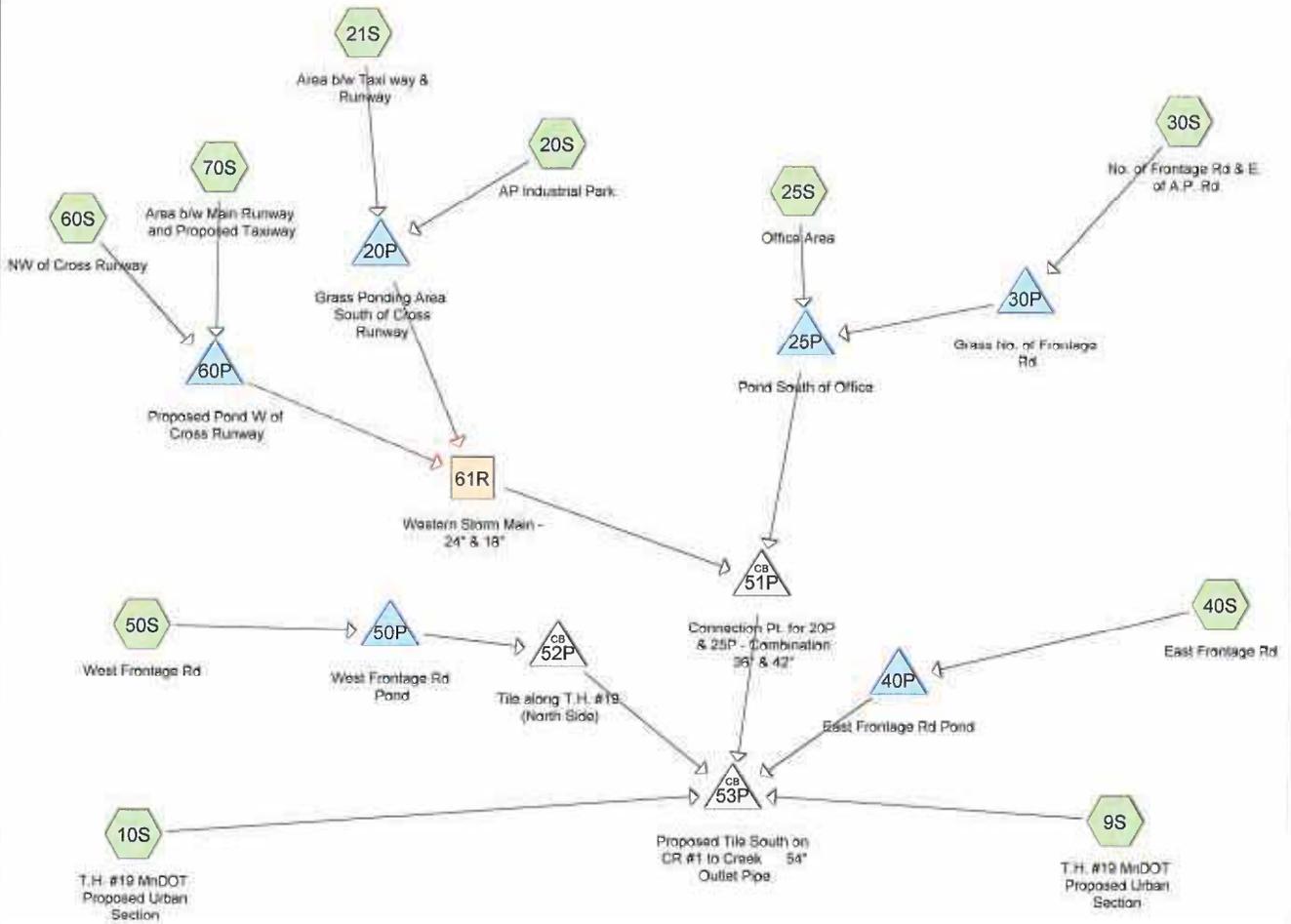
5/6/2012

ITEM NO.	ITEM	UNIT	UNIT PRICE	ESTIMATED QUANTITY	ESTIMATED COST
1	MOBILIZATION	LUMP SUM	\$10,000.00	1	\$10,000.00
2	CLEAR AND GRUB TREES	LUMP SUM	\$3,000.00	1	\$3,000.00
3	BIT REMOVAL & RECONSTRUCT	SQ YD	\$40.00	400	\$16,000.00
4	CONCRETE C&G REMOVAL & RECONSTRUCT	LINEAR FOOT	\$20.00	150	\$3,000.00
5	TILE REPAIR	LINEAR FOOT	\$20.00	200	\$4,000.00
6	COMMON EXCAVATION - POND (E.V.)	CUBIC YARD	\$10.00	18000	\$180,000.00
7	4" - 6" PERFORATED UNDERDRAIN PIPE	LINEAR FOOT	\$14.00	4800	\$67,200.00
8	12" RCP STORM SEWER PIPE, CLASS V	LINEAR FOOT	\$28.00	550	\$15,400.00
9	15" RCP STORM SEWER PIPE, CLASS V	LINEAR FOOT	\$35.00	20	\$700.00
10	18" RCP STORM SEWER PIPE, CLASS III	LINEAR FOOT	\$38.00	868	\$32,984.00
11	24" RCP STORM SEWER PIPE, CLASS III	LINEAR FOOT	\$42.00	2200	\$92,400.00
12	30" RCP STORM SEWER PIPE, CLASS III	LINEAR FOOT	\$55.00	30	\$1,650.00
13	36" RCP STORM SEWER PIPE, CLASS III	LINEAR FOOT	\$75.00	100	\$7,500.00
14	36" RCP STORM SEWER PIPE, TRENCHLESS	LINEAR FOOT	\$500.00	310	\$155,000.00
15	42" RCP STORM SEWER PIPE, CLASS III	LINEAR FOOT	\$120.00	30	\$3,600.00
16	42" RCP STORM SEWER PIPE, TRENCHLESS	LINEAR FOOT	\$600.00	220	\$132,000.00
17	54" RCP STORM SEWER PIPE, CLASS III	LINEAR FOOT	\$200.00	2350	\$470,000.00
18	15" RCP APRON	EACH	\$600.00	1	\$600.00
19	18" RCP APRON	EACH	\$1,000.00	3	\$3,000.00
20	54" RCP APRON	EACH	\$3,000.00	1	\$3,000.00
21	CONSTRUCT STORM SEWER STRUCTURE, 4020-48"	LINEAR FOOT	\$350.00	10	\$3,500.00
22	CONSTRUCT STORM SEWER STRUCTURE, 4020-54"	LINEAR FOOT	\$400.00	64	\$25,600.00
23	CONSTRUCT STORM SEWER STRUCTURE, 4020-72"	LINEAR FOOT	\$500.00	127	\$63,500.00
24	CONSTRUCT STORM SEWER STRUCTURE, 4020-78"	LINEAR FOOT	\$650.00	46	\$29,900.00
25	CONSTRUCT CONTROL STRUCTURE	EACH	\$2,000.00	1	\$2,000.00
26	CASTING ASSEMBLY, STORM	EACH	\$600.00	12	\$7,200.00
27	RIPRAP, RANDOM	CUBIC YARD	\$90.00	300	\$27,000.00
28	CONNECT TO EXISTING STORM SEWER	EACH	\$500.00	4	\$2,000.00
29	EROSION & SEDIMENT CONTROL	LUMP SUM	\$30,000.00	1	\$30,000.00
30	SEEDING	ACRE	\$2,000.00	10	\$20,000.00
SUBTOTAL					\$1,411,734.00
CONSTRUCTION CONTINGENCY (10%)					\$141,173.40
ESTIMATED CONSTRUCTION COST					\$1,552,907.40
ENGINEERING & ADMINISTRATION (18%)					\$279,523.33
TOTAL ESTIMATED PROJECT COST					\$1,832,430.73



APPENDIX NO. 1 - HYDROCAD MODEL RESULTS





Drainage Diagram for South Watershed - Airport Property with Ind Park_FULL
 Prepared by Bolton & Menk, Inc., Printed 5/23/2012
 HydroCAD® 9.10 s/n 02086 © 2009 HydroCAD Software Solutions LLC

South Watershed - Airport Property with Ind Park_FULL

Prepared by Bolton & Menk, Inc.

Printed 5/23/2012

HydroCAD® 9.10 s/n 02086 © 2009 HydroCAD Software Solutions LLC

Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
21.818	61	>75% Grass cover, Good, HSG B (30S, 70S)
21.490	69	50-75% Grass cover, Fair, HSG B (40S, 60S)
20.725	69	50-75% Grass cover,(Future Ind. Park) (20S)
19.306	78	Ag Area - (Future Ind Park) (60S)
11.590	79	50-75% Grass cover, Fair, HSG C (50S)
2.898	88	AP Master Plan Imp - industrial, 72% imp, HSG B (21S)
3.076	88	Existing Airport Industrial, 72% Imp (20S)
10.099	88	Existing External Industrial, 72%Imp (20S)
2.155	88	Existing Industrial Park (60S)
36.140	88	Urban industrial, 72% imp, HSG B (9S, 10S, 25S, 40S)
5.713	98	Existing Runway (21S, 60S, 70S)
1.611	98	Future Bit Taxiway (21S, 60S, 70S)
9.200	98	Paved parking & roofs (30S, 50S)
165.821		TOTAL AREA

South Watershed - Airport Property with Ind Park_FULL

Prepared by Bolton & Menk, Inc.

Printed 5/23/2012

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
82.346	HSG B	9S, 10S, 21S, 25S, 30S, 40S, 60S, 70S
11.590	HSG C	50S
0.000	HSG D	
71.885	Other	20S, 21S, 30S, 50S, 60S, 70S
165.821		TOTAL AREA

South Watershed - Airport Property with Ind Park_FULL

Prepared by Bolton & Menk, Inc.

Printed 5/23/2012

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Page 4

Notes Listing (all nodes)

Line#	Node Number	Notes
1	53P	This needs to be sized for a 100 yr event for the ponds and a 10yr event for MnDOT Water.
2		100 yr Storm Event = 51 cfs from ponds 52P, 51P, 40P
3		10 yr Storm Event = 54 cfs from Subcatchments 10S & 9S
4		10 yr Storm Event (Rational Method) = 62 cfs
5		48" Pipe @ 0.17% = 59 cfs (Flow Master)
6		54" Pipe @ 0.17% = 81 cfs (Flow Master)

South Watershed - Airport Property with Ind Park_ Type II 24-hr 10 Yr Stm Event Rainfall=4.10"

Prepared by Bolton & Menk, Inc.

Printed 5/23/2012

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Time span=0.00-100.00 hrs, dt=0.02 hrs, 5001 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 9S: T.H. #19 MnDOT Proposed	Runoff Area=5.460 ac 72.00% Impervious Runoff Depth=2.82" Tc=10.0 min CN=88 Runoff=23.08 cfs 1.284 af
Subcatchment 10S: T.H. #19 MnDOT Proposed	Runoff Area=8.710 ac 72.00% Impervious Runoff Depth=2.82" Tc=10.0 min CN=88 Runoff=36.81 cfs 2.048 af
Subcatchment 20S: AP Industrial Park	Runoff Area=33.900 ac 0.00% Impervious Runoff Depth=1.82" Flow Length=300' Slope=0.0032 1/1' Tc=52.5 min CN=76 Runoff=35.45 cfs 5.129 af
Subcatchment 21S: Area b/w Taxi way & Runway	Runoff Area=4.621 ac 82.44% Impervious Runoff Depth=3.21" Flow Length=580' Slope=0.0050 1/1' Tc=18.7 min CN=92 Runoff=16.53 cfs 1.238 af
Subcatchment 25S: Office Area	Runoff Area=18.770 ac 72.00% Impervious Runoff Depth=2.82" Flow Length=750' Slope=0.0040 1/1' Tc=30.3 min CN=88 Runoff=45.41 cfs 4.414 af
Subcatchment 30S: No. of Frontage Rd & E. of A.P.	Runoff Area=22.100 ac 34.39% Impervious Runoff Depth=1.67" Flow Length=1,580' Slope=0.0050 1/1' Tc=53.5 min CN=74 Runoff=20.69 cfs 3.076 af
Subcatchment 40S: East Frontage Rd	Runoff Area=10.620 ac 21.69% Impervious Runoff Depth=1.74" Flow Length=1,200' Slope=0.0050 1/1' Tc=47.5 min CN=75 Runoff=11.36 cfs 1.542 af
Subcatchment 50S: West Frontage Rd	Runoff Area=13.190 ac 12.13% Impervious Runoff Depth=2.21" Flow Length=975' Slope=0.0050 1/1' Tc=28.9 min CN=81 Runoff=25.83 cfs 2.425 af
Subcatchment 60S: NW of Cross Runway	Runoff Area=37.950 ac 6.37% Impervious Runoff Depth=1.89" Flow Length=1,500' Slope=0.0040 1/1' Tc=76.1 min CN=77 Runoff=31.44 cfs 5.979 af
Subcatchment 70S: Area b/w Main Runway and	Runoff Area=10.500 ac 30.30% Impervious Runoff Depth=1.53" Flow Length=1,300' Slope=0.0040 1/1' Tc=78.3 min CN=72 Runoff=6.65 cfs 1.339 af
Reach 61R: Western Storm Main - 24" & 18"	Avg. Flow Depth=0.74' Max Vel=4.97 fps Inflow=4.32 cfs 5.144 af 18.0" Round Pipe n=0.013 L=1,200.0' S=0.0071 1/1' Capacity=8.84 cfs Outflow=4.32 cfs 5.144 af
Pond 20P: Grass Ponding Area South of Cross	Peak Elev=1,013.32' Storage=3.214 af Inflow=38.76 cfs 6.366 af Discarded=2.72 cfs 3.944 af Primary=1.72 cfs 2.425 af Secondary=0.00 cfs 0.000 af Outflow=4.44 cfs 6.369 af
Pond 25P: Pond South of Office	Peak Elev=1,009.50' Storage=3.120 af Inflow=54.27 cfs 7.490 af Outflow=15.83 cfs 7.490 af
Pond 30P: Grass No. of Frontage Rd	Peak Elev=1,013.97' Storage=0.163 af Inflow=20.69 cfs 3.076 af 30.0" Round Culvert n=0.012 L=225.0' S=0.0222 1/1' Outflow=19.84 cfs 3.076 af
Pond 40P: East Frontage Rd Pond	Peak Elev=1,012.87' Storage=0.535 af Inflow=11.36 cfs 1.542 af Outflow=5.29 cfs 1.542 af
Pond 50P: West Frontage Rd Pond	Peak Elev=1,011.93' Storage=0.384 af Inflow=25.83 cfs 2.425 af 21.0" Round Culvert n=0.012 L=282.0' S=0.0018 1/1' Outflow=15.17 cfs 2.456 af

Pond 51P: Connection Pt. for 20P & 25P - Combination 36" & 42" Peak Elev=1,004.35' Inflow=19.95 cfs 12.634 af
42.0" Round Culvert n=0.013 L=440.0' S=0.0012 1/4' Outflow=19.95 cfs 12.634 af

Pond 52P: Tile along T.H. #19 (North Side) Peak Elev=1,007.93' Inflow=15.17 cfs 2.456 af
27.0" Round Culvert n=0.013 L=620.0' S=0.0081 1/4' Outflow=15.17 cfs 2.456 af

Pond 53P: Proposed Tile South on CR #1 to Creek 54" Outlet Peak Elev=1,004.34' Inflow=72.25 cfs 19.964 af
54.0" Round Culvert n=0.013 L=2,300.0' S=0.0014 1/4' Outflow=72.25 cfs 19.964 af

Pond 60P: Proposed Pond W of Cross Runway Peak Elev=1,012.80' Storage=3.211 af Inflow=38.06 cfs 7.318 af
Discarded=4.13 cfs 4.600 af Primary=2.60 cfs 2.719 af Secondary=0.00 cfs 0.000 af Outflow=6.73 cfs 7.319 af

Total Runoff Area = 165.821 ac Runoff Volume = 28.472 af Average Runoff Depth = 2.06"
73.08% Pervious = 121,190 ac 26.92% Impervious = 44.631 ac

South Watershed - Airport Property with Ind Park Type II 24-hr 10 Yr Stm Event Rainfall=4.10"

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Summary for Subcatchment 9S: T.H. #19 MnDOT Proposed Urban Section

Runoff = 23.08 cfs @ 12.01 hrs, Volume= 1.284 af, Depth= 2.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type II 24-hr 10 Yr Stm Event Rainfall=4.10"

Area (ac)	CN	Description
5.460	88	Urban industrial, 72% imp, HSG B
1.529		28.00% Pervious Area
3.931		72.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Summary for Subcatchment 10S: T.H. #19 MnDOT Proposed Urban Section

Runoff = 36.81 cfs @ 12.01 hrs, Volume= 2.048 af, Depth= 2.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type II 24-hr 10 Yr Stm Event Rainfall=4.10"

Area (ac)	CN	Description
8.710	88	Urban industrial, 72% imp, HSG B
2.439		28.00% Pervious Area
6.271		72.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry, Direct

Summary for Subcatchment 20S: AP Industrial Park

Runoff = 35.45 cfs @ 12.54 hrs, Volume= 5.129 af, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type II 24-hr 10 Yr Stm Event Rainfall=4.10"

Area (ac)	CN	Description
* 20.725	69	50-75% Grass cover,(Future Ind. Park)
* 3.076	88	Existing Airport Industrial, 72% Imp
* 10.099	88	Existing External Industrial, 72%Imp
33.900	76	Weighted Average
33.900		100.00% Pervious Area

South Watershed - Airport Property with Ind Park Type II 24-hr 10 Yr Stm Event Rainfall=4.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	300	0.0032	0.10		Sheet Flow, Grass: Short n= 0.150 P2= 2.80"

Summary for Subcatchment 21S: Area b/w Taxi way & Runway

Runoff = 16.53 cfs @ 12.10 hrs, Volume= 1.238 af, Depth= 3.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type II 24-hr 10 Yr Stm Event Rainfall=4.10"

Area (ac)	CN	Description
* 2.898	88	AP Master Plan Imp - industrial, 72% imp, HSG B
0.211	98	Future Bit Taxiway
* 1.512	98	Existing Runway
4.621	92	Weighted Average
0.811		17.56% Pervious Area
3.810		82.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.7	580	0.0050	0.52		Lag/CN Method,

Summary for Subcatchment 25S: Office Area

Runoff = 45.41 cfs @ 12.23 hrs, Volume= 4.414 af, Depth= 2.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type II 24-hr 10 Yr Stm Event Rainfall=4.10"

Area (ac)	CN	Description
18.770	88	Urban industrial, 72% imp, HSG B
5.256		28.00% Pervious Area
13.514		72.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	750	0.0040	0.41		Lag/CN Method,

Summary for Subcatchment 30S: No. of Frontage Rd & E. of A.P. Rd

Runoff = 20.69 cfs @ 12.55 hrs, Volume= 3.076 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type II 24-hr 10 Yr Stm Event Rainfall=4.10"

South Watershed - Airport Property with Ind Park *Type II 24-hr 10 Yr Stm Event Rainfall=4.10"*

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Area (ac)	CN	Description
14.500	61	>75% Grass cover, Good, HSG B
7.600	98	Paved parking & roofs
22.100	74	Weighted Average
14.500		65.61% Pervious Area
7.600		34.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.8	200	0.0050	0.10		Sheet Flow, Grass: Short n= 0.150 P2= 2.80"
21.7	1,380	0.0050	1.06		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
53.5	1,580	Total			

Summary for Subcatchment 40S: East Frontage Rd

Runoff = 11.36 cfs @ 12.49 hrs, Volume= 1.542 af, Depth= 1.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type II 24-hr 10 Yr Stm Event Rainfall=4.10"

Area (ac)	CN	Description
3.200	88	Urban industrial, 72% imp, HSG B
7.420	69	50-75% Grass cover, Fair, HSG B
10.620	75	Weighted Average
8.316		78.31% Pervious Area
2.304		21.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.8	200	0.0050	0.10		Sheet Flow, Grass: Short n= 0.150 P2= 2.80"
15.7	1,000	0.0050	1.06		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
47.5	1,200	Total			

Summary for Subcatchment 50S: West Frontage Rd

Runoff = 25.83 cfs @ 12.23 hrs, Volume= 2.425 af, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type II 24-hr 10 Yr Stm Event Rainfall=4.10"

South Watershed - Airport Property with Ind Park Type II 24-hr 10 Yr Stm Event Rainfall=4.10"

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Area (ac)	CN	Description
11.590	79	50-75% Grass cover, Fair, HSG C
1.600	98	Paved parking & roofs
13.190	81	Weighted Average
11.590		87.87% Pervious Area
1.600		12.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	100	0.0050	0.09		Sheet Flow, Grass: Short n= 0.150 P2= 2.80"
2.9	200	0.0050	1.14		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
7.8	675	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
28.9	975	Total			

Summary for Subcatchment 60S: NW of Cross Runway

Runoff = 31.44 cfs @ 12.86 hrs, Volume= 5.979 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type II 24-hr 10 Yr Stm Event Rainfall=4.10"

Area (ac)	CN	Description
10.680	69	50-75% Grass cover, Fair, HSG B
* 7.792	78	Ag Area - (Future Ind Park)
3.390	69	50-75% Grass cover, Fair, HSG B
2.155	88	Existing Industrial Park
* 11.514	78	Ag Area - (Future Ind Park)
* 0.762	98	Future Bit Taxiway
* 1.657	98	Existing Runway
37.950	77	Weighted Average
35.531		93.63% Pervious Area
2.419		6.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
76.1	1,500	0.0040	0.33		Lag/CN Method,

Summary for Subcatchment 70S: Area b/w Main Runway and Proposed Taxiway

Runoff = 6.65 cfs @ 12.96 hrs, Volume= 1.339 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type II 24-hr 10 Yr Stm Event Rainfall=4.10"

South Watershed - Airport Property with Ind Park_ Type II 24-hr 10 Yr Stm Event Rainfall=4.10"

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Area (ac)	CN	Description
7.318	61	>75% Grass cover, Good, HSG B
0.638	98	Future Bit Taxiway
* 2.544	98	Existing Runway
10.500	72	Weighted Average
7.318		69.70% Pervious Area
3.182		30.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
78.3	1,300	0.0040	0.28		Lag/CN Method,

Summary for Reach 61R: Western Storm Main - 24" & 18"

Inflow Area = 86.971 ac, 10.82% Impervious, Inflow Depth = 0.71" for 10 Yr Stm Event event
 Inflow = 4.32 cfs @ 14.99 hrs, Volume= 5.144 af
 Outflow = 4.32 cfs @ 15.04 hrs, Volume= 5.144 af, Atten= 0%, Lag= 3.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 2
 Max. Velocity= 4.97 fps, Min. Travel Time= 4.0 min
 Avg. Velocity = 3.27 fps, Avg. Travel Time= 6.1 min

Peak Storage= 1,042 cf @ 15.04 hrs
 Average Depth at Peak Storage= 0.74'
 Bank-Full Depth= 1.50', Capacity at Bank-Full= 8.84 cfs

18.0" Round Pipe
 n= 0.013
 Length= 1,200.0' Slope= 0.0071 '/'
 Inlet Invert= 1,009.00', Outlet Invert= 1,000.50'



Summary for Pond 20P: Grass Ponding Area South of Cross Runway

Inflow Area = 38.521 ac, 9.89% Impervious, Inflow Depth = 1.98" for 10 Yr Stm Event event
 Inflow = 38.76 cfs @ 12.52 hrs, Volume= 6.366 af
 Outflow = 4.44 cfs @ 14.89 hrs, Volume= 6.369 af, Atten= 89%, Lag= 142.4 min
 Discarded = 2.72 cfs @ 14.89 hrs, Volume= 3.944 af
 Primary = 1.72 cfs @ 14.89 hrs, Volume= 2.425 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 2

South Watershed - Airport Property with Ind Park_ Type II 24-hr 10 Yr Stm Event Rainfall=4.10"

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Peak Elev= 1,013.32' @ 14.89 hrs Surf.Area= 2.694 ac Storage= 3.214 af
 Flood Elev= 1,015.00' Surf.Area= 3.400 ac Storage= 8.335 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 335.3 min (1,200.9 - 865.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,012.00'	8.335 af	Filtration Basin (Conic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
1,012.00	2.200	0.000	0.000	2.200
1,015.00	3.400	8.335	8.335	3.403

Device	Routing	Invert	Outlet Devices
#1	Primary	1,010.00'	12.0" Round Culvert L= 100.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,010.00' / 1,008.00' S= 0.0200 '/ Cc= 0.900 n= 0.012
#2	Device 1	1,010.50'	6.0" Round Culvert X 2.00 L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,010.50' / 1,010.00' S= 0.0050 '/ Cc= 0.900 n= 0.013
#3	Device 2	1,012.00'	3.000 in/hr Exfiltration X 2.00 over Wetted area
#4	Secondary	1,014.90'	20.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#5	Discarded	1,012.00'	1.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=2.72 cfs @ 14.89 hrs HW=1,013.32' (Free Discharge)

↑ **5=Exfiltration** (Exfiltration Controls 2.72 cfs)

Primary OutFlow Max=1.72 cfs @ 14.89 hrs HW=1,013.32' TW=1,009.74' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 1.72 cfs of 5.60 cfs potential flow)

↑ **2=Culvert** (Barrel Controls 1.72 cfs @ 4.39 fps)

↑ **3=Exfiltration** (Passes 1.72 cfs of 16.31 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,012.00' TW=1,009.00' (Dynamic Tailwater)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 25P: Pond South of Office

Inflow Area = 40.870 ac, 51.66% Impervious, Inflow Depth = 2.20" for 10 Yr Stm Event event
 Inflow = 54.27 cfs @ 12.28 hrs, Volume= 7.490 af
 Outflow = 15.83 cfs @ 13.26 hrs, Volume= 7.490 af, Atten= 71%, Lag= 58.7 min
 Primary = 15.83 cfs @ 13.26 hrs, Volume= 7.490 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 1,009.50' @ 13.26 hrs Surf.Area= 1.028 ac Storage= 3.120 af

Flood Elev= 1,013.00' Surf.Area= 1.299 ac Storage= 7.196 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 287.1 min (1,141.0 - 853.9)

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Volume	Invert	Avail.Storage	Storage Description
#1	1,006.00'	7.196 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,006.00	0.757	0.000	0.000
1,013.00	1.299	7.196	7.196
Device	Routing	Invert	Outlet Devices
#1	Primary	1,004.30'	18.0" Round Culvert L= 100.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,004.30' / 1,002.00' S= 0.0230 '/ Cc= 0.900 n= 0.012
#2	Device 1	1,007.25'	30.0" Round Culvert L= 110.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,007.25' / 1,002.00' S= 0.0477 '/ Cc= 0.900 n= 0.012
#3	Device 1	1,004.50'	8.0" Round Culvert L= 200.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,004.50' / 1,004.30' S= 0.0010 '/ Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior
#4	Device 3	1,006.00'	1.000 in/hr Exfiltration over Surface area above 1,004.50' Excluded Surface area = 0.000 ac

Primary OutFlow Max=15.83 cfs @ 13.26 hrs HW=1,009.50' TW=1,003.23' (Dynamic Tailwater)

- 1=Culvert (Inlet Controls 15.83 cfs @ 8.96 fps)
- 2=Culvert (Passes < 20.92 cfs potential flow)
- 3=Culvert (Passes < 1.14 cfs potential flow)
- 4=Exfiltration (Passes < 1.04 cfs potential flow)

Summary for Pond 30P: Grass No. of Frontage Rd

Inflow Area = 22.100 ac, 34.39% Impervious, Inflow Depth = 1.67" for 10 Yr Stm Event event
 Inflow = 20.69 cfs @ 12.55 hrs, Volume= 3.076 af
 Outflow = 19.84 cfs @ 12.67 hrs, Volume= 3.076 af, Atten= 4%, Lag= 7.5 min
 Primary = 19.84 cfs @ 12.67 hrs, Volume= 3.076 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 1,013.97' @ 12.67 hrs Surf.Area= 0.170 ac Storage= 0.163 af
 Flood Elev= 1,016.00' Surf.Area= 0.512 ac Storage= 0.820 af

Plug-Flow detention time= 7.4 min calculated for 3.075 af (100% of inflow)
 Center-of-Mass det. time= 7.6 min (895.9 - 888.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,012.00'	0.820 af	Custom Stage Data (Prismatic) Listed below
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,012.00	0.000	0.000	0.000
1,013.00	0.080	0.040	0.040
1,014.00	0.173	0.126	0.166
1,015.00	0.311	0.242	0.409
1,016.00	0.512	0.412	0.820

South Watershed - Airport Property with Ind Park_ Type II 24-hr 10 Yr Stm Event Rainfall=4.10"

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Device	Routing	Invert	Outlet Devices
#1	Primary	1,012.00'	30.0" Round Culvert L= 225.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,012.00' / 1,007.00' S= 0.0222 ' /' Cc= 0.900 n= 0.012

Primary OutFlow Max=19.84 cfs @ 12.67 hrs HW=1,013.97' TW=1,009.06' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 19.84 cfs @ 4.78 fps)

Summary for Pond 40P: East Frontage Rd Pond

Inflow Area = 10.620 ac, 21.69% Impervious, Inflow Depth = 1.74" for 10 Yr Stm Event event
 Inflow = 11.36 cfs @ 12.49 hrs, Volume= 1.542 af
 Outflow = 5.29 cfs @ 13.03 hrs, Volume= 1.542 af, Atten= 53%, Lag= 31.9 min
 Primary = 5.29 cfs @ 13.03 hrs, Volume= 1.542 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 2
 Starting Elev= 1,010.70' Surf.Area= 0.140 ac Storage= 0.141 af
 Peak Elev= 1,012.87' @ 13.03 hrs Surf.Area= 0.225 ac Storage= 0.535 af (0.394 af above start)
 Flood Elev= 1,016.00' Surf.Area= 0.371 ac Storage= 1.461 af (1.319 af above start)

Plug-Flow detention time= 103.9 min calculated for 1.400 af (91% of inflow)
 Center-of-Mass det. time= 37.7 min (917.7 - 880.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,009.50'	1.461 af	Custom Stage Data (Prismatic) Listed below
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,009.50	0.094	0.000	0.000
1,010.50	0.132	0.113	0.113
1,011.00	0.151	0.071	0.184
1,012.00	0.188	0.169	0.353
1,013.00	0.231	0.209	0.563
1,014.00	0.275	0.253	0.816
1,015.00	0.322	0.298	1.114
1,016.00	0.371	0.347	1.461

Device	Routing	Invert	Outlet Devices
#1	Primary	1,010.06'	15.0" Round Culvert L= 238.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,010.06' / 1,009.82' S= 0.0010 ' /' Cc= 0.900 n= 0.012
#2	Device 1	1,010.70'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.29 cfs @ 13.03 hrs HW=1,012.87' TW=1,002.82' (Dynamic Tailwater)
 ↑**1=Culvert** (Barrel Controls 5.29 cfs @ 4.31 fps)
 ↑**2=Orifice/Grate** (Passes 5.29 cfs of 5.57 cfs potential flow)

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Summary for Pond 50P: West Frontage Rd Pond

Inflow Area = 13.190 ac, 12.13% Impervious, Inflow Depth = 2.21" for 10 Yr Stm Event event
 Inflow = 25.83 cfs @ 12.23 hrs, Volume= 2.425 af
 Outflow = 15.17 cfs @ 12.48 hrs, Volume= 2.456 af, Atten= 41%, Lag= 14.9 min
 Primary = 15.17 cfs @ 12.48 hrs, Volume= 2.456 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 1,009.00' Surf.Area= 0.051 ac Storage= 0.025 af

Peak Elev= 1,011.93' @ 12.48 hrs Surf.Area= 0.176 ac Storage= 0.384 af (0.359 af above start)

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	1,008.50'	1.375 af	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,008.50	0.000	0.000	0.000
1,009.50	0.101	0.051	0.051
1,010.00	0.115	0.054	0.105
1,011.00	0.145	0.130	0.234
1,012.00	0.178	0.162	0.396
1,013.00	0.255	0.216	0.612
1,014.00	0.310	0.283	0.895
1,015.00	0.650	0.480	1.375

Device	Routing	Invert	Outlet Devices
#1	Primary	1,007.55'	21.0" Round Culvert L= 282.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,007.55' / 1,007.04' S= 0.0018 '/ Cc= 0.900 n= 0.012

Primary OutFlow Max=15.17 cfs @ 12.48 hrs HW=1,011.92' TW=1,007.93' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 15.17 cfs @ 6.31 fps)**Summary for Pond 51P: Connection Pt. for 20P & 25P - Combination 36" & 42"**

Inflow Area = 127.841 ac, 23.88% Impervious, Inflow Depth = 1.19" for 10 Yr Stm Event event
 Inflow = 19.95 cfs @ 13.39 hrs, Volume= 12.634 af
 Outflow = 19.95 cfs @ 13.39 hrs, Volume= 12.634 af, Atten= 0%, Lag= 0.0 min
 Primary = 19.95 cfs @ 13.39 hrs, Volume= 12.634 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 1,004.35' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,000.29'	42.0" Round Culvert L= 440.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,000.29' / 999.76' S= 0.0012 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=19.95 cfs @ 13.39 hrs HW=1,003.13' TW=1,002.49' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 19.95 cfs @ 3.25 fps)

Summary for Pond 52P: Tile along T.H. #19 (North Side)

Inflow Area = 13.190 ac, 12.13% Impervious, Inflow Depth = 2.23" for 10 Yr Stm Event event
 Inflow = 15.17 cfs @ 12.48 hrs, Volume= 2.456 af
 Outflow = 15.17 cfs @ 12.48 hrs, Volume= 2.456 af, Atten= 0%, Lag= 0.0 min
 Primary = 15.17 cfs @ 12.48 hrs, Volume= 2.456 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 1,007.93' @ 12.48 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,006.00'	27.0" Round Culvert L= 620.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,006.00' / 1,001.00' S= 0.0081 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=15.17 cfs @ 12.48 hrs HW=1,007.93' TW=1,002.86' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 15.17 cfs @ 4.18 fps)

Summary for Pond 53P: Proposed Tile South on CR #1 to Creek 54" Outlet Pipe

This needs to be sized for a 100 yr event for the ponds and a 10yr event for MnDOT Water.

100 yr Storm Event = 51 cfs from ponds 52P, 51P, 40P

10 yr Storm Event = 54 cfs from Subcatchments 10S & 9S

10 yr Storm Event (Rational Method) = 62 cfs

48" Pipe @ 0.17% = 59 cfs (Flow Master)

54" Pipe @ 0.17% = 81 cfs (Flow Master)

Inflow Area =	165.821 ac, 26.92% Impervious, Inflow Depth = 1.44" for 10 Yr Stm Event event
Inflow =	72.25 cfs @ 12.02 hrs, Volume= 19.964 af
Outflow =	72.25 cfs @ 12.02 hrs, Volume= 19.964 af, Atten= 0%, Lag= 0.0 min
Primary =	72.25 cfs @ 12.02 hrs, Volume= 19.964 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 1,004.34' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	999.76'	54.0" Round Culvert L= 2,300.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 999.76' / 996.50' S= 0.0014 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=72.20 cfs @ 12.02 hrs HW=1,004.34' (Free Discharge)

↑**1=Culvert** (Barrel Controls 72.20 cfs @ 5.54 fps)

Summary for Pond 60P: Proposed Pond W of Cross Runway

Inflow Area = 48.450 ac, 11.56% Impervious, Inflow Depth = 1.81" for 10 Yr Stm Event event
 Inflow = 38.06 cfs @ 12.86 hrs, Volume= 7.318 af
 Outflow = 6.73 cfs @ 15.02 hrs, Volume= 7.319 af, Atten= 82%, Lag= 129.4 min
 Discarded = 4.13 cfs @ 15.02 hrs, Volume= 4.600 af
 Primary = 2.60 cfs @ 15.02 hrs, Volume= 2.719 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 1,012.80' @ 15.02 hrs Surf.Area= 4,097 ac Storage= 3.211 af
 Flood Elev= 1,014.00' Surf.Area= 4.400 ac Storage= 8.295 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 207.4 min (1,111.3 - 904.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	1,012.00'	8.295 af	Custom Stage Data (Conic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
1,012.00	3.900	0.000	0.000	3.900
1,014.00	4.400	8.295	8.295	4.405

Device	Routing	Invert	Outlet Devices
#1	Primary	1,010.00'	12.0" Round Tile Outlet to Existing Storm L= 50.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,010.00' / 1,009.00' S= 0.0200 1/1 Cc= 0.900 n= 0.013
#2	Device 1	1,010.50'	6.0" Round Pond Underdrain System X 4.00 L= 150.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,010.50' / 1,010.00' S= 0.0033 1/1 Cc= 0.900 n= 0.013
#3	Device 2	1,012.00'	3.000 in/hr Filtration over Wetted area above 1,010.00' Conductivity to Groundwater Elevation = 0.00' Excluded Wetted area = 0.000 ac
#4	Discarded	1,012.00'	1.000 in/hr Exfiltration over Surface area
#5	Secondary	1,013.90'	40.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=4.13 cfs @ 15.02 hrs HW=1,012.80' (Free Discharge)

↳4=Exfiltration (Exfiltration Controls 4.13 cfs)

Primary OutFlow Max=2.60 cfs @ 15.02 hrs HW=1,012.80' TW=1,009.74' (Dynamic Tailwater)

↳1=Tile Outlet to Existing Storm (Passes 2.60 cfs of 5.06 cfs potential flow)

↳↳2=Pond Underdrain System (Barrel Controls 2.60 cfs @ 3.31 fps)

↳↳↳3=Filtration (Passes 2.60 cfs of 12.41 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,012.00' TW=1,009.00' (Dynamic Tailwater)

↳5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

South Watershed - Airport Property with Ind Park *Type II 24-hr 100 Yr Stm Event Rainfall=5.90"*

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Time span=0.00-100.00 hrs, dt=0.02 hrs, 5001 points x 2

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 9S: T.H. #19 MnDOT Proposed	Runoff Area=5.460 ac 72.00% Impervious Runoff Depth=4.53" Tc=10.0 min CN=88 Runoff=36.11 cfs 2.061 af
Subcatchment 10S: T.H. #19 MnDOT Proposed	Runoff Area=8.710 ac 72.00% Impervious Runoff Depth=4.53" Tc=10.0 min CN=88 Runoff=57.61 cfs 3.288 af
Subcatchment 20S: AP Industrial Park	Runoff Area=33.900 ac 0.00% Impervious Runoff Depth=3.29" Flow Length=300' Slope=0.0032 1/100 Tc=52.5 min CN=76 Runoff=65.76 cfs 9.306 af
Subcatchment 21S: Area b/w Taxi way & Runway	Runoff Area=4.621 ac 82.44% Impervious Runoff Depth=4.97" Flow Length=580' Slope=0.0050 1/100 Tc=18.7 min CN=92 Runoff=24.97 cfs 1.914 af
Subcatchment 25S: Office Area	Runoff Area=18.770 ac 72.00% Impervious Runoff Depth=4.53" Flow Length=750' Slope=0.0040 1/100 Tc=30.3 min CN=88 Runoff=71.92 cfs 7.085 af
Subcatchment 30S: No. of Frontage Rd & E. of A.P.	Runoff Area=22.100 ac 34.39% Impervious Runoff Depth=3.10" Flow Length=1,580' Slope=0.0050 1/100 Tc=53.5 min CN=74 Runoff=39.69 cfs 5.711 af
Subcatchment 40S: East Frontage Rd	Runoff Area=10.620 ac 21.69% Impervious Runoff Depth=3.20" Flow Length=1,200' Slope=0.0050 1/100 Tc=47.5 min CN=75 Runoff=21.38 cfs 2.829 af
Subcatchment 50S: West Frontage Rd	Runoff Area=13.190 ac 12.13% Impervious Runoff Depth=3.79" Flow Length=975' Slope=0.0050 1/100 Tc=28.9 min CN=81 Runoff=44.39 cfs 4.169 af
Subcatchment 60S: NW of Cross Runway	Runoff Area=37.950 ac 6.37% Impervious Runoff Depth=3.39" Flow Length=1,500' Slope=0.0040 1/100 Tc=76.1 min CN=77 Runoff=57.55 cfs 10.727 af
Subcatchment 70S: Area b/w Main Runway and	Runoff Area=10.500 ac 30.30% Impervious Runoff Depth=2.91" Flow Length=1,300' Slope=0.0040 1/100 Tc=78.3 min CN=72 Runoff=13.22 cfs 2.548 af
Reach 61R: Western Storm Main - 24" & 18"	Avg. Flow Depth=0.82' Max Vel=5.19 fps Inflow=5.14 cfs 9.536 af 18.0" Round Pipe n=0.013 L=1,200.0' S=0.0071 1/100 Capacity=8.84 cfs Outflow=5.14 cfs 9.536 af
Pond 20P: Grass Ponding Area South of Cross	Peak Elev=1,014.47' Storage=6.595 af Inflow=70.88 cfs 11.220 af Discarded=3.20 cfs 6.899 af Primary=2.05 cfs 4.322 af Secondary=0.00 cfs 0.000 af Outflow=5.24 cfs 11.220 af
Pond 25P: Pond South of Office	Peak Elev=1,012.05' Storage=6.001 af Inflow=90.46 cfs 12.796 af Outflow=19.87 cfs 12.796 af
Pond 30P: Grass No. of Frontage Rd	Peak Elev=1,015.19' Storage=0.486 af Inflow=39.69 cfs 5.711 af 30.0" Round Culvert n=0.012 L=225.0' S=0.0222 1/100 Outflow=32.90 cfs 5.711 af
Pond 40P: East Frontage Rd Pond	Peak Elev=1,014.76' Storage=1.043 af Inflow=21.38 cfs 2.829 af Outflow=7.58 cfs 2.829 af
Pond 50P: West Frontage Rd Pond	Peak Elev=1,014.08' Storage=0.933 af Inflow=44.39 cfs 4.169 af 21.0" Round Culvert n=0.012 L=282.0' S=0.0018 1/100 Outflow=19.70 cfs 4.200 af

South Watershed - Airport Property with Ind Park *Type II 24-hr 100 Yr Stm Event Rainfall=5.90"*

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Pond 51P: Connection Pt. for 20P & 25P - Combination 36" & 42" Peak Elev=1,008.96' Inflow=24.75 cfs 22.332 af
42.0" Round Culvert n=0.013 L=440.0' S=0.0012 '/ Outflow=24.75 cfs 22.332 af

Pond 52P: Tile along T.H. #19 (North Side) Peak Elev=1,009.55' Inflow=19.70 cfs 4.200 af
27.0" Round Culvert n=0.013 L=620.0' S=0.0081 '/ Outflow=19.70 cfs 4.200 af

Pond 53P: Proposed Tile South on CR #1 to Creek 54" Outlet Peak Elev=1,009.10' Inflow=107.49 cfs 34.710 af
54.0" Round Culvert n=0.013 L=2,300.0' S=0.0014 '/ Outflow=107.49 cfs 34.710 af

Pond 60P: Proposed Pond W of Cross Runway Peak Elev=1,013.77' Storage=7.295 af Inflow=70.74 cfs 13.275 af
Discarded=4.38 cfs 8.064 af Primary=3.10 cfs 5.214 af Secondary=0.00 cfs 0.000 af Outflow=7.47 cfs 13.278 af

Total Runoff Area = 165.821 ac Runoff Volume = 49.637 af Average Runoff Depth = 3.59"
73.08% Pervious = 121.190 ac 26.92% Impervious = 44.631 ac

Summary for Subcatchment 9S: T.H. #19 MnDOT Proposed Urban Section

Runoff = 36.11 cfs @ 12.01 hrs, Volume= 2.061 af, Depth= 4.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type II 24-hr 100 Yr Stm Event Rainfall=5.90"

Area (ac)	CN	Description
5.460	88	Urban industrial, 72% imp, HSG B
1.529		28.00% Pervious Area
3.931		72.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Summary for Subcatchment 10S: T.H. #19 MnDOT Proposed Urban Section

Runoff = 57.61 cfs @ 12.01 hrs, Volume= 3.288 af, Depth= 4.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type II 24-hr 100 Yr Stm Event Rainfall=5.90"

Area (ac)	CN	Description
8.710	88	Urban industrial, 72% imp, HSG B
2.439		28.00% Pervious Area
6.271		72.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry, Direct

Summary for Subcatchment 20S: AP Industrial Park

Runoff = 65.76 cfs @ 12.54 hrs, Volume= 9.306 af, Depth= 3.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type II 24-hr 100 Yr Stm Event Rainfall=5.90"

Area (ac)	CN	Description
* 20.725	69	50-75% Grass cover,(Future Ind. Park)
* 3.076	88	Existing Airport Industrial, 72% Imp
* 10.099	88	Existing External Industrial, 72%Imp
33.900	76	Weighted Average
33.900		100.00% Pervious Area

South Watershed - Airport Property with Ind Park Type II 24-hr 100 Yr Stm Event Rainfall=5.90"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
52.5	300	0.0032	0.10		Sheet Flow, Grass: Short n= 0.150 P2= 2.80"

Summary for Subcatchment 21S: Area b/w Taxi way & Runway

Runoff = 24.97 cfs @ 12.10 hrs, Volume= 1.914 af, Depth= 4.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type II 24-hr 100 Yr Stm Event Rainfall=5.90"

Area (ac)	CN	Description
* 2.898	88	AP Master Plan Imp - industrial, 72% imp, HSG B
0.211	98	Future Bit Taxiway
* 1.512	98	Existing Runway
4.621	92	Weighted Average
0.811		17.56% Pervious Area
3.810		82.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.7	580	0.0050	0.52		Lag/CN Method,

Summary for Subcatchment 25S: Office Area

Runoff = 71.92 cfs @ 12.23 hrs, Volume= 7.085 af, Depth= 4.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type II 24-hr 100 Yr Stm Event Rainfall=5.90"

Area (ac)	CN	Description
18.770	88	Urban industrial, 72% imp, HSG B
5.256		28.00% Pervious Area
13.514		72.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.3	750	0.0040	0.41		Lag/CN Method,

Summary for Subcatchment 30S: No. of Frontage Rd & E. of A.P. Rd

Runoff = 39.69 cfs @ 12.54 hrs, Volume= 5.711 af, Depth= 3.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type II 24-hr 100 Yr Stm Event Rainfall=5.90"

South Watershed - Airport Property with Ind Park *Type II 24-hr 100 Yr Stm Event Rainfall=5.90"*

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Area (ac)	CN	Description
14.500	61	>75% Grass cover, Good, HSG B
7.600	98	Paved parking & roofs
22.100	74	Weighted Average
14.500		65.61% Pervious Area
7.600		34.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.8	200	0.0050	0.10		Sheet Flow, Grass: Short n= 0.150 P2= 2.80"
21.7	1,380	0.0050	1.06		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
53.5	1,580	Total			

Summary for Subcatchment 40S: East Frontage Rd

Runoff = 21.38 cfs @ 12.46 hrs, Volume= 2.829 af, Depth= 3.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type II 24-hr 100 Yr Stm Event Rainfall=5.90"

Area (ac)	CN	Description
3.200	88	Urban industrial, 72% imp, HSG B
7.420	69	50-75% Grass cover, Fair, HSG B
10.620	75	Weighted Average
8.316		78.31% Pervious Area
2.304		21.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.8	200	0.0050	0.10		Sheet Flow, Grass: Short n= 0.150 P2= 2.80"
15.7	1,000	0.0050	1.06		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
47.5	1,200	Total			

Summary for Subcatchment 50S: West Frontage Rd

Runoff = 44.39 cfs @ 12.23 hrs, Volume= 4.169 af, Depth= 3.79"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type II 24-hr 100 Yr Stm Event Rainfall=5.90"

South Watershed - Airport Property with Ind Park Type II 24-hr 100 Yr Stm Event Rainfall=5.90"

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Area (ac)	CN	Description
11.590	79	50-75% Grass cover, Fair, HSG C
1.600	98	Paved parking & roofs
13.190	81	Weighted Average
11.590		87.87% Pervious Area
1.600		12.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	100	0.0050	0.09		Sheet Flow, Grass: Short n= 0.150 P2= 2.80"
2.9	200	0.0050	1.14		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
7.8	675	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
28.9	975	Total			

Summary for Subcatchment 60S: NW of Cross Runway

Runoff = 57.55 cfs @ 12.84 hrs, Volume= 10.727 af, Depth= 3.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type II 24-hr 100 Yr Stm Event Rainfall=5.90"

Area (ac)	CN	Description
10.680	69	50-75% Grass cover, Fair, HSG B
* 7.792	78	Ag Area - (Future Ind Park)
3.390	69	50-75% Grass cover, Fair, HSG B
2.155	88	Existing Industrial Park
* 11.514	78	Ag Area - (Future Ind Park)
* 0.762	98	Future Bit Taxiway
* 1.657	98	Existing Runway
37.950	77	Weighted Average
35.531		93.63% Pervious Area
2.419		6.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
76.1	1,500	0.0040	0.33		Lag/CN Method,

Summary for Subcatchment 70S: Area b/w Main Runway and Proposed Taxiway

Runoff = 13.22 cfs @ 12.88 hrs, Volume= 2.548 af, Depth= 2.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs
Type II 24-hr 100 Yr Stm Event Rainfall=5.90"

Area (ac)	CN	Description
7.318	61	>75% Grass cover, Good, HSG B
0.638	98	Future Bit Taxiway
* 2.544	98	Existing Runway
10.500	72	Weighted Average
7.318		69.70% Pervious Area
3.182		30.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
78.3	1,300	0.0040	0.28		Lag/CN Method,

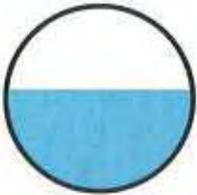
Summary for Reach 61R: Western Storm Main - 24" & 18"

Inflow Area = 86.971 ac, 10.82% Impervious, Inflow Depth = 1.32" for 100 Yr Stm Event event
 Inflow = 5.14 cfs @ 16.12 hrs, Volume= 9.536 af
 Outflow = 5.14 cfs @ 16.17 hrs, Volume= 9.536 af, Atten= 0%, Lag= 3.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 2
 Max. Velocity= 5.19 fps, Min. Travel Time= 3.9 min
 Avg. Velocity = 3.78 fps, Avg. Travel Time= 5.3 min

Peak Storage= 1,189 cf @ 16.17 hrs
 Average Depth at Peak Storage= 0.82'
 Bank-Full Depth= 1.50', Capacity at Bank-Full= 8.84 cfs

18.0" Round Pipe
 n= 0.013
 Length= 1,200.0' Slope= 0.0071 1/1
 Inlet Invert= 1,009.00', Outlet Invert= 1,000.50'



Summary for Pond 20P: Grass Ponding Area South of Cross Runway

Inflow Area = 38.521 ac, 9.89% Impervious, Inflow Depth = 3.50" for 100 Yr Stm Event event
 Inflow = 70.88 cfs @ 12.49 hrs, Volume= 11.220 af
 Outflow = 5.24 cfs @ 16.17 hrs, Volume= 11.220 af, Atten= 93%, Lag= 220.6 min
 Discarded = 3.20 cfs @ 16.17 hrs, Volume= 6.899 af
 Primary = 2.05 cfs @ 16.17 hrs, Volume= 4.322 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 2

South Watershed - Airport Property with Ind Park *Type II 24-hr 100 Yr Stm Event Rainfall=5.90"*

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Peak Elev= 1,014.47' @ 16.17 hrs Surf.Area= 3.169 ac Storage= 6.595 af
 Flood Elev= 1,015.00' Surf.Area= 3.400 ac Storage= 8.335 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 590.7 min (1,442.1 - 851.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,012.00'	8.335 af	Filtration Basin (Conic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
1,012.00	2.200	0.000	0.000	2.200
1,015.00	3.400	8.335	8.335	3.403

Device	Routing	Invert	Outlet Devices
#1	Primary	1,010.00'	12.0" Round Culvert L= 100.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,010.00' / 1,008.00' S= 0.0200 ' /' Cc= 0.900 n= 0.012
#2	Device 1	1,010.50'	6.0" Round Culvert X 2.00 L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,010.50' / 1,010.00' S= 0.0050 ' /' Cc= 0.900 n= 0.013
#3	Device 2	1,012.00'	3.000 in/hr Exfiltration X 2.00 over Wetted area
#4	Secondary	1,014.90'	20.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#5	Discarded	1,012.00'	1.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=3.20 cfs @ 16.17 hrs HW=1,014.47' (Free Discharge)

↑5=Exfiltration (Exfiltration Controls 3.20 cfs)

Primary OutFlow Max=2.05 cfs @ 16.17 hrs HW=1,014.47' TW=1,009.82' (Dynamic Tailwater)

↑1=Culvert (Passes 2.05 cfs of 6.50 cfs potential flow)

↑2=Culvert (Barrel Controls 2.05 cfs @ 5.21 fps)

↑3=Exfiltration (Passes 2.05 cfs of 19.19 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,012.00' TW=1,009.00' (Dynamic Tailwater)

↑4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 25P: Pond South of Office

Inflow Area = 40.870 ac, 51.66% Impervious, Inflow Depth = 3.76" for 100 Yr Stm Event event
 Inflow = 90.46 cfs @ 12.28 hrs, Volume= 12.796 af
 Outflow = 19.87 cfs @ 13.51 hrs, Volume= 12.796 af, Atten= 78%, Lag= 74.0 min
 Primary = 19.87 cfs @ 13.51 hrs, Volume= 12.796 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 1,012.05' @ 13.51 hrs Surf.Area= 1.226 ac Storage= 6.001 af

Flood Elev= 1,013.00' Surf.Area= 1.299 ac Storage= 7.196 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 245.5 min (1,087.0 - 841.4)

South Watershed - Airport Property with Ind Park *Type II 24-hr 100 Yr Stm Event Rainfall=5.90"*

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Volume	Invert	Avail.Storage	Storage Description
#1	1,006.00'	7.196 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,006.00	0.757	0.000	0.000
1,013.00	1.299	7.196	7.196
Device	Routing	Invert	Outlet Devices
#1	Primary	1,004.30'	18.0" Round Culvert L= 100.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,004.30' / 1,002.00' S= 0.0230 '/ Cc= 0.900 n= 0.012
#2	Device 1	1,007.25'	30.0" Round Culvert L= 110.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,007.25' / 1,002.00' S= 0.0477 '/ Cc= 0.900 n= 0.012
#3	Device 1	1,004.50'	8.0" Round Culvert L= 200.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,004.50' / 1,004.30' S= 0.0010 '/ Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior
#4	Device 3	1,006.00'	1.000 in/hr Exfiltration over Surface area above 1,004.50' Excluded Surface area = 0.000 ac

Primary OutFlow Max=19.87 cfs @ 13.51 hrs HW=1,012.05' TW=1,003.84' (Dynamic Tailwater)

- 1=Culvert (Inlet Controls 19.87 cfs @ 11.24 fps)
- 2=Culvert (Passes < 39.31 cfs potential flow)
- 3=Culvert (Passes < 1.43 cfs potential flow)
- 4=Exfiltration (Passes < 1.24 cfs potential flow)

Summary for Pond 30P: Grass No. of Frontage Rd

Inflow Area = 22.100 ac, 34.39% Impervious, Inflow Depth = 3.10" for 100 Yr Stm Event event
 Inflow = 39.69 cfs @ 12.54 hrs, Volume= 5.711 af
 Outflow = 32.90 cfs @ 12.79 hrs, Volume= 5.711 af, Atten= 17%, Lag= 14.8 min
 Primary = 32.90 cfs @ 12.79 hrs, Volume= 5.711 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 1,015.19' @ 12.79 hrs Surf.Area= 0.349 ac Storage= 0.486 af
 Flood Elev= 1,016.00' Surf.Area= 0.512 ac Storage= 0.820 af

Plug-Flow detention time= 8.6 min calculated for 5.711 af (100% of inflow)
 Center-of-Mass det. time= 8.2 min (878.7 - 870.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,012.00'	0.820 af	Custom Stage Data (Prismatic) Listed below
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,012.00	0.000	0.000	0.000
1,013.00	0.080	0.040	0.040
1,014.00	0.173	0.126	0.166
1,015.00	0.311	0.242	0.409
1,016.00	0.512	0.412	0.820

South Watershed - Airport Property with Ind Park Type II 24-hr 100 Yr Stm Event Rainfall=5.90"

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Device	Routing	Invert	Outlet Devices
#1	Primary	1,012.00'	30.0" Round Culvert L= 225.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,012.00' / 1,007.00' S= 0.0222 ' / Cc= 0.900 n= 0.012

Primary OutFlow Max=32.90 cfs @ 12.79 hrs HW=1,015.19' TW=1,011.21' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 32.90 cfs @ 6.70 fps)

Summary for Pond 40P: East Frontage Rd Pond

Inflow Area = 10.620 ac, 21.69% Impervious, Inflow Depth = 3.20" for 100 Yr Stm Event event
 Inflow = 21.38 cfs @ 12.46 hrs, Volume= 2.829 af
 Outflow = 7.58 cfs @ 13.16 hrs, Volume= 2.829 af, Atten= 65%, Lag= 41.7 min
 Primary = 7.58 cfs @ 13.16 hrs, Volume= 2.829 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 2

Starting Elev= 1,010.70' Surf.Area= 0.140 ac Storage= 0.141 af

Peak Elev= 1,014.76' @ 13.16 hrs Surf.Area= 0.311 ac Storage= 1.043 af (0.902 af above start)

Flood Elev= 1,016.00' Surf.Area= 0.371 ac Storage= 1.461 af (1.319 af above start)

Plug-Flow detention time= 94.6 min calculated for 2.688 af (95% of inflow)

Center-of-Mass det. time= 54.1 min (916.6 - 862.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,009.50'	1.461 af	Custom Stage Data (Prismatic) Listed below
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,009.50	0.094	0.000	0.000
1,010.50	0.132	0.113	0.113
1,011.00	0.151	0.071	0.184
1,012.00	0.188	0.169	0.353
1,013.00	0.231	0.209	0.563
1,014.00	0.275	0.253	0.816
1,015.00	0.322	0.298	1.114
1,016.00	0.371	0.347	1.461

Device	Routing	Invert	Outlet Devices
#1	Primary	1,010.06'	15.0" Round Culvert L= 238.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,010.06' / 1,009.82' S= 0.0010 ' / Cc= 0.900 n= 0.012
#2	Device 1	1,010.70'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=7.58 cfs @ 13.16 hrs HW=1,014.76' TW=1,003.46' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 7.58 cfs @ 6.18 fps)

↑**2=Orifice/Grate** (Passes 7.58 cfs of 7.62 cfs potential flow)

Summary for Pond 50P: West Frontage Rd Pond

Inflow Area = 13.190 ac, 12.13% Impervious, Inflow Depth = 3.79" for 100 Yr Stm Event event
 Inflow = 44.39 cfs @ 12.23 hrs, Volume= 4.169 af
 Outflow = 19.70 cfs @ 12.57 hrs, Volume= 4.200 af, Atten= 56%, Lag= 20.2 min
 Primary = 19.70 cfs @ 12.57 hrs, Volume= 4.200 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 2
 Starting Elev= 1,009.00' Surf.Area= 0.051 ac Storage= 0.025 af
 Peak Elev= 1,014.08' @ 12.57 hrs Surf.Area= 0.337 ac Storage= 0.933 af (0.907 af above start)

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 8.0 min (838.5 - 830.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,008.50'	1.375 af	Custom Stage Data (Prismatic) Listed below
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,008.50	0.000	0.000	0.000
1,009.50	0.101	0.051	0.051
1,010.00	0.115	0.054	0.105
1,011.00	0.145	0.130	0.234
1,012.00	0.178	0.162	0.396
1,013.00	0.255	0.216	0.612
1,014.00	0.310	0.283	0.895
1,015.00	0.650	0.480	1.375

Device	Routing	Invert	Outlet Devices
#1	Primary	1,007.55'	21.0" Round Culvert L= 282.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,007.55' / 1,007.04' S= 0.0018 '/ Cc= 0.900 n= 0.012

Primary OutFlow Max=19.70 cfs @ 12.57 hrs HW=1,014.08' TW=1,008.48' (Dynamic Tailwater)
 ←1=Culvert (Barrel Controls 19.70 cfs @ 8.19 fps)

Summary for Pond 51P: Connection Pt. for 20P & 25P - Combination 36" & 42"

Inflow Area = 127.841 ac, 23.88% Impervious, Inflow Depth = 2.10" for 100 Yr Stm Event event
 Inflow = 24.75 cfs @ 13.69 hrs, Volume= 22.332 af
 Outflow = 24.75 cfs @ 13.69 hrs, Volume= 22.332 af, Atten= 0%, Lag= 0.0 min
 Primary = 24.75 cfs @ 13.69 hrs, Volume= 22.332 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 1,008.96' @ 12.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,000.29'	42.0" Round Culvert L= 440.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,000.29' / 999.76' S= 0.0012 '/ Cc= 0.900 n= 0.013

Primary OutFlow Max=24.75 cfs @ 13.69 hrs HW=1,003.73' TW=1,003.12' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 24.75 cfs @ 3.25 fps)

Summary for Pond 52P: Tile along T.H. #19 (North Side)

Inflow Area = 13.190 ac, 12.13% Impervious, Inflow Depth = 3.82" for 100 Yr Stm Event event
 Inflow = 19.70 cfs @ 12.57 hrs, Volume= 4.200 af
 Outflow = 19.70 cfs @ 12.57 hrs, Volume= 4.200 af, Atten= 0%, Lag= 0.0 min
 Primary = 19.70 cfs @ 12.57 hrs, Volume= 4.200 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 1,009.55' @ 12.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,006.00'	27.0" Round Culvert L= 620.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,006.00' / 1,001.00' S= 0.0081 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=19.70 cfs @ 12.57 hrs HW=1,008.48' TW=1,003.58' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 19.70 cfs @ 4.95 fps)

Summary for Pond 53P: Proposed Tile South on CR #1 to Creek 54" Outlet Pipe

This needs to be sized for a 100 yr event for the ponds and a 10yr event for MnDOT Water.

100 yr Storm Event = 51 cfs from ponds 52P, 51P, 40P

10 yr Storm Event = 54 cfs from Subcatchments 10S & 9S

10 yr Storm Event (Rational Method) = 62 cfs

48" Pipe @ 0.17% = 59 cfs (Flow Master)

54" Pipe @ 0.17% = 81 cfs (Flow Master)

Inflow Area = 165.821 ac, 26.92% Impervious, Inflow Depth = 2.51" for 100 Yr Stm Event event

Inflow = 107.49 cfs @ 12.01 hrs, Volume= 34.710 af

Outflow = 107.49 cfs @ 12.01 hrs, Volume= 34.710 af, Atten= 0%, Lag= 0.0 min

Primary = 107.49 cfs @ 12.01 hrs, Volume= 34.710 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 1,009.10' @ 12.01 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	999.76'	54.0" Round Culvert L= 2,300.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 999.76' / 996.50' S= 0.0014 '/' Cc= 0.900 n= 0.013

Primary OutFlow Max=106.98 cfs @ 12.01 hrs HW=1,009.03' (Free Discharge)

↑**1=Culvert** (Barrel Controls 106.98 cfs @ 6.73 fps)

Summary for Pond 60P: Proposed Pond W of Cross Runway

Inflow Area = 48.450 ac, 11.56% Impervious, Inflow Depth = 3.29" for 100 Yr Stm Event event
 Inflow = 70.74 cfs @ 12.85 hrs, Volume= 13.275 af
 Outflow = 7.47 cfs @ 16.10 hrs, Volume= 13.278 af, Atten= 89%, Lag= 195.1 min
 Discarded = 4.38 cfs @ 16.10 hrs, Volume= 8.064 af
 Primary = 3.10 cfs @ 16.10 hrs, Volume= 5.214 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.02 hrs / 2
 Peak Elev= 1,013.77' @ 16.10 hrs Surf.Area= 4.341 ac Storage= 7.295 af
 Flood Elev= 1,014.00' Surf.Area= 4.400 ac Storage= 8.295 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 449.5 min (1,336.5 - 887.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,012.00'	8.295 af	Custom Stage Data (Conic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
1,012.00	3.900	0.000	0.000	3.900
1,014.00	4.400	8.295	8.295	4.405

Device	Routing	Invert	Outlet Devices
#1	Primary	1,010.00'	12.0" Round Tile Outlet to Existing Storm L= 50.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,010.00' / 1,009.00' S= 0.0200 '/ Cc= 0.900 n= 0.013
#2	Device 1	1,010.50'	6.0" Round Pond Underdrain System X 4.00 L= 150.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,010.50' / 1,010.00' S= 0.0033 '/ Cc= 0.900 n= 0.013
#3	Device 2	1,012.00'	3.000 in/hr Filtration over Wetted area above 1,010.00' Conductivity to Groundwater Elevation = 0.00' Excluded Wetted area = 0.000 ac
#4	Discarded	1,012.00'	1.000 in/hr Exfiltration over Surface area
#5	Secondary	1,013.90'	40.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=4.38 cfs @ 16.10 hrs HW=1,013.77' (Free Discharge)
 ↳4=Exfiltration (Exfiltration Controls 4.38 cfs)

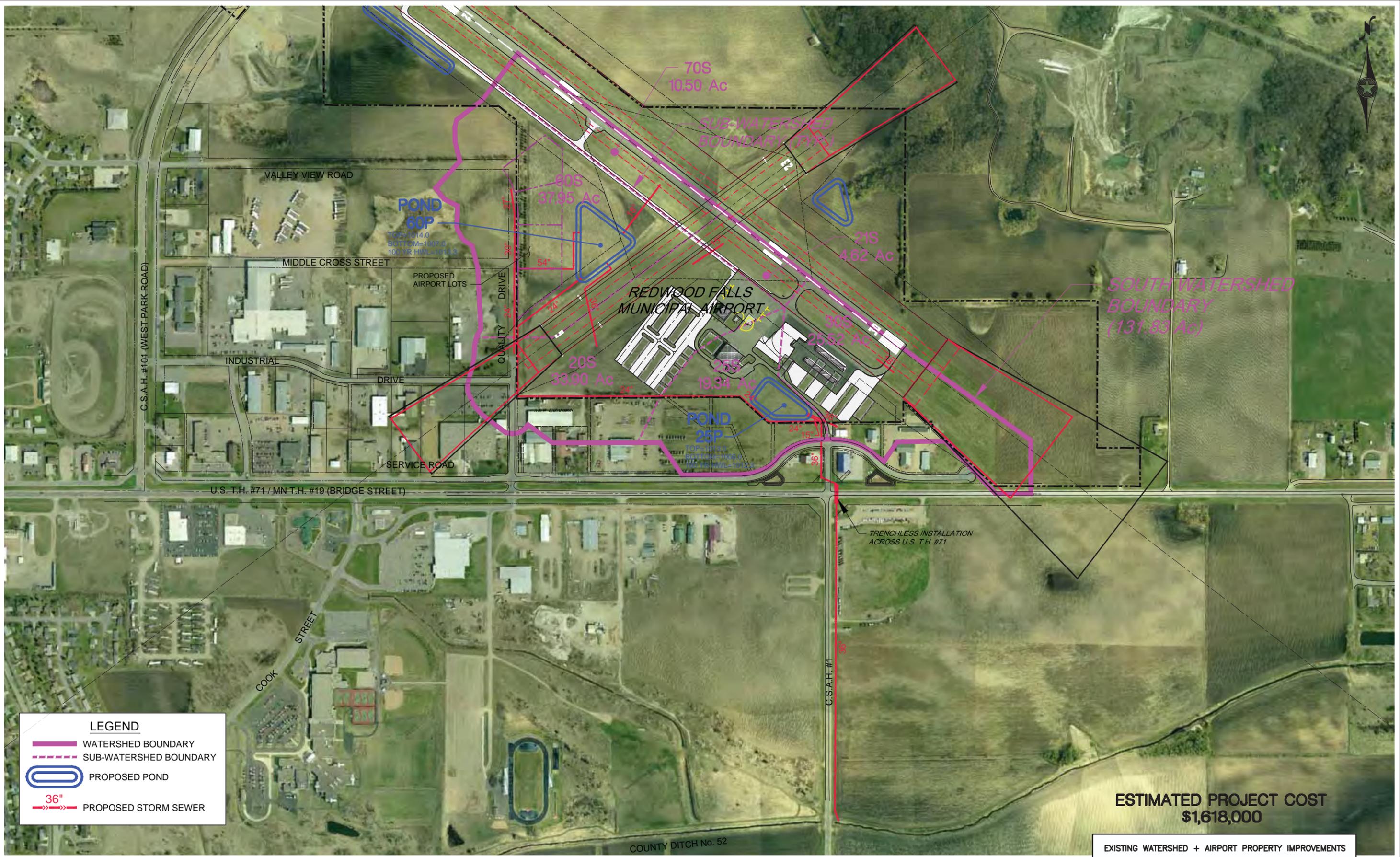
Primary OutFlow Max=3.10 cfs @ 16.10 hrs HW=1,013.77' TW=1,009.82' (Dynamic Tailwater)
 ↳1=Tile Outlet to Existing Storm (Passes 3.10 cfs of 6.04 cfs potential flow)
 ↳2=Pond Underdrain System (Barrel Controls 3.10 cfs @ 3.94 fps)
 ↳3= Filtration (Passes 3.10 cfs of 13.17 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,012.00' TW=1,009.00' (Dynamic Tailwater)
 ↳5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)



APPENDIX NO. 2 - 2007 OUTLET OPTIONS





LEGEND

- WATERSHED BOUNDARY
- - - - - SUB-WATERSHED BOUNDARY
- PROPOSED POND
- 36" PROPOSED STORM SEWER

ESTIMATED PROJECT COST
\$1,618,000



H:\REDW\T41103023\CAD\Figure 7 - South Watershed_Option 1.dwg 5/23/12 12:46 pm

DESIGNED: BLH
 DRAWN: CAL
 CHECKED: BLH

BOLTON & MENK, INC.
 Consulting Engineers & Surveyors

MANKATO, MN FAIRMONT, MN SLEEPY EYE, MN WILLMAR, MN
 BURNSVILLE, MN CHASKA, MN AMES, IA

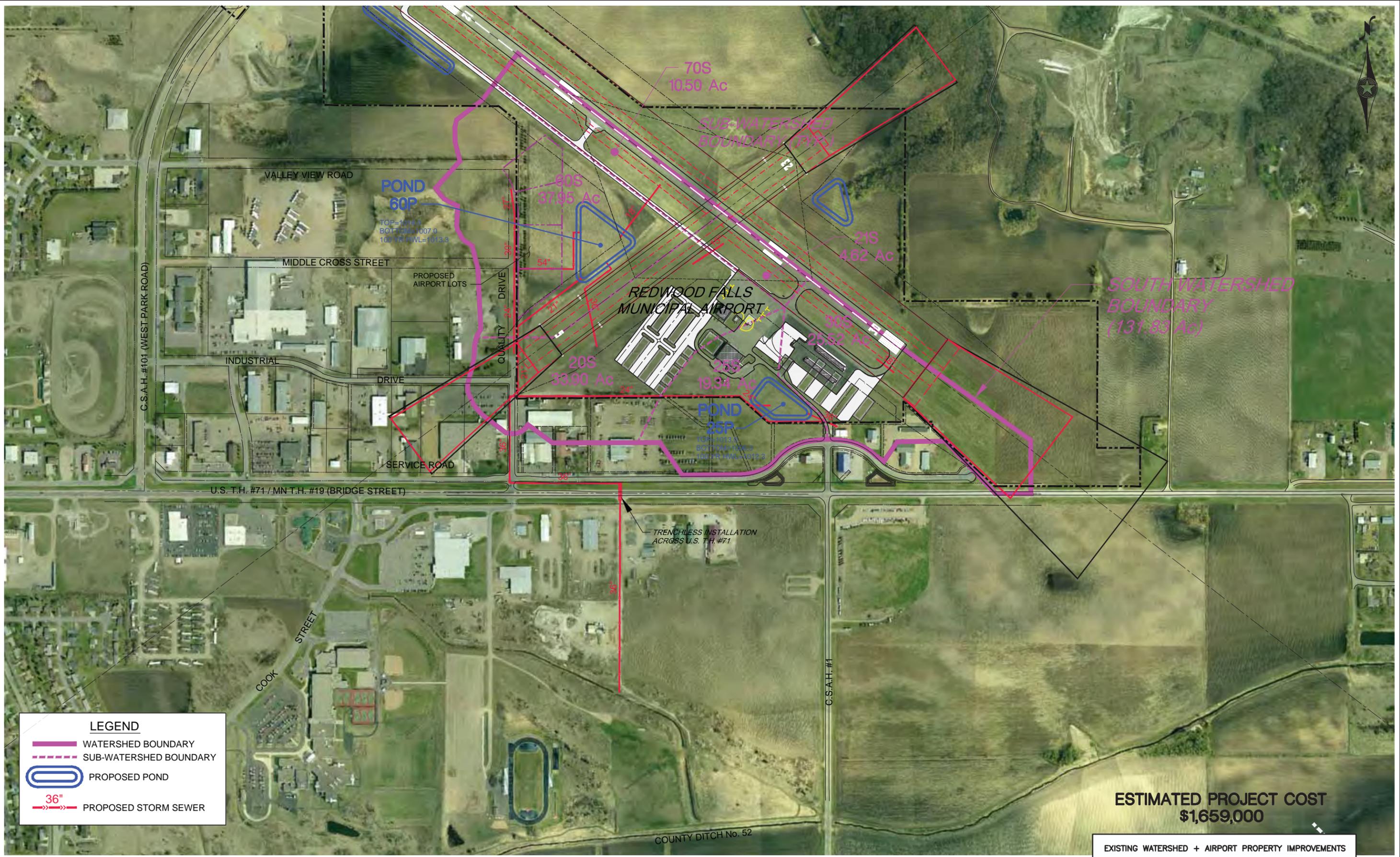
REV.	BY	DATE

EXISTING WATERSHED + AIRPORT PROPERTY IMPROVEMENTS

CITY OF REDWOOD FALLS, MINNESOTA
 AIRPORT AREA DRAINAGE STUDY

SOUTH WATERSHED
 PROPOSED STORM SEWER OUTLET No. 1

SHEET
7



LEGEND

- WATERSHED BOUNDARY
- - - - - SUB-WATERSHED BOUNDARY
- PROPOSED POND
- 36" PROPOSED STORM SEWER

ESTIMATED PROJECT COST
\$1,659,000



H:\REDW\T41103023\CAD\Figure 8 - South Watershed_Option 2.dwg 5/23/12 2:21 pm

DESIGNED: BLH
 DRAWN: CAL
 CHECKED: BLH

BOLTON & MENK, INC.
 Consulting Engineers & Surveyors

MANKATO, MN FAIRMONT, MN SLEEPY EYE, MN WILLMAR, MN
 BURNSVILLE, MN CHASKA, MN AMES, IA

REV.	BY	DATE

EXISTING WATERSHED + AIRPORT PROPERTY IMPROVEMENTS

CITY OF REDWOOD FALLS, MINNESOTA
 AIRPORT AREA DRAINAGE STUDY

SOUTH WATERSHED
 PROPOSED STORM SEWER OUTLET No. 2

SHEET
8



LEGEND

- WATERSHED BOUNDARY
- SUB-WATERSHED BOUNDARY
- PROPOSED POND
- 36" PROPOSED STORM SEWER

ESTIMATED PROJECT COST
\$1,853,000

EXISTING WATERSHED + AIRPORT PROPERTY IMPROVEMENTS

CITY OF REDWOOD FALLS, MINNESOTA
 AIRPORT AREA DRAINAGE STUDY

SOUTH WATERSHED
 PROPOSED STORM SEWER OUTLET No. 3

SHEET
9



DESIGNED: BLH
 DRAWN: CAL
 CHECKED: BLH

BOLTON & MENK, INC.
 Consulting Engineers & Surveyors

MANKATO, MN FAIRMONT, MN SLEEPY EYE, MN WILLMAR, MN
 BURNSVILLE, MN CHASKA, MN AMES, IA

REV.	BY	DATE

APPENDIX B

Section 106 Correspondence



U.S. Department
of Transportation
**Federal Aviation
Administration**

RECEIVED

SEP 9 - 2011

**BOLTON & MENK, INC
BURNSVILLE, MN**

Great Lakes Region
Minneapolis Airports District Office
6020 28th Ave S, Room 102
Minneapolis, MN 55450

September 6, 2011

Ms. Mary Ann Heidemann
Minnesota Historical Society
State Historic Preservation Office
345 Kellogg Boulevard West
St Paul, MN 55102

Dear Ms. Heidemann:

This letter is to initiate formal Section 106 consultation in accordance with 36 CFR Part 800 for an undertaking at the Redwood Falls Municipal Airport in Redwood Falls, Minnesota as well as to request concurrence with the proposed Area of Potential Effect (APE).

As recommended in 36 CFR Section 800.8, the Federal Aviation Administration (FAA) and the Redwood Falls Municipal Airport (Airport) intend to integrate the Section 106 process with the National Environmental Policy Act (NEPA) environmental review process. The FAA and the Airport are preparing an environmental assessment (EA) to evaluate and disclose the potential environmental impacts of the proposed development. The EA is being prepared to fulfill the requirements of NEPA as well as the Minnesota Environmental Review Program. The Section 106 process will be completed as part of developing the EA.

The undertaking consists of land acquisition, obstruction removal, stormwater management improvements and paving of the parallel taxiway. The FAA proposes to encompass all preliminary alternatives within the APE. The proposed APE is illustrated in the enclosed figure.

Also attached is a recent aerial photo of the 71 Drive-in Theater you mentioned in your letter dated August 10, 2011. It appears that the site is now being used for truck storage. There is little, if anything, remaining on the site that resembles the drive-in theater. Please let me know if you will require additional study of the site or if you have enough information to determine if the site retains enough integrity to still qualify for the National Register of Historic Places.

Based on the information provided, I respectfully request your written concurrence with the proposed APE. In addition, please verify that archaeological survey work is still not necessary for this project based on the proposed APE. If you have any questions or require additional information, please do not hesitate to contact me.

RECEIVED

NOV 11 2011

FAA REGIONAL OFFICE
MINNEAPOLIS

Sincerely,

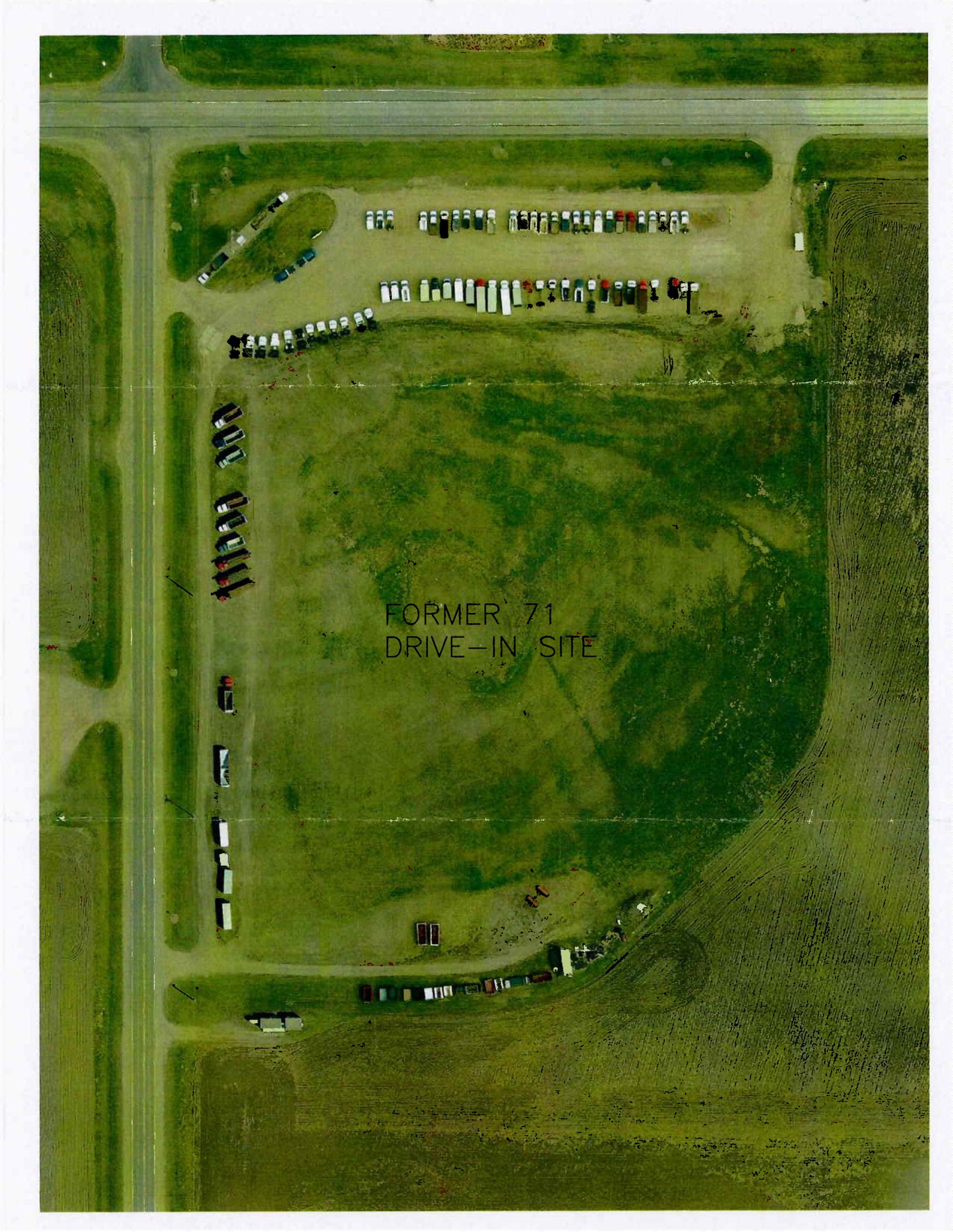
**Original Signed By:
Kandice Krull**

Kandice Krull
Environmental Protection Specialist
FAA - Minneapolis Airport District Office
612-713-4362

Enclosure: Proposed Area of Potential Effect
Drive-in Theater Aerial

Cc: Peter Langworthy, Bolton & Menk





FORMER 71
DRIVE-IN SITE



STATE HISTORIC PRESERVATION OFFICE

October 6, 2011

Kandice Krull, Environmental Protection Specialist
Federal Aviation Administration
6020 28th Ave. South, Rm 102
Minneapolis MN 55450

RE: Acquire land, remove obstructions and improve municipal airport
Redwood Falls, Redwood County
SHPO Number: 2011-2951

Dear Ms Krull:

Thank you for submitting additional information about the above project. Our review of this matter is based on the responsibilities given the State Historic Preservation Officer by the National Historic Preservation Act of 1966 and the Procedures of the Advisory Council on Historic Preservation (36CFR800).

We concur with the proposed Area of Potential Effect (APE). Based on the project information provided, we still believe that no archaeological survey work needs to be undertaken within the APE for this project, nor will any known archaeological sites be affected.

In terms of above-ground historical sites, we appreciate receiving the detailed aerial photo of existing conditions at the 71 Drive-In Theater. From this information we can determine that the site has largely been dismantled and converted to truck parking and storage use. The theater site now lacks physical and historical integrity. Therefore, we can safely determine, with no additional survey work, that **the 71 Drive-In Theater is not eligible for listing in the National Register of Historic Places.**

From your letter, it appears that the FAA is beginning the Environmental Assessment for this project. Based on the review thus far, our office is satisfied that **no historic properties will be affected by the project as proposed.** Unless the project changes substantially, we do not need to consult further with your office about this proposal.

As always, if you have any questions about our review, I can be reached at (651) 259-3456.

Sincerely,



Mary Ann Heidemann, Manager
Government Programs and Compliance

cc: Mr. Eric Johnson, PE, Bolton & Menk, Inc.

FAA Minneapolis
Airports Dist. Office

OCT 11 2011

Received

APPENDIX C

Section 4(f) Documentation



U.S. Department
of Transportation
**Federal Aviation
Administration**

RECEIVED

SEP 26 2012

**BOLTON & MENK, INC
BURNSVILLE, MN**

Great Lakes Region
Minneapolis Airports District Office
6020 28th Ave S, Room 102
Minneapolis, MN 55450

September 24, 2012

Mr. James Doering
Redwood Falls Public Works Coordinator
333 South Washington Street
PO Box 526
Redwood Falls, MN 56283

Re: Draft Section 4(f) de minimis Finding for the Proposed Improvement Project at
the Redwood Falls Municipal Airport

Dear Mr. Doering:

The Redwood Falls Municipal Airport (Airport), in cooperation with the Federal Aviation Administration (FAA), is proposing various improvement projects. These improvements include land acquisition, obstruction removal, construction of a parallel taxiway, and stormwater control. Portions of the proposed project (land acquisition and obstruction removal) will impact the bike/pedestrian trail adjacent to County Highway 101. The trail has been identified as a Section 4(f) resource.

Section 4(f) of the US Department of Transportation (DOT) Act requires the DOT to make an effort to preserve public park and recreation lands; wildlife and waterfowl refuges; and historic sites. It also prohibits the use of Section 4(f) resources if a feasible and prudent alternative is available. In accordance with the requirements of Section 4(f), the FAA has issued the attached draft Section 4(f) de minimis finding for the proposed improvements at the Airport.

The FAA respectfully requests for you review to the finding and provide comments or concurrence with the Section 4(f) de minimis finding.

If you have any comments, questions, or concerns regarding the analyses used to determine the potential effects of the proposed project on Section 4(f) resources, or have any questions regarding the project, please do not hesitate to contact me.

Sincerely,

Original Signed By:
Kandice Krull

Kandice Krull
Environmental Protection Specialist
FAA - Minneapolis Airport District Office
612-253-4639
Kandice.krull@faa.gov

Enclosure: Section 4(f) de minimis finding

Cc: Peter Langworthy, Bolton & Menk

**Department of Transportation
Federal Aviation Administration
Minneapolis Airports District Office
DRAFT SECTION 4(f) DE MINIMIS FINDING
For the Redwood Falls Municipal Airport
City of Redwood Falls, Redwood County, Minnesota**

The Federal Aviation Administration (FAA) prepared this Draft Section 4(f) *de minimis* finding for the proposed improvement projects at the Redwood Falls Municipal Airport (Airport).

I. Introduction - Section 4(f)

Section 4(f) was created when the US Department of Transportation (USDOT) was formed in 1966. It was initially codified at Title 49 United States Code (USC) § 1653(f) (Section 4(f) of the USDOT Act of 1966). In 1983, § 1653(f) was reworded and recodified at Title 49 USC § 303. These two statutes have no real practical distinction and are still commonly referred to as Section 4(f).

Section 4(f) declares that “it is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites.” In addition, Section 4(f):

Prohibits the use of land of significant publicly owned public parks, recreation areas, wildlife and waterfowl refuges, and land of a historic site for transportation projects unless the Administration determines that there is no feasible and prudent avoidance alternative and that all possible planning to minimize harm has occurred.

Congress amended Section 4(f) in 2005 when it enacted the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). The *de minimis* impact criteria and associated determination requirements are specified in SAFETEA-LU. *De minimis* impacts related to historic sites are defined as the determination of either “no adverse effect” or “no historic properties affected” in compliance with Section 106 of the National Historic Preservation Act. *De minimis* impacts on publicly owned parks, recreation areas, and wildlife/waterfowl refuges are defined as those that do not “adversely affect the activities, features, and attributes” of the Section 4(f) resource.

II. Project Description

The proposed project consists of:

- Obstruction Removal - Obstruction (12.1 acres of trees and light poles) removal to comply with Federal Aviation Regulation (FAR) Part 77 requirements for Runway 12/30 (34:1 approach slope) and Runway 5/23 (20:1 approach slope).
- Land Use Control - Approximately 45.9 acres of land will be acquired to provide the Airport with land use control within the FAA Runway Protection Zone (RPZ) and the Minnesota Department of Transportation designated Clear Zone.
- Parallel Taxiway - Extension of Runway 12/30 taxiway by 2,900’.
- Stormwater Treatment and Control – Improvements to stormwater management system to meet federal, state and local requirements.

III. Description of Section 4(f) Resource and Potential Impacts

There is a paved bike/pedestrian trail adjacent to County Highway 101 that connects North Redwood with Redwood Falls. The first quarter mile of the approximately 1.10 miles trail is lined by trees while the rest of the trail is open with a few scattered trees. The proposed project will result in acquisition of a portion of the bike/pedestrian trail and the removal of a few of the trees along the trail.

This trail is within the RPZ and Clear Zone to Runway 12/30. The portion of the trail within the RPZ and Clear Zone is within the area slated for acquisition. Approximately 0.60 acre of the trail will be acquired as part of the proposed project (approximately 0.08 mile of trail). However, access to the trail will remain as it exists today.

In addition, there are a few trees that line the trail along the portion of the trail within the approach. These trees are obstructions to the FAR Part 77 surfaces and are proposed to be removed as part of the proposed project, approximately 0.40 acre. The Airport will replace the trees removed along the path to an area outside the FAR Part 77 surfaces.

The project will have a minimal impact on the physical characteristics of the trail, and will not adversely affect the activities, features, and attributes that qualify the trail for protection under Section 4(f). The trail will continue to be available for use and the Airport will replace the trees removed.

IV. Discussion of Coordination

The public will be offered an opportunity to comment on this Section 4(f) *de minimis* finding when the Draft EA is released for public comment. The public will have 30 days to comment on the proposed project, the potential impacts, and this finding.

After the comment period is complete, the FAA will make a final decision based on the information provided above, any public comments received, and in coordination with the City of Redwood Falls as to whether the effects of the proposed project on the pedestrian/bike trail constitute a *de minimis* Section 4(f) impact.

V. Preliminary Finding

After careful and thorough consideration of the facts contained herein, the undersigned finds that the proposed Federal action is consistent with Title 49 USC § 303 and other applicable environmental requirements. The proposed Federal action will not significantly affect the pedestrian/bike trail and constitutes as a *de minimis* Section 4(f) impact.



Kandice Krull
Environmental Protection Specialist
Federal Aviation Administration
Minneapolis Airport District Office

9/24/12

Date

CITY OF REDWOOD FALLS

333 Washington Street • PO Box 526
Redwood Falls, Minnesota 56283-0526
507-637-5755 • Fax 507-637-2417

James Doering
Public Works Project Coordinator
jdoering@ci.redwood-falls.mn.us

Wednesday, September 26, 2012

Ms. Kandice Krull
Environmental Protection Specialist
Federal Aviation Administration
Minneapolis Airport District Office, MSP ADO-600
6020 28th Avenue South, Room 102
Minneapolis, MN 55425

RE: Redwood Falls Municipal Airport
Environmental Assessment – Section 4(f)

Dear Ms. Krull,

I have reviewed the draft Section 4(f) de minimis finding regarding improvements to the Redwood Falls Municipal Airport which you sent on September 24, 2012. This finding concerns the bicycle and pedestrian trail adjacent to the west of County Highway 101.

The information in the draft finding appears accurate, and I concur that the proposed project will not adversely affect the activities, features, and attributes of the trail. I also concur that the de minimis determination is appropriate for this project as it pertains to the trail referenced above. I understand that the 3-4 trees adjacent to the trail that will be removed need to be replaced outside the FAR Part 77 surfaces.

Sincerely,



James Doering
Public Works Project Coordinator
City of Redwood Falls

cc: Peter Langworthy, Bolton & Menk, Inc.

APPENDIX D

Early Coordination Correspondence



REPLY TO
ATTENTION

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
180 FIFTH STREET EAST, SUITE 700
ST. PAUL MINNESOTA 55101-1678

AUG 09 2011

RECEIVED

AUG 10 2011

BOLTON & MENK, INC
BURNSVILLE, MN

Operations
Regulatory (2011-03078-ERH)

Mr. Eric Johnson
Bolton & Menk, Inc.
12224 Nicollet Avenue
Burnsville, Minnesota 55337

Dear Mr. Johnson:

We have received your letter, dated July 18, 2011, concerning the proposed Redwood Falls Municipal Airport Improvements. We reviewed the information and exhibits provided in your letter. Please consider the following general information concerning our regulatory program that may apply to the proposed project.

If the proposal involves discharge of dredged and/or fill material into waters of the United States, it may be subject to the Corps of Engineers' jurisdiction under Section 404 of the Clean Water Act (CWA Section 404). Waters of the United States include navigable waters, their tributaries, and adjacent wetlands (33 CFR § 328.3). CWA Section 301(a) prohibits discharges of dredged or fill material into waters of the United States, unless the work has been authorized by a Department of the Army permit under Section 404. Information about the Corps permitting process can be obtained online at <http://www.mvp.usace.army.mil/regulatory>.

The Corps' evaluation of a Section 404 permit application involves multiple analyses, including (1) evaluating the proposal's impacts in accordance with the National Environmental Policy Act (NEPA) (33 CFR part 325), (2) determining whether the proposal is contrary to the public interest (33 CFR § 320.4), and (3) determining whether the proposal complies with the Section 404(b)(1) Guidelines (Guidelines) (40 CFR part 230).

If the proposal requires a Section 404 permit application, the Guidelines specifically require that "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences" (40 CFR § 230.10(a)). Time and money spent on the proposal prior to applying for a Section 404 permit cannot be factored into the Corps' decision whether there is a less damaging practicable alternative to the proposal.

If an application for a Corps permit has not yet been submitted, the project proposer may request a pre-application consultation meeting with the Corps to obtain information regarding the data, studies or other information that will be necessary for the permit evaluation process. A pre-

Operations
Regulatory (2011-03078-ERH)

- 2 -

application consultation meeting is strongly recommended if the proposal has substantial impacts to waters of the United States, or if it is a large or controversial project.

For further information or to request a pre-application consultation meeting, please contact Michael Setering at (651) 290-5396 (through September 12, 2011) or Eric Hanson at (651) 290-5386 (after September 12, 2011). In any correspondence or inquiries, please refer to the Regulatory number shown above.

Sincerely,



Tamara E. Cameron
for Chief, Regulatory Branch



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

RECEIVED

JUL 28 2011

BOLTON & MENK, INC
BURNSVILLE, MN

REPLY TO THE ATTENTION OF:

JUL 26 2011

E-19J

Eric Johnson, PE
Bolton & Menk, Inc.
12224 Nicollet Avenue
Burnsville, Minnesota 55337

RE: Scoping Comments for Redwood Falls Municipal Airport Improvements, Redwood Falls, Redwood County, Minnesota

Dear Mr. Johnson:

The NEPA Implementation Section has received the document listed above. Under the National Environmental Policy Act (NEPA), the Council on Environmental Quality regulations, and Section 309 of the Clean Air Act, U.S. EPA reviews and comments on major federal actions. Typically, these reviews focus on Environmental Impact Statements, but we also have the discretion to review and comment on other environmental documents prepared under NEPA, if interest and resources permit.

The document was given a cursory review, and we determined that there were no significant concerns meriting comment. However, we encourage FAA to implement green infrastructure and energy efficiency into the project. EPA also recommends FAA show, in the EA, the fate of storm water, and what measures are will be taken to both reduce off-site storm water discharge, and to remediate any aviation-related contaminated waters before discharging off-site (e.g. phytoremediation swales). EPA also recommends FAA develop an anti-idle policy for construction vehicles during the construction phase.

Please send us future NEPA documents on this project as they become available. If you have any questions, please call Mike Sedlacek of my staff at 312-886-1765 or e-mail him at sedlacek.michael@epa.gov.

Sincerely,

Kenneth A. Westlake, Chief *for*
NEPA Implementation Section
Office of Enforcement and Compliance Assurance

cc: Kandice Krull, FAA

Enclosures: NEPA Stormwater Green Sheet
Diesel Emissions Reductions During Construction

NEPA Stormwater Green Sheet

Stormwater section of NEPA documents should discuss/include (at a minimum):

- ✓ Compliance with NPDES construction and post-construction requirements (project larger than one acre has to comply by writing a pollution prevention plan)
- ✓ Compliance with local ordinances
- ✓ Compliance with the Energy Independence and Security Act of 2007

"Energy Independence and Security Act of 2007" Title IV ("Energy Savings in Building and Industry"), Subtitle C "(High Performance Federal Buildings)". Here is the entire provision:

SEC. 438. STORM WATER RUNOFF REQUIREMENTS FOR FEDERAL DEVELOPMENT PROJECTS.

The sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.

This provision is quite significant. It will require Federal sites to achieve/maintain the predevelopment hydrology to the "maximum extent technically feasible". Sites will need to include things like rain gardens and permeable pavements in order to do this.

Stormwater measures beyond the bare minimum:

- ✓ Mimic natural hydrology. Does the project decrease the recharge of the upper aquifer system?
- ✓ Sensitive areas should be given treatment beyond the bare minimum
- ✓ Keep native vegetation during construction and replant ASAP
- ✓ What types of salt/chemicals are being used for deicing? Latest BMP's used for deicing?
http://www.upperdesplainesriver.org/bbb_roadsalt.htm
- ✓ Sprawl is bad! Smart growth is good! Are there ways that the development can be implemented in a more compact area? www.epa.gov/ebtpages/pollsmartgrowth.html -select "pollution prevention programs" and "sustainability" for more info.
- ✓ Rain gardens, and permeable parking surfaces. Rain gardens and permeable parking surfaces increase the amount of water filtering into the ground and recharge aquifers, prevent community flooding and drainage problems, help protect waterbodies from pollutants carried by urban stormwater, and provide valuable wildlife habitat in an urban setting.
- ✓ Commitment to creating a Sustainable Buildings Implementation Plan (per Executive Order 13423) prior to construction.
- ✓ Green roofs, created wetlands, vegetated swales, native plant landscapes, and rain barrels
- ✓ Websites that can help with Stormwater Pollution Prevention and Sustainable Design:
 - Menu of stormwater BMP's: <http://cfpub1.epa.gov/npdes/stormwater/menuofbmps/>
 - Medium and small-sized model stormwater pollution prevention guides for construction sites: www.epa.gov/npdes/swpppguide
 - Green infrastructure practices (e.g. rain gardens):
<http://www.epa.gov/npdes/greeninfrastructure/>
 - Some standards, including standards for individual sites:
<http://www.sustainable-sites.org/>
 - Standards for neighborhoods (LEED for Neighborhood Development):
<http://www.usgbc.org/DisplayPage.aspx?CMSPageID=148>
 - Center for Watershed Protection: www.cwp.org
 - Low impact Development Center: www.lowimpactdevelopment.org

Diesel Emissions Reductions During Construction

Exposure to diesel exhaust by construction workers and those nearby a construction site can have serious health implications. For this reason, EPA recommends Best Available Diesel Retrofit Control Technology (BACT) on all significant construction projects. We believe this project is a significant construction project because of the size and duration of the project, the proximity to some residential areas, and the use of diesel equipment during construction.

Typically BACT requirements can be met through the retrofit of all diesel-powered equipment with diesel oxidation catalysts or diesel particulate filters, in addition to other strategies or technologies (for example, cleaner burning fuels or anti-idling policies). The statement below is reflective of a study EPA completed on diesel exhaust health effects:

Long-term (i.e., chronic) inhalation exposure to diesel exhaust is likely to pose a lung cancer hazard to humans, as well as damage the lung in other ways depending on exposure. Diesel exhaust is listed as a human carcinogen by the State of California and a likely human carcinogen by EPA. Short-term (i.e., acute) exposures can cause irritation and inflammatory symptoms of a transient nature, these being highly variable across the population. The assessment also indicates that evidence for exacerbation of existing allergies and asthma symptoms is emerging. EPA recognizes that diesel exhaust, as a mixture of many constituents, also contributes to ambient concentrations of several criteria air pollutants including nitrogen oxides and fine particulates, as well as other air toxics.¹

We recommend that the idling of all engines not exceed 5 minutes, and that proper enforcement is in place to ensure compliance. Shutting down gasoline and diesel vehicles and equipment when engine power is not required will reduce emissions of carbon monoxide, carbon dioxide, particulate matter, volatile organic compounds, oxides of nitrogen, and mobile source air toxics. These emissions can adversely affect local air quality, adversely affect human health through exposure, and can seep into nearby buildings and adversely affect indoor air quality.

These air quality mitigation measures for construction should be considered by FHWA. We recommend that FHWA formalize their actions for the Verona Road project by developing and implementing a construction emissions reduction plan. Although not required by EPA regulations, similar contract specifications have been established for large construction projects, including the O'Hare Airport Modernization Project and the Dan Ryan highway project in Chicago. Residents near the project and the construction workers will benefit from exposure to less air pollution.

Options to include in such a plan include:

- (a) retrofitting off-road construction equipment, including repower or engine

¹ U.S. Environmental Protection Agency (EPA). (2002) Health assessment document for diesel engine exhaust. Prepared by the National Center for Environmental Assessment, Washington, DC, for the Office of Transportation and Air Quality; EPA/600/8-90/057F. Available from: National Technical Information Service, Springfield, VA; PB2002-107661, and <<http://www.epa.gov/ncea>>.

- upgrades,
- (b) using ultra-low-sulfur fuels for all equipment,
- (c) limiting the age of on-road vehicles in construction projects to 1998 and newer, and 1996 and newer for off-road equipment,
- (d) fugitive dust control plans,
- (e) diesel particulate traps and oxidation catalysts,
- (f) using existing power sources or clean fuel generators rather than temporary power generators, and
- (g) encouraging the use of off-road equipment that meets the Tier 3 standards.

EPA is available to assist in efforts to select mitigation strategies that would be included in the final project. EPA has developed a compendium of contract specifications and language to assist State DOTs and other proponents of construction projects. Please see the following link for the specifications and language: <http://www.epa.gov/midwestcleandiesel/projects/index.html>

For ways to make your construction project environmentally sound, check out Chapter 2 of this EPA guidance: *Potential for Reducing Greenhouse Gas Emissions in the Construction Sector*.

<http://www.epa.gov/sectors/pdf/construction-sector-report.pdf>



BOLTON & MENK, INC.®

Consulting Engineers & Surveyors

12224 Nicollet Avenue • Burnsville, MN 55337
Phone (952) 890-0509 • Fax (952) 890-8065
www.bolton-menk.com

Telephone Record

Project No. T41.103023

Date: August 5, 2011

Client: City of Redwood Falls

Incoming

Outgoing

Phone: 507.359.6073

Project: Redwood Falls EA

Time:

Person Contracted: Kevin Mixon

AM

PM

Organization & Location: DNR, New Ulm; general resource review

Recorded By: Langworthy

Summary of Conversation

1. I called Kevin to follow up on the early coordination package we had sent out on July 18, 2011. I said that we had sent a separate Natural Heritage Database Information Service (NHIS) request for T and E species to DNR in St. Paul, but wished to get his thoughts from a general resources impact perspective.
2. He said that he had reviewed our package and some preliminary data sources he has regarding natural resource inventories. He said that he had no issues with the project at this time.
3. He said that he did not anticipate any significant impact issues to come out of the separate NHIS search and review, but of course we will have to wait for that to confirm.

Decision and Task:

N/A



Minnesota Department of Natural Resources

Division of Ecological and Water Resources, Box 25

500 Lafayette Road

St. Paul, Minnesota 55155-4025

Phone: (651) 259-5109 E-mail: lisa.joyal@state.mn.us

August 5, 2011

Correspondence # ERDB 20120019

Mr. Peter Langworthy
Bolton & Menk, Inc.
12224 Nicollet Avenue
Burnsville, MN 55337-1649

RE: Natural Heritage Review of the proposed Redwood Falls Municipal Airport Improvements;
T113N R35W Sections 32 & 33 and T112N R35W Section 5; Redwood County

Dear Mr. Langworthy,

As requested, the above project has been reviewed for potential effects to known occurrences of rare features. A search of the Minnesota Natural Heritage Information System (NHIS) did identify rare features within an approximate one-mile radius of the proposed project, but these records did not include any federally listed species and were either historical or not of concern given the project details that were provided with the data request form. As such, I do not believe the proposed project will adversely affect any known occurrences of rare features.

The Natural Heritage Information System, a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Division of Ecological and Water Resources, Department of Natural Resources. The NHIS is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. However, the NHIS is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. Therefore, ecologically significant features for which we have no records may exist within the project area.

For environmental review purposes, the results of this Natural Heritage Review are valid for one year; the results are only valid for the project location (noted above) and project description provided on the NHIS Data Request Form. Please contact me if project details change or if an updated review is needed.

Please note that locations of the gray wolf (*Canis lupus*), federally-listed as threatened and state-listed as special concern, and the Canada lynx (*Lynx canadensis*), federally-listed as threatened, are not currently tracked in the NHIS. As such, the Natural Heritage Review does not address these species.

Furthermore, the Natural Heritage Review does not constitute review or approval by the Department of Natural Resources as a whole. Instead, it identifies issues regarding known occurrences of rare features and potential effects to these rare features. Additional rare features for which we have no data may be present in the project area, or there may be other natural resource concerns associated with the proposed project. For these concerns, please contact your DNR Regional Environmental Assessment Ecologist (contact information available at http://www.dnr.state.mn.us/eco/ereview/erp_regioncontacts.html). Please be aware that additional site assessments or review may be required.

Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources. An invoice will be mailed to you under separate cover.

Sincerely,

A handwritten signature in black ink that reads "Lisa Joyal".

Lisa Joyal
Natural Heritage Review Coordinator



Minnesota Pollution Control Agency

520 Lafayette Road North | St. Paul, Minnesota 55155-4194 | 651-296-6300

800-657-3864 | 651-282-5332 TTY | www.pca.state.mn.us | Equal Opportunity Employer

August 30, 2011

Mr. Eric Johnson
Transportation Planning Engineer
Bolton & Menk, Inc.
12224 Nicollet Avenue
Burnsville, MN 55337

Re: Redwood Falls Municipal Airport Improvements

Dear Mr. Johnson:

The Minnesota Pollution Control Agency (MPCA) Environmental Review Unit has reviewed the information in the letter and attachment dated July 18, 2011, regarding the proposed improvements to the Redwood Falls Municipal Airport in Redwood County, Minnesota. Based on the limited information provided, and regarding matters for which the MPCA has regulatory responsibility and other interests, MPCA staff has the following comments for your consideration.

- If the project will disturb a total of one acre or more of land, a National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Construction Stormwater Permit (CSW Permit) is required from the MPCA. The owner and operator (usually the general contractor) are jointly responsible for obtaining and complying with the conditions of the CSW Permit. A detailed Stormwater Pollution Prevention Plan (SWPPP), containing stormwater management requirements both during and post construction, as well as erosion control and sediment control requirements during construction, must be prepared prior to submitting a CSW Permit application. CSW Permit coverage is required prior to commencing land disturbing activities (i.e., clearing, grading, filling, or excavating) relating to the project. For an overview of this permit and program, please refer to the following factsheet: <http://www.pca.state.mn.us/publications/wq-strm2-05.pdf>. Questions regarding CSW Permit requirements should be directed to Larry Zdon at 651-757-2839.
- We recommend you check the current listing of impaired waters on the MPCA Inventory of Impaired Waters located on the MPCA website at <http://www.pca.state.mn.us/water/tmdl/tmdl-303dlist.html>. We recommend you utilize the MPCA Special Waters and Impaired Waters Search mapping tool to identify special or impaired waters located near proposed projects. The mapping tool is located on the MPCA website at <http://pca-gis02.pca.state.mn.us/website/stormwater/csw/viewer.htm>. The Redwood River is impaired for fecal coliform and turbidity. The turbidity impairment will dictate additional increased stormwater treatment both during construction and require additional increased permanent treatment post construction. These requirements will be included in any CSW Permit. The project proposer should determine that compliance with these increased stormwater water quality treatments can be achieved on the project site or elsewhere. Information regarding the MPCA's Construction Stormwater Program can be found on the MPCA's website at: <http://www.pca.state.mn.us/water/stormwater/stormwater-c.html>.

In addition, any project that will result in over 50 acres of disturbed area and has a discharge point within one mile of a special or impaired water is required to submit their SWPPP to the MPCA for a review at least 30 days prior to the commencement of land disturbing activities. If the SWPPP is found to be out of compliance with the terms and conditions of the General Permit, further delay may occur. The MPCA encourages the project proposer to meet with staff at preliminary points to avoid this situation. Questions regarding SWPPPs should be directed to Todd Smith at 651-757-2732.

Mr. Eric Johnson
Page 2
August 30, 2011

- Please be aware that if a U.S. Army Corps of Engineers Section 404 Individual Permit is required for any project related wetland impacts, an MPCA Clean Water Act Section 401 Water Quality Certification or waiver must also be obtained as part of the permitting process. The Section 401 Water Quality Certification ensures that the activity will comply with the state water quality standards. Any conditions required within the MPCA 401 Certificate are then incorporated into the Corps 404 Permit. You can find additional information about the MPCA's 401 Certification process at www.pca.state.mn.us/water/401.html. For further information about the 401 Water Quality Certification process, please contact Kevin Molloy at 651-757-2577 or Bill Wilde at 651-757-2825.
- It is not uncommon for projects to encounter contamination, especially petroleum-contaminated soil from storage tanks or spills. Efforts should be made prior to construction to determine if and where any petroleum or other contamination is likely to be encountered during the project. Utilization of the MPCA's database and mapping tool, *What's In My Neighborhood?* can be helpful in evaluating the project area or areas for potential contamination. This mapping tool can be found at: <http://www.pca.state.mn.us/wimn/index.cfm>. It is the responsibility of the project sponsor to complete the project safely through any areas of contamination and to properly manage any contaminated soil that is excavated during the project. The factsheet, *Managing Petroleum Contaminated Soil at Public Works Projects*, is available to assist with this process, including how to identify potential sources of contamination. The factsheet can be found at: <http://www.pca.state.mn.us/publications/c-prp5-01.pdf>. If contamination is found, it must be reported immediately to the State Duty Officer at 651-649-5451 or 800-422-0798.

We appreciate the opportunity to review this project. Please be aware that this letter does not constitute approval by the MPCA of any or all elements of the project for the purpose of pending or future permit action(s) by the MPCA. Ultimately, it is the responsibility of the project proposer to secure any required permits and to comply with any requisite permit conditions. If you have any questions concerning our review of this project, please contact me at 651-757-2508.

Sincerely,



Karen Kromar
Planner Principal
Environmental Review and Feedlot Section
Regional Division

KK:mbo

cc: Craig Affeldt, MPCA, St. Paul
Larry Zdon, MPCA, St. Paul
Todd Smith, MPCA, St. Paul
Kevin Molloy, MPCA, St. Paul
Bill Wilde, MPCA, St. Paul
Randy Hukriede, MPCA, Marshall

SOIL AND WATER CONSERVATION DISTRICTS

"Helping bring YOU clean water"



Redwood SWCD

1241 E Bridge St.—Suite C
Redwood Falls, MN 56283
Phone: 507-637-2427 EXT 3
Fax: 507-637-6002
redwoodswcd.org

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Ralph Heiling
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Vice Chair
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District V
(507) 629-8276

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Marilyn
Bernhardson
District
Administrator

Kari Clouse
Office Assistant

Kristy Zajac
District
Technician

Karen Wilhelmi
Education
Coordinator

02 August 2011

Eric Johnson
Bolton & Menk
12224 Nicollet Avenue
Burnsville, MN 55337

Re: Redwood Falls Municipal Airport Improvements

Dear Mr. Johnson,

Thank you for contact me regarding your upcoming project. After in-office review, there is only one concern I have for the project – an obstruction removal in a wetland. The aerial photo you sent me is attached and the area of concern is both highlighted and circled in black.

You are allowed to cut the trees, remove the stumps and fill the holes. However, leveling the area would be regulated under the MN Wetland Conservation Act (WCA). Otherwise, I see no other objections or concerns regarding the proposed project.

Please contact me if you have further questions.

Sincerely,


Kristy Zajac
District Technician

Enc.

Acquisition - 13.2 Acres
 Required to obtain fee control over
 Runway 12 Mn/DOT Clear Zone

Fee Acquisition - 5.6 Acres
 For RPZ protection and obstruction removal

Fee Acquisition - 4.1 Acres
 For BRL protection

Fee Acquisition - 12.9 Acres
 For RPZ protection and obstruction removal

Fee Acquisition - 1.5 Acres
 For obstruction removal

Fee Acquisition - 1.3 Acres
 If required to obtain fee control over
 the Runway 30 Mn/DOT Clear Zone

Light Poles
 - Penetrate airspace up to 15 feet
 - Obstruction lighted

Fee Acquisition - 5.2 Acres
 If required to obtain fee control over
 the Runway 30 Mn/DOT Clear Zone

Boundaries are
 obstructions.

Total Fee Acquisition Area	45
Bituminous Taxiway Area	2.5
Obstruction Removal	10





Minnesota Department of Transportation

District 8 Headquarters
2505 Transportation Road
Willmar, MN 56201

RECEIVED

AUG 22 2011

Office Tel: 320.231.5195
Fax: 320.214.6305
Toll Free: 1.800.657.3792

August 19, 2011

CITY OF REDWOOD FALLS

James Doering
Public Works Project Coordinator
City of Redwood Falls
333 Washington Street
Redwood Falls, MN 56283

RE: Preparation for Environmental Assessment (EA) – Redwood Municipal Airport
State Highway 19; Control Section 6404

Dear Mr. Doering:

Thank you for notifying the Minnesota Department of Transportation (MnDOT), District 8 of the forthcoming Environmental Assessment (EA) for the proposed improvements at the Redwood Falls Municipal Airport, which is owned and operated by the city of Redwood Falls, and located north of the intersection of State Trunk Highway 19 and Redwood County State Aid Highway 1. The proposed improvements include the acquisition of land on both sides of Highway 19 and the installation of a storm water conveyance crossing Highway 19. Upon review of the proposed airport improvements, MnDOT offers the following comments:

- MnDOT requests that all of MnDOT's permits be listed in the permit section of the future EA. MnDOT's permits include:
 - Driveway permits – Minnesota Rule 8810.4400.
 - Utility Accommodation Permit (long form permit TP-2525) - Minnesota Rule 8810.3300.
 - Work within a right of way (short form permit TP-1723) - Minnesota Rule 8810.3300.
 - Aviation Clearance from the Office of Aeronautics – Minnesota Rule 8800.1200
 - Oversize and Overweight Permit - Minnesota Statute 169.80-169.87

For additional information concerning all permits please contact, Geri Vick, Permit Agent at 320.214.6364.

- MnDOT requires that the proposed storm water conveyance adhere to MnDOT's Utility Accommodation Policies including such provisions as encasement and boring requirements.

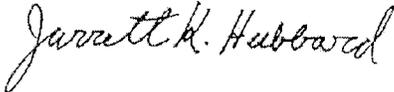
An Equal Opportunity Employer



Page 2
August 19, 2011

Mn/DOT appreciates the opportunity to comment on any site development plans or zoning requests on properties adjacent to state highways. If you have any questions or concerns, please contact me at 320.214.6362.

Sincerely,



Jarrett K. Hubbard
Senior Transportation Planner
MnDOT District 8, Willmar

Cc: Geri Vick, MnDOT

An Equal Opportunity Employer



APPENDIX E

Us Fish and Wildlife Species Information



Threatened and Endangered Species

Prairie Bush Clover (*Lespedeza leptostachya*)

The prairie bush clover is a threatened species. Threatened species are animals and plants that are likely to become endangered in the foreseeable future. Endangered species are animals and plants that are in danger of becoming extinct. Identifying, protecting, and restoring endangered and threatened species is the primary objective of the U.S. Fish and Wildlife Service's endangered species program.

What is prairie bush clover and where does it occur?

Prairie bush clover (*Lespedeza leptostachya*) is a federally threatened prairie plant found only in the tallgrass prairie region of four midwestern states.

It is a member of the bean family and a midwestern “endemic” – known only from the tallgrass prairie region of the upper Mississippi River Valley.

Why be concerned about prairie bush clover?

Like all native species, prairie bush clover has its own specific niche in the ecosystem and its own unique relationships to other plants and animals with which it lives. The loss of prairie bush clover could result in the disappearance of as yet unknown dependent species such as tiny predatory insects specialized to live on its seeds.

Prairie bush clover possesses a unique genetic and chemical makeup, different from that of any other species. This genetic information has an unknown potential value. For example, cultivated crops such as wheat and corn have been developed and improved by using wild relatives as breeding stock. Prairie bush clover and round headed bush clover (*Lespedeza capitata*) provide the only potential native genetic stock for breeding of cold tolerant bush clovers suitable for the midwest.

Alkaloids from wild plants are used as the active agents in anesthetics, insecticides, anticancer drugs and muscle relaxants. Loss of prairie bush clover would eliminate forever the opportunity for future biological research and the potential for such medical and agricultural benefits.

What does prairie bush clover look like?

Prairie bush clover is a member of the pea family. Also known as slender-leaved bush clover, it has a clover-like leaf comprised of three leaflets about an inch long and a quarter inch wide. Flowering plants are generally between nine and eighteen inches tall with the flowers loosely arranged on an open spike.

The pale pink or cream colored flowers bloom in mid-July. The entire plant has a grayish-silver sheen, making it easy to distinguish from its more round-leaved cultivated relative, the sweet clover (*Melilotus species*). The only closely related bush clover species that is widespread throughout the range of prairie bush clover is the round headed bush clover. This plant is similar in color but more robust, with leaflets about 1-1/2 inches long and 3/8 inches wide and a tight round flowering head. The more southern Virginia bush clover (*Lespedeza virginica*) overlaps the range of prairie bush clover in Illinois. Although it has slender leaves like the prairie bush clover, Virginia bush clover can be distinguished by the fact that its leaves are closer together on the stem and its flowers are the brighter pink.

What laws protect prairie bush clover?

Prairie bush clover was listed as threatened under the Endangered Species Act in February 1987. The Endangered Species Act prohibits the removal or destruction of prairie bush clover on Federal lands or in knowing



Photo by USFWS; Phil Delphey

The showy pink flowers of prairie bush clover are less often seen than the silvery-green pods because of the plant's short blooming season and its ability to produce pods directly from flowers that never open.

violation of any state law protecting the species.

In addition to its Federal status, prairie bush clover is listed as endangered or threatened in each of the four states where it occurs.

Specific provisions of state law vary from state to state and can be obtained from the appropriate state contact listed at the end of this fact sheet.

As a general guideline, citizens should contact these agencies before engaging in any action that would alter a population of prairie bush clover, including the removal of plants or

harvest of seeds for research or for commercial sale.

It is not a violation of law for private land owners to continue agricultural activities on their own lands where prairie bush clover occurs. Although heavy summer grazing appears to have an adverse effect on prairie bush clover, populations exposed to light grazing appear to be less affected.

The effect of mowing remains unknown, although the concentration of bush clover in unmown areas of hayland suggests that long term late-summer mowing removes the seeds, thus reducing population size.

Caution should be exerted to assure that herbicides do not affect bush clover populations. Users of herbicides should always be sure to follow label directions and restrictions.

Why is prairie bush clover rare?

Prairie bush clover's rarity is probably best explained by the loss of its tallgrass prairie habitat. At the beginning of the 19th century, native prairie covered almost all of Illinois and Iowa, a third of Minnesota and six percent of Wisconsin. Prairie with moderately damp to dry soils favored by prairie bush clover was also prime cropland; today only scattered remnants of prairie can be found in the four states. Many of today's prairie bush clover populations occur in sites that escaped the plow because they were too steep or rocky.

How is prairie bush clover threatened?

Prairie bush clover is listed as a federally threatened species because it is likely to become endangered with extinction in all or a significant portion of its range. Some of the surviving populations are threatened by conversion of pasture to cropland, overgrazing, agricultural expansion, herbicide application, urban expansion, rock quarrying, and transportation right-of-way maintenance and rerouting; hybridization with the more common round-headed bush clover has also been identified as a potential threat in some areas.

Who knows the location of prairie bush clover populations?

Up-to-date information on the status and location of populations is maintained in

computerized databases of the state's Natural Heritage Program and is used for environmental review and conservation planning. A federally-appointed recovery team uses this information to help the U.S. Fish and Wildlife Service plan for the protection of the species and to assess progress toward its recovery.

Information from these databases is available to consulting firms and state agencies preparing environmental assessments of proposed projects.

Where is prairie bush clover protected?

Approximately 40 percent of the known prairie bush clover sites are protected as dedicated state nature preserves, scientific and natural areas and preserves managed by private conservation organizations such as The Nature Conservancy.

A large number of prairie bush clover sites occur on private lands where farmers or other landowners have maintained the species through conservation-minded agricultural practices. Many landowners are proud to have such a rare species on their land and keep the plant in mind when planning agricultural activities. Prairie bush clover persists on lightly grazed prairie pastures, haylands, and prairie remnants that families have maintained for their own enjoyment.

How are prairie bush clover preserves managed?

Prairie bush clover is one of many native prairie species that occur in prairie preserves. Frequent fires historically maintained the composition and treeless structure of the tall-grass prairie. Today's remnants are often invaded by non-native grasses that create a buildup of mulch and by woody species that shade out bush clover populations. For these reasons, natural area managers have reintroduced prescribed fires as a way of maintaining the natural balance of species in the prairie ecosystem and remove invasive woody plants by cutting and spot application of herbicide.

Such fires are carefully planned and controlled by teams of trained managers. Research suggests that although summer fires can be detrimental to emerging prairie bush clover plants, early spring fires are not harmful.

Although prescribed burns are an important prairie management tool, burning every year, with no years of rest, may be harmful to prairie bush clover. Annual burns may result in a cover of native warm-season grasses that is too dense.

At times when fire cannot be used to control shrubby invasion, handcutting or haying may be used to maintain the open prairie condition required by prairie bush clover for flowering.

Whom do I contact?

In Illinois Contact:

Illinois Department of Natural Resources
Office of Resource Conservation
One Natural Resources Way
Springfield, IL 62711
(217/782-2685)

U.S. Fish & Wildlife Service
1511 47th Avenue
Moline, IL 61265
(309/757-5800)

In Iowa Contact:

Conservation and Recreation Division
Iowa Department of Natural Resources
502 E 9th St.
Des Moines, IA 50319-0034
(515-281-3891)

U.S. Fish & Wildlife Service
1511 47th Avenue
Moline, IL 61265
(309/757-5800)

In Minnesota Contact:

Minnesota Natural Heritage Program
Department of Natural Resources
Box 7, 500 Lafayette Road
St. Paul, Minnesota 55155
(651/259-5136)

U.S. Fish & Wildlife Service
4101 American Blvd. E.
Bloomington, Minnesota 55425-1665
(612/725-3548)

In Wisconsin Contact:

Bureau of Endangered Resources
Department of Natural Resources
P.O. Box 7921
Madison, Wisconsin 53707
(608/267-5037)

U.S. Fish & Wildlife Service
2061 Scott Tower Drive
New Franken, Wisconsin 54229
(920/866-1717)

APPENDIX F

NRCS Coordination for Farmland Impacts

Peter Langworthy

From: Peter Langworthy
Sent: Monday, June 18, 2012 1:55 PM
To: 'joseph.kristoff@mn.usda.gov'
Subject: Redwood Falls Airport Environmental
Attachments: RWF Airport AD-1006.pdf; 103023 Project Location 8x11.pdf; 103023 Project Map 11x17 RED.pdf

Joe,

As I mentioned in my voicemail, I got your name from Brian Pfarr in Redwood County. We are assisting the City of Redwood falls in the preparation of an Environmental Assessment for improvements to the Redwood Falls Municipal Airport. One of the components of the proposed work is a 5 acre drainage detention basin. The project location is attached, as is the project map, depicting the basin directly west of the intersection of the main runway and the turf crosswind runway. The five acres would be taken out of agricultural production.

Please let me know if you have questions or need further information. Thanks,

Peter

Peter Langworthy, AICP
Transportation Planner
Bolton & Menk, Inc.
Consulting Engineers & Surveyors
12224 Nicollet Avenue
Burnsville, MN 55337
P: (952) 890.0509 ext. 2886
F: (952) 890.8065
email: peterla@bolton-menk.com
www.bolton-menk.com

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I (To be completed by Federal Agency)		Date Of Land Evaluation Request 6/18/12	
Name Of Project Redwood Falls Airport Improvements		Federal Agency Involved FAA	
Proposed Land Use Drainage Retention Basin		County And State Redwood, MN	
PART II (To be completed by NRCS)		Date Request Received By NRCS	
Does the site contain prime, unique, statewide or local important farmland? <i>(If no, the FPPA does not apply -- do not complete additional parts of this form).</i>		Yes <input type="checkbox"/>	No <input type="checkbox"/>
Major Crop(s)		Acres Irrigated	Average Farm Size
Name Of Land Evaluation System Used		Farmable Land In Govt. Jurisdiction Acres: %	Amount Of Farmland As Defined in FPPA Acres: %
Name Of Local Site Assessment System		Date Land Evaluation Returned By NRCS	

PART III (To be completed by Federal Agency)	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	5.0			
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site	5.0	0.0	0.0	0.0

PART IV (To be completed by NRCS) Land Evaluation Information	Site A	Site B	Site C	Site D
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide And Local Important Farmland				
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value				

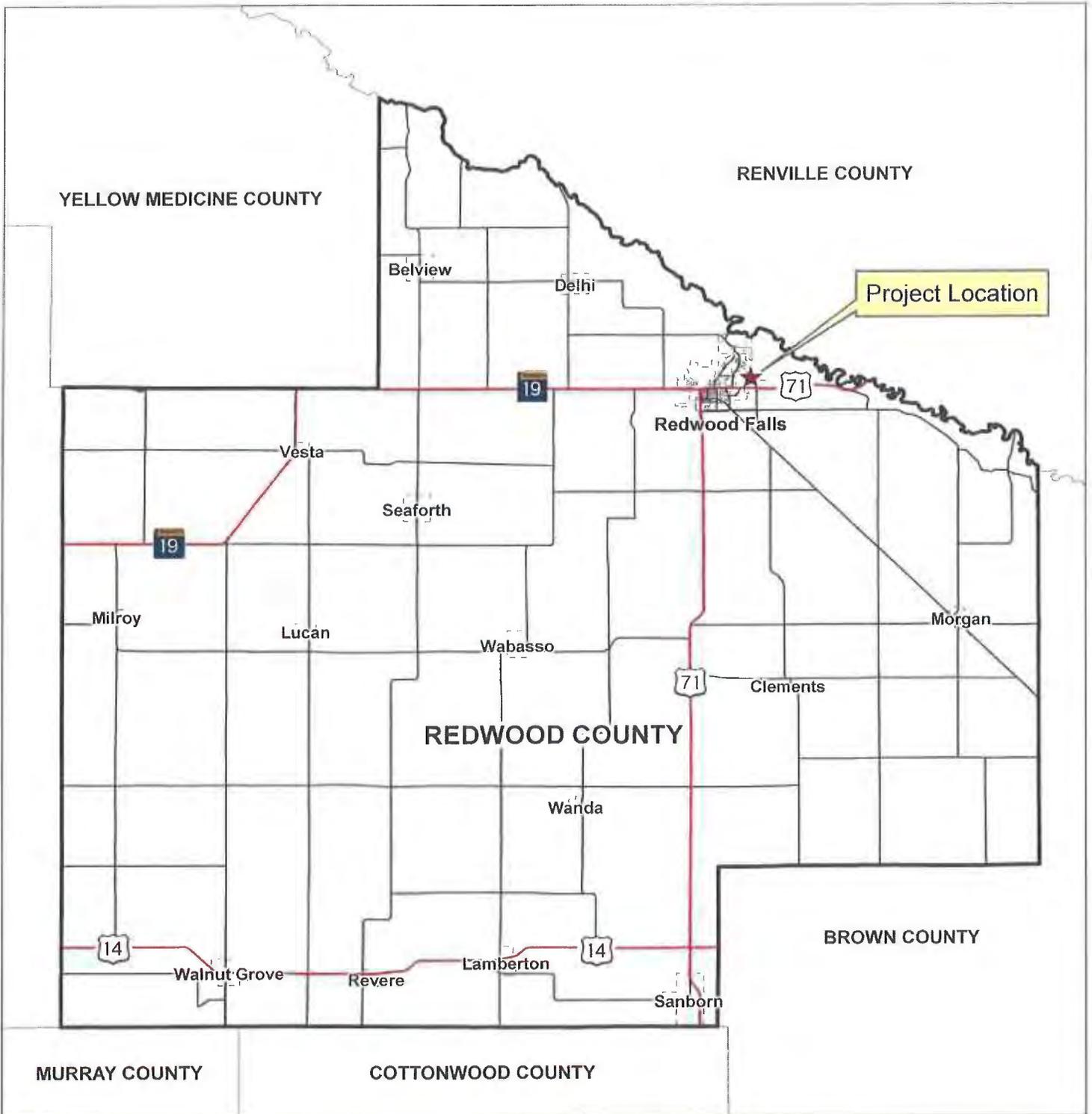
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value Of Farmland To Be Converted (Scale of 0 to 100 Points)	Site A	Site B	Site C	Site D
	0	0	0	0

PART VI (To be completed by Federal Agency) Site Assessment Criteria (These criteria are explained in 7 CFR 658.5(b))	Maximum Points	Site A	Site B	Site C	Site D
1. Area In Nonurban Use					
2. Perimeter In Nonurban Use					
3. Percent Of Site Being Farmed					
4. Protection Provided By State And Local Government					
5. Distance From Urban Builtup Area					
6. Distance To Urban Support Services					
7. Size Of Present Farm Unit Compared To Average					
8. Creation Of Nonfarmable Farmland					
9. Availability Of Farm Support Services					
10. On-Farm Investments					
11. Effects Of Conversion On Farm Support Services					
12. Compatibility With Existing Agricultural Use					
TOTAL SITE ASSESSMENT POINTS	160	0	0	0	0

PART VII (To be completed by Federal Agency)	Site A	Site B	Site C	Site D	
Relative Value Of Farmland (From Part V)	100	0	0	0	0
Total Site Assessment (From Part VI above or a local site assessment)	160	0	0	0	0
TOTAL POINTS (Total of above 2 lines)	260	0	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes <input type="checkbox"/> No <input type="checkbox"/>
----------------	-------------------	---

Reason For Selection:



Legend

- ★ Project Location
- Local Road
- Major Road/Highway
- Principal Arterial
- County Boundary
- Municipal Boundary

Source: MnDNR, MnDOT



REDWOOD FALLS
minnesota
**Redwood Falls Municipal Airport
Condensed Environmental Assessment**

Project Location

Figure 1
June, 2012

Legend

- Property Boundaries**
 Existing Airport Property
 Existing Easement
Proposed Actions
 Bituminous Taxiway
 Proposed Fee Acquisition *
 Obstruction Removal
 Detention Pond
 Storm Water Conveyance
 Pavement Removal
Land Use Safety
 Runway Protection Zone
 Runway Clear Zone
 20' Building Restriction Line

* Some of the areas depicted as fee acquisition for obstruction removal may ultimately be avigation easement
 Source: MnDac



Project Map

Figure 2

June 2012



Fee Acquisition - 13.2 Acres
 To obtain fee control over the Runway 12 Mn/DOT Clear Zone

Fee Acquisition - 4.7 Acres
 For RPZ, protection and obstruction removal

Fee Acquisition - 4.1 Acres
 For BRL protection

Fee Acquisition - 12.9 Acres
 For RPZ, protection and obstruction removal

Fee Acquisition - 1.5 Acres
 For obstruction removal

Fee Acquisition - 1.3 Acres
 To obtain fee control over the Runway 30 Mn/DOT Clear Zone

Fee Acquisition - 5.2 Acres
 To obtain fee control over the Runway 30 Mn/DOT Clear Zone

Light Poles
 - Continue coordination with landowner
 - Lower remove or otherwise mitigate poles

Total Fee Acquisition	45.1 Acres
Pavement Removal	5 Acres
Bituminous Taxiway	2.6 Acres
Obstruction Removal	12.1 Acres

Peter Langworthy

From: Kristoff, Joseph - NRCS, Marshall, MN [Joseph.Kristoff@mn.usda.gov]
Sent: Thursday, June 21, 2012 10:24 AM
To: Peter Langworthy
Subject: RE: Redwood Falls Airport Environmental
Attachments: Redwood_airport.pdf

Peter; please see attachment.

Thanks; Joe

From: Peter Langworthy [mailto:peterla@bolton-menk.com]
Sent: Monday, June 18, 2012 1:55 PM
To: Kristoff, Joseph - NRCS, Marshall, MN
Subject: Redwood Falls Airport Environmental

Joe,

As I mentioned in my voicemail, I got your name from Brian Pfarr in Redwood County. We are assisting the City of Redwood falls in the preparation of an Environmental Assessment for improvements to the Redwood Falls Municipal Airport. One of the components of the proposed work is a 5 acre drainage detention basin. The project location is attached, as is the project map, depicting the basin directly west of the intersection of the main runway and the turf crosswind runway. The five acres would be taken out of agricultural production.

Please let me know if you have questions or need further information. Thanks,

Peter

Peter Langworthy, AICP
Transportation Planner
Bolton & Menk, Inc.
Consulting Engineers & Surveyors
12224 Nicollet Avenue
Burnsville, MN 55337
P: (952) 890.0509 ext. 2886
F: (952) 890.8065
email: peterla@bolton-menk.com
www.bolton-menk.com

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U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I (To be completed by Federal Agency)		Date Of Land Evaluation Request 06/18/2012			
Name Of Project Redwood Falls Airport Improvements		Federal Agency Involved FAA			
Proposed Land Use Drainage Retention Basin		County And State Redwood County, MN			
PART II (To be completed by NRCS)		Date Request Received By NRCS 06/18/2012			
Does the site contain prime, unique, statewide or local important farmland? <i>(If no, the FPPA does not apply -- do not complete additional parts of this form).</i>		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Acres Irrigated	Average Farm Size
					450
Major Crop(s) Corn/Soybeans	Farmable Land In Govt. Jurisdiction Acres: 541132 % 97	Amount Of Farmland As Defined in FPPA Acres: 537980 % 97			
Name Of Land Evaluation System Used Redwood PI	Name Of Local Site Assessment System	Date Land Evaluation Returned By NRCS 06/21/2012			
PART III (To be completed by Federal Agency)		Alternative Site Rating			
		Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly		5.00			
B. Total Acres To Be Converted Indirectly					
C. Total Acres In Site		5.00	0.00	0.00	0.00
PART IV (To be completed by NRCS) Land Evaluation Information					
A. Total Acres Prime And Unique Farmland		1.00			
B. Total Acres Statewide And Local Important Farmland		4.00			
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted		0.0009			
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value		98.00000			
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value Of Farmland To Be Converted (Scale of 0 to 100 Points)		47	0	0	0
PART VI (To be completed by Federal Agency) Site Assessment Criteria <i>(These criteria are explained in 7 CFR 658.5(b))</i>		Maximum Points			
1. Area In Nonurban Use					
2. Perimeter In Nonurban Use					
3. Percent Of Site Being Farmed					
4. Protection Provided By State And Local Government					
5. Distance From Urban Builtup Area					
6. Distance To Urban Support Services					
7. Size Of Present Farm Unit Compared To Average					
8. Creation Of Nonfarmable Farmland					
9. Availability Of Farm Support Services					
10. On-Farm Investments					
11. Effects Of Conversion On Farm Support Services					
12. Compatibility With Existing Agricultural Use					
TOTAL SITE ASSESSMENT POINTS		160	0	0	0
PART VII (To be completed by Federal Agency)					
Relative Value Of Farmland <i>(From Part V)</i>		100	47	0	0
Total Site Assessment <i>(From Part VI above or a local site assessment)</i>		160	0	0	0
TOTAL POINTS (Total of above 2 lines)		260	47	0	0
Site Selected:		Date Of Selection		Was A Local Site Assessment Used? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Reason For Selection:					

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I (To be completed by Federal Agency)		Date Of Land Evaluation Request 06/18/2012			
Name Of Project Redwood Falls Airport Improvements		Federal Agency Involved FAA			
Proposed Land Use Drainage Retention Basin		County And State Redwood County, MN			
PART II (To be completed by NRCS)		Date Request Received By NRCS 06/18/2012			
Does the site contain prime, unique, statewide or local important farmland? <i>(If no, the FPPA does not apply -- do not complete additional parts of this form).</i>		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Acres Irrigated	Average Farm Size
Major Crop(s) Corn/Soybeans		Farmable Land In Govt. Jurisdiction Acres: 541132 % 97		Amount Of Farmland As Defined in FPPA Acres: 537980 % 97	
Name Of Land Evaluation System Used Redwood PI		Name Of Local Site Assessment System		Date Land Evaluation Returned By NRCS 06/21/2012	
PART III (To be completed by Federal Agency)		Alternative Site Rating			
		Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly		5.00			
B. Total Acres To Be Converted Indirectly					
C. Total Acres In Site		5.00	0.00	0.00	0.00
PART IV (To be completed by NRCS) Land Evaluation Information					
A. Total Acres Prime And Unique Farmland		1.00			
B. Total Acres Statewide And Local Important Farmland		4.00			
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted		0.0009			
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value		98.00000			
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value Of Farmland To Be Converted (Scale of 0 to 100 Points)		47	0	0	0
PART VI (To be completed by Federal Agency) Site Assessment Criteria (These criteria are explained in 7 CFR 658.5(b))		Maximum Points			
1. Area In Nonurban Use		15	11		
2. Perimeter In Nonurban Use		10	7		
3. Percent Of Site Being Farmed		20	20		
4. Protection Provided By State And Local Government		20	0		
5. Distance From Urban Builtup Area		15	1		
6. Distance To Urban Support Services		15	0		
7. Size Of Present Farm Unit Compared To Average		10	10		
8. Creation Of Nonfarmable Farmland		10	10		
9. Availability Of Farm Support Services		5	5		
10. On-Farm Investments		20	20		
11. Effects Of Conversion On Farm Support Services		10	0		
12. Compatibility With Existing Agricultural Use		10	0		
TOTAL SITE ASSESSMENT POINTS		160	84	0	0
PART VII (To be completed by Federal Agency)					
Relative Value Of Farmland (From Part V)		100	47	0	0
Total Site Assessment (From Part VI above or a local site assessment)		160	84	0	0
TOTAL POINTS (Total of above 2 lines)		260	131	0	0
Site Selected: Preferred Alternative		Date Of Selection 7/5/12		Was A Local Site Assessment Used? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	

Reason For Selection:

- Meets Purpose & Need
- Agriculture impacts are acceptable

APPENDIX G

Wetland Investigation and Delineation Report

Wetland Investigation and Delineation Report

**FOR THE CITY OF
REDWOOD FALLS
REDWOOD FALLS MUNICIPAL AIRPORT
ENVIROMENTAL ASSESSMENT**

November 23, 2011



BOLTON & MENK, INC.[®]

Consulting Engineers & Surveyors

2638 Shadow Lane, Suite 200 • Chaska, MN 55318-1172
Phone (952) 448-8838 • Fax (952) 448-8805
www.bolton-menk.com

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DESCRIPTION OF THE SITE	3
CLIMATE DATA.....	3
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CONCLUSION	7

APPENDIX

EXHIBIT A:	Location and Site Topography – U.S.G.S. Map
EXHIBIT B:	Aerial Photo
EXHIBIT C:	National Wetlands Inventory Map
EXHIBIT D:	Minnesota Department of Natural Resources – Protected Waters
EXHIBIT E:	Redwood County Soil Survey map
EXHIBIT F	(“Sheet 2”): Wetland Inventory -2007 Drainage Study
EXHIBIT G:	Site Map with 2011 Wetland Delineation
EXHIBIT H:	Wetland Delineation Data Sheets

WETLAND INVESTIGATION AND DELINEATION REPORT

Redwood Falls Airport Redwood Falls, Minnesota

INTRODUCTION

Bolton & Menk, Inc. was asked by the City of Redwood Falls to investigate and delineate the boundaries of any wetland located within the proposed airport improvement project boundaries. The project is located in Township 113 N., Range 35 W., Section 32, in Redwood County, Minnesota. This report summarizes the findings of the wetland investigation and delineation performed on October 13, 2011. A level 3 delineation was performed, based upon the client request and project scope.

WETLAND DELINEATION METHODOLOGY

A level 3 delineation was employed based on the project scope. The majority of the proposed improvements are to clear vegetation from within the airport clear zone. Some of the wetlands were identified using available GIS information and visual confirmation in the field. These wetlands are identified in Exhibit G as probable wetlands. These wetlands were not staked and surveyed in the field because no excavation or fill activity is proposed in these areas. They were delineated based upon photo tone and topography. One wetland, identified by the National Wetland Inventory (NWI), was staked using 2 foot pins and surveyed in the field on October 13, 2011 using methods described in the "United States Army Corps of Engineers Wetland Delineation Manual (January 1987)". Wetlands identified were classified using "Wetland Plants and Plant Communities of Minnesota and Wisconsin (Eggers and Reed)" and "Wetlands of the United States (United States Fish and Wildlife Service Circular No. 39, 1971 edition)". Subsequently, mandatory technical criteria for wetland determinations are as follows:

1. **Hydrophytic Vegetation.** The "50/20 rule" is the recommended method for selecting dominant species from a plant community for each stratum. More than 50 percent of the dominant species in all strata must have a National Range of Indicator of Obligate (OBL), Facultative Wet (FACW), or Facultative (FAC), which excludes FAC-. The National Range of Indicators was determined using the "National List of Plant Species That Occur in Wetlands (United States Fish and Wildlife Service, 1988)".
2. **Hydric Soils.** A hydric soil is defined as a soil that formed under conditions of saturation, flooding or ponding long enough during the growing season (the portion of the year when soil temperatures at 19.7 inches below the soil surface are above 41 degrees Fahrenheit), to develop anaerobic conditions in the upper part. Hydric soils were identified using the Redwood County Soil Survey and Munsell Soil Color Charts.
3. **Wetland Hydrology.** An area has wetland hydrology if it is inundated or saturated to the soil surface for at least 5 percent of the growing season in most years. Most years is defined as having a 50 percent probability of occurrence in any given year. The minimum 5 percent duration refers to a continuous single episode.

WETLAND INVESTIGATION AND DELINEATION REPORT
City of Redwood Falls
Redwood County, Minnesota

BACKGROUND INFORMATION

Prior to conducting a field investigation of this site, Exhibits A through F (see Appendix) were used to complete a preliminary evaluation. Delineation Exhibit G was prepared from the information gathered at the site.

- EXHIBIT A: Location and Site Topography – U.S.G.S.
- EXHIBIT B: Aerial Photo
- EXHIBIT C: National Wetlands Inventory Map
- EXHIBIT D: Minnesota Department of Natural Resources – Protected Waters
- EXHIBIT E: Redwood County Soil Survey map
- EXHIBIT F: Wetland Inventory - 2007 Drainage Study
- EXHIBIT G: Site Map with 2011 Wetland Delineation
- EXHIBIT H: Wetland Delineation Data Sheets

The data gathered during the preliminary investigation was used as described below:

Exhibit A is a location map of the study area, using the U.S.G.S. quadrangle map with a 10-foot contour interval. This map shows the general topography and helps in determining the general drainage of the site and the surrounding areas. This information is needed to evaluate the hydrology of the site and adjacent areas.

Exhibit B is an aerial photo providing information regarding the use of the property. This photo was also used to evaluate vegetation changes on the site. The photo helped identify some areas of interest that would require a closer onsite review.

Exhibit C is the National Wetlands Inventory map of the site and surrounding properties. This information is used to complete a preliminary investigation of the wetlands that may or may not exist on the site.

Exhibit D is used to identify waters that would be regulated by the DNR. This exhibit shows that there are no DNR protected waters relative to the site.

Exhibit E is used to complete a preliminary investigation of the soils found on the property. This is used to aid in determining the existence of soils that may be listed on either the State or National hydric soils list.

Exhibit F is the site map showing the boundaries of the delineated wetlands in the 2007 Airport drainage study prepared by Bolton & Menk, Inc (the delineation was performed by Bolton & Menk, Inc. in 2006).

Exhibit G is the site map showing the boundaries of the 2011 delineated wetlands.

Exhibit H includes the wetland delineation data sheets.

WETLAND INVESTIGATION AND DELINEATION REPORT
City of Redwood Falls
Redwood County, Minnesota

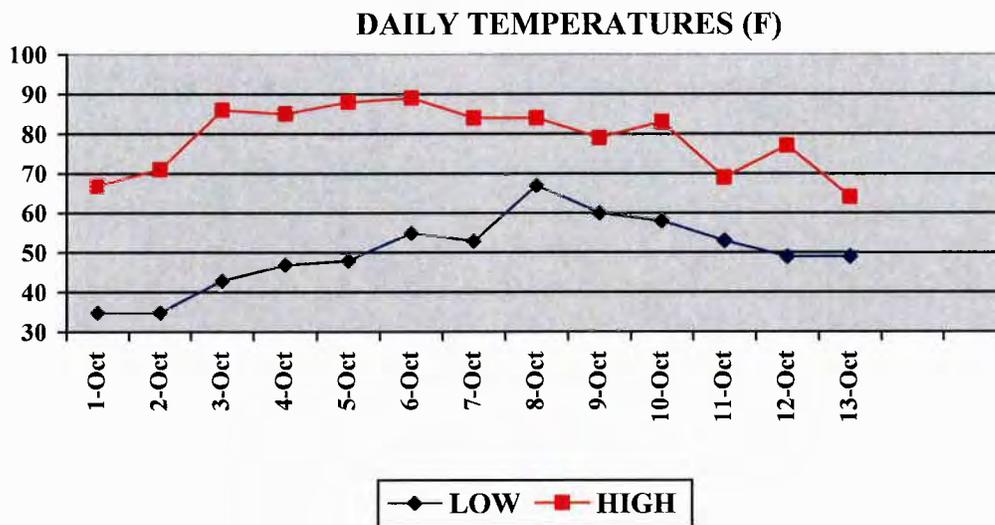
DESCRIPTION OF THE SITE

Redwood Falls Airport is located in the Northeast quadrant of the City of Redwood Falls. The runways and building areas are surrounded by agriculture, woods, commercial and residential areas. Much of the airport property is disturbed ground, consisting of cut and fill areas and subsurface drainage. Most of the area is flat to gently rolling. The wooded areas north and north east of the airport main runway (runway 21/30) are steeply sloping. The area generally slopes to the northeast towards the ravine.

CLIMATE DATA

The daily temperature table, Table A, illustrates the daily high and low temperatures for the two weeks prior to the delineation.

TABLE A



WETLAND INVESTIGATION AND DELINEATION REPORT
City of Redwood Falls
Redwood County, Minnesota

The precipitation table below, Table B, illustrates the monthly precipitation totals for the three months prior to the investigation. The mean rainfall for this area during the month of September is 2.66-inches. This year .27-inches have been recorded for the month of September. In general, the rates of precipitation leading up to the delineation have been below the mean for this period.

TABLE B

(values are in inches)	first prior month: September 2011	second prior month: August 2011	third prior month: July 2011
estimated precipitation total for this location:	0.15	1.19	4.13
there is a 30% chance this location will have less than: *	1.83	2.53	2.19
there is a 30% chance this location will have more than: *	3.80	4.41	4.52
type of month: dry normal wet	dry	dry	normal
monthly score	3	2	2
multi-month score:			
6 to 9 (dry) 10 to 14 (normal) 15 to 18 (wet)	7 (dry)		

This climatic data was gathered using the Climatology Working Group Website, <http://climate.umn.edu/>, Station 216839 Redwood Falls Airport.

SOILS

The Redwood County Soil Survey shows the following soil as mapped within the study area boundaries (Exhibit E). The majority of the soils are non-hydric.

Symbol	Name	Slopes	Hydric Soil
1016	Udorthents	1-3%	No
1053	Aquolls	0-1%	Yes
1852F	Terril	25-60%	No
247	Linder	0-2%	No

WETLAND INVESTIGATION AND DELINEATION REPORT
City of Redwood Falls
Redwood County, Minnesota

Symbol	Name	Slopes	Hydric Soil
255	Mayer	0-2%	Yes
282	Hanska	0-2%	Yes
327	Dickman	0-6%	No
392	Biscay	0-2%	Yes
39A	Wadena	0-2%	No
41	Estherville	0-6%	No
421B	Ves	1-4%	No

*Hydric Inclusions may occur

FINDINGS

On October 13, 2011 a field investigation was performed to evaluate and verify the existence and location of any wetlands on the Redwood Falls Airport property and clear zone. Six wetlands were identified using level 3 methods. Data was not gathered on five of these wetlands nor were they surveyed. They were identified using GIS data and visual confirmation in the field of landscape position and presence of hydric soil indicators. One wetland identified had detailed notes gathered, the boundary was flagged and the flags were surveyed using a Trimble Geoexplorer 6000. Attached to this report, as Exhibit H, are data sheets showing the results of this field investigation.

The following describes the wetland found, together with a brief description of its type and observations made in determining the upper wetland limits.

Wetland 1 (Exhibit G):

Wetland 1 is an isolated depression. This wetland has been identified by the National Wetland Inventory as a Palustrine Emergent temporarily flooded (PEMA) wetland. This investigation concurs with this classification. This wetland encompasses 0.2-acres of the study area. The wetland discharges overland to the east.

One transect and several sample points were taken to determine the wetland boundary. Soils, hydrology and topography aided in determining the wetland boundary.

The wetland plant community is dominated by crop stubble.

According to the Redwood County Soil Survey (Exhibit E) this wetland lies within Linder loam, a non-hydric soil.

WETLAND INVESTIGATION AND DELINEATION REPORT
City of Redwood Falls
Redwood County, Minnesota

The remaining wetlands were identified based upon hydrology, hydric soil indicators and landscape position. None of these wetland areas were identified by NWI.

Wetlands 2 & 3 (Exhibit G):

Wetlands 2 and 3 are probably best described as floodplain forest, type 1 wetlands. They are in the bottom of the steeply sloping ravines. The narrow (3-6 feet wide) channels were saturated and in areas had surface water.

The wetland plant community is dominated by upland trees – oaks, elms, maples, none of which were in the narrow channel. There was no or little vegetation evident in the channel.

According to the Redwood County Soil Survey (Exhibit E) these wetlands lie within the Terril-Swanlake, F slope (25-70%) map unit which is considered a non-hydric soil.

Wetland 4 (Exhibit G):

Wetland 4 is a Wet to Wet-Mesic Prairie, type 2 wetland. This wetland is a depression area adjacent to the top of the steep ravine slopes. This wetland encompasses approximately .01 acres of the study area.

The wetland plant community is dominated by crop stubble. The adjacent upland is hardwood forest.

According to the Redwood County Soil Survey (Exhibit E) this wetland lies within the Terril-Swanlake, F slope (25-70%) map unit which is considered a non-hydric soil.

Wetland 5 (Exhibit G):

Wetland 5 is a Wet to Wet-Mesic Prairie, type 2 wetland. This wetland is a depression area adjacent to the top of the steep ravine slopes. This wetland is the beginning of the ravine channel. This wetland encompasses approximately .004 acres of the study area.

The wetland plant community is dominated by unidentified shrubs. The adjacent upland is cropland.

According to the Redwood County Soil Survey (Exhibit E) this wetland lies within the Terril-Swanlake, F slope (25-70%) map unit which is considered a non-hydric soil.

Wetland 6 (Exhibit G):

Wetland 6 is a Wet to Wet-Mesic Prairie, type 2 wetland. This wetland is an enclosed depression area encompassing approximately .06 acres of the study area.

The wetland plant community is dominated by lawn type grasses and weeds. The adjacent upland is the same vegetation.

According to the Redwood County Soil Survey (Exhibit E) this wetland lies within the Biscay loam map unit which is considered to be a hydric soil.

WETLAND INVESTIGATION AND DELINEATION REPORT
City of Redwood Falls
Redwood County, Minnesota

CONCLUSION

Bolton & Menk, Inc., was asked to determine the boundaries of those jurisdictional wetlands that exist upon this property as defined by the Wetland Conservation Act.

This field investigation and delineation was performed on October 13, 2011. One wetland was staked in the field with two foot pin "Wetland Delineation" pin flags. The flagging was surveyed by Bolton & Menk, Inc. (Exhibit F). The delineated limits are believed to be the upper limits of where all three of the required criteria were present. It should be noted that wetland boundaries may vary as a result of varied precipitation and evaporation rates from season to season. There is no guarantee that a future wetland delineation boundary will be in the same location.

In addition to the above mentioned delineated wetland, five probable wetlands were identified. These wetlands were not staked and surveyed in the field because no excavation or fill activity is proposed in these areas.

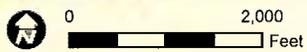
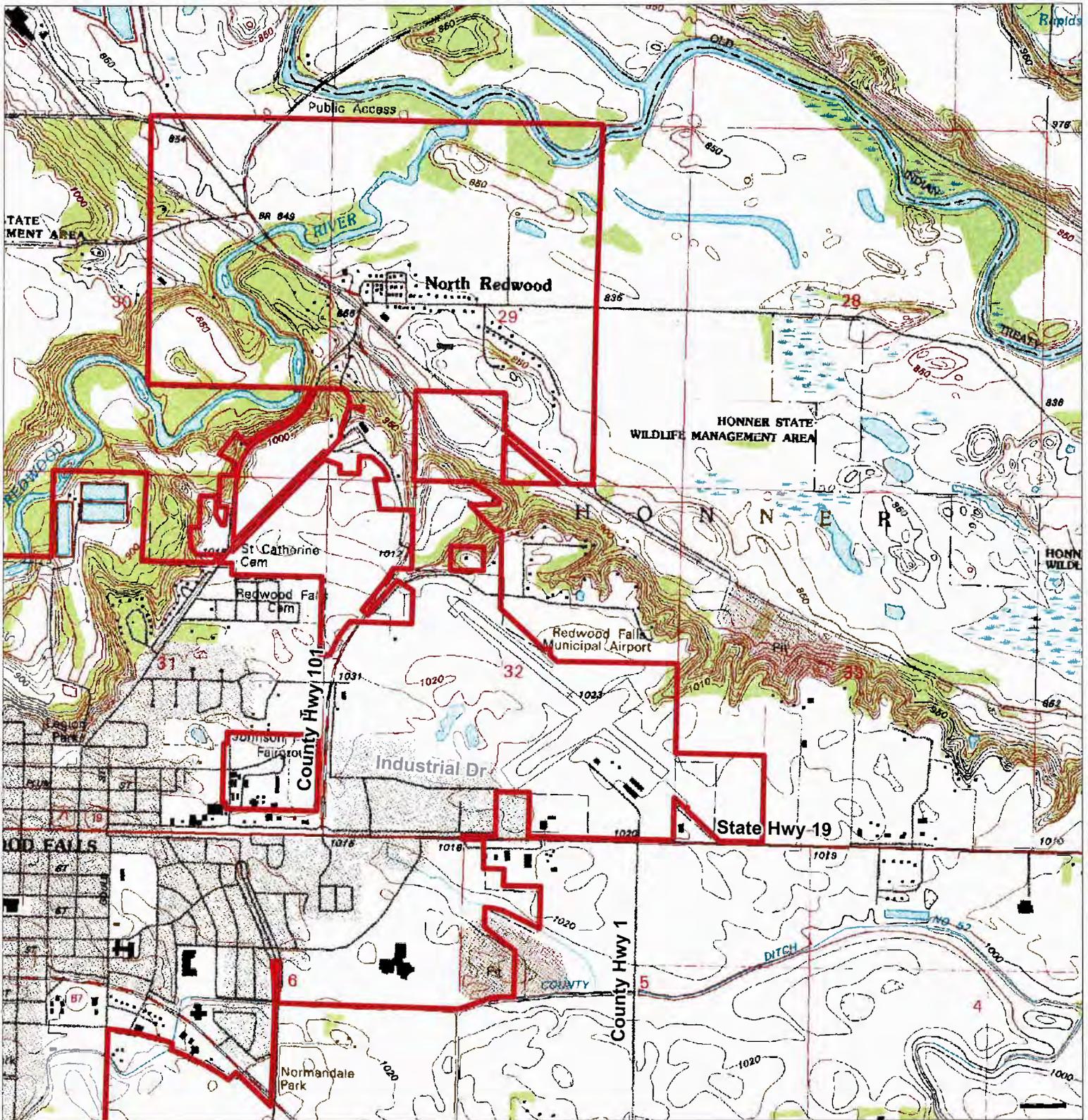
Sincerely,

BOLTON & MENK, INC.



Mark L. Perry
Natural Resources Specialist

APPENDIX



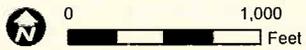
Legend

 Redwood Falls City Limit

**REDWOOD FALLS
MUNICIPAL AIRPORT**

**WETLAND
INVESTIGATION
Location &
Topo Quad Map**

EXHIBIT A
OCTOBER, 2011



Legend

 Redwood Falls City Limit

**REDWOOD FALLS
MUNICIPAL AIRPORT**

**WETLAND
INVESTIGATION**

AERIAL PHOTO

EXHIBIT B
OCTOBER, 2011



Legend

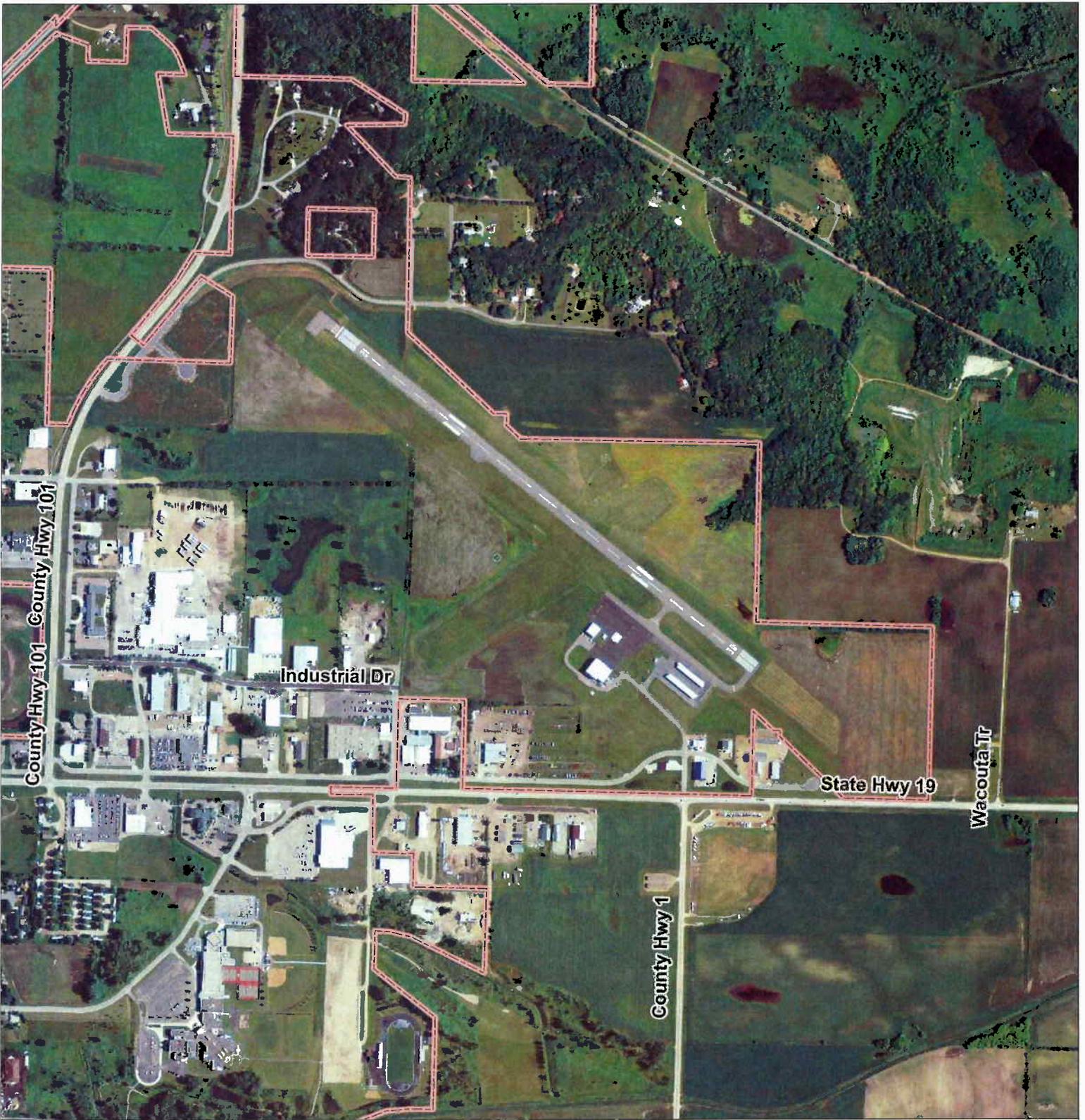
-  Redwood Falls City Limit
-  NWI

**REDWOOD FALLS
MUNICIPAL AIRPORT**

**WETLAND
INVESTIGATION**

**NATIONAL WETLANDS
INVENTORY (NWI)**

EXHIBIT C
OCTOBER, 2011



Legend

-  Redwood Falls City Limit
-  PWI_Basin

**REDWOOD FALLS
MUNICIPAL AIRPORT
WETLAND
INVESTIGATION
DNR PROTECTED
WATERS INVENTORY
(PWI)**

EXHIBIT D
OCTOBER, 2011



Legend

- Redwood Falls City Limit
- Hydric Soils
- Non Hydric Soils

**REDWOOD FALLS
MUNICIPAL AIRPORT
WETLAND
INVESTIGATION
REDWOOD FALLS
SOIL SURVEY**

EXHIBIT E
OCTOBER, 2011



1.14 acres filled and mitigated as part of the Ponderosa Business Park Development (2009)

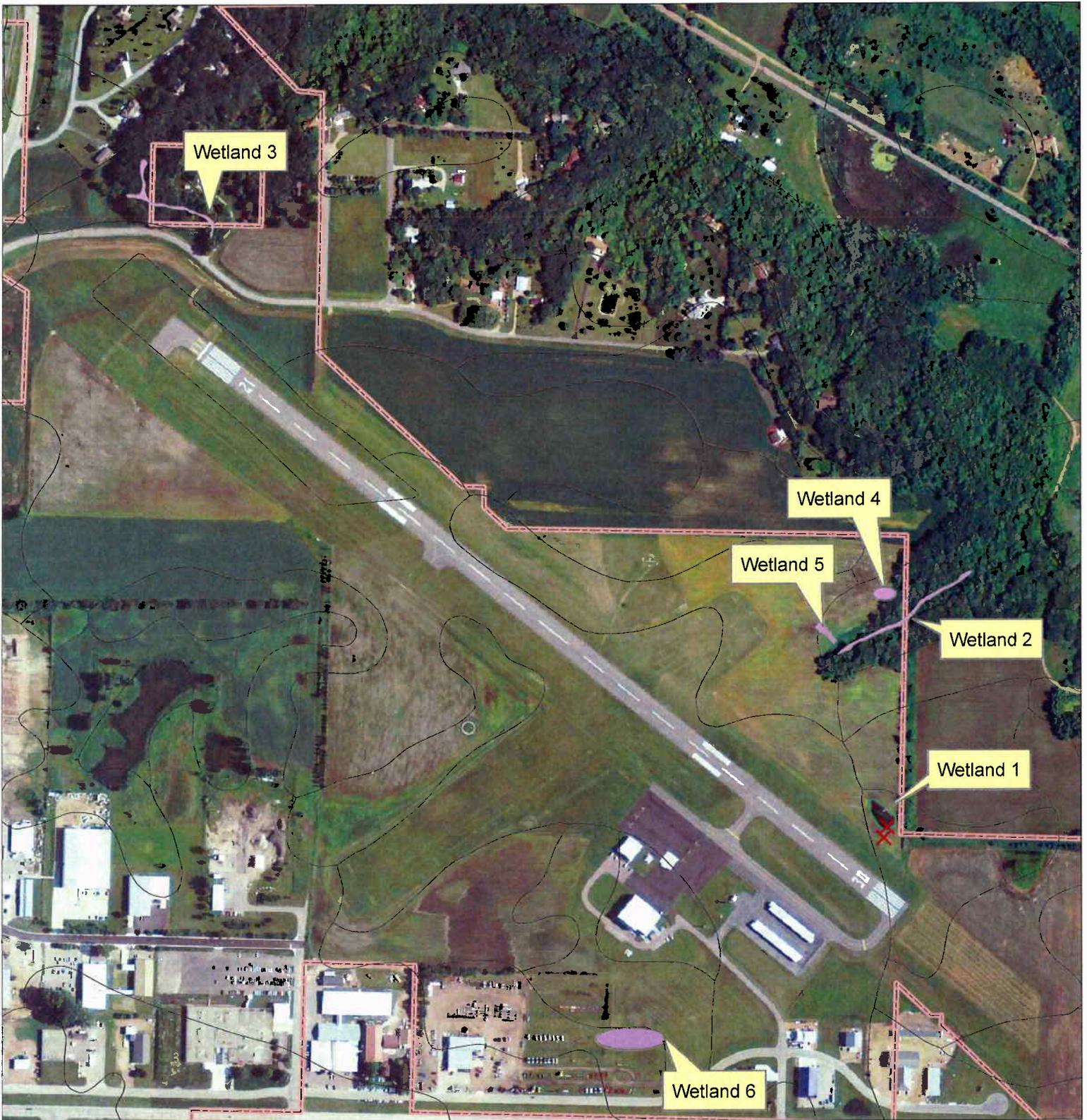


Legend

- Redwood Falls City Limit
- Prior Delineated Wetlands (2007)

**REDWOOD FALLS
MUNICIPAL AIRPORT
WETLAND
INVESTIGATION
PREVIOUSLY IDENTIFIED
WETLAND AREAS
(APPROXIMATE)**

EXHIBIT F
OCTOBER, 2011



Legend

- Surveyed Wetland
- Soil Sample Sites
- Probable Wetland
- Redwood Falls City Limit

**REDWOOD FALLS
MUNICIPAL AIRPORT
WETLAND
INVESTIGATION**

**DELINEATED
WETLAND AREAS**

EXHIBIT G
OCTOBER, 2011



WETLAND DETERMINATION DATA FORM
(Midwest Region)

Project/Site: Red wood Falls Airport
 Applicant/Owner: City of Redwood Falls
 Investigator(s): Mark L Perry, WDC
 Landform (hillside, terrace, etc.): Hillside
 Slope (%): 3 Lat: 44-32-42
 Soil Map Unit Name: Linder

City/County: Redwood Falls, Redwood
 State: MN
 Sec, Twp, Ran: 32-113-35
 Local Relief (concave, convex, none): linear
 Long: -93-4-35
 NWI or WWI Classification: _____

Sampling Date: 10-13-11
 Sampling Point: U1

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (if no explain in remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "normal circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Hydric Soil Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Wetland Hydrology Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is the Sampled Area within a wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Remarks: The field is cropped. The dominant vegetation was crop stubble.	

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	% Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	Number of dominant species that are OBL, FACW, or FAC: _____ (A) Total number of dominant species across all strata: _____ (B) Percent of dominant species that are OBL, FACW or FAC: _____ (A/B)
2. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
3. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
4. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
5. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
= Total Cover				
Saplings/Shrub Stratum (Plot Size: _____)				
1. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	Prevalence Index Worksheet: Total % Cover of: Multiply By: OBL species: _____ x 1 _____ FACW species: _____ x 2 _____ FAC species: _____ x 3 _____ FACU species: _____ x 4 _____ UPL species: _____ x 5 _____ Column Totals: _____ (A) _____ (B) Prevalence Index (B/A) = _____
2. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
3. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
4. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
5. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
= Total Cover				
Herb Stratum (Plot size: _____)				
1. Crop Stubble	_____	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	NR	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤ 3.0' <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation (Explain in Remarks) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
3. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
4. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
5. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
6. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
7. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
8. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
9. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
10. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
= Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	Hydrophytic Vegetation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
= Total Cove				
Remarks:				



WETLAND DETERMINATION DATA FORM
(Midwest Region)

SOILS

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (in)	Matrix		Redox Features				Texture		Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²			
0-10	10YR 2/2	100	_____	_____	_____	_____	loam	Plow layer	
10-15	10YR 3/4	100	_____	_____	_____	_____	loam	Dry	
15-24	10YR 4/4	100	_____	_____	_____	_____	Sandy loam	Dry	
26-36	10YR 5/4	100	_____	_____	_____	_____	gravelly sandyloam	Dry	
_____	_____	_____	_____	_____	_____	_____	_____	_____	
_____	_____	_____	_____	_____	_____	_____	_____	_____	
_____	_____	_____	_____	_____	_____	_____	_____	_____	
_____	_____	_____	_____	_____	_____	_____	_____	_____	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Gleyed Matrix (S4) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Mucky Mineral (F1) |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> 2 cm Muck (A10) | <input type="checkbox"/> Depleted Matrix (F3) |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Redox Depressions (F8) |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) | |

Indicators for Problematic Hydric Soils³:

- Coast Prairie Redox (A16)
- Iron-Manganese Masses (F12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive layer (if observed):

Type: _____
Depth (in): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- | | |
|--|---|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water Stained Leaves (B9) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Fauna (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> True Aquatic Plants (B14) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Sediment Deposits (B3) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9) |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Other (Explain in Remarks) |

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes No Depth (in): _____
 Water Table Present? Yes No Depth (in): _____
 Saturation Present? Yes No Depth (in): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gage, monitoring well, aerial photos, previous inspections), if available:

Remarks:



WETLAND DETERMINATION DATA FORM
(Midwest Region)

Project/Site: Red wood Falls Airport

City/County: Redwood Falls, Redwood

Sampling Date: 10-13-11

Applicant/Owner: City of Redwood Falls

State: MN

Sampling Point: WI

Investigator(s): Mark L Perry, WDC

Sec, Twp, Ran: 32-113-35

Landform (hillside, terrace, etc.): Depression

Local Relief (concave, convex, none): Concave

Slope (%): 1

Lat: 44-32-42

Long: -93-4-35

Datum: _____

Soil Map Unit Name: Linder

NWI or WWI Classification: PEMA

Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (if no explain in remarks)

Yes No (if no explain in remarks)

Are Vegetation , Soil , or Hydrology significantly disturbed?

Are "normal circumstances" present? Yes No

Are Vegetation , Soil , or Hydrology naturally problematic?

(If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Hydric Soil Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is the Sampled Area within a wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Remarks: The field is cropped. The dominant vegetation was crop stubble.	

VEGETATION – Use scientific names of plants

Stratum	% Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
Tree Stratum (Plot Size: _____)				
1. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	Number of dominant species that are OBL, FACW, or FAC: _____ (A) Total number of dominant species across all strata: _____ (B) Percent of dominant species that are OBL, FACW or FAC: _____ (A/B)
2. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
3. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
4. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
5. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
		= Total Cover		
Saplings/Shrub Stratum (Plot Size: _____)				Prevalence Index Worksheet: Total % Cover of: _____ Multiply By: _____ OBL species: _____ x 1 _____ FACW species: _____ x 2 _____ FAC species: _____ x 3 _____ FACU species: _____ x 4 _____ UPL species: _____ x 5 _____ Column Totals: _____ (A) _____ (B) Prevalence Index (B/A) = _____
1. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
2. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
3. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
4. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
5. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
		= Total Cover		
Herb Stratum (Plot size: _____)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0' <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation (Explain in Remarks) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. Crop Stubble	_____	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	NR	
2. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
3. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
4. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
5. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
6. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
7. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
8. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
9. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
10. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
		= Total Cover		
Woody Vine Stratum (Plot size: _____)				Hydrophytic Vegetation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
1. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
2. _____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	
		= Total Cove		

Remarks: Cropland - natural vegetation has been removed or controlled. Entire field was harvested. If not cropped, I am confident that wetland vegetation would grow.



WETLAND DETERMINATION DATA FORM
(Midwest Region)

SOILS

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (in)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-10	N 2/0	100	_____	_____	_____	_____	loam	Plow layer
10-18	10YR 2/1	100	_____	_____	_____	_____	loam	_____
18-26	10YR 5/2	95	10YR 5/6	5	C	M	loam	moist
26-36	2.5Y 5/2	92	10YR 5/6	6	C	M	gravelly loam	saturated
_____	_____	_____	10YR 5/1	2	D	PL	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Gleyed Matrix (S4) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Mucky Mineral (F1) |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> 2 cm Muck (A10) | <input type="checkbox"/> Depleted Matrix (F3) |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Redox Depressions (F8) |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) | |

Indicators for Problematic Hydric Soils³:

- Coast Prairie Redox (A16)
 Iron-Manganese Masses (F12)
 Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive layer (if observed):

Type: _____
 Depth (in): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- | | |
|--|---|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water Stained Leaves (B9) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Fauna (B13) |
| <input checked="" type="checkbox"/> Saturation (A3) | <input type="checkbox"/> True Aquatic Plants (B14) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Sediment Deposits (B3) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9) |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Other (Explain in Remarks) |

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
 Drainage Patterns (B10)
 Dry-Season Water Table (C2)
 Crayfish Burrows (C8)
 Saturation Visible on Aerial Imagery (C9)
 Stunted or Stressed Plants (D1)
 Geomorphic Position (D2)
 FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes No Depth (in): _____
 Water Table Present? Yes No Depth (in): _____
 Saturation Present? Yes No Depth (in): 30
 (includes capillary fringe)

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gage, monitoring well, aerial photos, previous inspections), if available:

Remarks: Sub soil was saturated at about 30 inches. Soil indicators support the presence of hydrology within 12 inches for at least 2 weeks of the growing season.

APPENDIX H

Agency Comments on Draft EA



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

NOV 05 2012

REPLY TO THE ATTENTION OF:

E-19J

Kandice Krull
Federal Aviation Administration
Minneapolis Airports District Office, MSP-ADO-600
6020 28th Avenue South, Room 102
Minneapolis, Minnesota 55450

**RE: Draft Environmental Assessment for Redwood Falls Municipal Airport
Improvements, Redwood Falls, Redwood County, Minnesota**

Dear Ms. Krull:

The NEPA Implementation Section has received the document listed above. Under the National Environmental Policy Act (NEPA), the Council on Environmental Quality regulations, and Section 309 of the Clean Air Act, U.S. EPA reviews and comments on major federal actions. Typically, these reviews focus on Environmental Impact Statements, but we also have the discretion to review and comment on other environmental documents prepared under NEPA, if resources permit.

We have determined that there were no significant concerns meriting comment. We would, however, like to take to time to commend the Federal Aviation Administration and their consultant, Bolton & Menk, Inc., for implementing green storm water management into the project, which will undoubtedly provide increased intra-watershed flood protection, and will also benefit local water quality.

Please send us the Finding of No Significant Impact (FONSI) document when it becomes available. If you have any questions, please call Mike Sedlacek of my staff at 312-886-1765 or e-mail him at sedlacek.michael@epa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Kenneth A. Westlake".

Kenneth A. Westlake, Chief
NEPA Implementation Section
Office of Enforcement and Compliance Assurance

cc: Peter Langworthy, IACP
Bolton & Menk, Inc.
12224 Nicollet Avenue
Burnsville, Minnesota 55337



Minnesota Pollution Control Agency

520 Lafayette Road North | St. Paul, Minnesota 55155-4194 | 651-296-6300

800-657-3864 | 651-282-5332 TTY | www.pca.state.mn.us | Equal Opportunity Employer

November 20, 2012

Mr. Peter Langworthy
Bolton & Menk, Inc.
12224 Nicollet Avenue
Burnsville, MN 55337

Re: Redwood Falls Municipal Airport Environmental Assessment

Dear Mr. Langworthy:

Thank you for the opportunity to review and comment on the Environmental Assessment (EA) for the Redwood Falls Municipal Airport project (Project) located in the city of Redwood Falls in Redwood County, Minnesota. The Project consists of various improvements to the airport. Regarding matters for which the Minnesota Pollution Control Agency (MPCA) has regulatory responsibility and other interests, the MPCA staff has the following comment for your consideration.

In the event the residential property to be acquired by the airport is to be demolished, the demolition must be in compliance with state and federal regulations that require the structure be inspected for hazardous materials such as asbestos, lead based paint, light ballasts, thermostats, stored chemicals, ozone depleting chemicals, etc. Regulated asbestos-containing materials (RACM) should be abated prior to demolition activities. A "Notification of Asbestos Related Work" must be submitted to the Minnesota Department of Health by a licensed asbestos inspector ten working days prior to conducting abatement activities, if abatement of 160 square feet, 260 linear feet, or 35 cubic feet of RACM is required. A "Notification of Intent to Perform a Demolition" must be submitted to the MPCA 10 working days prior to the commencement of demolition. Flaking lead based paint that may be present on the structure should be encapsulated or removed and properly disposed of off site at the appropriate disposal facility prior to demolition activities. Any lead based paint chips that are present on the ground following demolition should also be removed and properly disposed of off site at the appropriate disposal facility. The project proposer should also consider recycling as much of the structure materials as possible to reduce the volume of material disposed of in the landfill. If you have any questions regarding demolition issues or asbestos and lead paint abatement, please contact Sean O'Connor in our St. Paul office, at 651-757-2620.

We appreciate the opportunity to review this Project. Please provide your specific responses to our comments and notice of decision on the need for an Environmental Impact Statement. Please be aware that this letter does not constitute approval by the MPCA of any or all elements of the Project for the purpose of pending or future permit action(s) by the MPCA.

Mr. Peter Langworthy

Page 2

November 20, 2012

Ultimately, it is the responsibility of the Project proposer to secure any required permits and to comply with any requisite permit conditions. If you have any questions concerning our review of this EA, please contact me at 651-757-2508.

Sincerely,



Karen Kromar
Planner Principal
Environmental Review Unit
Resource Management and Assistance Division

KK:mbo

cc: Ken Westlake, EPA, Chicago
Craig Affeldt, MPCA, St. Paul
Randy Hukriede, MPCA, Willmar
Sean O'Connor, MPCA, St. Paul

APPENDIX I

Public Comments on Draft EA (with responses)

Redwood Falls Municipal Airport Environmental Assessment Process Verbal Comments on Draft Environmental

Jo Kremin (110 Burr Oak Road, Redwood Falls) – Conversation with Jim Doering, Redwood Falls Public Works Project Manager

Comment:

Ms. Kremin called on November 13, 2012 with questions regarding the Runway 12 obstructions in regards to timing and process of the acquisition that includes her house. She would like to be involved with the appraiser selection. Ms. Kremin was invited to put her comments in writing, but chose not to.

Response:

As identified in the body of the Environmental Assessment, the City will meet the requirements established in the Uniform Real Property Acquisition and Relocation Act of 1970, as amended, and as put forth in FAA Order 5100.37B (Land Acquisition & Relocation for Airport Projects) and FAA Advisory Circular 150/5100-17 (Land Acquisition and Relocation for AIP-Assisted Projects).

The typical process is that the airport sponsor (in this case, the City of Redwood Falls) uses a licensed appraiser to perform the initial appraisal. Another licensed appraiser is then hired to perform a review appraisal as a check on the assumptions and methods of initial appraisal. The landowner has the option to have their own appraisal done also; the cost of this appraisal is eligible for reimbursement by the airport sponsor per Federal guidelines. If there are significant differences between the appraisals, mutually agreeable terms are negotiated or an appraisal review of the owner appraisal is completed to reconcile differences.

The land acquisition process is separate from and follows the NEPA process. The Kremin acquisition is not scheduled until 2016 per the latest Airport Capital Improvement Plan. Further information will be provided to Ms. Kremin and further coordination will take place as part of the land acquisition process moving forward.

Carlton Burke (138 Woodhill Road, Redwood Falls) – Conversation with Jim Doering, Redwood Falls Public Works Project Manager

Comment:

Mr. Burke visited with Mr. Doering at the City on November 14, 2012. He had questions regarding the acquisition process for his wooded and undeveloped parcel north and east of Runway 23. These questions included when the appraisals would be conducted and by whom. Mr. Burke also questioned the identified extent of acquisition in this area based on the local topography. Mr. Burke was invited to put his comments in writing, but chose not to.

Response:

Please refer to information on the land acquisition process provided in the response to the Jo Kremin, above.

For the purposes of the Environmental Assessment process, the “worst case” or most extensive area was identified for fee acquisition which would be required for the purposes of tree removal and land use control within the federal (FAA) Runway Protection Zone and the state (MnDOT) Clear Zone per

applicable policies. The actual area that will need to be acquired in fee will be subject to further technical review and coordination between the City, the FAA, and MnDOT, as well as Mr. Burke as appropriate to meet airport safety requirements given the site conditions. This work will be outside of the scope of the NEPA process and will be conducted as part of the land acquisition process.

Peter Langworthy

To: Marcus Watson
Subject: RE: Airport acquisition

Sent: Thursday, November 29, 2012 11:41 AM

To: jdoering@ci.redwood-falls.mn.us

Subject: Airport acquisition

Jim;

As a follow up to our conversation last week, I feel that the acquisition of 13 acres of my CREP ground is totally unnecessary. The entire 34 acre field in section 32 is enrolled in a perpetual conservation easement, which requires the maintenance of native prairie groundcover. I do prescribed burns on this property every 3 to 5 years to maintain the prairie and prevent the development of invasive trees.

Selling the 13 acres to the airport would make managing these burns on my remaining property more difficult. I'm also concerned about losing access to this property for hunting and hunting dog training purposes.

Since this perpetual (CREP)easement prevents development, and does not present conflicts with maintaining the airport clear zone requirements, I question the need for airport fee title acquisition. Thanks, Mike

Michael Salmon
853 North Swain St
Redwood Falls. MN
507-644-2741

Redwood Falls Municipal Airport Environmental Assessment Process Response to Michael Salmon Correspondence

The Environmental Assessment identifies acquisition in fee of the defined area as a “worst case,” or most extensive scenario for the purposes of National Environmental Policy Act (NEPA) environmental review. The action defined for the Salmon property is consistent with MnDOT policy regarding land use control within the Clear Zone. However, other factors may be considered in the final determination of fee acquisition versus easement for the property. This determination will be subject to further technical review and coordination between the City, FAA, MnDOT, and Mr. Salmon as appropriate.



NORTHERN CON-AGG, LLP

3231 FERNBROOK LANE NORTH

PLYMOUTH, MINNESOTA 55447

PH. 763-509-9344 FAX 763-509-9347

RECEIVED

NOV 08 2012

CITY OF REDWOOD FALLS

November 6, 2012

James Doering
Public Works Project Coordinator
Redwood Falls Municipal Offices
333 S. Washington Street, PO Box 526
Redwood Falls, MN 56283

Mr. Doering,

I am writing on behalf of Northern Con Agg, LLP in response to your request for public comment concerning the proposed improvements to the Redwood Falls Municipal Airport.

It was explained to us that a land fee acquisition is the favored option over an easement acquisition for the airport improvements project. As an adjacent property owner and small business operator we believe any land acquisition appraisals used to determine the market value of our property for a fee acquisition should be based on the kaolin clay mineral reserves that lie below the grade. Proven kaolin reserves on our property are found as far down as 150' below grade.

Northern Con Agg purchased this property based on the value of those kaolin reserves and we feel the same should apply to a forced sale or acquisition of this property. Please let us know if any clarification is needed or if we can answer any questions.

Regards,

Brad Salman

Northern Con Agg, LLP

Redwood Falls Municipal Airport Environmental Assessment Process Response to Northern Con-Agg, LLP Letter

The Environmental Assessment identifies acquisition in fee of the defined area as a “worst case,” or most extensive scenario for the purposes of National Environmental Policy Act (NEPA) environmental review. The actual extent of the acquisition area, and the final determination of fee acquisition versus easement will be subject to further technical review and coordination between the City, FAA, MnDOT, and Northern Con-Agg as appropriate.

The land acquisition process as part of implementing the proposed action is separate from and follows the NEPA review process. If fee acquisition is ultimately pursued for portions of the Northern Con-Agg property, the presence and economic value of sub-grade mineral deposits would be considered in the appraisal process. As identified in the body of the Environmental Assessment, the City will meet the requirements established in the Uniform Real Property Acquisition and Relocation Act of 1970, as amended, and as put forth in FAA Order 5100.37B (Land Acquisition & Relocation for Airport Projects) and FAA Advisory Circular 150/5100-17 (Land Acquisition and Relocation for AIP-Assisted Projects).