FHWA-WISC-EIS-12-01-F

PROJECT I.D. 2788-01-00
WEST WAUKESHA BYPASS
COUNTY TT
I-94 TO WIS 59

WAUKESHA COUNTY, WISCONSIN

FINAL ENVIRONMENTAL IMPACT STATEMENT

and Section 4(f) and Section 6(f) Evaluation

Submitted Pursuant to 42 U.S.C. 4332(2)(c) and 49 U.S.C. 303
by the

U.S. Department of Transportation, Federal Highway Administration,
State of Wisconsin Department of Transportation,
and the Waukesha County Department of Public Works

Cooperating Agency

U.S. Army Corps of Engineers
Wisconsin Department of Natural Resources (pursuant to 23 U.S.C. 139)

APPROVALS

09/11/14 _____
Date For Federal Highway Administration

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Date For Wisconsin Department of Transportation

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ABSTRACT

The study area includes County TT from I-94 on the north to WIS 59 on the south, a distance of about 5 miles. For decades this corridor has been the planned route for the last leg of a circumferential bypass around Waukesha. This corridor has safety issues, and design deficiencies including narrow lanes, lack of shoulders, and sharp curves and steep hills. As time passes and traffic increases, safety and operations on this corridor will continue to deteriorate. Traffic volumes are forecast to increase 17 to 56 percent by 2035. The Draft Environmental Impact Statement (EIS) was approved on October 19, 2012. The Draft EIS evaluates the social, environmental, and economic impacts of the No-Build Alternative and a range of Build Alternatives, as well as the extent to which these alternatives address the project's purpose and need. This Final EIS documents the input received on the Draft EIS and identifies the preferred alternative.

National Environmental Policy Act Statement

The National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4332) requires that all federal agencies prepare a detailed Environmental Impact Statement (EIS) for major federal actions that will significantly affect the quality of the human environment. The Federal Highway Administration (FHWA) is therefore required to prepare an EIS for proposals funded under its authority if such proposals are determined to be major actions significantly affecting the quality of the human environment.

The EIS process is carried out in two stages. The **Draft EIS** is circulated for review by federal, state, and local agencies with jurisdiction by law or special expertise, and made available to the public. The Draft EIS must be made available to the public at least 15 days before the public hearing, and no later than the first public hearing notice. A minimum 45-day comment period is provided from the date the Draft EIS availability notice is published in the *Federal Register*. WisDOT must receive agency comments on or before the date listed on the front cover of the Draft EIS unless a time extension is requested and granted by WisDOT. After the Draft EIS comment period has elapsed, work may begin on the Final EIS.

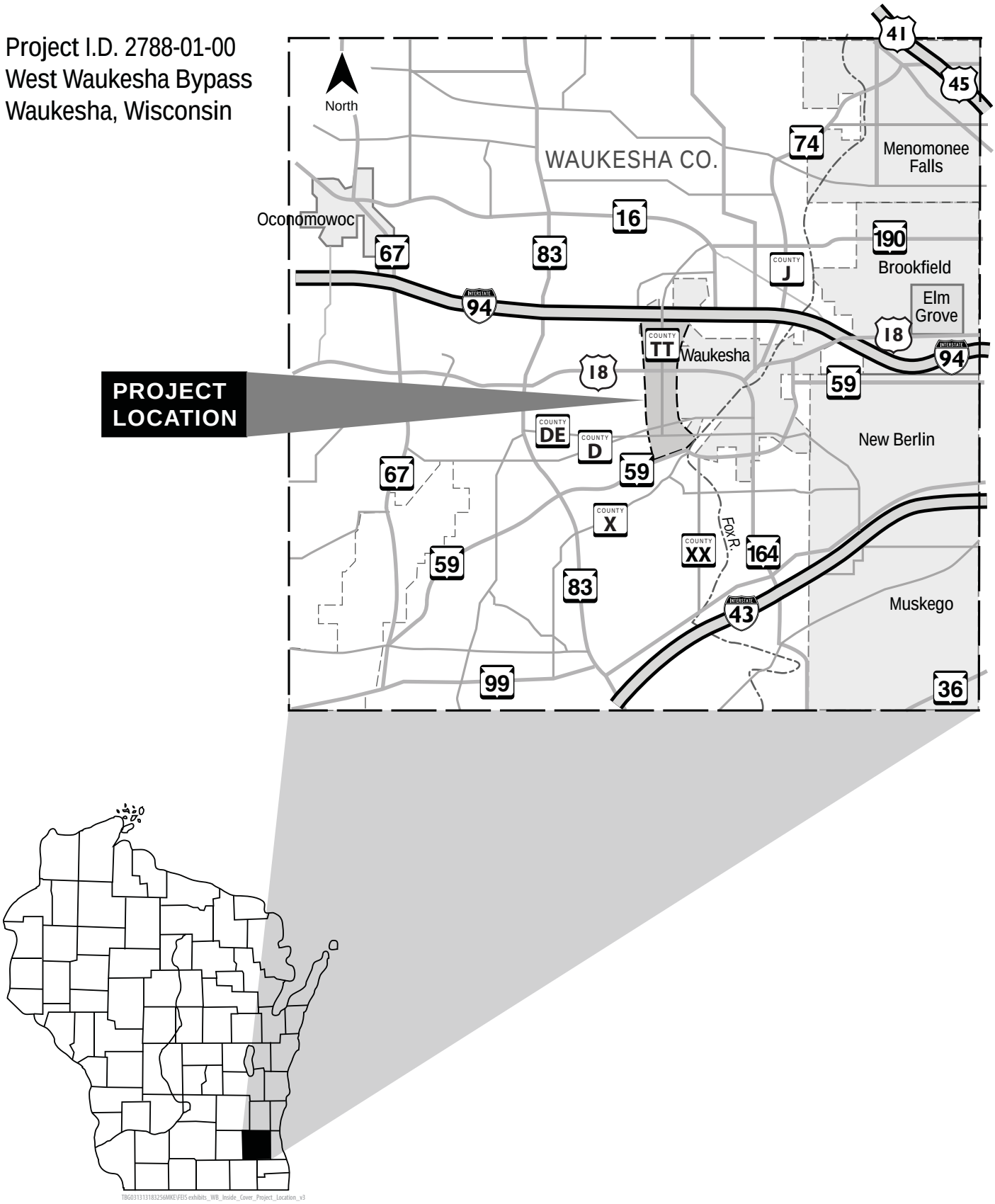
The **Final EIS** includes the following:

1. Identification of the preferred course of action (alternative) and the basis for its selection.
2. Basic content of the Draft EIS along with any changes, updated information, or additional information as a result of agency and public review.
3. Summary and disposition of substantive comments on social, economic, environmental and engineering aspects resulting from the public hearing/public comment period and agency comments on the Draft EIS.
4. Resolution of environmental issues and documentation of compliance with applicable environmental laws and related requirements.

Final administrative action by FHWA (Record of Decision) cannot occur sooner than 90 days after filing the Draft EIS, or 30 days after filing the Final EIS with the U.S. Environmental Protection Agency (USEPA). Both the Draft and Final EISs are full-disclosure documents that provide descriptions of the proposed action, the affected environment, alternatives considered and an analysis of the expected beneficial or adverse environmental effects.

Project Location

Project I.D. 2788-01-00
West Waukesha Bypass
Waukesha, Wisconsin



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Summary

Information About the Final EIS

This Final EIS includes information presented in the Draft EIS which was approved by the Federal Highway Administration (FHWA) on October 19, 2012, for distribution to agencies and the public. It responds to comments on the Draft EIS, summarizes input received as a result of the public hearing and availability of the Draft EIS for review, and identifies the preferred alternative and basis for selection. The following is a list of format changes, revisions, and additions between the Draft and Final EIS, based on comments and public hearing input on the Draft EIS. New material in the Final EIS is highlighted with shading.

- **Summary—**Discussion of preferred alternative and additional information in the impact summary table.
- **Section 1—Purpose of and Need for Proposed Action.** Updates to Section 1.3.1 Project History and Section 1.3.5 Highway Capacity.
- **Section 2—Alternatives/Preferred Alternative.** Previously titled "Alternatives" in the Draft EIS. The complete alternatives development and screening process from the Draft EIS is maintained in this document. Section 2.6 has changed from "Alternatives Retained for Further Evaluation" to "Selection of a Preferred Alternative." It should be noted that the proposed bridge over the Glacial Drumlin State Trail and the Wisconsin & Southern Railroad discussed in the Draft EIS has been replaced with an at-grade crossing of the trail and railroad. The proposed bridge has been eliminated because the few trains that cross County TT daily (about 2) do not require a bridge according to WisDOT standards. In addition, the results of WisDOT's benefit-cost analysis of the proposed bridge did not view construction of the bridge as a prudent investment.
- **Section 3—Existing Conditions, Environmental Impacts and Measures to Minimize Adverse Effects.** Several sections have been updated. A new section "Wetlands—Only Practicable Alternative Finding" has been added to Section 3.16. Although a preferred alternative has been selected the impact analysis of all the reasonable alternative remains in Section 3.
- **Section 4—Final Section 4(f) Evaluation.** Previously titled "Draft Section 4(f) Evaluation." The coordination section has been updated to reflect coordination with the State Historic Preservation Officer and a change in status of the former Pewaukee fire station on the corner of Meadowbrook Road and Northview Road to a Section 4(f) resource. The section has also been updated to show that the Section 106 Memorandum of Agreement is completed.
- **Section 5—Public Involvement and Agency Coordination during Draft EIS Preparation Prior to Draft EIS Availability.** No changes.
- **Section 6—Comments and Coordination Following Draft EIS Availability and Public Hearing.** New to the Final EIS.

- **Appendix A and B—**No changes.
- **Appendix C—Agency Correspondence on Draft EIS and Earlier Relevant Documents.** New appendix that contains local, state, and federal agency comments on the Draft EIS. Relevant resolutions from the Town of Waukesha and City of Waukesha are also included in this appendix even though they were approved prior to Draft EIS completion.
- **Appendix D—Natural Resource Reports Prepared After Draft EIS Availability.**
- **Appendix E—Aerial Photo Exhibit.** Formerly Appendix C. Minor changes to reflect updated design and impacts.

Description of the Proposed Action

Waukesha County, in consultation with the Wisconsin Department of Transportation (WisDOT) and the Federal Highway Administration (FHWA), is proposing to improve the safety and efficiency of the arterial connection between the Wisconsin State Highway (WIS) 59/County X intersection and I-94 on Waukesha's west side, the last piece of the long-planned circumferential route around Waukesha. Because of development on the west side of the city, and in west and south central Waukesha County, the arterial connection between the project termini no longer would serve as a bypass. Rather, the proposed improvements would fill a gap in the transportation system by providing an efficient north-south roadway on the city's west side. The proposed action is the next step in implementing future highway improvements recommended in regional, county, and city transportation system plans.

The study area lies on the west side of the city of Waukesha and the town of Waukesha in central Waukesha County (see project location map after the front cover). The project termini are I-94 on the north and the intersection of WIS 59 and County X on the south.

WisDOT and FHWA are the lead state and federal agencies, respectively, for the project. Waukesha County is a joint lead agency.

The Draft EIS was circulated for review in October 2012, and a public hearing was held on November 13, 2012.

Purpose of and Need for the Project

The purpose of the West Waukesha Bypass is to provide a safe and efficient north-south arterial roadway on the west side of the City of Waukesha to complete the long-planned circumferential route around Waukesha; to accommodate growing traffic volumes along the corridor; and to improve roadway deficiencies that include tight curves, steep hills, narrow lanes, and lack of shoulders. The proposed improvements address two major needs:

- Improve safety by providing a roadway that meets current design standards.
- Accommodate traffic demand generated by existing and planned development within and outside the study corridor.

The need for the proposed action is demonstrated through a combination of factors that include project history, regional/local transportation and land-use planning, traffic demand, safety concerns, existing roadway deficiencies, system linkage, and environmental aspects. Section 1, Purpose of and Need for the Proposed Action, discusses these factors in detail.

The purpose of and need for the proposed improvements sets the stage for developing and evaluating the alternatives presented in Section 2.

Alternatives / Preferred Alternative

Waukesha County, WisDOT, and FHWA developed and evaluated a wide range of alternatives. The alternatives were presented to the public and were assessed to determine their environmental impacts and the extent to which they fulfill the purpose of the project. The initial range of alternatives considered includes the following:

- **No-Build Alternative—**No safety or capacity improvements would be made. Only maintenance and minor improvements would be performed. This alternative serves as a baseline for comparison to the build alternatives.
- **Transportation Demand Management—**This alternative strives to reduce the number of auto trips through increased transit ridership and other strategies. The public transit system element of *A Regional Transportation System Plan for Southeastern Wisconsin: 2035* recommends several ways to increase bus service in Waukesha County.
- **Transportation System Management—**This alternative includes measures to maximize the efficiency and use of the highway system to help alleviate or postpone the need to expand capacity. The Transportation System Management element of the SEWRPC regional transportation plan recommends measures such as signal coordination, intersection improvements, access management, and on-street parking restrictions.
- **Build Alternatives--**The preliminary range of alternatives was developed in the context of regional transportation plans and various forms of community involvement, including public information meetings; meetings with local officials, citizens, state and federal resource agencies, and interest groups; and input from the Community Sensitive Solutions advisory group. The alternatives are grouped into three corridors, from east to west (**Figure 1** on page XI):
  - **County T Corridor** (County T/ Grandview Boulevard/Moreland Boulevard/Genesee Road)—The alignment would use existing streets to connect I-94 and WIS 59. Between I-94 and Summit Avenue, it would use County T (Grandview Boulevard). It would then follow Summit Avenue from County T to Moreland Boulevard and Moreland Boulevard from Summit Avenue to Genesee Road/County X. See **Exhibit 2-2**.
  - **County TT Corridor—**The County TT corridor has been the focus of planning for the West Waukesha Bypass for decades. Plans by SEWRPC, Waukesha County, and the City of Waukesha all include an improved roadway in the County TT corridor. Waukesha County and the public developed three alternatives in the County TT corridor (TT1, TT2, TT3). All would use the County TT alignment between I-94 and Summit Avenue. Alternative TT2 follows the officially mapped route of the West Waukesha Bypass. See **Exhibit 2-3**.
  - **County SS Corridor—**A new roadway would extend south from the County SS interchange with I-94. Several attendees at the public information meeting in May 2010 suggested that a new roadway be built west of County TT to avoid traffic, noise and proximity impacts to properties along County TT. Waukesha County developed four

alternatives in the County SS corridor (SS1, SS2, SS3, SS4). All would share a common alignment from the I-94/County SS interchange south about 1.5 miles. From that point, the four alternatives diverge and would follow various routes. See **Exhibit 2-5**.

South of the Wisconsin & Southern Railroad, most of the County TT and County SS corridor alternatives have multiple connections to the WIS 59/County X intersection. To simplify the descriptions of alternatives, alternatives north of the railroad are described separately from the connecting segments south of the railroad.

- **Far West Alternative—**The Far West Alternative would follow Town Line Road from Sunset Drive to WIS 59 (**Exhibit 2-8**). WIS 59 would be improved from Town Line Road to County X.
- **Long D-X Alternative—**The Long D-X Alternative would follow Sunset Drive (County D) from Town Line Road to County X, then follow County X to the WIS 59/County X intersection (**Exhibit 2-8**).
- **Golf Course West Alternative—**The Golf Course West Alternative would be located on new alignment from the railroad to WIS 59, and pass between Merrill Hills Country Club and a subdivision west of the golf course (**Exhibit 2-8**). WIS 59 would be improved between its intersection with the new roadway and County X.
- **Golf Course East Alternative—**The Golf Course East Alternative would follow Merrill Hills Road from Sunset Drive to WIS 59 and WIS 59 from Merrill Hills Road to County X (**Exhibit 2-8** and **2-10**).
- **Sunset-to-County X Alternative—**The Sunset-to-County X Alternative would cross a farm field on new alignment south of the Wisconsin & Southern Railroad before tying into Sunset Drive near the Pebble Creek crossing. From there it would follow Sunset Drive and County X to the County X/WIS 59 intersection (**Exhibit 2-8 and 2-12**). County X was widened to 4 lanes in 2010 and 2011 to a point just north of Pebble Creek.
- **Pebble Creek Alternative—**The Pebble Creek Alternative follows the mapped Waukesha bypass route in regional, county and city plans. It would cross wetlands, floodplain, and primary environmental corridor between Sunset Drive and the County X/WIS 59 intersection (**Exhibit 2-8 and 2-11**). Three subalternatives were developed: the Pebble Creek Mapped Route, Pebble Creek West, and Pebble Creek Far West (**Exhibit 2-21**).

Based on input from the public and the advisory group, costs, impacts and the alternatives' ability to satisfy purpose and need, the County T and County SS corridor alternatives were dropped from consideration, as were the County TT1 and TT3 corridors and the Far West, Long D-X, and Golf Course West Alternatives south of the Wisconsin & Southern Railroad **(Figure 1)**. After narrowing the County T, County TT, and County SS alternatives down to Alternative TT2 and three connecting routes south of the Wisconsin & Southern Railroad (**Exhibit 2-14**) Waukesha County evaluated 2- and 4-lane roadway cross sections to determine which options would meet project purpose and need while minimizing environmental impacts to the extent practicable. Four cross sections were evaluated for Alternative TT2 and the three connecting alternatives:

- 2-lane on existing alignment alternative with limited intersection improvements (following existing County TT and Sunset Drive)

- 2-lane on existing alignment alternative with full intersection improvements (following existing County TT and Sunset Drive)
- 2-lane off-alignment alternative with full intersection improvements (following mapped bypass route)
- 4-lane off-alignment alternative (following mapped bypass route)

The 2- and 4-lane alternatives that remained under consideration through the February 10, 2011, public information meeting were evaluated in terms of their ability to meet project purpose and need, public input, and local government input.

The 2-Lane on Existing Alignment Alternative was eliminated because it would not adequately accommodate future traffic volumes, would not be as safe as the off-alignment alternatives, would displace more homes than the 2-Lane Off-Alignment Alternative, and has less support than the other alternatives.

The 2-Lane on Existing Alignment with Full Intersection Improvements Alternative was eliminated because it would not adequately accommodate future traffic volumes, would not be as safe as the off-alignment alternatives, would displace more homes than the 2-Lane Off-Alignment Alternative, and has less support than the 2-Lane Off-Alignment and 4-Lane Alternatives.

The 2-Lane Off-Alignment Alternative was eliminated because it would have a lower level of service than the 4-Lane Alternative. It would operate at level of service D or E in the design year (compared to level of service B with the 4-Lane Alternative).

The 4-Lane Off-Alignment Alternative remained under consideration because it satisfied purpose and need for the project and had public support.

The Golf Course East Alternative was eliminated in February 2011 because of its high residential relocation impacts, high cost, and lack of public support.

Of the three Pebble Creek subalternatives, the Pebble Creek Mapped Route was eliminated because of high wetland impacts and primary environmental corridor impacts, concerns expressed by the Wisconsin Department of Natural Resources (DNR) and U.S. Army Corps of Engineers (Corps of Engineers), and greater public support for the Pebble Creek West and Far West alternatives. The Pebble Creek West and Pebble Creek Far West Alternatives remained under consideration through the Draft EIS public comment period because they have less wetland and primary environmental corridor impact and more public support than the Pebble Creek Mapped Route. The Pebble Creek Far West Alternative would have a lower wetland impact than the Pebble Creek West Alternative but would require deeper cuts into the slope and therefore would have a greater impact to the upland woods west of Pebble Creek than the Pebble Creek West Alternative. Waukesha County will continue to modify these alternatives to minimize their environmental impact. Public support for both of these alternatives is about that same. Despite a lower rating by the advisory group, the Sunset-to-County X Alternative remained under consideration through the Draft EIS public comment period because it uses an existing roadway to cross the Pebble Creek corridor rather than a new roadway, and it affects fewer acres of primary environmental corridor.

Based on the screening of the refined alternatives, the No-Build and 4-lane alternatives were retained for detailed study. The No-Build Alternative serves as a baseline for comparison to

the build alternatives. South of the Wisconsin & Southern Railroad tracks, the 4-lane Pebble Creek West, Pebble Creek Far West and Sunset-to-County X alternatives were retained for detailed study. The build alternatives would cost about $54.2 million to construct in 2016 dollars, the anticipated construction year.

A 10-foot-wide multi-use path would be built parallel to new or reconstructed roadways between the north project limit and Sunset Drive under all remaining build alternatives. The multi-use path would provide a safe connection between the Glacial Drumlin State Trail and the existing multi-use path along the east side of County TT north of Summit Avenue. Many public comments noted it is unsafe to walk or ride bikes along County TT, and a connection between the Glacial Drumlin State Trail and the multi-use trail was requested.

A bridge would be built to carry the new roadway over Pebble Creek. The new roadway would cross the Wisconsin & Southern Railroad at grade. WisDOT will construct a box culvert under the new road to carry the Glacial Drumlin Trail.

Based on safety, traffic operations, impacts, local government input and its ability to meet the purpose and need for the project WisDOT concurs with Waukesha County's recommendation to select the Build Alternative, which comprises the 4-lane divided TT2 Alignment between I-94 and the Wisconsin & Southern Railroad and the 4-lane divided Pebble Creek West Alternative between the railroad and WIS 59 (**Figure 2**). The preferred alternative is also found on the Aerial Photo Exhibit in Appendix E. The TT2 Alignment is described in Section 2.4.4.1, the Pebble Creek West Alternative in Section 2.4.4.2. The Corps of Engineers, the USEPA, and the DNR have concurred with the preferred alternative.

Environmental Impacts

Table 1 summarizes the impacts of the No-Build, Pebble Creek, and Sunset-to-County X alternatives.

The impacts of the build alternatives are the same north of the Wisconsin & Southern Railroad. South of the railroad, the notable impacts of the Pebble Creek West and Pebble Creek Far West Alternatives would occur in the wetland and primary environmental corridor adjacent to Pebble Creek. These alternatives would be built on a new alignment, introducing a roadway where there is none today. The Sunset-to-County X Alternative would affect slightly more wetland than the Pebble Creek Far West Alternative, but would involve widening an existing roadway through the Pebble Creek wetland and primary environmental corridor.

Seven residences on Sunset Drive would be relocated under the Sunset-to-County X Alternative. The Pebble Creek West and Far West Alternatives would require two residential relocations. Three residences north of the Wisconsin & Southern Railroad would be relocated under all build alternatives. There is the potential for one business relocation. No publically owned buildings would be relocated.

TABLE 1
Impact Summary Table

		Build Alternatives		
		I-94[1] to WIS 59 (Includes County TT 4-Lane Off-Alignment Alternative)		
	No-Build Alternative	Pebble Creek West Alternative Preferred Alternative (4.9 miles)	Pebble Creek Far West Alternative (4.9 miles)	Sunset-to-County X Alternative (5.6 miles)
Total cost including design, construction, real estate, utilities, contingency cost in 2015–2016 dollars, the anticipated year of construction	$0	**$54.2 million**	$54.2 million	$52.2 million
New right-of-way (acres)	0	68.2	67.5	58.4
Traffic Level of Service (LOS)	C to F	B to D	B to D	B to D
Residential displacements	0	5	5	10
Commercial displacements	0	0-1	0-1	0-1
100-year floodplain crossings	3	3	3	3
100-year floodplain (acres)	0	5.1	4.8	6.9
Stream crossings	7	6	6	7
Wetland (acres)	0	14.3	10.6	11.7
Parkland (acres)	0	1.2	1.2	5.4
Farmland (acres)	0	38.3	37.1	38.6
Upland (acres)	0	33.6	36.8	23.2
Threatened and endangered species?	No	No	No	Yes
Primary environmental corridor (acres)	0	19.4	18.7	9.5
Primary environmental corridor crossings	4	6	6	4
Natural areas (acres)	0	1.9	1.4	3.6
Historic sites affected	0	1	1	0
Archaeological sites affected	0	0	0	0
Environmental justice issues?	No	No	No	No
Air quality permit?	No	No	No	No
Noise receptors affected (design year 2035)	NA	55	55	70
Potentially contaminated sites	0	4	4	4

[1] The northern limit of the study is I-94 but the north limit of construction would be Rolling Ridge Drive, which is about one-quarter mile south of I-94.

Public Involvement

Waukesha County, WisDOT and FHWA implemented an extensive public involvement program for this study. Meetings have been held with neighborhood, community, environmental, business and other stakeholder groups. Open house public information meetings were held in May, July and August 2010 and February 2011. A public hearing was held on November 13, 2012. During the public hearing and public comment period, 387 people commented on the project, including 177 people who signed a petition supporting an alternative referred to as the No Build.Improve that was originally circulated in February 2011. The No Build.Improve alternative supports a limited range of improvements to County TT within the existing two-lane footprint. Fifty-four people supported a 4-lane alternative. Of those, about 27 supported either the Pebble Creek West or Far West Alternative. Seven supported the Sunset-to-County X Alternative, and 19 did not state which Build Alternative they supported. Of the people opposed to a 4-lane alternative, 309 (132 not including petition signers) supported the No-Build Alternative or a 2-lane alternative. Twenty-four people provided comments that did not take a position on project alternatives. Many who opposed the 4-lane alternatives stated that the roadway needs to be improved, but that the socioeconomic and natural resource impacts and cost of the 4-lane alternatives are unnecessary because additional capacity is neither needed nor wanted.

Agency Comments

Comments on the Draft EIS were received from the Corps of Engineers, USEPA, DNR and U.S. Department of the Interior. The Corps of Engineers asked for more information on the project's potential indirect and cumulative effects, and more information about plans to mitigate impacts to aquatic resources (wetlands).

The Department of the Interior's comments focused on Section 4(f) issues and historic properties. The Department concurred with FHWA's decision on the properties identified as Section 4(f) resources, and with the de minimis finding for the Glacial Drumlin State Trail. For the historic properties, the Department concurs that there appears to be no feasible or prudent alternative to the build alternatives that would not result in impacts to these properties.

USEPA asked for more information on a range of resource topics including aquatic resource mitigation, stormwater runoff, and T&E species.

The DNR Southeast Region asked for more information about bike route connections to the Glacial Drumlin Trail from the area between WIS 59 and Sunset Drive. The DNR also asked how the project affects reasonably foreseeable improvements to Sunset Drive and how this project and future improvements to Sunset Drive would affect Pebble Creek.

Local Government Input

Waukesha County, the City of Pewaukee and the City of Waukesha passed resolutions in support of the project in November and December 2012. The Town of Waukesha approved a series of resolutions in December 2012 supporting the No-Build Alternative.

The School District of Waukesha supported the most direct route to connect the Waukesha Bypass to and from WIS 59 without identifying an alternative.

The City of Pewaukee resolution supported the project and identifies the Pebble Creek West Alternative as its preferred alternative.

The Waukesha County Board passed a resolution supporting the Pebble Creek West Alternative.

The Town of Waukesha passed four resolutions that support the No-Build Alternative. The City of Waukesha resolution supported the project, but did not specify a preferred alternative. There is only one Build Alternative under consideration in the City of Waukesha part of the study area.

Section 6 includes more detailed information about the comments received from the public and agencies at the public hearing and during the Draft EIS comment period, including responses to the public's frequently asked questions. Appendix C includes comments from agencies on the Draft EIS and Waukesha County's and WisDOT's responses.

Other Federal or State Actions Required

WisDOT and FHWA will apply to the Corps of Engineers for a permit to place fill in waters of the United States under Section 404 of the Clean Water Act. WisDOT will also request water quality certification from the DNR under Section 401 of the Clean Water Act. WisDOT will coordinate threatened and endangered species impacts with DNR under state statute 29.604 and administrative code NR 27. WisDOT has coordinated with and obtained approval from the State Historic Preservation Officer under Section 106 of the National Historic Preservation Act. FHWA has complied with Section 4(f) of the U.S. Department of Transportation Act (49 U.S.C. Section 303). If federally-listed threatened or endangered species are affected by the project coordination with the U.S. Fish and Wildlife Service will occur.

Significant Actions by Other Government Agencies in the Same Geographic Area as the Proposed Action

Listed below is a summary of the actions (transportation-related and new development) in the general study area. A description of past projects is found in the Cumulative Effects Analysis (Section 3.4.3).

WisDOT is reconstructing WIS 83 from a 2-lane to a 4-lane divided roadway from a point south of the WIS 83/County D intersection through the WIS 83/US 18 intersection.

The City of Waukesha is continuing to pursue approval to receive drinking water from Lake Michigan.

Development of condominiums continues in Turnberry Reserve subdivision in the southeast quadrant of the County TT/Northview Road intersection.

Cloverland Farms, a 57-lot subdivision single family subdivision is being developed in the City of Pewaukee just west of Northview Road (west of the intersection with County TT).

Summary of the Proposed Action's Economic Advantages and Disadvantages

The economic advantages of the proposed County TT improvements include the expectation of fewer crashes of all types. In four of the five segments evaluated during the crash analysis, the study area crash rate exceeded the statewide crash rate for similar roadways. Each crash and crash type has a cost, with injury and fatal crashes imposing the highest costs. In addition to the improved safety with the proposed County TT improvements, it is expected that travel through the corridor will be more efficient, particularly at intersections during the peak morning and evening commuting times. The more efficient movement of traffic through the corridor will have economic benefits for business and commuter trips. Finally, construction of the County TT improvements would provide construction jobs and have benefits to businesses that support the construction industry.

The economic disadvantages of the proposed County TT improvements involves the five potential residential relocations and one potential commercial relocation. The economic disadvantage has less to do with the compensation provided to property owners, which is required by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, than the potential tax base loss to local communities if the displaced residences and business move to another community.

Permits and Other Agency Actions

Chapter 30, Wisconsin Statutes, administered by DNR, requires permits for structures and deposits into navigable waters. Section 30.12(4)(a) provides an exemption to the permit requirements for WisDOT actions carried out in accordance with interagency liaison procedures to minimize the adverse effects of transportation actions on environmental resources. Liaison efforts under the WisDOT/DNR Cooperative Agreement cover project development from early corridor alignment studies through selection of a recommended alternative, design, and construction. Coordination with DNR has been ongoing while developing and refining the alternatives presented in this EIS.

Wisconsin's Endangered Species Law (Section 29.604, Wisconsin Statutes) can allow for an Incidental Take Authorization from DNR for taking of individual state-listed threatened or endangered species.

Section 32.25, Wisconsin Statutes, requires that Relocation Assistance Plans for displaced residences and businesses be approved by the Wisconsin Department of Commerce.

Stream and wetland impacts are subject to permits under Section 404 of the Clean Water Act. The permit program, administered by the Corps of Engineers, covers the discharge of fill material into waters of the U.S., including wetlands. Issuance of Section 404 permits is contingent on receipt of water quality certification from DNR under Section 401 of the Clean Water Act, and Wisconsin Administrative Code Chapter NR 299. WisDOT and Waukesha County will develop the Retzer Nature Center wetland mitigation site plan during the upcoming design phase. Both agencies will coordinate the design of the mitigation site with the Corps of Engineers and USEPA.

Another Clean Water Act provision that governs the discharge of dredged or fill material is provided in the Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Part 230), administered by USEPA and the Corps of Engineers. The

guidelines are premised on the mandate that dredged or fill material should not be discharged into aquatic ecosystems (including wetlands) unless it can be demonstrated that there are no practical alternatives to such discharge, that such discharge will not have unacceptable adverse impacts either individually or in combination with known or probable impact of other activities, and that all practicable measures to minimize adverse effects are undertaken. Wetlands located in primary environmental corridors as defined by SEWRPC, are included in USEPA's ADID program. Such wetlands are considered unsuitable for discharge of dredged or fill material unless it can be demonstrated that there are no practicable alternatives to the discharge.

The Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) has prepared an Agricultural Impact Statement (AIS) in accordance with Section 32.035 Wisconsin Statutes. The AIS is an information and advisory document that describes and analyzes the potential impacts of the project on farm operation and agricultural resources, but cannot stop a project.

With the Memorandum of Agreement between FHWA and the Wisconsin State Historic Preservation Officer finalized for the Sebina Barney House (see Appendix C page C73) and the City of Waukesha and Waukesha County agreeing with FHWA's conclusion that proposed impacts to Kisdon Hill Park and Retzer Nature Center would be de minimis impacts, the Section 4(f) coordination for the project has been concluded.

The DNR has concluded that placing the Glacial Drumlin State Trail in a box culvert under County TT would not constitute a Section 6(f) impact, therefore, no further coordination with the DNR on Section 6(f) is required. See Appendix C page C83.

Proposed Mitigation

Waukesha County, WisDOT and FHWA will avoid and minimize environmental impacts to the extent practicable. Unavoidable impacts will be mitigated to the extent practicable and allowable under state and federal law. Where there is no practicable alternative to filling wetlands, state and federal regulations require compensatory wetland mitigation in accordance with the *WisDOT/Wisconsin Department of Natural Resources Cooperative Agreement on Compensatory Wetland Mitigation* (WisDOT, DNR 2002). Mitigation measures are summarized in Table 2 and discussed on a section-by-section basis in Section 3. Residential relocations would follow federal law, which requires just compensation for residences and businesses displaced by a transportation project. Waukesha County, WisDOT and FHWA will work with local officials and affected residents to determine the location of noise barriers in areas where barriers are reasonable, feasible, and likely to be incorporated.

TABLE 2
Summary of Measures to Mitigate Adverse Impacts

Resource	Summary of Measures to Mitigate Adverse Impacts
Transportation Service	Extending the Meadowbrook Road multi-use trail between Summit Avenue and Sunset Drive, which will improve safety for bicyclists and pedestrians. Section 3.27, Construction, describes measures to manage traffic during construction. Additional information on measures to mitigate adverse impacts to transportation services can be found in Section 3.5.3.
Utilities	Waukesha County and WisDOT will compensate utilities that are outside the highway right-of-way and must relocate facilities as a result of the proposed action. Additional information on measures to mitigate adverse impacts to utilities can be found in Section 3.6.3.
Residential and Commercial Development	Federal property acquisition law provides for payment of just compensation for residences and businesses displaced for a federally funded transportation project under the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Additional information on measures to mitigate adverse impacts to residential and commercial development can be found in Sections 3.7.3 and 3.8.3 respectively.
Agriculture	Management and design practices will be implemented to help minimize agricultural impacts by limiting severances, maintaining accessibility to fields, maintaining existing drainage patterns, and limiting erosion. Additional information on measures to mitigate adverse impacts to agriculture and DATCP recommendations can be found in Section 3.9.3.
Socioeconomic Characteristics	The following mitigation measures could reduce the preferred alternative's impacts to community character, public services, and pedestrian facilities: – The contractor and WisDOT would coordinate with the City of Waukesha, Waukesha County, and local emergency service providers in developing detour plans. – Emergency service providers would be given advance notice of road and sidewalk closures and detour routes. – The contractor would maintain local access and circulation to neighborhoods and businesses during construction for pedestrians, bicyclists, and motorists.
Surface Water and Groundwater Resources	Mitigation measures to help mitigate the adverse effects to water quality include minimizing the size of disturbed area exposed at any one time and the duration of exposure, using control methods such as ditch checks to prevent erosion and sedimentation in sensitive areas, and implementing best management practices (BMPs) such as dry detention basins to minimize suspended solids and pollutants in stormwater. Although the preferred alternative has been elevated above the groundwater level drainage systems would be installed if roadway excavations encounter groundwater to convey groundwater from the west side of the proposed improvements to the east side (toward Pebble Creek). In addition, a land bridge will be constructed just south of Hawthorne Hollow Drive cul-de-sac to avoid a wetland supported by root-level groundwater. See Section 3.12.8. To minimize impacts to fish and aquatic life, in-water construction would be avoided during the spring fish spawning season (March 15 to June 1), box culverts will be constructed with either an open bottom or a partially buried bottom that will maintain substrate continuity consistent with FHWA Aquatic Organism Passage guidelines.
Floodplains	Narrowing the roadway median will reduce the roadway cross section where floodplain impacts occur. During the design phase, WisDOT will evaluate whether it is practicable to extend the length of bridges where floodplain impacts occur, to avoid floodplain impacts. Additional information on measures to mitigate adverse impacts floodplains can be found in Section 3.14.3.
Wetlands	Measures to minimize harm to wetlands, which include a land bridge over W-4 south of Sunset Drive and the use of a 14-foot median rather than a 30-foot median south of Sunset Drive. The conceptual wetland mitigation plan is to create a project-specific mitigation site on the Retzer Nature Center property, which is located on the west side of County TT, preserve an unprotected offsite fen in the Upper Fox River Watershed and possibly preserve the unaffected portion of W-8 (fen). The wetland mitigation plan is described in Section 3.16.3.

TABLE 2
Summary of Measures to Mitigate Adverse Impacts

Resource	Summary of Measures to Mitigate Adverse Impacts
Upland Habitat	Waukesha County and WisDOT are investigating tree mitigation for impacts to the upland forest/interior forest bird habitat in the primary environmental corridor south of Sunset Drive. WisDOT and Waukesha County are considering planting one acre of trees for each acre affected by the preferred alternative. Waukesha County is also coordinating with the owner of the upland forest south of Sunset Drive to donate the unaffected portion of property to a land conservancy or to Waukesha County. During design, WisDOT and Waukesha County will also evaluate the feasibility of planting native grasses, shrubs and trees within the right-of-way, including areas where segments of existing roadway would be removed.
Wildlife	The inadvertent loss of nesting birds in the construction area and bat roosting/nurseries in cavity trees, particularly south of Sunset Drive, will be avoided by imposing a tree clearing restriction. Tree removal would not be allowed between April 15 and August 15 of any given year. Potential mitigation measures for marsh and grassland nesting birds and bats roosting under the County X bridge will be assessed during design. Waukesha County and WisDOT also will consider the feasibility of acquiring and preserving remnant parcels between rights-of-way and natural areas to increase the wildlife habitat within the corridor.More detailed information on measures to mitigate adverse impacts to wildlife can be found in Section 3.18.3.
Threatened and Endangered Species	WisDOT will survey the County X bridge over Pebble Creek for little brown bats. If the bats are present on the County X bridge, which is planned for demolition, WisDOT will follow the guidelines established by the DNR in its *Broad Incidental Take Permit and Broad Incidental Take Authorization for Wisconsin Cave Bats Conservation Plan.* To protect migratory birds, nests may not be disturbed between May 1 and August 30 of the construction year. If construction would conflict with the nesting period, measures for avoiding impacts or preventing swallows from nesting on the structures would be implemented. Additional information about measures to mitigate adverse impacts can be found in Section 3.19.3.
Noise	Based on the noise analysis, WisDOT intends to incorporate feasible and reasonable noise barriers into the project. During design, as locations of retaining walls are more accurately defined relative to the surrounding areas, the location of feasible and reasonable noise mitigation will be reassessed. More detailed information about traffic noise abatement can be found in Section 3.20.3.
Hazardous Materials	WisDOT will develop remediation measures for contaminated sites that cannot be avoided. Disposition of any petroleum contamination will be resolved to the satisfaction of the DNR, WisDOT, and FHWA. During the real estate acquisition phase buildings needing to be demolished will be surveyed for asbestos. Additional information about the handling and disposal of hazardous materials can be found in Section 3.22.3.
Historic Sites	The design changes adjacent to the Sebina Barney House are mitigation measures. Additional measures to mitigate adverse impacts on the Sebina Barney House include vegetative screening and archival quality photographs, which are described in Section 4.
Parks and Recreation	Waukesha County and WisDOT will provide a connection between the Glacial Drumlin State Trail and the planned 10-foot multi-use path to be constructed next to the Bypass. Details of the trailhead and connection between the two trails will be finalized during design. See Section 4.4.5 and **Exhibit 4-4**.

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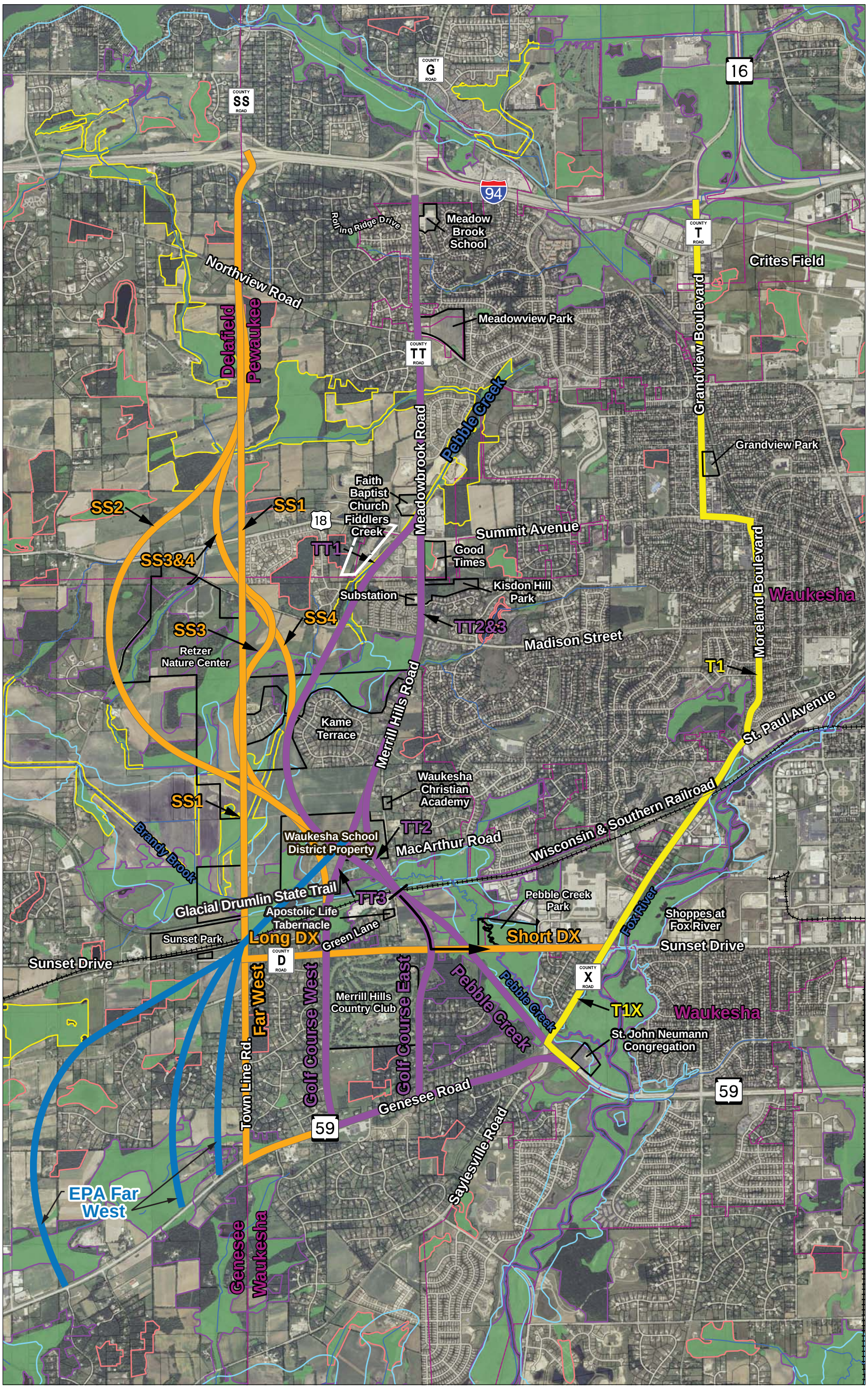

Legend

- River/Stream
- Railroad
- Wetlands
- Municipal Boundary
- FEMA Floodplain
- Parcel
- Isolated Natural Resource Area
- Primary Environmental Corridor
- Secondary Environmental Corridor

Notes:

1. 2008 Aerial Photography from the National Agriculture Imagery Program (NAIP)

N

0 1,400 2,800 Feet

Figure 1

Initial Range of Build Alternatives
County T Corridor, County TT Corridor, and County SS Corridor

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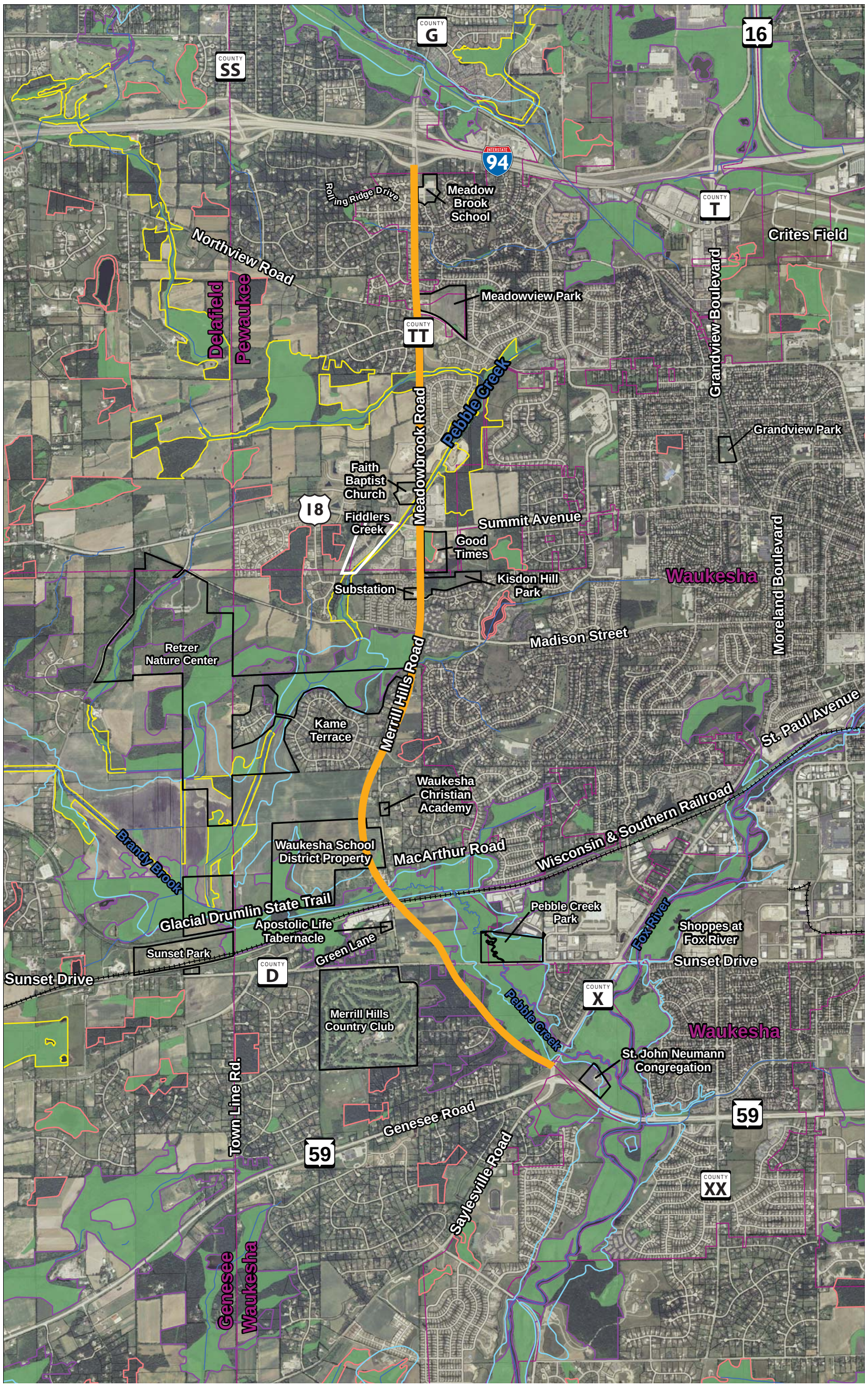

Legend

- River/Stream
- Railroad
- Wetlands
- Municipal Boundary
- FEMA Floodplain
- Parcel
- Isolated Natural Resource Area
- Primary Environmental Corridor
- Secondary Environmental Corridor

Notes:

1. 2008 Aerial Photography from the National Agriculture Imagery Program (NAIP)

N

0 1,400 2,800 Feet

Figure 2
Preferred Alternative

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Acronyms and Abbreviations

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway Transportation Officials
ACM	asbestos containing materials
ADID	Advanced Identification of Wetland Disposal Areas
ADT	average daily traffic
AIS	Agricultural Impact Statement
APE	area of potential effect
BMP	best management practices
Btu	British thermal unit
CAAAs	Clean Air Act Amendments
CD	Compact Disc
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
CO	carbon monoxide
CO2	carbon dioxide
CSS	community sensitive solution
DATCP	Department of Agricultural, Trade, and Consumer Protection
dBA	decibels
DNR	Department of Natural Resources
EIS	Environmental Impact Statement
EO	Executive Order
FDM	Facilities Development Manual
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
ft	feet
FTA	Federal Transit Administration
HAPs	Hazardous Air Pollutants
in	inch
ITS	Intelligent Transportation System
Leq	equivalent sound level
LOS	Level of Service
LUST	leaking underground storage tanks
LWCF	Land and Water Conservation Fund Act
mg/m3	milligrams per cubic meter
µg/m3	micrograms per cubic meter
µm	microns
mph	miles per hour
MPOs	Metropolitan Planning Organizations
MSAT	Mobile Source Air Toxics

NA-3	Natural Areas of Local Importance
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NCHRP	National Cooperative Highway Research Program
NEPA	National Environmental Policy Act
NHI	National Heritage Inventory
NHPA	National Historic Preservation Act
NLC	Noise Level Criteria
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NOI	Notice of Intent
NO_X	nitrogen oxides
PCB	polychlorinated biphenyl
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than 2.5 micrometers
PM_{10}	particulate matter with an aerodynamic diameter less than 10 micrometers
ppm	parts per million
PS&E	Plans, Specifications and Estimate
RCRA	Resource Conservation and Recovery Act of 1976
RCBC	reinforced concrete box culvert
RSA	road safety audit
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act—A Legacy for Users
SEWRPC	Southeastern Wisconsin Regional Planning Commission
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
TDM	Transportation Demand Management
TIP	Transportation Improvement Program
TNM	Traffic Noise Model
TSM	Transportation System Management
TSP	total suspended particulate matter
USC	United States Code
USDA	United State Department of Agriculture
USFWS	U.S. Department of the Interior Fish and Wildlife Service
UST	underground storage tank
USEPA	United States Environmental Protection Agency
VMT	vehicle miles traveled
VOCs	volatile organic compounds
VPD	vehicles per day
VPH	vehicles per hour
WDOA	Wisconsin Department of Administration
WGNHS	Wisconsin Geological and Natural History Survey
WIS	Wisconsin State Highway
WisDOT	Wisconsin Department of Transportation

Waukesha Street Guide

Several street and highway names referred to in this Final EIS are known by more than one name.

Street Name Used in this EIS	Other Street Names
Summit Avenue	US 18
Sunset Drive	County D
County TT	Meadowbrook Road north of Summit Avenue, Merrill Hills Road south of Summit Avenue
County X	St. Paul Avenue and Genesee Road north of WIS 59, Saylesville Road south of WIS 59
WIS 59	Les Paul Parkway east of County X, Genesee Road west of County X
County T	Grandview Boulevard

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Appendix A
Mobile Source Air Toxics

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APPENDIX A

Mobile Source Air Toxics

In December 2012, FHWA issued an interim guidance update for the analysis of mobile source air toxics (MSATs) in the NEPA process for highway projects.[1] The following language is based on the interim guidance update. In addition to criteria air pollutants for which there are National Ambient Air Quality Standards (NAAQSs), USEPA regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, nonroad mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments of 1990, whereby Congress mandated that USEPA regulate 188 air toxics, also known as hazardous air pollutants. USEPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (*Federal Register,* Vol. 72, No. 37, page 8430, February 26, 2007), identified a group of 93 compounds emitted from mobile sources; these are listed in the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects."[2]

USEPA also identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA).[3] These are acrolein, benzene, 1,3-butidiene, diesel particulate matter plus diesel exhaust organic gases (diesel particulate matter, or PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority MSATs, the list is subject to change and may be adjusted in consideration of future USEPA rules.

The 2007 USEPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using USEPA's MOBILE6.2 model, even if vehicle activity (vehicle-miles traveled, or VMTs) increases by 145 percent, as assumed, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050, as shown in Figure A-1.

MSAT Analysis Guidance

FHWA's *Interim Guidance on Air Toxics Analysis in NEPA Documents* (February 2006) presents a three-level tiered approach for analyzing MSATs. The level used depends on project specifics:

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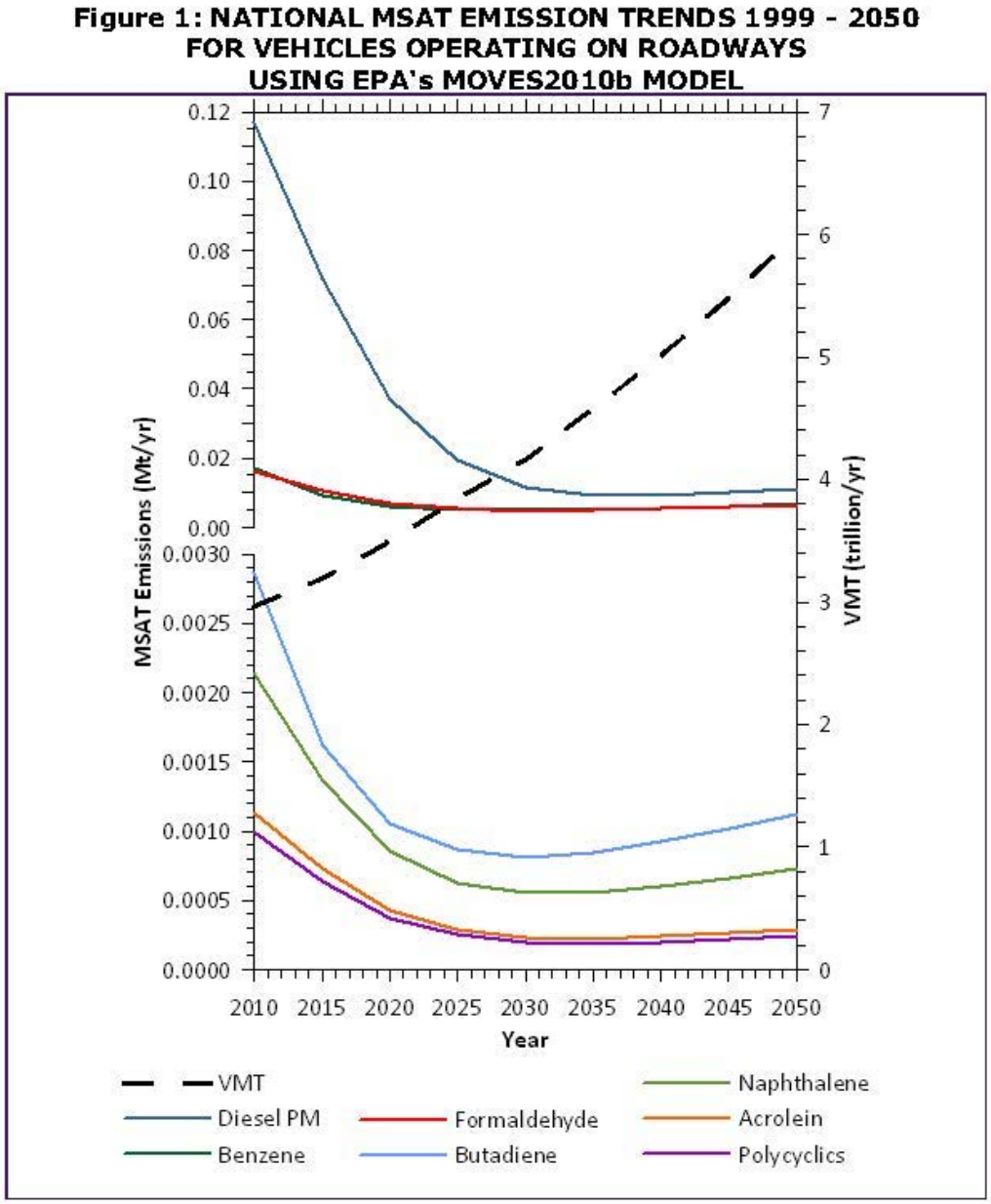
[1] "Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA," available at http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/aqintguidmem.cfm

[2] http://cfcpub.epa.gov/ncea/iris/index.cfm.

[3] http://www.epa.gov/ttn/atw/nata1999/.

- Tier I: No analysis for projects with no potential for meaningful MSAT effects
- Tier II: Qualitative analysis for projects with low potential MSAT effects
- Tier III: Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects

FIGURE A-1
MSAT Trends



The proposed improvements, with design-year average annual daily traffic of fewer than 150,000 vehicles, meet FHWA's criteria for a Tier II analysis. As such, a qualitative analysis of potential MSAT emissions for the six priority MSATs for each alternative is required.

For each alternative in this EIS, the amount of MSATs emitted would be proportional to the vehicle miles of travel (VMTs), assuming that other variables such as fleet mix are the same for each alternative. The VMTs estimated for each of the build alternatives is slightly higher than those for the no-build alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. (See Section 3.5, Transportation.) This increase in VMTs would lead to higher MSAT emissions for the preferred action alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to USEPA's MOVES2010b model, emissions of all of the priority MSAT except for diesel particulate matter decrease as speed increases. Because the estimated VMT under each of the alternatives are nearly the same it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of USEPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent between 2010 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the USEPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The additional travel lanes contemplated as part of the project alternatives will have the effect of moving some traffic closer to nearby homes, schools, and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSAT could be higher under the build alternatives than under the no-build alternative. The localized increases in MSAT concentrations would likely be most pronounced along the expanded roadway sections that would be built between Rolling Ridge Drive and the Wisconsin & Southern railroad (under both build alternatives), along Sunset Drive (under the Sunset-to-County X Alternative), and near Hawthorne Hollow Drive (under the Pebble Creek Alternatives).

However, the magnitude and the duration of these potential increases compared to the no-build alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, when a highway is widened, the localized level of MSAT emissions for a build alternative could be higher relative to the no-build alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, USEPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause future regionwide MSAT levels to be significantly lower than today.

Incomplete or Unavailable Information for Analysis of Project-Specific MSAT Health Impacts

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of

highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The U.S. Environmental Protection Agency (USEPA) is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, http://www.epa.gov/iris/). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are; cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/view.php?id=282) or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts - each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (http://www.epa.gov/risk/basicinformation.htm#g) and the HEI

(http://pubs.healtheffects.org/getfile.php?u=395) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

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Appendix B
Agency Coordination during Draft EIS Preparation

B1, H.E. Clinkenbeard, City Planner/City of Pewaukee, July 15, 2010
B3, Town of Genesee, July 21, 2010
B5, Town of Delafield, September 7, 2010
B7, Waukesha County Department of Parks and Land Use, October 6, 2010
B9, Waukesha County Department of Public Works, February 9, 2011
B11, U.S. Department of Agriculture/National Resources Conservation Service, May 6, 2011
B13, State of Wisconsin Governor Scott Walker/Department of Agriculture, Trade and Consumer Protection Secretary Ben Brancel, May 9, 2011
B15, Wisconsin Department of Natural Resources, May 4, 2010
B17, Wisconsin Department of Natural Resource, May 12, 2012
B19, Wisconsin Department of Transportation Section 106 Review, Archaeological/Historical Information, State Historic Preservation Office, May 20, 2011
B25, Wisconsin Department of Transportation Section 106 Review, Archaeological/Historical Information, State Historic Preservation Office, May 2, 2012
B33, Waukesha County Department of Parks and Land Use, May 20, 2011
B37, City of Waukesha Parks, Recreation & Forestry, September 19, 2011
B39, City of Pewaukee, May 27, 2010
B41, Wisconsin Historical Society, June 14, 2010
B43, Southeastern Wisconsin Regional Planning Commission, June 25, 2010
B45, U.S. Army Corps of Engineers, June 28, 2010
B49, U.S. Environmental Protection Agency, June 2, 2010
B53, Wisconsin Department of Natural Resources, July 21, 2010
B55, U.S. Department of the Interior/Fish and Wildlife Service, August 24, 2010
B57, U.S. Army Corps of Engineers, November 4, 2010
B59, U.S. Environmental Protection Agency, December 10, 2010
B63, City of Pewaukee, May 26, 2011
B65, Wisconsin Department of Natural Resources, June 23, 2011
B67, U.S. Army Corps of Engineers, June 5, 2012
B71, U.S. Environmental Protection Agency, June 8, 2012
B75, Wisconsin Department of Natural Resources, September 15, 2011

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Memo from City of Pewaukee providing comments on preliminary alternatives

DATE: July 15, 2010
TO: Whom It May Concern
FROM: H.E. Clinkenbeard, City Planner

SUBJECT: Proposed Waukesha Bypass

After a brief discussion, the Mayor has asked me to comment in writing on the latest proposals for the long proposed 'City of Waukesha Bypass'.

There are currently three alternative bypass proposals that are being reviewed by the County and State as well as the City of Waukesha and, at least, those adjacent communities that are directly and indirectly impacted. Basically, the proposed route of the "bypass" that has been shown on the Transportation Plan for SE Wisconsin prepared by the Southeastern Wisconsin Regional Planning Commission (SEWRPC) initially in 1966, and subsequently in three updates/revisions of that plan, is a route primarily along Meadowbrook Road (CTH TT) south of I-94. The other two routes being explored follow a route along Grandview Boulevard in the City of Waukesha south of I-94 and a route along the eastern boundary of the Towns of Delafield and Genesee connecting to I-94 at CTH SS.

The proposed eastern Grandview Boulevard route was rejected over 40 years ago for several reasons, including: the route would not be a significant "bypass" of the City of Waukesha; the route could not be expanded without very large expenditures of money and removal of significantly high numbers of residences from the route to accommodate additional traffic lanes; and, it would split several primarily residential neighborhoods in the City of Waukesha.

The proposed western route extending south from I-94 at CTH SS and lying two-and-one-half miles west of the eastern route would skirt the western edge of the City of Pewaukee but has several faults as a viable "bypass" route, including: it would require acquisition of more than three miles of right-of-way (minimum 130 foot width) including the purchase of several homes and, possibly, part of the Shoenstatt Sisters retreat complex and, perhaps, public park/recreation lands on the south side of Northview Road; the interchange at I-94 and CTH SS would have to be completely rebuilt to accommodate a major "bypass" facility; and, the route is probably too far west to accommodate favorable access to existing north-south arterial routes north of I-94.

The Meadowbrook Road/CTH TT routing for the "bypass" is still the better route and there are compelling reasons for that statement, including: the route has been on the plans of the County, the Town/City of Pewaukee and SEWRPC since 1966 and most of the required public right-of-way is in place; during the past 44 years additional right-of-way has been acquired to accommodate future widening and Meadowbrook Road has been extended south from Northview Road to STH 18; development in both the City of Waukesha and the Town/City of Pewaukee has been designed and configured to ensure that there will be limited lateral traffic conflict with the route; and, when the I-94 interchange at Meadowbrook Road was rebuilt several years ago it was in anticipation that Meadowbrook Road would at some point in time become the western bypass route of the City of Waukesha and the interchange was configured to accommodate that expectation. Basically, if there is to be a western bypass of the City of Waukesha the only viable route is over Meadowbrook Road from I-94 south to a point south of MacArthur Avenue where a southeast/northwest connection can be made to the southern City of Waukesha bypass (STH 59/STH 164).

I hope this is helpful to all concerned. If you have questions, please contact either the SEWRPC or the Waukesha County Department of Public Works.

Respectfully,
H.E. Clinkenbeard,
City Planner

HEC/ah

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TOWN OF GENESEE
S43 W31391 HWY. 83
P.O. BOX 242
GENESEE DEPOT, WI 53127
(262) 968-3656
FAX (262) 968-3809

July 21, 2010

Mr. Charlie Webb
Consultant Team Project Manager
CH2M HILL
135 South 84th Street, Suite 325
Milwaukee, WI 53226

Dear Mr. Webb:

I appreciated the information shared with local officials at the July 13, 2010, meeting regarding the West Waukesha bypass proposals.

One of the alternate routes presented would pass through a portion of our 90 acre Genesee Sunset Park en route to Highway SS. This letter is a formal objection on behalf of the Town of Genesee to the above proposed bypass. A good deal of stewardship grant funding and Genesee taxpayer money have provided us with some beautiful park land intended to serve our community's growth needs for years to come. Our park provides a connection to the Glacial Drumlin Trail and is used extensively by the public. We do not wish to have this area disrupted. In addition, this proposal would also carry the bypass through a portion of Retzer Nature Center, a gem within our community and a facility which fosters an awareness of the natural environment and provides programming for a wide range of students and the public.

Genesee would like to go on the record strongly opposing this alternative. Thank you for your consideration of our concerns.

Sincerely yours,

Sharon L. Leair

Sharon L. Leair
Genesee Town Chairman

cc: Genesee Town Board
Genesee Park Board
Genesee Plan Commission
Jeffrey Herrmann, Administrator

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A PERFECT ENVIRONMENT

Residential ⅄ Recreational ⅄ Responsible

Chair
Paul L. Kanter
Supervisors
Larry Krause
Clare Dundon
Russ Ackley
Pete Van Horn
Clerk/Treasurer
Mary Elsner

September 7, 2010

Mr. Gary Evans, P.E.
Engineering Services Manager
Waukesha County DPW
1320 Pewaukee Road
Waukesha, WI 53188

Re: Proposed Waukesha Bypass

Dear Mr. Evans:

Please consider this as the Town of Delafield's strong opposition to the Waukesha by-pass alternative that would connect to I-94 at CTH SS on the east Town line. We have reviewed copies of letters sent to you from both the City of Pewaukee and the Town of Genesee and are in complete agreement with the stated reasons opposing this proposal. This alternative would substantially change the quality of life for those residents living near the impacted area, and forever change the "sub-rural" atmosphere which the Town has striven to create and maintain.

Sincerely,

Paul L. Kanter
Town Chairman

N14 W30782 Golf Road ⅄ Delafield, Wisconsin 53018-2117 ⅄ Phone: 262-646-2398 ⅄ Fax: 262-646-8687
www.townofdelafield.org

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Daniel P. Vrakas
County Executive

Dale R. Shaver
Director

Waukesha
COUNTY

DEPARTMENT OF
PARKS AND LAND USE

DATE: October 6, 2010

TO: Allison Bussler, Director
Waukesha County Department of Public Works

FROM: Dale R. Shaver
Director

SUBJECT: Waukesha West By-Pass Alternative Routes

This correspondence is submitted as a formal recommendation against the Waukesha Bypass alternatives identified as County Highway SS due to their impact on the Waukesha County Retzer Nature Center.

For decades, the Waukesha County Department of Parks and Land Use has been making land use acquisition and permitting decisions based on the planned alignment for the Waukesha West Bypass. Specifically, we have added to the Retzer Nature Center by acquiring lands through purchase or donation in 1980, 1984 and 1999. Those acquisitions contain grant or other use restrictions that would make it very difficult for the County to turn the land back over for a development purpose.

Should you have any questions, please feel free to contact me.

515 W. Moreland Blvd. • Room AC 260
Waukesha, Wisconsin 53188-3878
Phone: (262) 896-8300 • Fax: (262) 896-8298
www.waukeshacounty.gov/landandparks

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Daniel P. Vrakas
County Executive

Allison Bussler
Director of Public Works

Waukesha
COUNTY
DEPARTMENT OF PUBLIC WORKS

February 9, 2011

Dewayne Johnson, Director
WisDOT SE Region
141 NW Barstow Street
Waukesha, WI 53187

Subject: ***WEST WAUKESHA BYPASS***

Dear ~~Mr. Johnson~~ Dewayne:

As you know, the West Waukesha Bypass study team, comprising representatives of WisDOT, Town of Waukesha, City of Waukesha and Waukesha County Department of Public Works, continues to assess the reasonableness of alternative routes for the long-planned West Waukesha Bypass. Last year, the study team recommended that three alternatives remain under consideration:

- ***The No-Build Alternative***
- ***The Pebble Creek West Alternative***
- ***The Sunset-to-County X Alternative***

Among the alternatives dropped from further consideration was the Golf Course East Alternative, which would have widened Merrill Hills Road between Sunset Drive and Highway 59. The alternative would have required the acquisition of either 9 to 12 homes on the east side of Merrill Hills Road or 6 homes and a significant part of the Merrill Hills Country Club on the west side of Merrill Hills Road, which would threaten the continued operation of the 80-year-old country club. I concurred with the decision to eliminate the Golf Course East Alternative from consideration.

The U.S. Environmental Protection Agency asked the study team to reconsider that decision and to evaluate the Golf Course East Alternative as a way to avoid the sensitive environmental resources in the Pebble Creek corridor south of Sunset Drive.

There are several reasons that Waukesha County opposes the Golf Course East Alternative. It is in neither the County transportation plan nor SEWRPC's regional transportation plan. It would cost more to implement than the other alternatives, and the hilly terrain on Merrill Hills Road would require extensive cutting and filling to make the road safe. Constructing the Golf Course East Alternative would transform the quiet, low-volume residential street and neighborhood south of Sunset Drive. Because Merrill Hills Road south of Sunset Drive is not included in SEWRPC and County trans [illegible] was not setback to stay out of the future Waukesha B [illegible] rrill Hills Road north of Sunset Drive.

515 W. Moreland Blvd., Rm. 220
Waukesha, Wisconsin 53188
Phone: (262) 548-7740
Fax: (262) 896-8097
www.waukeshacounty.gov

Widening Merrill Hills Road to the east would displace 9 to 12 homes, more homes than the other alternatives (especially the Pebble Creek Alternative, which would affect only one home). Three of the residences are potentially historic structures and more work is being conducted to determine whether Merrill Hills Country Club is potentially historic. The other alternatives would eliminate residential driveways onto the bypass. The only way to reduce the residential relocations under the Golf Course East Alternative would be to widen Merrill Hills Road to the west, which still would require acquisition of 5 to 6 homes and completely take out two holes at the Merrill Hills Country Club and shorten a third. The country club's management and board of directors have serious concerns about the country club's ability to stay in existence if part of its course is acquired.

For these reasons, I have directed the Department of Public Works to stand by the original decision to drop the Golf Course East Alternative from consideration. I know WisDOT has taken the same position. Thank you for WisDOT's continuing support of this important project.

Sincerely,

Dan Vrakas
Waukesha County Executive

E-mail from USDA/NRCS indicating no further action needed for compliance with Farmland Protection Policy Act (FPPA)

From: Turk, Jesse - Stevens Point, WI [Jesse.Turk@wi.usda.gov]
Sent: Friday, May 06, 2011 8:40 AM
To: Dupies, Dan/MKE; Wacker, Carl - Madison, WI
Subject: RE:

Dan,

Thank you for allowing NRCS to review the proposed project. After a brief review, I've determined that the site would not be considered farmland, since under the definition of farmland in the FPPA, Farmland does not include land committed to urban development and land committed to urban development includes land that would receive a score of 160 or less. I briefly estimated the score of this site and determined that it would be below 160. So, no need for further compliance.

While zoning in itself is not an outright exemption to the act, Most sites that are zoned residential would receive a low site score that would therefore lead to the determination that the site is committed to urban development.

If you have any questions, please don't hesitate to contact me!

Jesse.
(715)-343-6200.

From: Dan.Dupies@ch2m.com [mailto:Dan.Dupies@ch2m.com]
Sent: Thursday, May 05, 2011 3:32 PM
To: Wacker, Carl - Madison, WI
Cc: Turk, Jesse - Stevens Point, WI
Subject:

Carl, thanks for taking the time to briefly discuss the West Waukesha Bypass with me and the need to complete the 1006 form for the project. The alternative pdf shows the current alignments under consideration. The project is located on the west side of Waukesha in a fairly suburban area. There clearly is, however; agricultural land adjacent to County TT that would be affected by the project. I have also attached the Town of Waukesha's zoning map which shows the remaining farm properties zoned R-1 residential. After reviewing this information, I am interested in your views on whether completing the 1006 form is still necessary. Thanks in advance for your assistance. Please ring me at 414-847-0206 with any questions. dd

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State of Wisconsin
Governor Scott Walker

Department of Agriculture, Trade and Consumer Protection
Ben Brancel, Secretary

May 9, 2011

Mr. Ben Goldsworthy
CH2M Hill
135 South 84th Street
Suite 400
Milwaukee, WI 53214

Dear Mr. Goldsworthy:

Re: Project ID#: 2788-01-00
West Waukesha Bypass Study
Waukesha County

The Department has received the notification you submitted concerning the potential need for an agricultural impact statement (AIS) for the above project. Based upon the information received, it appears that an AIS is required for this project.

The Department is reviewing the project to determine what, if any, additional information is needed to prepare the AIS. If no additional information is necessary, you will receive written notification that the AIS is being prepared. The AIS will be completed within **60 days of the date of that notification**.

Upon completion of the AIS, the Department will charge a fee to cover preparation costs as stipulated in §32.035, *Wisconsin Statutes*. The potential condemnor may not negotiate with or make a jurisdictional offer to any landowner until 30 days after the AIS has been published. Please contact me if you have questions concerning the AIS.

Sincerely,

Peter Nauth

Peter Nauth
Agricultural Impact Program
608/224-4650

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State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

WISCONSIN
DEPT. OF NATURAL RESOURCES

Jim Doyle, Governor
Matthew J. Frank, Secretary
Gloria L. McCutcheon, Regional Director

Southeast Region Headquarters
2300 N. Dr. Martin Luther King, Jr. Drive
Milwaukee, Wisconsin 53212-3128
FAX 414-263-8606
Telephone 414-263-8500
TTY Access via relay - 711

May 4, 2010

Ben Goldsworthy
CH2M HILL
135 South 84th Street, Suite 325
Milwaukee, WI 53214

Subject: West Waukesha Bypass Study - State listed special concern, threatened and endangered species
WisDOT# 2788-01-00
Waukesha County

Dear Mr. Goldsworthy:

The Department of Natural Resources has done a preliminary look up of the Natural Heritage Inventory (NHI). This correspondence is only a review of state listed species and should not be considered an initial review of the project or the study area. Our review of the NHI included the following sections, per your request:

T6N, R18E, Sections [redacted]
T6N, R19E, Sections [redacted]
T7N, R18E, Sections [redacted]
T7N, R19E, Sections [redacted]

Our Natural Heritage Inventory (NHI) data files contain the following rare species occurring within or near the requested areas of study, some in multiple locations:

- *Thamnophis butleri* (Butler's Gartersnake) – Threatened snake
- *Triglochin maritima* (Common Bog Arrow) – Special concern plant
- Mesic Prairie – Natural area of special concern
- *Calylophus serrulatus* (Yellow Evening Primrose) – Special concern plant
- *Cypripedium parviflorum var. makasin* (Northern Yellow Lady's slipper) – Special concern plant
- *Emydoidea blandingii* (Blanding's Turtle) – Threatened turtle
- Southern Dry Forest – Natural Area of special concern
- *Erimyzon sucetta* (Lake Chubsucker) – Special concern fish
- *Alasmidonta marginata* (Elktoe Mussel) – Special concern mussel
- *Alasmidonta viridis* (Slippershell Mussel) – Threatened mussel
- *Aster furcatus* (Forked Aster) – Threatened plant
- *Agrimonia parviflora* (Swamp Agrimony) – Special concern plant
- *Cypripedium candidum* (Small White Lady's slipper) – Threatened plant

Special Concern (Watch) species are species about which some problem of abundance or distribution is suspected but not yet proved. The main purpose of this category is to focus attention on certain species before they become endangered or threatened. Comprehensive endangered resource surveys may not have been completed for this area. As a result, our data files may be incomplete. We will continue to work with you throughout the study to determine impacts and avoidance of sensitive species.

Sincerely,

Maureen Millmann
WDNR Environmental Coordinator

CC: Lisie Kitchel, WDNR Bureau of Endangered Resources
Karla Leithoff, WisDOT Wetland Ecologist

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State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Scott Walker, Governor
Cathy Stepp, Secretary

101 S. Webster St.
Box 7921
Madison, Wisconsin 53707-7921
Telephone 608-266-2621
FAX 608-267-3579
TTY 608-267-6897

May 12, 2012

Gary Evans
Waukesha County DPW
515 W. Moreland Blvd.
Waukesha, WI 53188

SUBJECT: West Waukesha Bypass Study
Revised state listed endangered species information
WisDOT # 2788-01-00, Waukesha County

Dear Mr. Evans,

The Bureau of Endangered Resources is providing the attached revised list of threatened, endangered and special concern species, as well as high quality natural communities, for the West Waukesha Bypass study area. This revised list is based on information not available in the NHI database at the time of Ms. Millmann's initial letter of 4 May 2010.

The attached information contains the name, status, and most recent observation date of the species. Species known to occur in Pebble Creek are noted. This information is generalized and can be provided in publicly disseminated documents. Specific locational information will be provided separately and should not be shared in public documents.

The occurrence of these species is subject to the presence of suitable habitat for the species within the project impact area. Please be aware that additional species may be found to occur in the project area if additional surveys are conducted.

For additional information on the rare species, high-quality natural communities, and other endangered resources listed above, please visit our species and natural communities website page; http://dnr.wi.gov/org/land/er/biodiversity.

The attached information only addresses endangered resources issues. This ER Review does not constitute DNR authorization of the proposed project and does not exempt the project from securing necessary permits and approvals from the DNR and/or other permitting authorities.

Please contact me at 608-266-5248 or via email at Lisie.Kitchel@wisconsin.gov if you have any questions about this information.

Sincerely,

Lisie Kitchel

Endangered Resources Program

cc: Maureen Millmann – WDNR/Milwaukee
Mike Thompson – WDNR/Milwaukee
Karla Leithoff – WDOT/Waukesha
Dan Dupies – CH2MHill
Charlie Webb – CH2MHill

West Waukesha Bypass Revised list.doc

Waukesha Bypass threatened, endangered and special concern species and high quality communities.

5/12/2012

Scientific Name	Common Name	Status	Last Obs	Group	Site
Birds					
Ammodramus henslowii	Henslow's sparrow	THR	2006-06-04	Bird	
Herptiles					
Thamnophis butleri	Butler's Gartersnake	THR	2010-06-10	Snake	Pebble Creek
Emydoidea blandingii	Blanding's Turtle	THR	1993-05	Turtle	Pebble Creek
Fish					
Lepomis megalotis	Longear sunfish	THR	2006-08-06	Fish	Pebble Creek
Notropis texanus	Weed Shiner	SC/N	2006-08-06	Fish	Pebble Creek
Invertebrates					
Venustachonca eliipsiformis	Ellipse	THR	2007-08-15	Mussel	Pebble Creek
Alasmidonta viridis	Slippershell	THR	2007-08-15	Mussel	Pebble Creek
Procambarus gracilis	Prairie crayfish	SC	2006-08-06	Crayfish	
Lycaena dione	Great copper	SC	2006-06-04	Invertebrate	
Aeshna clepsydra	Mottled darner	SC	2006-06-04	Invertebrate	
Plants					
Agrimonia parviflora	Swamp Agrimony	SC	1999-05-03	Plant	
Asclepias purpurascens	Purple milkweed	END	2006-06-04	Plant	
Besseya bullii	Kitten Tails	THR	1997-06-04	Plant	
Cacalia tuberosa	Prairie Indian plantain	THR	2006-06-04	Plant	
Camassia scilloides	Wild hyacinth	END	2006-06-04	Plant	
Calylophus serrulatus	Yellow Evening Primrose	SC	2002-07-26	Plant	
Carex lupuliformis	False hop sedge	END	2006-06-04	Plant	
Cypripedium candidum	Small White Lady's-slipper	THR	1994-05-20	Plant	
Eleocharis rostellata	Beaked spikerush	THR	2006-06-04	Plant	
Equisetum palustre	Marsh horsetail	SC	2006-06-04	Plant	
Gentiana alba	Yellow gentian	THR	2006-06-04	Plant	
Gymnocladus diocus	Kentucky coffee-tree	SC	2006-06-04	Plant	
Houstonia caerulea	Innocence	SC	2006-06-04	Plant	
Liatris spicata	Marsh blazing star	SC	2006-06-04	Plant	
Penstemon hirsutus	Hairy beardtongue	SC	2006-06-04	Plant	
Plantanthera hookeri	Hooker orchis	SC	2006-06-04	Plant	
Plantanthera leucophaea	Prairie White-Fringed Orchid	END	2006-06-04	Plant	
Prenanthes aspera	Rough Rattlesnake-root	END	2006-06-04	Plant	
Ptelea trifoliata	Wafer-ash	SC	2006-06-04	Plant	
Ranunculus cymbalaria	Seaside crowfoot	THR	2006-06-04	Plant	
Ruellia humilis	Hairy wild-petunia	END	2006-06-04	Plant	
Scirpus cespitosus	Tufted club-rush	THR	2006-06-04	Plant	
Scleria verticillata	Low nutruch	SC	2006-06-04	Plant	
Scutellaria ovata	Heart-leaved skullcap	SC	2006-06-04	Plant	
Thalictrum revolutum	Waxleaf meadowrue	SC	2006-06-04	Plant	
Thaspium trifoliatum var. *flavum*	Purple Meadow-parsnip	SC	1999-05-30	Plant	
Tofieldia glutinosa	Sticky false-asphodel	THR	2006-06-04	Plant	
Natural Communities					
Southern dry forest	Southern Dry Forest	NC	1992-04-30	Community	
Mesic prairie	Mesic Prairie	NC	2002-07-26	Community	Pebble Creek Railroad Prairie

Note: In a follow up e-mail (6/21/12), DNR noted that the Forked aster (Aster furcatus), a threatened plant, was inadvertently left off the above list. This species is potentially present in the West Waukesha Bypass study area and is therefore included in the EIS discussion on state-listed threatened and endangered species.

Signed Section 106 review form indicating SHPO concurrence in archaeological survey report and eligibility of Ward Farmstead to National Register of Historic Places

SECTION 106 REVIEW
ARCHAEOLOGICAL/HISTORICAL INFORMATION

SHPO

Wisconsin Department of Transportation
DT1635 11/2006

For instructions, see FDM Chapter 26

I. PROJECT INFORMATION

Project ID 2788-01-00	Highway - Street West Waukesha Bypass (CTH TT)	County Waukesha
Project Termini I94/CTH TT interchange on the north to WIS 59/CTH X intersection on the south		Region - Office SE Region (Waukesha)
Regional Project Engineer - Project Manager Doug Cain Wisconsin Department of Transportation	RECEIVED	Area Code - Telephone Number (262) 548-5603
Consultant Project Engineer - Project Manager Charlie Webb/CH2M HILL	MAY 20 2011	Area Code - Telephone Number 414-847-0248
Archaeological Consultant David Keene/Archaeoogical Research, Inc		Area Code - Telephone Number 773-975-1753
Architecture/History Consultant Brian Faltinson/Heritage Research, Ltd.	DIV HIST PRES	Area Code - Telephone Number 262-251-7792
Date of Need April 2011		SHSW # 11-0526/WK
Return a signed copy of this form to:		pg 1/3

II. PROJECT DESCRIPTION

Project Length 5.0 - 5.5 miles miles	Land to be Acquired: Fee Simple 80-90 acres	Land to be Acquired: Easement acres

Distance as measured from existing centerline	Existing	Proposed	Other Factors	Existing	Proposed
Right-of-Way Width	varies	100 ft	Terrace Width	varies	24 ft.
Shoulder	varies	10 ft	Sidewalk Width	varies	10 ft.
Slope Intercept	varies	6:1	Number of Lanes	2	4
Edge of Pavement	varies	39 - 47 ft	Grade Separated Crossing	no	potentially
Back of Curb Line		41.5 - 49.5 ft	Vision Triangle acres		
Realignment			Temporary Bypass acres	N/A	N/A
Other - List:			Stream Channel Change	☐ Yes	☒ No
Attach Map(s) that depict "maximum" impacts.	☒ Yes	☐ No	Tree topping and/or grubbing	☒ Yes	☐ No

Brief Narrative Project Description - Include all ground disturbing activities. For archaeology, include plan view map indicating the maximum area of ground disturbance and/or new right-of-way, whichever is greater. Include all temporary, limited and permanent easements.

The proposed action is to develop and evaluate a range of alternatives to complete the last segment of a long planned circumferential bypass around Waukesha. This segment of the project is located between Interstate 94 and WIS 59 on the west side of the City of Waukesha. The alternatives and associated transportation improvements are being studied to address growing local and regional traffic volumes, meet applicable roadway design standards, and enhance safety. Key improvements include a new 4-lane roadway and intersection improvements.

Ground disturbing activities will include clearing and grubbing, grading, shoulders and ditches, and excavation of soils unsuitable for roadway construction.

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11-0526/WK
pg 2/3

RECEIVED

MAY 20 2011

DIV HIST PRES

☐ Add continuation sheet, if needed.

III. CONSULTATION

How has notification of the project been provided to:

☒ Property Owners
- ☒ Public Information Meeting Notice
- ☒ Letter - Required for Archaeology
- ☒ Telephone Call
- ☐ Other:

☒ Historical Societies/Organizations
- ☒ Public Information Meeting Notice
- ☒ Letter
- ☒ Telephone Call
- ☐ Other:

☒ Native American Tribes
- ☒ Public Info. Mtg. Notice
- ☒ Letter
- ☐ Telephone Call
- ☐ Other:

*Attach one copy of the base letter, list of addresses and comments received. For history include telephone memos as appropriate.

IV. AREA OF POTENTIAL EFFECTS - APE

ARCHAEOLOGY: Area of potential effect for archaeology is the existing and proposed ROW, temporary and permanent easements. Agricultural practices do not constitute a ground disturbance exemption.

HISTORY: Describe the area of potential effects for buildings/structures.

The Area of Potential Effects (APE) is all propertis adjacent to CTH TT between CTH D and I-94, as well as all properties adjacent to off current alignment portions of the proposed bypass.

V. PHASE I ARCHEOLOGICAL OR RECONNAISSANCE HISTORY SURVEY NEEDED

ARCHAEOLOGY	HISTORY
☒ Archaeological survey **is needed**	☒ Architecture/History survey **is needed**
☐ Archaeological survey **is not needed** - Provide justification ☐ Screening list (date).	☐ Architecture/History survey **is not needed** ☐ No structures or buildings of any kind within APE ☐ Screening list (date).

VI. SURVEY COMPLETED

ARCHAEOLOGY	HISTORY
☐ **NO** archaeological sites(s) identified - ASFR attached	☐ **NO** buildings/structures identified - A/HSF attached
☒ **NO** potentially eligible site(s) in project area - Phase I Report attached	☒ Potentially eligible buildings/structures identified in the APE - A/HSF attached
☐ Potentially eligible site(s) identified-Phase I Report attached ☐ Avoided through redesign ☐ Phase II conducted – go to VII (Evaluation).	☐ Potentially eligible buildings/structures avoided – documentation attached
☐ Phase I Report attached - Cemetery/cataloged burial documentation	

VII. DETERMINATION OF ELIGIBILITY (EVALUATION) COMPLETED

☒ No arch site(s) eligible for NRHP - Phase II Report attached	☐ No buildings/structure(s) eligible for NRHP - DOE attached
☐ Arch site(s) eligible for NRHP - Phase II Report attached	☒ Building/structure(s) eligible for NRHP - DOE attached
☐ Site(s) eligible for NRHP - DOE attached	

VIII. COMMITMENTS/SPECIAL PROVISIONS – must be included with special provisions language

IX. PROJECT DECISION

☐ No historic properties (historical or archaeological) in the APE.
☐ No historic properties (historical or archaeological) affected.
☒ Historic properties (historical and/or archaeological) may be affected by project;
- ☒ Go to Step 4: Assess affects and begin consultation on affects
- ☐ Documentation for Determination of No Adverse Effects is included with this form. WIDOT has concluded that this project will have No Adverse Effect on historic properties. Signature by SHPO below indicates SHPO concurrence in the DNAE and concludes the Section 106 Review process for this project.

Douglas A Cate (Regional Project Manager) 4/26/11 (Date)	for (WIDOT Historic Preservation Officer) 5/18/11 (Date)	(State Historic Preservation Officer) 6-8-2011 (Date)
(Consultant Project Manager) 4/20/11 (Date)		11-0526/WK pg 3/3

RECEIVED

MAY 20 2011

DIV HIST PRES

(DOE March 2011)

Wisconsin Historical Society
Determination of Eligibility Form

RECEIVED
MAY 20 2011
DIV HIST PRES

WisDOT Project ID #: 2788-01-00

WHS #: 11-0526/WK

Property Name(s): Ward Brown Farmstead

Address/Location: W272 S2137 County Highway TT/Merrill Hills Rd

City & County: Town of Waukesha **Zip Code:** 53188

Town: 6N **Range:** 19E **Section:** 6

Date of Construction: 1963-1964

WisDOT Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this request for Determination of Eligibility:

☒ Meets the National Register of Historic Places criteria.
☐ Does not meet the National Register of Historic Places criteria.

5/18/11

Rebecca Burkel, WisDOT Historic Preservation Officer **Date**

State Historic Preservation Office

In my opinion, the property:

X Meets the National Register of Historic Places criteria.
___ Does not meet the National Register of Historic Places criteria.

June 8, 2011

Michael E. Stevens, State Historic Preservation Officer **Date**

Comments (FOR AGENCY USE ONLY):
SHPO comment: The accompanying farm buildings define the context for which the house was built, provide setting. All associated farm buildings are contributing except garage, which is non-contributing.

Division of Historic Preservation
Wisconsin Historical Society
816 State Street
Madison, WI 53706

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Signed amended Section 106 review form indicating SHPO concurrence in elibitility of Smirl and Ledward residences to National Register of Historic Places

Amended

SECTION 106 REVIEW
ARCHAEOLOGICAL/HISTORICAL INFORMATION

Wisconsin Department of Transportation
DT1635 11/2006

SHPO RECEIVED
MAY 02 2012
DIV HIST PRES

For instructions, see FDM Chapter 26

I. PROJECT INFORMATION

Project ID 2788-01-00 THIS IS AN UPDATED SUBMITTAL WITH ~~THREE~~ 4 NEW DOEs FOR AN ALTERNATIVE PREVIOUSLY DISMISSED FROM CONSIDERATION	Highway - Street West Waukesha Bypass (CTH TT)	County Waukesha
Project Termini I94/CTH TT interchange on the north to WIS 59/CTH X intersection on the south		Region - Office SE Region (Waukesha)
Regional Project Engineer - Project Manager Doug Cain Wisconsin Department of Transportation		Area Code - Telephone Number (262) 548-5603
Consultant Project Engineer - Project Manager Charlie Webb/CH2M HILL		Area Code - Telephone Number 414-847-0248
Archaeological Consultant David Keene/Archaeoogical Research, Inc		Area Code - Telephone Number 773-975-1753
Architecture/History Consultant Brian Faltinson/Heritage Research, Ltd.		Area Code - Telephone Number 262-251-7792
Date of Need April 2012		SHSW # 11-0526/WK
Return a signed copy of this form to:		

II. PROJECT DESCRIPTION

Project Length 5.0 - 5.5 miles miles	Land to be Acquired: Fee Simple 80-90 acres	Land to be Acquired: Easement acres

Distance as measured from existing centerline	Existing	Proposed	Other Factors	Existing	Proposed
Right-of-Way Width	varies	100 ft	Terrace Width	varies	24 ft.
Shoulder	varies	10 ft	Sidewalk Width	varies	10 ft.
Slope Intercept	varies	6:1	Number of Lanes	2	4
Edge of Pavement	varies	39 - 47 ft	Grade Separated Crossing	no	potentially
Back of Curb Line		41.5 - 49.5 ft	Vision Triangle acres		
Realignment			Temporary Bypass acres	N/A	N/A
Other - List:			Stream Channel Change	☐ Yes	☒ No
Attach Map(s) that depict "maximum" impacts.	☒ Yes	☐ No	Tree topping and/or grubbing	☒ Yes	☐ No

Brief Narrative Project Description - Include all ground disturbing activities. For archaeology, include plan view map indicating the maximum area of ground disturbance and/or new right-of-way, whichever is greater. Include all temporary, limited and permanent easements.

The proposed action is to develop and evaluate a range of alternatives to complete the last segment of a long planned circumferential bypass around Waukesha. This segment of the project is located between Interstate 94 and WIS 59 on the west side of the City of Waukesha. The alternatives and associated transportation improvements are being studied to address growing local and regional traffic volumes, meet applicable roadway design standards, and enhance safety. Key improvements include a new 4-lane roadway and intersection improvements.

Ground disturbing activities will include clearing and grubbing, grading, shoulders and ditches, and excavation of soils unsuitable for roadway construction.

☐ Add continuation sheet, if needed.

III. CONSULTATION

How has notification of the project been provided to:

☒ Property Owners
- ☒ Public Information Meeting Notice
- ☒ Letter - Required for Archaeology
- ☒ Telephone Call
- ☐ Other:

☒ Historical Societies/Organizations
- ☒ Public Information Meeting Notice
- ☒ Letter
- ☒ Telephone Call
- ☐ Other:

☒ Native American Tribes
- ☒ Public Info. Mtg. Notice
- ☒ Letter
- ☐ Telephone Call
- ☐ Other:

*Attach one copy of the base letter, list of addresses and comments received. For history include telephone memos as appropriate.

IV. AREA OF POTENTIAL EFFECTS - APE

ARCHAEOLOGY: Area of potential effect for archaeology is the existing and proposed ROW, temporary and permanent easements. Agricultural practices do not constitute a ground disturbance exemption.

HISTORY: Describe the area of potential effects for buildings/structures.

The Area of Potential Effects (APE) is all propertis adjacent to CTH TT between CTH D and I-94, as well as all properties adjacent to off current alignment portions of the proposed bypass.

V. PHASE I ARCHEOLOGICAL OR RECONNAISSANCE HISTORY SURVEY NEEDED

ARCHAEOLOGY	HISTORY
☐ Archaeological survey **is needed**	☒ Architecture/History survey **is needed**
☒ Archaeological survey **is not needed** - Provide justification ☐ Screening list (date). *See attached ARI 4/19/12 letter	☐ Architecture/History survey **is not needed** ☐ No structures or buildings of any kind within APE ☐ Screening list (date).

VI. SURVEY COMPLETED

ARCHAEOLOGY	HISTORY
☐ **NO** archaeological sites(s) identified - ASFR attached	☐ **NO** buildings/structures identified - A/HSF attached
☒ **NO** potentially eligible site(s) in project area - Phase I Report attached	☒ Potentially eligible buildings/structures identified in the APE - A/HSF attached
☐ Potentially eligible site(s) identified-Phase I Report attached ☐ Avoided through redesign ☐ Phase II conducted – go to VII (Evaluation).	☐ Potentially eligible buildings/structures avoided – documentation attached
☐ Phase I Report attached - Cemetery/cataloged burial documentation	

VII. DETERMINATION OF ELIGIBILITY (EVALUATION) COMPLETED

☒ No arch site(s) eligible for NRHP - Phase II Report attached	☐ No buildings/structure(s) eligible for NRHP - DOE attached
☐ Arch site(s) eligible for NRHP - Phase II Report attached	☒ Building/structure(s) eligible for NRHP - DOE attached
☐ Site(s) eligible for NRHP - DOE attached	

VIII. COMMITMENTS/SPECIAL PROVISIONS – must be included with special provisions language

IX. PROJECT DECISION

☐ No historic properties (historical or archaeological) in the APE.
☐ No historic properties (historical or archaeological) affected.
☒ Historic properties (historical and/or archaeological) may be affected by project;
- ☒ Go to Step 4: Assess affects and begin consultation on affects
- ☐ Documentation for Determination of No Adverse Effects is included with this form. WIDOT has concluded that this project will have No Adverse Effect on historic properties. Signature by SHPO below indicates SHPO concurrence in the DNAE and concludes the Section 106 Review process for this project.

(Regional Project Manager)	(WIDOT Historic Preservation Officer)	(State Historic Preservation Officer)
3-8-12	5/1/2012	5/8/2012
(Date)	(Date)	(Date)
(Consultant Project Manager)		
3/8/12		
(Date)		

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11-0526/WK

(DOE March 2011)

Wisconsin Historical Society
Determination of Eligibility Form

WisDOT Project ID #: 2788-01-00

WHS #:

Property Name(s): Dr. Warren & Jean Smirl Residence
Address/Location: S33 W26950 Hawthorne Hollow Drive
City & County: Town of Waukesha **Zip Code:** 53188
Town: 6N **Range:** 19E **Section:** 17
Date of Construction: 1956, 1965, 1973

WisDOT Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this request for Determination of Eligibility:

☒ Meets the National Register of Historic Places criteria.
☐ Does not meet the National Register of Historic Places criteria.

Rebecca Burkel 5/1/2012

Rebecca Burkel, WisDOT Historic Preservation Officer **Date**

State Historic Preservation Office

In my opinion, the property:

✓ Meets the National Register of Historic Places criteria.
___ Does not meet the National Register of Historic Places criteria.

6/12/12

Michael E. Stevens, State Historic Preservation Officer **Date**

Comments (FOR AGENCY USE ONLY):

Division of Historic Preservation
Wisconsin Historical Society
816 State Street
Madison, WI 53706

11-0526/WK

(DOE March 2011)

Wisconsin Historical Society
Determination of Eligibility Form

WisDOT Project ID #: 2788-01-00

WHS #: #11-0526

Property Name(s): Dr. Allan & Martha Ledward Residence
Address/Location: W269 S3282 Merrill Hills Road
City & County: Town of Waukesha **Zip Code:** 53188
Town: 6N **Range:** 19E **Section:** 17
Date of Construction: 1955

WisDOT Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this request for Determination of Eligibility:

☒ Meets the National Register of Historic Places criteria.
☐ Does not meet the National Register of Historic Places criteria.

6/5/12

Rebecca Burkel, WisDOT Historic Preservation Officer **Date**

State Historic Preservation Office

In my opinion, the property:

✓ Meets the National Register of Historic Places criteria.
___ Does not meet the National Register of Historic Places criteria.

6/12/12

Michael E. Stevens, State Historic Preservation Officer **Date**

Comments (FOR AGENCY USE ONLY):

Division of Historic Preservation
Wisconsin Historical Society
816 State Street
Madison, WI 53706

11-0526/WK

(DOE March 2011)

Wisconsin Historical Society
Determination of Eligibility Form

WisDOT Project ID #: 2788-01-00

WHS #:

Property Name(s): Earle & Ethel Hardy Residence
Address/Location: W269 S3244 Merrill Hills Road
City & County: Town of Waukesha **Zip Code:** 53188
Town: 6N **Range:** 19E **Section:** 17
Date of Construction: 1952, 1989

WisDOT Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this request for Determination of Eligibility:

☐ Meets the National Register of Historic Places criteria.
☒ Does not meet the National Register of Historic Places criteria.

Rebecca Burkel 5/1/2012

Rebecca Burkel, WisDOT Historic Preservation Officer **Date**

State Historic Preservation Office

In my opinion, the property:

___ Meets the National Register of Historic Places criteria.
✓ Does not meet the National Register of Historic Places criteria.

6/12/12

Michael E. Stevens, State Historic Preservation Officer **Date**

Comments (FOR AGENCY USE ONLY):

Division of Historic Preservation
Wisconsin Historical Society
816 State Street
Madison, WI 53706

11-0526/WK

(DOE March 2011)

Wisconsin Historical Society
Determination of Eligibility Form

WisDOT Project ID #: 2788-01-00

WHS #:

Property Name(s): Waukesha Country Club/Merrill Hills Country Club Golf Course
Address/Location: W270 S3425 Merrill Hills Road
City & County: Town of Waukesha **Zip Code:** 53188
Town: 6N **Range:** 19E **Section:** 18
Date of Construction: 1930

WisDOT Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this request for Determination of Eligibility:

☐ Meets the National Register of Historic Places criteria.
☒ Does not meet the National Register of Historic Places criteria.

Rebecca Burkel 5/1/2012

Rebecca Burkel, WisDOT Historic Preservation Officer **Date**

State Historic Preservation Office

In my opinion, the property:

___ Meets the National Register of Historic Places criteria.
✓ Does not meet the National Register of Historic Places criteria.

6/12/12

Michael E. Stevens, State Historic Preservation Officer **Date**

Comments (FOR AGENCY USE ONLY):

Division of Historic Preservation
Wisconsin Historical Society
816 State Street
Madison, WI 53706

Daniel P. Vrakas
County Executive

Dale R. Shaver
Director

Waukesha
COUNTY
DEPARTMENT OF
PARKS AND LAND USE

DATE: May 10, 2011

TO: Gary Evans, Engineering Services Manager
Waukesha County Department of Public Works

FROM: Dale R. Shaver
Director

SUBJECT: Waukesha West By-Pass De Minimis Impact Finding on Retzer Nature Center

This correspondence is submitted in response to your April 28, 2011 memo concerning a notice of intent to make a De Minimis Impact Finding for the West Waukesha Bypass on the Waukesha County Retzer Nature Center.

Specifically, your correspondence indicates an impact of 0.1 to 0.2 acres of property from the east end of Retzer Nature Center along Merrill Hills Road. The Waukesha County Department of Parks and Land Use is in concurrence that this potential impact will not adversely affect the activities, features and attributes of the Retzer Nature Center.

Should you have any questions, please feel free to contact me.

cc. Allison Bussler, Director of Public Works
Duane Grimm, Parks System Manager
Larry Kascht, Retzer Nature Center Supervisor

B33

515 W. Moreland Blvd. • Room AC 260
Waukesha, Wisconsin 53188-3878
Phone: (262) 896-8300 • Fax: (262) 896-8298
www.waukeshacounty.gov/landandparks

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On April 19, 2011, Charlie Webb of CH2M HILL spoke with Duane Grimm of your staff. Mr. Grimm's initial position is that the 0.1 to 0.2-acre impact would not have an adverse effect on the Retzer Nature Center. As the official with jurisdiction over the Section 4(f) resource, we request you concur in writing that the West Waukesha Bypass project will not adversely affect the activities, features and attributes that make the Retzer Nature Center eligible for Section 4(f) protection.

You may contact me at 262/548-7746 or gevans@waukeshacounty.gov, if you have any questions or concerns.

Sincerely,

Gary

Gary Evans
Waukesha County DPW

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City of Waukesha

PARKS, RECREATION & FORESTRY

Ron Grall, Director
rgrall@ci.waukesha.wi.us

1900 AVIATION DRIVE
WAUKESHA, WISCONSIN 53188-2471
TELEPHONE 262/524-3737 FAX 262/524-3713

MEMORANDUM

DATE: September 19, 2011

TO: Gary Evans, Engineering Services Manager
Waukesha County Department of Public Works

FROM: Ron Grall, Director
Parks, Recreation & Forestry

SUBJECT: Waukesha West By-Pass De Minimis Impact Finding on Kisdon Hill and Pebble Creek City of Waukesha Park lands (see attached map)

As per action taken at the September 12, 2011, City of Waukesha Parks, Recreation & Forestry Board (PRFB) meeting, please accept this correspondence to confirm that the Board is in concurrence that the presented potential impact of the West By-Pass project will not adversely affect the activities, features and attributes associated with the subject City park properties (Kisdon Hill & Pebble Creek).

If you have any questions or required further information, please feel free to contact me at (262) 524-3734 or rgrall@ci.waukesha.wi.us

cc. Mayor Scrima
Steve Crandell, Interim City Administrator
PRFB Members

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E-mail from City of Pewaukee requesting that the city be added to the Participating Agency list for the West Waukesha Bypass Study

From: Clinkenbeard, Harlan <Clink@pewaukee.wi.us>
Sent: Thursday, May 27, 2010 4:09 PM
To: Evans, Gary <GEvans@waukeshacounty.gov>
Subject:

Gary—We haven't had a chance to review the Coordination Plan but please add the City of Pewaukee to your list of participants in the West Waukesha Bypass Corridor Study. Clink-, for Mayor Klein.

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WISCONSIN
HISTORICAL
SOCIETY

June 14, 2010

Mr. Doug Cain
Wisconsin Dept. of Transportation
P.O. Box 798
Waukesha, WI 53187-0798

RE: West Waukesha Bypass Corridor Study
ID: 2788-01-00/Waukesha County

Dear Mr. Cain:

Thank you for informing us of the above referenced project. We no longer conduct initial reviews for these types of WisDOT/FHA projects. Mr. Robert Newbery, WisDOT Staff Historian, conducts all initial WisDOT project reviews. If Mr. Newbery determines that any project that he reviews may affect historic properties, the project is forwarded to us for further review, pursuant to the applicable state or federal laws.

I have sent your submittal to Mr. Newbery, pursuant to the above. With further questions about the nature of his review or the timing of same, you may contact Mr. Newbery directly at (608) 266-0369. Additionally, please send all future project proposals of this nature to Mr. Newbery, Wisconsin Dept. of Transportation, Bureau of Equity and Environmental Services, 4802 Sheboygan Ave., Madison, WI 53707, for his review.

For your information, the State Historic Preservation Officer is currently Dr. Michael Stevens. Please update your records accordingly.

Thank you very much for your attention to, and concern for historic preservation and its relevance in your project design.

Sincerely,

Dan Duchrow
Division of Historic Preservation
and Public History

Cc: (w/Enclosure)
Robert Newbery, WisDOT

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E-mail from SEWRPC accepting invitation to be a Participating Agency for the West Waukesha Bypass Study

From: Hiebert, Christopher T. [mailto:CHIEBERT@SEWRPC.org]
Sent: Friday, June 25, 2010 8:30 AM
To: 'Evans, Gary'
Cc: Yunker, Kenneth R.; 'abussler@waukeshacounty.gov'; 'Carlos A. Pena (carlos.pena@dot.gov)'; 'michael.murphy@dot.wi.gov'; 'Jay.Waldschmidt@dot.wi.gov'; Webb, Charlie/ZOO
Subject: Invitation to Become a Participating Agency for West Waukesha Bypass Study

Mr. Evans:

Pursuant to Ms. Allison Bussler's letter to Mr. Kenneth R. Yunker, dated May 25, 2010, the Commission accepts the County's invitation to become a participating agency in the environmental aspects of the West Waukesha Bypass study. In addition, Commission staff has no comments related to the draft coordination plan or draft impact analysis methodology.

Sincerely,

Christopher T. Hiebert, P.E.
Chief Transportation Engineer
Southeastern Wisconsin Regional Planning Commission
W239 N1812 Rockwood Drive
PO Box 1607
Waukesha, WI 53187-1607
(262) 547-6722 Ext. 227
www.sewrpc.org

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

June 28, 2010

REPLY TO
ATTENTION OF
Operations
Regulatory (2010-00746-DJP)

Ms. Tracey McKenney
U.S. Department of Transportation
Federal Highway Administration
525 Junction Road, Suite 8000
Madison, Wisconsin 53717

Dear Ms. McKenney:

This letter is in response to your June 8, 2010, request that the Corps of Engineers, St. Paul District act as a Cooperating Agency in the environmental review process for the West Waukesha Bypass corridor study (Wis DOT Project I.D. 2788-01-00) and provide comments regarding the draft Coordination Plan for Agency and Public Involvement and the draft SAFETEA-LU 6002 Impact Analysis Methodology. The project corridor is located in Waukesha County, Wisconsin.

We agree to serve as a Cooperating Agency. We look forward to our continuing participation in the development of the Environmental Impact Statement (EIS). Further, we ask that you consider the following comments on specific sections of the draft Impact Analysis Methodology.

Section 20: Construction Impact Methodology indicates that a discussion of additional construction related impacts concerning utility relocations and the possible availability of construction material sources (borrow sites) would be included in the EIS.

1

For utility line relocations, a reasonable estimate of the type and quantity of stream/wetland impacts (in addition to the impacts stated in the EIS for the roadway construction work) should be included in the EIS and the significance of the estimated impacts should be evaluated.

See attached comment responses

We understand that the selection of borrow sites and location of haul roads are determined by contractor(s) after contracts have been awarded. However, if off-site fill material is not obtained from a licensed commercial facility, the Corps may be required to evaluate potential impacts and incorporate additional analysis into our administrative record for this project. To alleviate the potential for future project delays, it is recommended that the EIS include an analysis of reasonably foreseeable impacts based on estimated quantities while giving consideration to environmental and human constraints within an economically feasible area. The EIS should also outline procedures that would be implemented to insure that any related impacts are evaluated and considered with respect to aquatic resources, cultural and historic properties, threatened

2

and endangered species, and other environmental and human factors, including but not limited to lateral drainage in bordering wetlands and the likelihood of the spread and establishment of invasive species. (2)

Section 4: Project Schedule indicates that a public hearing would be held following the release of the Draft EIS. This public hearing should follow a format that provides citizens and stakeholders with the opportunity to make their views known to the governing agencies as well as the community. The public hearing should allow members of the community attending the hearing to present their views to agency representatives in front of members of the community attending the public hearing. (3)

The Corps point of contact for this project is Dale Pfeiffle in our Waukesha office a U.S. Army Corps of Engineers, 1617 E. Racine Avenue, Room 101, Waukesha, Wisconsin 53186. If you have any questions, please call Mr. Pfeiffle at (262) 547-0868. In any correspondence or inquiries, please refer to the Regulatory number shown above.

Sincerely,

for Tamara E. Cameron
Chief, Regulatory Branch

Copy furnished:
Doug Cain - WDOT;
Kenneth Westlake – EPA;
Maureen Milmann – WDNR.

Comment Responses
Corps of Engineers Letter—6/28/10

1. See Section 3.6, Utilities. Raising the electrical transmission line between the railroad and the Glacial Drumlin State Trail may require work in the railroad prairie to swap out the existing wooden single poles for taller poles. This area is also a wetland. The transmission line on the south side of the railroad is not in a wetland. The single wooden poles occupy less space than lattice towers. The Glacial Drumlin State Trail would provide relatively good access to electrical transmission poles that would need to be replaced. As a result, no construction access road would need to be built in wetland. Based on utility coordination that has occurred to date, there is no indication any electrical transmission lines would have to move to a new corridor that would affect wetland.

2. A discussion on material source (borrow) sites is provided in Section 3.27.3.

3. The public hearing will follow the format suggested by the Corps of Engineers.

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

JUL 02 2010

REPLY TO THE ATTENTION OF:

E-19J

Ms. Tracey McKenney
FHWA – Wisconsin Division
525 Junction Road, Suite 8000
Madison, Wisconsin 53717-2157

Re: Participating Agency Request Regarding West Waukesha bypass Corridor Study, Waukesha County, Wisconsin

Dear Ms. McKenney:

The U.S. Environmental Protection Agency – Region 5 (U.S. EPA) has received the June 8, 2010 letter from the Federal Highway Administration (FHWA) in which FHWA asked U.S. EPA to be a participating agency for the above-mentioned project. We understand that FHWA, in cooperation with Wisconsin Department of Transportation (WisDOT) and Waukesha County, is developing an Environmental Impact Statement (EIS) for transportation improvements in the Waukesha area.

The purpose of this letter is to formally agree to be a participating agency for this project. As a participating agency, U.S. EPA agrees to provide project-related input on our areas of expertise during the EIS development process. We agree to provide input on impact assessment methodologies; participate in coordination meetings, calls, and field visits; and provide comment on preliminary information developed for the EIS. Specifically, we look to provide information on purpose and need, alternatives considered, anticipated impacts, selected alternative, and mitigation. We will provide comments and/or concurrence on these points when requested. U.S. EPA retains its independent review and comment function under Section 309 of the Clean Air Act. During the formal EIS comment period, we will submit comments on this project, as we do for all federal EISs.

We have reviewed the Coordination and the Impact Analysis Methodology Plans both dated May 2010. We have no comments on the coordination document. However, we have a comment on the Impact Analysis Methodology Plan. We believe that additional discussions between the agencies should take place regarding borrow sites. It is important that everyone understands what the borrow needs might be for the project. Additionally, it would be helpful to know how the borrow issue will be handled conceptually in the EIS. We would welcome being part of those discussions. (1)

See attached comment response

We are committed to working together with FHWA, WisDOT, and Waukesha County on this project, and we will do this as our resources and time allow. Thank you for providing us this opportunity. If you have any questions, please call Sherry Kamke of my staff at 312-353-5794.

Sincerely,

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

Comment Response
EPA Letter—7/2/10

1. A discussion on material source (borrow) sites is provided in Section 3.27.3.

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State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Matthew J. Frank, Secretary
Gloria L. McCutcheon, Regional Director

Southeast Region Headquarters
2300 N. Dr. Martin Luther King, Jr. Drive
Milwaukee, Wisconsin 53212-3128
FAX 414-263-8606
Telephone 414-263-8500
TTY Access via relay - 711

July 21, 2010

File Ref: 1600

Doug Cain, Project Manager
Wisconsin Department of Transportation, Southeast Region
141 N.W. Barstow Street
Waukesha, WI 53187

Dear Mr. Cain:

Thank you for inviting the Department to be a cooperating agency for WisDOT Project 2788-01-00, West Waukesha Bypass Corridor Study. The Study will evaluate increasing traffic, safety, and alternatives for providing a north-south arterial highway between I-94 and WIS 59. The Department accepts your invitation to be a cooperating agency, with the following considerations:

Our role as a cooperating agency will be implemented in a manner consistent with the *November 2002, Cooperative Agreement between the Wisconsin Department of Natural Resources and Wisconsin Department of Transportation* which is a basis for collaboration between our two State agencies.

The Departments of Natural Resources and Transportation work together during transportation planning, design, and construction to develop projects that meet transportation needs, minimize adverse environmental impacts, maximize use of existing infrastructure, consider stakeholder input and public opinion, support a compact regional development pattern, and enhance community and regional character. The Department is committed to intergovernmental cooperation and planning to protect public health, safety, and the environment while conserving resources that support a sustainable, high quality of life.

The corridor study will implement a merged National Environmental Policy Act (NEPA) and Army Corps of Engineers Section 404 water quality permit process with "concurrence points" to move forward in a step-by-step manner. The Department will provide comments at the Study's purpose and need, alternatives analysis, and other concurrence points and acknowledges that once the Study proceeds past a concurrence point, that point will not be revisited unless there is new and compelling information not already considered and there is good cause for further analysis of corridor planning. Future final design projects will implement a refined concurrence process for construction approvals. Coordinating the merged federal process with our agencies' Cooperative Agreement is essential for our successful collaboration.

This clarifies my June 22, 2010 letter. I look forward to upcoming Study meetings and providing comments on the Study. Please contact me at Maureen.millmann@wisconsin.gov or (414) 263-8613, if you have any questions. I would be glad to meet or speak with you.

Sincerely,

Maureen Millmann

Maureen Millmann
Environmental Analysis and Review Specialist

Cc: Mike Thompson, DNR
Jay Waldschmidt, WisDOT

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Green Bay ES Field Office
2661 Scott Tower Drive
New Franken, Wisconsin 54229-9565
Telephone 920/866-1717
FAX 920/866-1710

August 24, 2010

Ms. Tracey McKenney
FHWA-Wisconsin Division
525 Junction Road, Suite 8000
Madison, Wisconsin 53717-2157

re: Participating Agency Status
West Waukesha Bypass Corridor Study
Waukesha County, Wisconsin

Dear Ms. McKenney:

This letter is in response to your June 8, 2010, letter inviting the U.S. Fish and Wildlife Service (Service) to serve as a participating agency with the Federal Highway Administration in the development of the West Waukesha Bypass Corridor Study project in Waukesha County, Wisconsin.

We agree that the Service has jurisdiction and special expertise with respect to potential impacts to wetlands and wildlife habitat that may be affected by the project. However, due to staff time constraints, we are not currently able to become a participating agency.

We appreciate the invitation to become a participating agency on the proposed project. If you have further questions you may contact Jill Utrup at 920-866-1734.

Sincerely,

Louise Clemency
Field Supervisor

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DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
190 FIFTH STREET EAST, Suite 700
ST. PAUL, MN 55101-1678

NOV 0 4 2010

REPLY TO
Operations
Regulatory (2010-00746-DJP)

Mr. Charlie Webb
Consultant Project Manager
CH2M Hill
135 S. 84th Street, Suite 400
Milwaukee, Wisconsin 53214

Dear Mr. Webb:

We have completed our review of the Draft 'Purpose and Need" statement that was prepared for the West Waukesha Bypass project (WisDOT Project I.D. 2788-01-00). The project is located in Waukesha County, Wisconsin.

We have determined that the "Purpose and Need" for the project has been adequately addressed. Based upon the information you provided, we concur with the Draft "Purpose and Need" statement as presented. If substantial new information regarding "Purpose and Need" is brought forward during project development, the adequacy of the "Purpose and Need" statement may be reconsidered.

Sections 1.3.1 and 1.3.2.2 of the Draft Purpose and Need as well as scoping and advisory group meetings attended by Corps staff identified the desire to incorporate pedestrian and bicycle paths as an important element of the project. Although the construction of bicycle and pedestrian paths could be inferred as improvement to roadway deficiencies or a safety enhancement, we suggest that the purpose statement in Section 1.2 be modified to specifically identify the addition of separate bicycle and pedestrian paths. (1)

See attached comment response

The decision regarding this action is based on information found in the administrative record, which documents the District's decision-making process, the basis for the decision, and the final decision.

If you have any questions, contact Dale Pfeiffle in our Waukesha office at (262) 547-0868. In any correspondence or inquiries, please refer to the Regulatory number shown above.

Sincerely

Todd Vegas

Tamara E. Cameron
for Chief, Regulatory Branch

Comment Response
Corps of Engineers Letter—11/4/10

1. Section 1.2 has been revised to include a reference to Wisconsin Administrative Code Chapter TRANS 75, *Bikeways and Sidewalks in Highway Projects*.

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

DEC 1 0 2010

REPLY TO THE ATTENTION OF: E-19J

Charlie Webb, Project Manager
CH2M HILL
135 South 84th Street, Suite 400
Milwaukee, Wisconsin 53214

Re: Draft Purpose and Need Section for West Waukesha Bypass Corridor Study (I-94 to WIS 59), Waukesha County, Wisconsin

Dear Mr. Webb:

The U.S. Environmental Protection Agency has reviewed the draft Purpose and Need section of the West Waukesha Bypass Environmental Impact Statement (EIS) for the above-mentioned project. This review was performed in accordance with our responsibilities under the National Environmental Policy Act, the Council on Environmental Quality's NEPA Implementing Regulations (49 CFR 1500-1508), and Section 309 of the Clean Air Act, as well as our role as a Cooperating Agency for this project.

The study area is located on the west side of the City of Waukesha between the project termini of I-94 on the north and the WIS 59/County X intersection on the south. The analysis focuses on county roads TT, D, and X, which lie between the project termini. The proposed project has evolved from the original bypass concept to completion of a 4-lane circumferential route around Waukesha designed to serve both local and through traffic.

Additional issues the proposed project seeks to address include the following:

- accommodate growing traffic volumes in the study corridor,
- improve level of service for the highway segments along the project corridor,
- improve roadway deficiencies- tight curves, steep vertical grades, narrow lanes, lack of shoulders, substandard stopping sight distance – by providing a roadway that meets current design standards.

We concur with the project's purpose and need as stated in the draft section based on the current level of service, roadway deficiencies, above-average crashes, and the high number of access points. We look forward to learning about access control policies considered as part of the proposed alternatives.

We have one recommendation concerning the safety discussion. We suggest this section be revised to include information concerning wildlife/vehicle collisions. Table 1-9 summarizes crash information for County TT for the 3-year period 2007 through 2009, excluding information about deer/vehicle crashes. Teasing out the wildlife collision rate from the crash numbers shown in Table 1-9 would provide the reviewer with a more complete picture of the array of problems currently found in the study area. (1)

See attached comment response

The proposed project has the potential to result in a large number of environmental impacts, particularly with the presence of Advanced Identification Program (ADID) wetlands, which are generally unsuitable for receiving fill material, located in the study area. The presence of rare wetland types (a sedge fen supported by groundwater discharges) and state threatened or endangered species indicate the importance of the Pebble Creek wetland corridor. It will be difficult, if not impossible, to mitigate for these types of losses. This project warrants a robust examination of a variety of alternatives to minimize impacts to high-quality environmental resources. We will look to the EIS section that discloses alternatives and the criteria by which alternatives were retained or eliminated to discuss avoidance measures taken to decrease impacts to high-quality resources.

Since fens are groundwater-supplied wetlands, it is imperative that the hydrologic re-charge and discharge dynamics of any fen areas in the study area be well understood. With these types of constraints in the study area, we strongly recommend early coordination with EPA and other state and federal natural resource agencies.

EPA appreciates the opportunity to provide comments related to the project throughout the process. We look forward to participating in future discussions regarding this project. If you have any questions regarding the contents of this letter, please do not hesitate to contact me or Kathleen Kowal of my staff at (312) 353-5206 or via email at kowal.kathleen@epa.gov.

Sincerely,

Kenneth A. Westlake, Chief
NEPA Implementation Section
Office of Enforcement & Compliance Assurance

cc: Tracey McKenney, FHWA – Wisconsin Division
Douglas Cain, WisDOT

Comment Response
EPA Letter—12/10/10

1. Car-deer crashes have been removed from the crash data in Table 1-9. Section 1.3.6 now includes a statement that the project purpose and need does not include reducing wildlife collision rates because in general roadway improvements do not affect wildlife collision rates.

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E-mail from City of Pewaukee concurring in range of alternatives to be considered in EIS

From: Clinkenbeard, Harlan [Clink@pewaukee.wi.us]
Sent: Thursday, May 26, 2011 9:27 AM
To: Webb, Charlie/ZOO
Subject: RE: West Waukesha Bypass, Range of Alternatives Considered Concurrence Point

Charlie-- The remaining general alternatives are fine. It is our view that the TT2/Pebble Creek alternative is the only viable alternative to creating a true 'bypass'. Clink-, City of Pewaukee City Planner

From: Charlie.Webb@CH2M.com [mailto:Charlie.Webb@CH2M.com]
Sent: Wednesday, May 25, 2011 3:13 PM
To: dale.j.pfeiffle@usace.army.mil; kowal.kathleen@epa.gov; Clinkenbeard, Harlan; Maureen.Millmann@Wisconsin.gov; Brandi.Richter@wi.usda.gov
Cc: GEvans@waukeshacounty.gov; Jay.Waldschmidt@dot.wi.gov; KBraun@waukeshacounty.gov; Dan.Dupies@CH2M.com; tem@tds.net; Benjamin.Goldsworthy@CH2M.com; Paul Day; Douglas.Cain@dot.wi.gov; Scott.Lee@dot.wi.gov; chairman@townofwaukesha.us
Subject: West Waukesha Bypass, Range of Alternatives Considered Concurrence Point

Waukesha County, the Wisconsin Department of Transportation (WisDOT) and Federal Highway Administration (FHWA) have prepared Section 2 of the West Waukesha Bypass EIS, *Alternatives Considered*. This document is being sent to you for your review as a participating or cooperating agency under SAFETEA-LU Section 6002.

This is the second concurrence point in the SAFETEA-LU Section 6002 process. At this point we are not seeking your agency's recommendation or concurrence on a preferred alternative. Rather, the purpose of this concurrence point is to seek concurrence that the lead agencies have appropriately defined the range of alternatives to be considered. In accordance with the 30-day time frame established in the Coordination Plan, we would appreciate hearing from you on or before **June 25, 2011**.

After the Draft EIS has been made available for public and agency review and a public hearing has been held the lead agencies will seek concurrence on a preferred alternative. That will be the third concurrence point, and is expected to occur in fall 2011. Concurrence with the purpose and need for the proposed action, completed in fall 2010, was the first concurrence point.

Due to the large file size the document has been placed on this ftp site:

ftp://ftp.ch2m.com/pub

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State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
Southeast Region Headquarters
2300 N. Dr. Martin Luther King, Jr. Drive
Milwaukee WI 53212-3128

Scott Walker, Governor
Cathy Stepp, Secretary
John Hammen, Acting Regional Director
Telephone 414-263-8500
FAX 414-263-8606
TTY Access via relay - 711

June 23, 2011

File Ref: 1600

Charlie Webb
CH@M HILL
135 South 84th Street
Suite 325
Milwaukee WI 53214

Dear Mr. Webb:

Thank you for the opportunity to review and comment on the West Waukesha Bypass Draft Environmental Impact Statement (EIS) Section 2, Alternatives Considered. The Department has participated in many advisory group meetings and looks forward to continued coordination with the Bypass Team during further development of the EIS and selection of a Preferred Alternative.

The Department supports the decision to retain Alternative TT2 for further analysis. As discussed in previous meetings, the Department recommends Alternative TT2 include a clear span bridge over Pebble Creek and a grade separated Glacial Drumlin Trail crossing. Creating bike and pedestrian facilities on the new roadway will significantly increase the amount of usable recreational trail in the county, and provide a connection between the Glacial Drumlin Trail and multi-use path on the east side of CTH TT north of Summit, and ultimately, the Lake Country Trail.

The Department supports the decision to remove the "Pebble Creek Mapped Route" alternative from consideration. As stated in the document, this alternative is closest to Pebble Creek and would have direct adverse impacts to ADID wetlands, primary environmental corridor and floodplain, as well as significant secondary impacts to the Pebble Creek Corridor due to stormwater runoff and potential future developments.

WDNR recommends retaining the "Far West Pebble Creek" alternative for further study until field wetland delineations and rare species surveys are completed. This alternative could potentially result in less impact to the wetlands in the Pebble Creek corridor, if the Pebble Creek Far West, West or Sunset to CTH X alternatives is chosen as the preferred alternative. The wetland and rare species information will allow accurate comparisons of direct and indirect resource impacts and assist refined selection of Alternatives.

Please contact me at (414)263-8613 or Maureen.millmann@wisconsin.gov if you would like to discuss the project further. I look forward to continuing to work together throughout the planning, design and construction of the project.

Sincerely,

Maureen Millmann

Maureen Millmann
WDNR Environmental Analysis & Review Specialist

CC: Doug Cain, WisDOT Project Manager
Gary Evans, Waukesha County Dept.of Public Works
Michael Thompson, WDNR EA Supervisor
Scott Lee, WisDOT Regional Environmental Coordinator
Karla Leithoff, WisDOT Regional Wetland Ecologist

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

JUN 05 2012

REPLY TO
ATTENTION OF

Operations
Regulatory (2010-00746-DJP)

Mr. Charlie Webb
CH2M Hill
135 S. 84th Street, Suite 400
Milwaukee, Wisconsin 53186

Dear Mr. Webb:

We have completed our review of Section 2 of the Draft Environmental Impact Statement (DEIS) being prepared for the West Waukesha Bypass project. Section 2 of the DEIS discusses the alternatives considered and identifies the alternatives that would be dismissed from further consideration. The project is located in Waukesha County, Wisconsin.

We concur that when considering the project's previously identified "purpose and need," the project alternatives identified in Section 2 of the DEIS (i.e. County TT2 corridor and the Pebble Creek West, Pebble Creek Far West, and Sunset to County X alternatives) should be carried forward for detailed analysis. Although the remaining build alternatives discussed in Sections 2.2.1 through 2.5.3 will not be evaluated in detail in the DEIS, we suggest the summaries provided in each Section be retained and depicted in a comparative format to demonstrate why each alternative dropped from consideration does not meet the project's stated "purpose and need." 1

In addition, Section 2.4.3 discusses the inclusion of bicycle and pedestrian accommodations to new highway construction or reconstruction projects. We suggested in our November 4, 2010 letter that the "purpose and need" statement be modified to identify the addition of bicycle and pedestrian paths. Since a modified "purpose and need" statement was not provided, we request that aquatic impacts due to bicycle and pedestrian path construction are identified and separated from roadway impacts. Also, please note that if there are substantial changes to the alternatives carried forward or there is new information on the project, we may require re-consideration of alternatives. 2

See attached comment responses

In accordance with compensatory mitigation regulations found in 33 CFR Part 332, we urge Waukesha County to take all practicable and appropriate steps to ensure that compensatory mitigation for the project is located within the same watershed as the impacted waters of the U.S. and that it would support the sustainability or improvement of the aquatic resources within the same watershed. The DEIS should include the watershed name(s) for the locations of the proposed impacts to waters of the U.S. and of any proposed compensatory mitigation locations. 3

We look forward to reviewing and commenting on the DEIS. If you have any questions, contact Marie Kopka in our Waukesha office at (262) 717-9539 ext. 4. In any correspondence or inquiries, please refer to the Regulatory number shown above.

Sincerely

Tamara E. Cameron
Chief, Regulatory Branch

Electronic copy furnished:
Bethaney Bacher-Gresock, Federal Highway Administration
Kathleen Kowal, Kerryann Weaver, U.S. Environmental Protection Agency
Karla Leithoff, Wisconsin Department of Transportation
Mike Thompson, Wisconsin Department of Natural Resources
Gary Evans, Waukesha County
Don Reed, Southeastern Wisconsin Regional Planning Commission

Comment Responses
Corps of Engineers Letter—6/5/12

1. A table summarizing the impacts of those alternative dropped from consideration is provided in Section 2.

2. Section 1.2 has been revised to include a reference to Wisconsin Administrative Code Chapter TRANS 75, *Bikeways and Sidewalks in Highway Projects*.

3. Section 3.16.2 notes that the project's wetland impacts would occur in the Pebble Creek watershed and Section 3.16.3 notes that Waukesha County and WisDOT are searching for wetland mitigation sites in the Pebble Creek watershed.

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

JUN 0 8 2012

E-19J

REPLY TO THE ATTENTION OF

Mark R. Chandler, Ph.D., PE, CMfgE
Federal Highway Administration, Wisconsin Division
525 Junction Road, Suite 8000
Madison, Wisconsin 53717

Douglas Cain, Project Manager
Wisconsin Department of
Transportation, SE Region
141 NW Barstow Street
Waukesha, Wisconsin 53187

Re: Draft Purpose and Need Section for West Waukesha Bypass Corridor Study (I-94 to WIS 59), Waukesha County, Wisconsin

Dear Messrs. Chandler and Cain:

The U.S. Environmental Protection Agency has reviewed the draft Section 2, Alternatives Considered for the West Waukesha Bypass Environmental Impact Statement (EIS). This review was performed in accordance with our responsibilities under the National Environmental Policy Act, the Council on Environmental Quality's NEPA Implementing Regulations (49 CFR 1500-1508), and Section 309 of the Clean Air Act, as well as our role as a Cooperating Agency for this project.

The study area is located on the west side of the City of Waukesha between the project termini of I-94 on the north and the WIS 59/County X intersection on the south. The analysis focuses on county roads TT, D, and X, which lie between the project termini. The proposed project has evolved from the original bypass concept to completion of a 4-lane circumferential route around Waukesha designed to serve both local and through traffic.

EPA has reviewed information contained in the draft "Section 2, Alternatives Considered" and additional refinements as stated in the May 9, 2012 "Draft Responses to U.S.EPA Questions E-mailed on April 26, 2012. This letter provides EPA's concurrence on the second concurrence point, "Alternatives to be Carried Forward for Detailed Study." The alternatives to be carried forward include the following three alternatives:

- Sunset-to-County X,
- Pebble Creek West, and
- Pebble Creek Far West.

1 We understand from conversations between the Federal Highway Administration (FHWA), the Wisconsin Department of Transportation (WisDOT), CH2M Hill, and the U.S. Army Corps of Engineers (ACE) on June 4 that a waiver from WisDOT will be sought to exclude a bicycle path south of Sunset to reduce impacts to high-quality resources. EPA's concurrence signifies that the information presented is adequate to advance to the next stage of project development.

See attached comment responses

Based on the nature of high quality aquatic resources located in the project area, we strongly recommend the draft EIS address or contain the following:

- 2 How the proposed project meets the goals and objectives of the Waukesha Watershed Protection Plan;
- 3 SEWRPC's functional analysis of aquatic resources in the project area;
- 4 The proposed stormwater management plan and its anticipated effects to high quality upland and aquatic resources;
- 5 Based on the SEWRPC's functional analysis, an analysis of potential hydrologic impacts from altered hydrology and impervious surfaces posed by the project to the remaining aquatic resources on and adjacent to the site;
- 6 Exhibits that depict wetland boundaries/wetland types, stormwater basins, and the proposed roadway in one map;
- 7 Consistent descriptions of both direct and potential indirect impacts to aquatic and upland resources; a table format would provide reviewers with a concise depiction of impacts to each resource associated with each alternative;
- 8 Exhibits that depict location of state threatened and endangered plant/animals in relation to the proposed impact to suitable habitat within the boundaries of the alternatives carried forward;
- 3 SEWRPC's validation of the aquatic and upland resource analyses of the existing environment and proposed impacts;
- 3 SEWRPC's assessment of proposed mitigation options;
- 3 A summary of the SEWRPC's functional assessment in the body of the draft EIS to indicate the significance of aquatic and upland resources on site in comparison to other wetland communities within the State of Wisconsin or the region;
- 9 Discussion of potential indirect impacts to upland and aquatic resources based on current land use plans and reasonably-foreseeable development in the study area; and
- 10 Consideration of flexible mitigation options within the expansive Pebble Creek wetland/stream complex based on the high quality of resources proposed to be impacted within the study area.

We recommend the above information be included in the draft EIS to facilitate an expedited review process. As mentioned previously, we are available to review draft sections at any stage of development. If you have questions regarding any of the above items, please do not hesitate

to contact me or Kathleen Kowal of my staff at (312) 353-5206 or via email at kowal.kathleen@epa.gov. For aquatic resources questions, feel free to contact Kerryann Weaver at (312) 353-9483 or via email at weaver.kerryann@epa.gov.

Sincerely,

Kathleen Kowal

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

cc: Charlie Webb
Dan Dupies
Gary Evans
Geoffrey Parish
Rebecca Graser
Marie Pokka
Michael Thompson
Don Reed
Scott Lee
Bethaney Bacher-Gresock
Jay Waldschmidt
Karla Leithoff

Comment Responses
EPA Letter—6/8/12

1. A waiver for no sidewalk south of Sunset Drive will be submitted to WisDOT. Off-road pedestrian accommodations are not required since on-road bicycle accommodations would be provided on the 8-foot paved shoulder.

2. The project team confirmed that this comment referred to the Pebble Creek Watershed Protection Plan. This plan is referenced in several locations in Section 3.

3. SEWRPC's functional analysis of aquatic resources is discussed in Section 3.16. SEWRPC input on potential mitigation measures will be sought after a preferred alternative is selected. SEWRPC's entire functional assessment is provided on the CD at the back of the EIS.

4. Section 3.12.3 discusses stormwater management.

5. See Section 3.12 and Section 3.16.

6. See Exhibit 3-13.

7. Direct impacts are discussed in several areas of Section 3, including Section 3.3, Indirect Effects, Section 3.12 Surface Water and Section 3.16 Wetlands. An impact summary table is provided in the EIS summary. The table provides an overview of those direct impacts that are quantifiable.

8. These exhibits will be provided directly to U.S. EPA. At DNR's request the specific location of threatened and endangered species will not be publically disseminated.

9. See Section 3.3, Indirect Effects.

10. Mitigation measures are discussed in Section 3. A more detailed discussion of potential mitigation measures will be developed after a preferred alternative is selected.

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
Southeast Region Headquarters
2300 N. Dr. Martin Luther King, Jr. Drive
Milwaukee WI 53212-3128

Scott Walker, Governor
Cathy Stepp, Secretary
John Hammen, Acting Regional Director
Telephone 414-263-8500
FAX 414-263-8606
TTY Access via relay - 711

September 15, 2011

File Ref: 1600

Charlie Webb
CH2M HILL
135 South 84th Street
Suite 325
Milwaukee, WI 53214

West Waukesha Bypass, Waukesha County – WDNR Initial Review Comments
WisDOT# 2788-01-00

Dear Mr. Webb:

Thank you for the opportunity to comment on the West Waukesha Bypass, WisDOT# 2788-01-00. I have coordinated with WDNR trail managers, wildlife, fisheries and water resource experts to present our concerns and recommendations for this project. The WDNR is providing additional information about waterways, wetlands, rare species and habitat, recreational trails, storm water treatment and construction recommendations.

Waterways
The proposed alternatives for the West Waukesha Bypass will impact the Pebble Creek corridor, and will cross the Pebble Creek main stream in two to four locations, and potentially impact additional tributaries to Pebble Creek. Pebble Creek is a cold water community north and west of the intersection of CTH TT and the railroad tracks. WDNR stocks brook trout near this intersection on a yearly basis and the trout swim upstream.

Cold-water communities are unique in Southeastern Wisconsin and are valuable resources that must be protected. September 15 through March 30 is the spawning, incubating and rearing period for trout. Therefore, the Department recommends that there be no in stream construction work during this time of year.

It is important to maintain the temperature as well as depth and width of the stream, as temperature, flow and siltation are critical to trout. Trees and stream-side vegetation should not be removed because these plants help to shade the streams in the summer. In addition, branches or "tree-falls" should not be removed from the river because trout depend on these hiding places as they migrate up and downstream. The Department requests that no limestone rip rap be placed in the water.

It our understanding that the structures over Pebble Creek on the north end of the project, north of USH 18 may need to be extended. Continued coordination will be necessary to make sure that the creek receives the least amount of impact possible.

Just south of Madison Street, there is a small waterway that is very close to existing road on the east side and then flows under CTH TT, into Retzer Nature Center. It will be important to avoid impacts to the stream, if possible, or work closely with WDNR if a stream relocation is necessary.

Just south of Madison Street on the west side of CTH TT, there is a high quality ground water seep area that will need to be studied to determine the quality and how to best avoid the area, or maintain it before, during and after construction. SEWRPC will be evaluating this area during their field work.

Pebble Creek is a warm water community downstream of CTH TT near the railroad tracks,. Recent studies have found Longear Sunfish (*Lepomis Megalotis*) a state threatened species, in the lower reaches of Pebble Creek, near the Fox River. WDNR fisheries plan to do a fish survey in Pebble Creek where it intersects CTH TT, Sunset Drive and CTH X in 2011. WDNR will share those results along with our recommendations when they are available.

New structures over Pebble Creek should have five feet or more between the normal water level and the underside of the structure to allow for navigation. Though the area is not used often for navigation at this time, the area has the potential to be a great area for small, non-motorized watercraft.

Wetlands
As discussed at meetings, the Pebble Creek corridor is an area of high quality aquatic, wetland and upland habitat. According to the *Pebble Creek Watershed Protection Plan, SEWRPC Community Assistance Planning Report No. 284,* Pebble Creek and its tributaries are a unique water resource with a unique aesthetic value. Primary environmental corridors in the Pebble Creek watershed "contain almost all of the best remaining woodlands, wetlands, and wildlife habitat areas in the watershed and represent a composite of the best remaining elements of the natural resource base." The report recommends "a combination of good planning, stream restoration, and land management practices are needed to prevent further degradation of the stream and its associated riparian wetlands."

A review of the Wisconsin Wetlands Inventory indicates a number of wetland complexes adjacent to the West Waukesha Bypass project corridor. A determination of the extent (acres) and type of wetland affected, will need to be made for consistency with the DNR-DOT Cooperative Agreement-Compensatory Wetland Mitigation Policy. Please coordinate wetland issues with Karla Leithoff, WisDOT Southeast Region Wetland Ecologist. The DNR would like to work closely with DOT to investigate potential areas for mitigation.

SEWRPC will be completing a wetland delineation in the Pebble Creek corridor south of the railroad tracks in August and September 2011. This will define the boundaries of the wetlands in that area, as well as the quality and presence or absence of threatened, endangered and special concern plant species in the area.

The Department recommends an alignment and design that would require the least amount of wetland fill, as well as the least impacts to waterways for the road and bridges, in order to be consistent with the DNR-DOT Cooperative Agreement to avoid and minimize wetland fill wherever possible.

Indirect and cumulative impacts to the waterways, wetlands and habitats throughout this corridor need to be assessed. It is my understanding that there was a meeting to discuss these potential impacts, however, WDNR would like to review and comment on the impacts discussed and reviewed at that meeting.

Threatened and Endangered Resources & Habitat concerns
Our Natural Heritage Inventory (NHI) data files contain the following rare species occurring within the proposed project boundary:

- *Thamnophis butleri* (Butler's Gartersnake) – Threatened snake
- *Triglochin maritima* (Common Bog Arrow) – Special concern plant
- Mesic Prairie – Natural area of special concern
- *Calylophus serrulatus* (Yellow Evening Primrose) – Special concern plant
- *Cypripedium parviflorum var. makasin* (Northern Yellow Lady's slipper) – Special concern plant
- *Emydoidea blandingii* (Blanding's Turtle) – Threatened turtle
- Southern Dry Forest – Natural Area of special concern
- *Erimyzon sucetta* (Lake Chubsucker) – Special concern fish
- *Alasmidonta marginata* (Elktoe Mussel) – Special concern mussel
- *Alasmidonta viridis* (Slippershell Mussel) – Threatened mussel
- *Aster furcatus* (Forked Aster) – Threatened plant
- *Agrimonia parviflora* (Swamp Agrimony) – Special concern plant
- *Cypripedium candidum* (Small White Lady's slipper) – Threatened plant

Tier 3 habitat for the *Thamnophis Butleri* (Butler's Garter Snake), a state threatened species, in the Pebble Creek corridor, particularly in the areas north and south of Sunset Drive. The snakes are known to be in this area, so an inventory is not necessary at this time.

The Pebble Creek corridor is also good habitat for the *Emydoidea Blandingii* (Blanding's Turtle), and state threatened turtle. The species is known to be in this area, so an inventory is not necessary at this time. As the project progresses, it would be important to complete a survey for the species so that it is known where the best habitat is in order to preserve it, enhance it and perhaps provide some connectivity between habitats where appropriate.

SEWRPC recently identified a population of *Ranunculus cymbalaria* (seaside crowfoot), a state Threatened plant species that is usually found in sandy or muddy soils on the shore of Lake Michigan and Lake Superior, within the project corridor. Impacts to the plant should be avoided and minimized.

Comprehensive endangered resource surveys have not been completed for the project area. As a result, our data files may be incomplete. The lack of additional known occurrences does not preclude the possibility that other endangered resources may be present. I will be coordinating with the WDNR Bureau of Endangered Resources for additional recommendations to avoid and minimize habitat for the above mentioned species.

There may be evidence of swallow nesting underneath bridges. It is violation of the Federal Migratory Bird Treaty Act to destroy nests during the nesting season, (May 15 to August 20). If swallow nests will be destroyed by this project, you will need to coordinate this activity in accordance with existing DOT / U.S. Fish and Wildlife guidelines.

The upland area just south of Sunset and west of Pebble Creek has some very old oak trees. Waukesha County historically contained many oak savannas that provided a unique habitat to many kinds of wildlife. Though this area is somewhat degraded, the ancient oaks provide great habitat for many bird and mammals species. The uplands in this area, the wetlands and the areas in between are vital to the life cycle of many species.

Recreational Trails

CTH TT crosses the Glacial Drumlin Trail at grade, near the railroad and Pebble Creek, north of Sunset Drive. The West Waukesha Bypass alternatives cross the Glacial Drumlin Trail in this area as well. It is our understanding that one of the goals of this project is to provide a highway crossing over the Glacial Drumlin Trail, the railroad and Pebble Creek and the associated wetlands. WDNR supports this separated crossing.

WDNR supports a connection between the Glacial Drumlin Trail and the Lake Country Trail at the north end of the project corridor. Bikes and pedestrians should be accommodated on or near any new highway facility in the area.

If CTH TT is cul-du-sac-ed north and south of the railroad near the Glacial Drumlin Trail, WDNR recommends maintaining bike and pedestrian access to the Glacial Drumlin Trail from the north and the south. Furthermore, the road and bridge north the trail should be maintained as a parking area for trail riders and those wishing to access Pebble Creek for fishing and non-motorized boating.

Stormwater

Impacts on wetlands or surface waters, directly or via engineered storm sewers must be assessed. Please specify if any measures will be taken relative to anticipated changes to stormwater discharge, velocity, or water quality. Stormwater treatment needs and location of stormwater treatment facilities will need to assessed throughout the corridor and WDNR recommends that it be considered as soon as practicable. It will be particularly important to avoid thermal pollution impacts to the cold water streams.

The *Pebble Creek Watershed Protection Plan, SEWRPC Community Assistance Planning Report No. 284* recommends protecting "water resources when adding, improving and upgrading urban infrastructure, such as proposed sewer extensions and the completion of the CTH TT / STH 59 bypass."

Construction

WDNR recommends that all construction activities occur in an environmentally sound manner. This includes the proper disposal of all demolition material that cannot be recycled, maintenance of adequate drainage patterns, and design and implementation of sound erosion control practices during construction.

Excess fill material or spoils should be stockpiled on upland areas an adequate distance away from wetlands, storm sewer inlets, floodplains and waterways. Piles of stock piled soil shall be protected against erosion and shall not create nuisance dust emissions.

An effective erosion control plan needs to be developed and implemented for this project.

Should contamination be encountered within the right-of-way either before or during construction, you must notify the appropriate person in the DNR Solid Waste Section prior to continuing operations. If the project should change from what is currently proposed, or other environmental issues arise, please contact this office for additional review and concurrence.

WDNR looks forward to coordinating with you throughout the planning, design and construction of this project. If you have any questions or concerns, please contact me at maureen.millmann@wisconsin.gov or (414)263-8613.

Sincerely,

Maureen Millmann

Maureen Millmann
WDNR Environmental Analysis & Review Specialist

CC: Doug Cain, WisDOT Project Manager
Gary Evans, Waukesha County Department of Public Works
Michael Thompson, WDNR EA Supervisor
Scott Lee, WisDOT Regional Environmental Coordinator
Karla Leithoff, WisDOT Regional Wetland Ecologist
Kathleen Kowal, USEPA
Rebecca Grasser, US Army Corps of Engineers
Anthony Jernigan, US Army Corps of Engineers
Don Reed, SEWRPC

Appendix C
Agency Correspondence on Draft EIS and Earlier Relevant Documents

Note to reader: The WisDOT/FHWA responses to substantive participating and cooperating agency comments follow the agency letters in this appendix, with the responses numbered to correspond to brackets on the agency letters. All correspondence in this appendix was received after the Draft EIS was approved in October 2012. Rather than shading each piece of correspondence, only this index contains shading identifying the correspondence as new information not included in the Draft EIS.

Federal Agencies

C2, Corps of Engineers, December 6, 2012
C6, U.S. Department of the Interior, December 7, 2012
C10, USEPA, December 10, 2012
C39, USEPA, July 12, 2013
C43, Corps of Engineers, July 18, 2013
C46, Corps of Engineers, May 5, 2014
C50, USEPA, May 7, 2014
C55, Waukesha County Response to USEPA/Corps of Engineers, May 14, 2014
C57, U.S. Fish and Wildlife Service, May 19, 2014

State Agencies

C58, DNR, December 10, 2012
C61, DNR Input Meeting Summary, March 5, 2013
C65, Wisconsin Historical Society, March 12, 2013
C67, DNR, May 1, 2013
C69, DNR, May 24, 2013
C71, DNR, December 3, 2013
C73, Memorandum of Agreement Between the Federal Highway Administration and the Wisconsin State Historic Preservation Officer, December 13, 2013
C83, DNR, June 23, 2014

Local Agencies

C85, School District of Waukesha, November 20, 2012
C87, City of Pewaukee, November 21, 2012
C91, Waukesha County, December 11, 2012
C95, Waukesha County, December 5, 2005
C97, Town of Waukesha, December 13, 2005
C101, City of Waukesha, December 8, 2005
C105, Town of Waukesha, December 5, 2012
C145, City of Waukesha, December 6, 2012
C147, Waukesha County Department of Parks and Land Use, May 20, 2013
C149, City of Waukesha Parks, Recreation, & Forestry, October 25, 2013

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

REPLY TO
ATTENTION OF

Operations
Regulatory (2010-00746-DJP)

DEC 06 2012

Mr. Gary Evans, PE
Waukesha County Department of Public Works
515 Moreland Boulevard
Waukesha, Wisconsin 54303

Dear Mr. Evans:

This letter is in response to your request for comments on the Draft Environmental Impact Statement (DEIS) prepared for the West Waukesha Bypass project. The project is located in Waukesha County, Wisconsin. This document was provided for comment on October 25, 2012. The Corps submits the following comments regarding the content of the DEIS:

We recommend that the alternatives dismissed in Section 2 be depicted in a comparative format to demonstrate why each alternative dropped from consideration does not meet the project's stated "purpose and need." We recommended this in our June 5, 2012 letter as well. We found Table 2-1, which summarizes alternatives south of the Wisconsin & Southern Railroad and the reasons for elimination, to be very helpful. We recommend a similar table summarizing the other build alternatives discussed in Section 2.2.4 be included in the final EIS. In addition, we recommend that the alternatives carried forward be included in a comparative format similar to the table that was provided in the April 19, 2012 meeting; 1

We suggest that the EIS include Exhibit 1 of the Indirect and Cumulative Effects Report to illustrate the area considered for describing the indirect effects of the proposed project. We recommend incorporating an interaction matrix and cause-effect diagrams which would easily identify effects to resources and consequences of the proposed action; 2

Table 5 of the Indirect and Cumulative Effects Report provides a concise summary of the resources and the past, present, future, and cumulative effects of the proposed project and would be a beneficial addition to the EIS. A matrix documenting the degree by which the resources would change over time for each alternative carried forward is highly recommended for inclusion in the final EIS. When applicable, supplemental matrices should be used to illustrate how each alternative carried forward would quantitatively affect a resource (e.g. if 41% of the Pebble Creek watershed was urbanized in 2005 which equates to 9% directly connected imperviousness, and 25% is the threshold beyond which it is difficult to maintain good water quality, a table summarizing the anticipated percent impervious and anticipated percent urbanized per project alternative would be appropriate); 3

Response to Corps of Engineers' Dec 6, 2012 letter

1. Table 2-9 was developed in response to this comment. Not all dismissed alternatives were dropped because they did not meet purpose and need. Some alternatives that meet purpose and need were dropped because their environmental impacts were greater than another alternative that also met purpose and need or because another alternative better met the purpose and need (i.e. safety).

   A series of tables in Section 2.6, Selection of a Preferred Alternative, present the alternatives carried forward in a comparative format similar to the table that was provided at the April 19, 2012 meeting.

2. Exhibit 1 from the Indirect and Cumulative Effects report has been added to the Final EIS. It is now Exhibit 3-3. The effects to resources and consequences of the proposed action are documented in the series of tables in Section 2.6.

3. WisDOT and Waukesha County do not believe that there will be any difference in urbanization of the indirect effects study area between the Build Alternatives based on the indirect and cumulative effects analysis prepared for the study. Therefore the degree to which resources change over time is not expected to vary between the Build Alternatives. The indirect and cumulative effects analysis concluded there would not be discernable differences in the indirect or cumulative effects of the Build Alternatives retained for detailed evaluation (note that run-off and thermal impacts, for example, are considered direct impacts) in large part because they alternatives are so similar to one another.

   However, the study team did quantitatively assess directly connected imperviousness based on this comment and a similar Draft EIS comment from USEPA. Using land use data provided by SEWRPC, the project team developed the 2010 directly connected imperviousness for the Pebble Creek Watershed. The project's preferred alternative was then added to the 2010 baseline to determine the project's potential impact on water quality. The directly connected percentage in the Pebble Creek Watershed with the preferred alternative would be 9 percent as compared to the 8.6 percent in 2005 and 8.7 percent in 2010. By remaining below the 10 percent threshold for connected imperviousness, which at least one study indicates is the level below which the health of the stream will be maintained, it is reasonable to determine that the Waukesha Bypass' preferred alternative would not adversely affect water quality in Pebble Creek to an extent that it would adversely affect the health of the creek or its fishery. Since the imperviousness of the other two alternatives are similar, this finding would apply to them as well.

We request that the final EIS discuss which of the predicted direct, indirect, and cumulative effects are considered significant, and what mitigation measures will be required. We believe that some affected resources warrant additional analysis to determine the degree of potential effects. For example, the effect of runoff from the proposed roadway on fishery resources and mitigation/management to this resource should be further explored and incorporated in the final EIS. In the absence of specific thresholds that would assess resource degradation, the analysis should include a description of whether or not the resource is significantly affected and how that determination was made. Monitoring and adaptive management strategies should also be identified and clearly presented in the final EIS; 4

Lastly, the DEIS did not include the locations of proposed aquatic resource compensatory mitigation sites. We highly recommend that the discussion of potential mitigation plans take place in the near future as the approval of such plans requires additional coordination effort and evaluation. Further, we request that the final EIS incorporate information about proposed aquatic resource compensatory mitigation. 5

Thank you for your continued coordination efforts involving this project. If you have any questions, contact Marie Kopka in our Waukesha office at (262) 717-9539 ext. 4. In any correspondence or inquiries, please refer to the Regulatory number shown above.

Sincerely,

Tamara E. Cameron
Chief, Regulatory Branch

Electronic copy furnished:
Charlie Webb, CH2M Hill;
Bethaney Bacher-Gresock, Federal Highway Administration;
Kathleen Kowal and Kerryann Weaver, U.S. Environmental Protection Agency;
Scott Lee and Karla Leithoff, Wisconsin Department of Transportation;
Mike Thompson, Wisconsin Department of Natural Resources.

4. Under NEPA, according to FHWA's Environmental Review Toolkit, "NEPA significance is primarily a factor in determining the type of environmental document and process to use for a particular project. NEPA requires an EIS for major Federal actions that significantly affect the quality of the human environment. To determine the appropriate class of action and the requisite level of documentation necessary to comply with NEPA, it is essential to understand the term "significance" and the process for its determination." [1] At the start of the project, FHWA, WisDOT and Waukesha County considered the project's potential to create significant impacts before selecting the project's environmental document type. With the environmental constraints identified in the 2008 Pebble Creek Watershed Protection Plan among other plans, the agencies were able to make informed estimates about the project's potential to create significant impacts by evaluating the context and intensity of potential impacts.

   From a context standpoint, the following was known about the study area:

   - SEWRPC designated the Pebble Creek corridor and the Pebble Creek Railroad Prairie as Natural Areas of Local Significance and Pebble Creek Park as critical species habitat
   - There is primary environmental corridor south of Madison Street, including ADID wetlands
   - The Henslow's sparrow, longear sunfish, Blanding's turtle, and Butler's garter snake were known in the study area

   At the start of the study, the intensity of the potential impacts were assessed using the following factors from the Council on Environmental Quality (CEQ) regulations:

   - Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
   - The degree to which the effects on the quality of the human environment are likely to be highly controversial.
   - The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

   The additional environmental information the project team collected during the data gathering phase and the input the project team received from regulatory agencies confirmed the initial conclusion that the project could have significant impacts and the EIS is the appropriate document type.

   Having made the initial decision about the significance of the project's potential impacts and confirmed that decision after the data gathering phase with regulatory agency input, identifying the appropriate mitigation for project impacts is the required next step.

   The comment asked for the Final EIS to document the mitigation measures, which it does. The lead agencies' position is that it is more relevant to compare the impacts of the alternatives against one another than it is to deem the impacts significant or not.

5. The Final EIS includes more specific aquatic resource mitigation plans, including the planned location. See Section 3.16.3.

[1] http://environment.fhwa.dot.gov/projdev/tdmimpacts.asp

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Custom House, Room 244
200 Chestnut Street
Philadelphia, Pennsylvania 19106-2904

IN REPLY REFER TO:

December 7, 2012

9043.1
ER 12/784

Mr. George Poirier
Division Administrator
Federal Highway Administration
525 Junction Road, Suite 8000
Madison, Wisconsin 53717

Dear Mr. Poirier:

The Department of the Interior (Department) has reviewed the Draft Environmental Impact Statement for the West Waukesha Bypass County TT, from I-94 to Wisconsin State Highway (WIS) 59, Waukesha County, Wisconsin. The Department offers the following comments and recommendations for your consideration.

Section 4(f) Evaluation Comments

The document considers effects to several identified properties in the project study area eligible to be considered under Section 4(f) of the Department of Transportation Act of 1966 (codified at 49 U.S.C. 303§ 771.135). The project intends to improve the connection between the WIS 59/County X intersection and I-94 on Waukesha's west side, the last piece of the planned circumferential route around Waukesha. Waukesha County (County), in consultation with the Wisconsin Department of Transportation (WisDOT) and the Federal Highway Administration (FHWA), propose improvements that would fill a gap in the transportation system by providing an efficient north-south roadway on the city's west side.

The Section 4(f) Evaluation, prepared by the County, WisDOT and FHWA, considered eleven park/recreational facilities, including a property currently planned as a park and a State recreational trail, as well as two historic properties, the Ward Brown house and the Sebina-Barney house. The recreational properties are owned either by the City of Waukesha, City of Pewaukee, or by Waukesha County. Of these park/recreational facilities, Pebble Creek Park, Good Times Day Camp, and Merrill Hills Country Club have been considered and rejected as 4(f) eligible properties; the Department would agree. The Waukesha County Pebble Creek Greenway functions essentially as green space; the evaluation dismisses this as an eligible property because it has no designated public access points or parking. The Department would tend to agree that green space like this property may not be eligible as a 4(f) property, but not for the reasons given. The key to whether this greenway qualifies is whether it functions as a recreational property, and whether the owner/manager/administering agency considers this property as providing significant park and/or recreational space. It is likely that Waukesha County does not consider it significant, but it would be helpful to the reader to present this 1

Response to U.S. Department of the Interior December 7, 2012 letter

1. The *Waukesha County Park and Open Space Plan,* which is part of *A Comprehensive Development Plan for Waukesha County* (February 4, 2009) describes the County's vision for the 11 greenways under its ownership, including the Pebble Creek Greenway. Page 96 of the plan states "Greenways are generally located along a stream or river, environmental corridor, ridgeline, or other linear natural feature and are intended to provide aesthetic and natural resource continuity. The vision of the Waukesha County Greenway Project is to create a system of corridors along the County's major rivers and streams, which will protect the high quality natural resource based elements, connect major state, county, and local parkland, as well as other community social and cultural amenities, and provide recreational and educational opportunities for the use and enjoyment by present and future generations." The Plan goes on to note that "The Greenway corridor serves as a River/Streamway buffer to:

   - Protect water quality by filtering and removing sedimentation, organic matter, pesticides and other pollutants from surface runoff and subsurface flow through deposition, absorption, plant uptake, denitrification or other processes.
   - Create, enhance and protect wildlife habitat and provide a corridor for the movement of a wide range of species.
   - Protect and stabilize the riparian land and reduce flood water velocity.
   - Protect high quality plant communities, including upland woods.
   - Provide non-motorized trail opportunities."

   From the text above, it is clear that the primary purpose of greenways are to protect natural resources features and water quality rather than primarily for recreation. Waukesha County Parks and Land Use Department confirmed this position (Appendix C, page C147).

information. The Ward Brown house is eligible for listing in the National Register of Historic Places as an example of modern architecture, having been built in the 1960's. The Sebina Barney house is an outstanding example of Italianate architecture constructed in 1878, and is complimented by its circa-1878, Gothic Revival-inspired carriage house. 1

For the recreational properties, no impacts are identified for the planned Meadowview Park, Heritage Hills Park, the William R. Oliver Youth Sports Complex, or South Park since the build alternatives will not affect them directly. Impacts are identified for Kisdon Hill Park and the Retzer Nature Center, and for the Glacial Drumlin State Trail. The Department would concur with the FHWA and the WisDOT that there appears to be no feasible or prudent alternative to the build alternatives which would not result in impacts to Kisdon Hill Park and the Retzer Nature Center. The Department cannot concur with the measures to minimize harm to the property until the parties finalize mitigation for the effects beyond compensation for the land taken from Kisdon Hill Park. We would expect to see the mitigation detailed in the final evaluation. We also concur with the determination of a *de minimis* finding for the Glacial Drumlin State Trail. 2

For the historic properties, the Department would concur with the FHWA and the WisDOT that there appears to be no feasible or prudent alternative to the build alternatives which would not result in impacts to these properties. However, the consultation process with the State Historic Preservation Offices appears to be ongoing, and has yet to result in any determination of mitigation needed. Therefore, the Department cannot concur with the measures to minimize harm to the property until the parties finalize an agreement and that agreement appears in the final evaluation. 3

The Department has a continuing interest in working with the FHWA and the WisDOT to ensure impacts to resources of concern to the Department are adequately addressed. For issues concerning section 4(f) resources, please contact Regional Environmental Coordinator Nick Chevance, Midwest Regional Office, National Park Service, 601 Riverfront Drive, Omaha, Nebraska 68102, telephone 402-661-1844.

We appreciate the opportunity to provide these comments.

Sincerely,

Lindy Nelson
Regional Environmental Officer

cc:
SHPO-WI (michael.stevens@wisconsinhistory.org)

2. It is not Waukesha County's intention to provide mitigation for the project's impacts to Kisdon Hill Park beyond constructing the bike path that will provide access to the park as well as purchasing the required right-of-way. As evidenced in the letter from the City of Waukesha's Director of Parks, Recreation & Forestry (Appendix B, Page B37), the park administrator indicated the "project will not adversely affect the activities, features and attributes associated with the subject City park properties." In meetings with the study team, the City parks board cited the proposed bike path that will serve the park as the key reason why the city concluded the mitigation is appropriate.

   It should also be noted that because FHWA determined the project effect on the Glacial Drumlin Trail was not considered a use under Section 4(f), no de minimis process was initiated with the DNR. The project would place the Glacial Drumlin Trail in a culvert under the road and provide a multi-use path that will connect the Glacial Drumlin Trail and the Lake Country Trail just north of the project area. The DNR's request to maintain the current County TT bridge over Pebble Creek to provide direct access to the trail (and potentially a small parking area) is also part of the proposed project.

3. Waukesha County has revised the project design to move a proposed cul-de-sac off the Ward Brown house historic boundary. As a result, SHPO has agreed that there will be no adverse effect on the property. See Appendix C, Page C73. The memorandum of agreement for the Sebina Barney house property is in Appendix C, Page C73.

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

DEC 10 2012

REPLY TO THE ATTENTION OF: E-19J

George Poirier
Federal Highway Administration
525 Junction Road, Suite 8000
Madison, Wisconsin 53717

Rebecca Burkel
Wisconsin Department of Technical Services
Wisconsin Department of Transportation
P.O. Box 7965
Madison, Wisconsin 53707-7965

Gary Evans
Waukesha County Department of Public Works
515 West Moreland Blvd.
Waukesha, Wisconsin 53188

Re: Draft Environmental Impact Statement for the West Waukesha Bypass – County TT, I-94 to WIS 59, Waukesha County, Wisconsin - CEQ # 20120343

Dear Messrs. Poirier and Evans and Ms. Burkel:

The U.S. Environmental Protection Agency (EPA) has reviewed the above-mentioned document provided by Federal Highway Administration (FHWA) and Wisconsin Department of Transportation (WisDOT). Our comments in this letter are provided in accordance with our responsibilities under the National Environmental Policy Act (NEPA), Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act.

Waukesha County, in consultation with WisDOT and FHWA, is proposing to improve the safety and efficiency of the arterial connection between the WIS 59/County X intersection as the southern terminus and I-94 as the northern terminus on the west side of Waukesha. The proposed action is the last piece of a long-planned circumferential route around Waukesha. As indicated in the Draft Environmental Impact Statement (EIS), the planned arterial connection improvement would no longer serve as a bypass, as originally designated. Instead, the proposed improvement is designed to fill a gap in the transportation system by providing an efficient north-south arterial on Waukesha's west side, as recommended in regional, county, and city transportation system plans.

As stated in the Draft EIS, the proposed improvements have two objectives: 1) improve safety by providing a roadway that meets current design standards, and 2) accommodate traffic demand generated by existing and planned development within and outside the study corridor.

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In addition to the No Build Alternative, three build alternatives have been retained for evaluation in the Draft EIS. Between the northern terminus of I-94 and the Wisconsin & Southern Railroad located in the southern half of the study area, the 4-lane County TT corridor alternative has been retained. According to the Draft EIS, the County TT corridor has been the focus of planning for the West Waukesha Bypass for decades as indicated in plans by the Southeastern Wisconsin Regional Planning Commission (SEWRPC), Waukesha County, and the City of Waukesha.

Chapter TRANS 75 of the Wisconsin Administrative Code indicates that new highway construction or reconstruction projects funded in whole or in part from state funds or federal funds shall include bikeways and sidewalks. To fulfill this requirement, the Build Alternatives from I-94 to Sunset Drive will include on-road bicycle accommodation and off-road bicycle/pedestrian accommodations. However, under TRANS 75.05, bikeways and sidewalks can be excluded in constrained environments if establishing them would have excessive negative impacts. The study team is in the midst of obtaining a waiver from TRANS 75 requirements for the area at Sunset Drive and south of Sunset Drive due to additional high-quality wetlands that would be affected with a separate multi-use path.

Between the Wisconsin & Southern Railroad and the Wis 59/County X intersection, three 4-lane build alternatives have been retained: the Sunset-to-County X, the Pebble Creek West, and the Pebble Creek Far West alternatives. Three alternatives are proposed for the southern portion of the study area in an attempt to avoid adversely impacting high-quality natural resources.

Sunset-to-County X Alternative – This alternative would cross a farm field on new alignment south of the Wisconsin & Southern Railroad before tying into Sunset Drive near the Pebble Creek crossing. The proposed route would then follow Sunset Drive and County X to the County X/WIS 59 intersection. Wetland impacts associated with this alternative are approximately 6.5 acres.

Pebble Creek West Alternative – Refinements were made to the original alignment as a result of wetland delineations performed by SEWRPC in 2011 in an attempt to minimize impacts to high-quality aquatic resources in the Pebble Creek wetland complex. Wetland impacts associated with this alternative are approximately 8.4 acres.

Pebble Creek Far West Alternative – This alternative shares most of the characteristics of the Pebble Creek West Alternative. Distinguishing differences include a reduction in aquatic resource impacts, but deeper slope cuts could potentially disrupt groundwater flow to the Pebble Creek wetland complex. Wetland impacts associated with this alternative are approximately 5.7 acres.

We would like to take this opportunity to compliment FHWA, WisDOT, and Waukesha County on their continued efforts to revise the alternatives to meet the stated purpose and need while reducing resource impacts. Based on available information, EPA views the Pebble Creek West Alternative as the less damaging of the two Pebble Creek alternatives in terms of wetland impacts. This statement is based on the understanding that the Pebble Creek West Alternative would cause less damage to higher quality wetlands and should not result in significant disruption of ground water flow (through sand lenses) that feed the sedge fen wetlands along

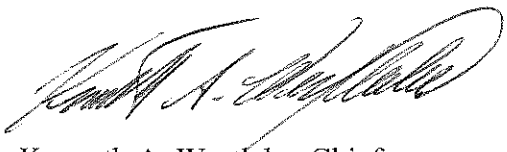
Pebble Creek. It will be important that all practicable steps are taken to avoid wetland impacts along this alternative, and we support efforts to bridge aquatic resources where possible. It is also important to ensure that road construction does not "cut into" sand lenses along the alignment. EPA understands that the Pebble Creek West Alternative on the proposed alignment can be constructed without disturbing the sand lenses. 1

The Pebble Creek Far West Alternative would necessitate cutting into one of the sand lenses during road construction, thus significantly impacting the water source for the sedge fen areas along Pebble Creek. This alternative would have significant adverse impacts on the sedge fen complex along Pebble Creek. 2

Based on our review of the Draft EIS, EPA has rated the Draft EIS as "**Environmental Concerns – Insufficient Information (EC-2)**." This rating is based on a lack of conceptual mitigation, preferably within the same watershed as impacted resources; remaining questions about the alternatives' performance; cumulative effects questions; and state-listed threatened or endangered species concerns. In particular, a conceptual mitigation plan needs to be developed before we can fully assess project impacts and determine whether Pebble Creek will suffer adverse impacts as a result of the proposed project. The Final EIS should disclose all available best management practices that will eliminate surface water runoff from construction and operation of the road from entering the Pebble Creek wetland complex. As more detailed construction plans are developed, FHWA, WisDOT, and Waukesha County will need to ensure that ground water flow to the sedge fens is maintained. Exactly what actions may need to be taken to protect ground water flow will need to be determined once a specific alignment is developed, and should be part of the minimization/mitigation plan. EPA is available to discuss these matters. Lastly, we look to the Final EIS and Record of Decision to commit to incorporating all mitigation measures mentioned in the EIS into project design and construction.

Thank you in advance for your consideration of our comments. EPA's detailed comments are enclosed as well as a summary of the rating system used in the evaluation of the Draft EIS. We are available to discuss the contents of this letter as well as elements of a conceptual mitigation plan. Please send a copy of the Final EIS once it is available. If you have any questions, please contact me at 312-886-2910, Kathy Kowal of my staff at 312-353-5206 or via email at kowal.kathleen@epa.gov or Sue Elston of EPA's Wetlands Section at 312-886-6115 or via email at elston.sue@epa.gov.

Sincerely,



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

Response to USEPA Dec 10, 2012 letter

1. Waukesha County performed additional soil borings in February and March 2013 to gain additional information on the location of groundwater and sand lenses in the area adjacent to Pebble Creek where cuts into the slope would be required. See Section 3.12.6 of the Final EIS for results of this analysis. The full analysis is in Appendix D.
2. Only one area immediately south of Sunset Drive has been identified as a sedge fen by SEWRPC based on their 2011/2012 wetland delineations. Part of this sedge fen would be impacted by the Pebble Creek West Alternative. Section 3.12.6 summarizes new information about groundwater impacts.

EPA's Detailed Comments on the Draft Environmental Impact Statement for the
West Waukesha Bypass – County TT,
I-94 to WIS 59, Waukesha County, Wisconsin
December 10, 2012

Alternatives

Transportation Impacts

The Transportation Impacts Section found in Section 3 of the Draft EIS states, "Under the Pebble Creek West and Far West alternatives there would be a greater amount of traffic on the bypass north of Sunset Drive compared to the No-Build and Sunset-to-County X alternatives." 3

> **Recommendation:** This statement is confusing and should be clarified in the context of project purpose and alternatives analyses that retained the Pebble Creek West and Far West alternatives.

Level of Service for Build Alternatives

The Purpose and Need Section includes Table 1-5, entitled *Existing and Design Year (Year 2035) Segment Level of Service for No-Build Alternatives*. Similar information is not provided in the Alternatives Considered Section for the build alternatives still under consideration. EPA believes this information would be useful to inform decision makers and reviewers of the build alternatives' ability to handle traffic demand at the present time and at the design year. 4

> **Recommendation:** EPA recommends that the Final EIS include a table with information for the highway segments and level of service (LOS) for each of the build alternatives listed in Table 2-3.

Table 1-7, entitled *Existing and Design Year (2035) Weekday PM Peak Hour Level of Service: Traffic Signals & Four-Way Stop Intersections* indicates the intersection at County TT and Madison Street is controlled by a four-way stop and will operate at LOS F in the design year. The Draft EIS indicates that, under existing traffic volumes, all signalized intersections operate at LOS C or better. It seems likely that a replacement of the four-way stop at County TT and Madison Street with a signalized intersection will result in a better LOS. 5

> **Recommendation:** The Final EIS should include a discussion focused on four-way stops in the study corridor and whether replacing them with signalized intersections would improve LOS. If four-way stops will not be replaced with signalized intersections, the rationale behind retaining four-way stops should be included in the Final EIS.

3. Exhibits 3-5 and 3-6 illustrate what this sentence is referring to. Under the No-Build Alternative fewer people will find this route desirable and therefore fewer people will use the narrow two-lane road. Under the Sunset-to-County X Alternative, fewer people will use the roadway because it includes some indirection at the south end compared to the Pebble Creek Alternatives. In the context of the project Purpose and Need, the higher traffic volumes on the bypass under the Pebble Creek Alternatives reflects that these alternatives do a better job of addressing the transportation factors than the No-Build and Sunset-to-County X Alternative. This is reflected in the travel time and safety advantages of the Pebble Creek Alternatives compared to the No-Build and Sunset-to-County X Alternative. This information has been added to the Final EIS, Section 2.6.
4. This information is provided in Table 3-2.
5. There is only one four-way stop in the project area, at County TT/Madison Street. This four-way stop would be replaced with a signal under any of the Build Alternatives. This would improve the level of service at this intersection. Section 2.4.4.1 notes that a signal would be added at the County TT/Madison Street intersection. Table 3-3 documents the expected level of service at this intersection under the No-Build Alternative (level of service F) Pebble Creek Alternative (level of service B) and Sunset-to-County X Alternative (level of service B).

Table 3-2, entitled *Projected 2035 Segment and Intersection Level of Service* indicates the LOS for the Sunset Drive: County TT to County X intersection under the Pebble Creek Alternative is projected to be "D" and the Sunset Drive/County X intersection under the Sunset-to-County X Alternative would be "D." The desirable LOS for signalized intersections is stated as LOS C.

> **Recommendation:** The Final EIS should explain how these LOS designations were derived. Furthermore, if the design year LOS will be below the desirable LOS, what are the advantages of the Pebble Creek Alternatives and the Sunset-to-County X Alternative if traffic demand will not be adequately accommodated? 6

Crash Rates

A road safety audit conducted by WisDOT and Waukesha County concluded that the Sunset-to-County X Alternative would have a higher risk of crashes than the Pebble Creek Alternatives because of the additional intersection turns required. Later in the same paragraph, the Draft EIS states that additional turning movements associated with traveling along the Bypass route *may* increase number of crashes compared to Pebble Creek alternatives. (emphasis added)

> **Recommendation:** "May" is a vague term that does not allow decision makers or the public to understand how safe the Sunset-to-County X intersections will be. Would these intersections have traffic signals and/or dedicated turning lanes? We recommend an estimate of crash rates based on similar road configurations be included in the Final EIS to provide the reviewer with quantitative figures for projected crash rates and a better understanding of potential risk associated with the Sunset-to-County X Alternative. 7

Median Width North of Sunset Drive

Between Rolling Ridge Drive and Northview Road, the 2-lane Meadowbrook Road will be widened to continue the 4-lane divided urban section with a 24-foot-wide raised grass median. Between Northview Road and Summit Avenue, the road will be widened to accommodate 4 lanes and a 30-foot-wide median. 8

> **Recommendation:** The Draft EIS is unclear why median width changes are proposed north of Sunset Drive. The Final EIS should include an explanation for different median widths north of Sunset Drive.

Bicycle/Pedestrian Accommodations

Chapter TRANS 75 of the Wisconsin Administrative Code indicates that new highway construction or reconstruction projects funded in whole or in part from state funds or federal funds shall include bikeways and sidewalks. To fulfill this requirement, the Build Alternatives from I-94 to Sunset Drive will include on-road bicycle accommodation and off-road bicycle/pedestrian accommodations. However, under TRANS 75.05, bikeways and sidewalks can be excluded in constrained environments if establishing them would have excessive negative impacts. The study team is in the midst of obtaining a waiver from TRANS 75 requirements for 9

6. Traffic analysis software based on the Highway Capacity Manual (HCM) is used to calculate the roadway and intersection level of service. Section 1.3.5 provides a thorough explanation of level of service. Sunset Drive from County TT to County X will not be reconstructed as part of the Pebble Creek Alternatives. Improving the level of service on this segment of roadway is not part of the project's purpose and need. The level of service on Sunset Drive between County TT and County X would be E under the No Build Alternative and level of service D under the Pebble Creek West Alternative.

   The Sunset Drive/County X intersection would operate at level of service D under the Sunset-to-County X Alternative. While not desirable, level of service D would meet minimum standards. This intersection would operate at level of service C under the Pebble Creek Alternatives.

7. Estimated crash rates for the Pebble Creek Alternatives and the Sunset-to-County X Alternative have been added to the traffic safety discussion in Section 3.5.2. The estimated crash rate for the Sunset-to-County X Alternative is 146 crashes per 100 million vehicle miles of travel. The estimated crash rate for the Pebble Creek Alternatives is 128 crashes per 100 million vehicle miles of travel. The full Road Safety Audit is on a CD at the back of this document. The primary reason for the difference in crash rates is 1) the Sunset-to-County X Alternative is longer than the Pebble Creek Alternatives, which increases the exposure for crashes and 2) the Sunset-to-County X Alternative routes drivers through an additional intersection (Sunset Drive/County X). Intersections have more crashes than segments between intersections. Under the Sunset-to-County X Alternative signals and turn lanes would be provided at this intersection.

8. The 30-foot median is needed south of Northview Road because it will have a 45 mph posted speed limit. The 35 mph posted speed limit north of Northview Road will allow for a narrower median. Section 2.4.4.1 of the Final EIS has been modified to clarify the reasons for the different median widths.

9. The TRANS 75 exception request was approved by WisDOT.

   Neither Waukesha County's nor the City of Waukesha's recently completed bike plans include a bike path on Merrill Hills Road south of Sunset Drive (http://www.waukeshacounty.gov/defaultwc.aspx?id=40979 and http://www.ci.waukesha.wi.us/web/guest/Parks). Both plans recommend using the proposed Waukesha Bypass as a shared use bicycle facility. Paved shoulders will provide on-road bicycle accommodations.

   Numerous mature trees would need to be removed and extensive grading done to provide a bike path along this narrow hilly segment of Merrill Hills Road south of Sunset Drive (see page 2-36, top photo). However, this low-volume road provides an alternative for bicyclists and pedestrians without a trail. The Fox River Trail currently intersects Sunset Drive just east of County X and provides a north-south trail connection to the Glacial Drumlin State Trail.

the area at Sunset Drive and south of Sunset Drive due to additional high-quality wetlands that would be affected with a separate multi-use path.

> **Recommendation:** EPA anticipates that WisDOT will make a decision regarding the requested waiver for the area at and south of Sunset Drive prior to the release of the Final EIS. A decision on the waiver is relevant to understanding the location and extent of impacts to natural resources and necessary mitigation. EPA recommends retaining as small a footprint as possible in the corridor, particularly south of Sunset Drive. 9
>
> We also recommend the Final EIS look at alternatives for a bicycle/pedestrian path south of Sunset Drive. We recommend consideration of a path running adjacent to the Merrill Hills Country Club golf course.

Affected Environment, Impacts, and Mitigation

Aquatic Resource Mitigation

The Draft EIS indicates that, if a build alternative is implemented, a wetland mitigation plan will be developed during project design, in consultation with state and federal agencies. Additionally, the Draft EIS states that WisDOT and Waukesha County have begun a review of the project corridor to identify potential mitigation sites, and have identified two properties owned by Waukesha County as suitable. The Draft EIS provides a very brief description of one parcel. If on-site or near-site mitigation measures are not available, WisDOT proposes to debit wetland acreage credits from a state-wide wetland mitigation bank in Walworth County, which is not in the same watershed as the West Waukesha Bypass project.

> **Recommendation:** We agree with the concept stated in the Draft EIS that the focus of potential mitigation should be on properties adjacent to larger wetland corridors. However, making mitigation decisions during the project design phase does not allow for public input on potential mitigation nor does it allow for a decision to be made about whether a build alternative should be implemented without knowing the extent of impacts and the potential for proposed mitigation to successfully mitigate impacts. Information pertaining to conceptual mitigation for aquatic resource impacts is vital to understanding whether impacts will be reduced to an acceptable level. 10
>
> Based on the above, we anticipate that discussions regarding conceptual mitigation will take place between the appropriate agencies prior to the release of Final EIS to ensure an appropriate mitigation and monitoring plan (including measures of success such as percentage of living native species/acre, maximum percentage of non-native invasive species (NNIS) allowed per acre, etc.) are proposed in the Final EIS. We suggest consideration of flexible mitigation options that would not only mitigate for impacted acreage and lost functions and values, but also enhance the Pebble Creek riparian buffer and wetland complex; any surplus mitigation credits could possibly be used for other highway projects

10. The conceptual framework of the wetland mitigation has been established. USEPA participated in a February 25, 2013 interagency meeting to discuss wetland mitigation and a May 8, 2013 wetland mitigation site field review. Several details of the mitigation plan will be finalized during the design phase. See Section 3.16.3.

in southeast Wisconsin. At a minimum, we recommend the conceptual mitigation discussion in the Final EIS include the following information: ratios for impacted wetland types, whether mitigation will be in-kind, proposed within the same watershed, etc. 10

Stormwater Runoff

In the Indirect Effects Analysis section, the Draft EIS indicates, "The indirect effects on natural resources is more difficult to assess. An expert panel consisting of various community members expressed concern about runoff from the roadway adversely affecting Pebble Creek's Class II brook and brown trout, as well as a warmwater fishery where longear sunfish (a state-listed threatened species) are documented to exist. … Runoff from the new roadway would contain pollutants that would be carried into adjacent wetlands, and potentially Pebble Creek, if effective mitigation measures are not implemented. If this occurs, it would degrade the wetlands downslope of the roadway and water quality, and associated fisheries and wildlife community within Pebble Creek if the project is built."

Furthermore, the Pebble Creek Watershed Protection Plan (pp. 26-30) notes "directly connected imperviousness" is a major factor in degradation of urban water bodies. The Plan defines directly-connected imperviousness as impervious area that discharges directly to the stormwater drainage system without potential for infiltration.

Lastly, the draft *West Waukesha Bypass Indirect and Cumulative Effects Analysis – Summary of Expert Panel Input* (June 2011) states, "It is important to note that a riparian buffer effectiveness analysis was included within the Pebble Creek Watershed Protection Plan. This analysis indicates that riparian buffers are extremely effective in protecting water quality by reducing contaminant loads as well as terrestrial wildlife and instream aquatic communities. The Pebble Creek watershed plan concluded that the existing and future water quality and associated high quality fishery and wildlife in this river system was largely due to the high quality and extent of the riparian buffer land uses and environmental corridors adjacent to Pebble Creek. Therefore, the protection of these is the key to the protection of this stream system and quality of life of the residents that live within it."

Recommendation: Due to the high quality of aquatic resources in the study area, special attention needs to be paid to stormwater runoff treatment. Stormwater treatment options and their effectiveness at reducing adverse impacts to aquatic resources should be discussed in the Final EIS. We recommend close coordination with the U.S. Army Corps of Engineers, Wisconsin Department of Natural Resources (WDNR), and Southeastern Wisconsin Regional Planning Commission (SEWRPC) to develop suitable best management practices to reduce stormwater runoff impacts. We appreciate the exhibits in Section 3, which illustrate stormwater mitigation features; however, it can be difficult to discern effectiveness without seeing suggested sites in the field. Also, we recommend discussing equipment location with agencies during the design phase and construction phase to avoid impacts as much as possible from the construction of stormwater mitigation features. 11

11. WisDOT and Waukesha County met with DNR on March 5, 2013 to discuss stormwater management. Minutes of this meeting are in Appendix C, Page C61. DNR's input on stormwater BMPs in the Pebble Creek corridor was to avoid using wet ponds, and have numerous small outfalls from the roadway. DNR and WisDOT agreed that 40 percent total suspected solids (TSS) removal will be the minimum for the segment of the project north of Kame Terrace and 60 percent TSS removal for the segment south of Kame Terrace.

The Draft EIS indicates that stormwater treatment techniques, such as bioretention facilities in the form of rain gardens in the median, and use of catch basins with yearly maintenance will also be investigated.

> **Recommendation:** EPA recommends the Final EIS and Record of Decision (ROD) include a commitment to incorporate bioretention facilities to the extent practicable. Filtration of stormwater runoff is particularly important in this study area due to the presence of high-quality aquatic and terrestrial resources. 12

Streams

The Draft EIS indicates that Pebble Creek contains a large amount of in-stream cover, characterized by undercut banks, woody debris, and large boulders. In-stream large woody debris is an important component of stream ecosystems that provides essential food and habitat for aquatic organisms. However, culverts and bridges can create physical and hydrological migratory barriers to fish movement. 13

> **Recommendation:** All stream crossings must be designed to ensure that there is enough capacity to carry bankful flows. Any culverts should be partially buried to maintain stream bed substrate continuity at stream crossings. If box culverts are used, these should be open bottom for the same reason. Natural stream channel design principles should be utilized when placing anything in streams.

Aquatic Health

The Draft EIS indicates the Sunset-to-County X Alternative would affect 3.5 acres of wetland at the Sunset Drive crossing (Wetlands 9 and 11). The Surface Water Impacts section of the Draft EIS notes the potential for increased thermal impact to Pebble Creek from the Sunset-to-County X Alternative, because runoff from the roadway would be close to Pebble Creek. The Draft EIS also states that, because of the Pebble Creek temperature variations from year to year that are driven by air temperature, the potential increase in water temperature from roadway runoff is *unlikely* to adversely affect aquatic organisms. (emphasis added) 14

> **Recommendation:** We request additional detail be provided in the Final EIS regarding the conclusion that potential increase in water temperature from roadway runoff is unlikely to adversely affect aquatic organisms. We suggest coordination with WDNR to confirm this conclusion regarding affect to aquatic organisms. We also request that correspondence with WDNR on this issue be added to the Final EIS as an appendix.

Floodplain

The Draft EIS states the loss of naturally vegetated floodplains may aggravate flood hazards and reduce flood velocities and peaks. The Draft EIS also states that, given the small acreage 15

12. WisDOT and Waukesha County will incorporate bioretention facilities to the extent practicable. See Section 3.12.8.
13. WisDOT and Waukesha will construct box culverts with either an open bottom or with a partially buried bottom that will maintain substrate continuity. The decision on bottomless or partially buried bottom will be made during the design phase based on structural borings and scour analysis.
14. WisDOT and Waukesha County met with DNR on March 5, 2013 to discuss water quality, including thermal impacts to Pebble Creek. DNR staff stated that the distance between the Pebble Creek West Alternative and Pebble Creek itself, combined with effective stormwater BMPs, satisfy DNR that run-off from the new roadway is unlikely to have a thermal impact on aquatic organisms. The minutes from the March 5th meeting are in Appendix C, Page C61.
15. It is beyond the scope of this study to estimate the floodplain impacts of all future projects in the seven-county region covered by SEWRPC's plan as USEPA alludes to, or even in all of Waukesha County. WisDOT and Waukesha County will continue to consider those past present and reasonably foreseeable project in the cumulative effects study area boundary rather than a broader area suggested by USEPA. Section 3.4.2 documents the boundaries of the cumulative effects study area and how the boundary was chosen. At a February 25, 2013 meeting between USEPA, Corps of Engineers, DNR, Waukesha County, WisDOT and FHWA it was agreed the Waukesha County Planning Department and local governments in the Pebble Creek watershed would be asked identify those projects in the Pebble Creek watershed that would affect floodplain that are in the permit stage. No projects that would affect floodplain are in the permit stage in the watershed, based on input from County and local planning staff.

    The project team conducted a preliminary no-rise analysis using the FEMA regulatory effective model for Pebble Creek at the Pebble Creek crossings north of the railroad. A comparison of the water surface elevations for the existing and proposed condition models using FEMA flows showed no rise at the Pebble Creek crossings. Based on that preliminary finding, the statement was made in the Draft EIS that the project's small floodplain impact is not expected to alter the flood hazard. During the design phase, the project team will conduct another modeling effort to determine the preferred alternative's impact on flood elevation. The modeling performed during design will evaluate floodplain impacts at Pebble Creek crossings and other locations where the floodplain will be affected. During the design phase, the no-rise analysis will be performed with the FEMA regulatory effective flow values and the flow values produced through a revised SEWRPC hydrologic model that has been developed for Pebble Creek and Brandy Brook. The output from both models will be the definitive answer as to the impact of the preferred alternative's floodplain impacts on flood hazard.

    To put the Pebble Creek West Alternative's 6-acre floodplain impact in perspective, there are 1,600 acres of floodplain in the 12,000-acre Pebble Creek watershed according to Waukesha County's GIS. See Section 3.4.7.

affected compared to the size of the floodplain, loss of cover type is not expected to alter the flood hazard.

> **Recommendation:** We believe the cumulative impacts analysis would be more complete if the Final EIS contained an estimate of floodplain acreage affected by all reasonably-foreseeable projects. We believe the list of projects to estimate comprehensive floodplain impacts should include those transportation projects listed in the 2035 regional transportation system plan, as well as the WIS 59 widening project west of County X which will cross floodplain in two locations, and the WIS 83 widening project which will affect one larger floodplain area along Scuppernong Creek. Additionally, the rationale for the above statement regarding the small acreage of affected floodplain and unaltered flood hazard needs to be substantiated. Acreages and percentages of affected floodplain compared to the remaining, unaffected floodplain will aid in explaining to reviewers the extent of floodplain impact. 15

Land Use and Indirect Effects

In Section 3.3.7 – Staff Analysis, the Draft EIS states, "Areas already developed, designated as primary environmental corridor (PEC), or in public ownership *likely* would not change *land use* as an indirect result of the project." (emphasis added)

> **Recommendation:** The EIS would be enhanced by an explanation of the above statement. We recommend the discussion focus on: 1) ownership of PECs, 2) how land use of areas designated as PECs or areas held in public ownership might change as an indirect result of the project (i.e., be developed into residences, etc.), and 3) options for permanent protection of resources not already publicly held and protected in perpetuity. 16

Cumulative Effects Analysis

The Water Quality section of the cumulative impacts analysis states that once 25 percent of a watershed develops, it's hard to maintain water quality and biological diversity. Approximately 41 percent of the Pebble Creek watershed was urbanized in 2005 according to the *Pebble Creek Watershed Protection Plan* (Waukesha County 2008).

> **Recommendation:** If 41% of the Pebble Creek watershed has already been urbanized as of 2005 and if this equates to 9% directly-connected imperviousness, with 25% set as the threshold beyond which it is difficult to maintain good water quality, the Final EIS should "connect the dots." Tabular formats are useful to present quantitative effects. For example, directly connected imperviousness and anticipated percent urbanization for each alternative would provide reviewers with a clear explanation of potential effect to the watershed. We recommend this information be included in the Final EIS. 17

16. The response to this comment is divided into four components: 1) ownership of primary environmental corridors, 2a) how areas designated as primary environmental corridor may change as an indirect result of the project, 2b) how areas held in public ownership may change as an indirect result of the project, 3) options for permanent protection of resources not publically held or protected in perpetuity.

    1) According to SEWRPC's 2006 *A Regional Land Use Plan for Southeastern Wisconsin: 2035* (page 81)"…. about 183 square miles, or 40 percent of the primary environmental corridors in the Region, were protected through public interest ownership in 2000—including 93 square miles of publicly owned lands; 19 square miles of privately held lands, consisting of lands owned by conservancy organizations and other privately held lands that were in compatible outdoor recreational use; and 71 square miles of surface water. An additional 146 square miles, or 32 percent of the primary environmental corridors, were effectively protected from inappropriate urban development through joint state-local floodplain and shoreland-wetland zoning. Beyond this, 30 square miles, representing 6 percent of the primary environmental corridors, were substantially protected through State administrative rules governing sanitary sewer extensions within planned sanitary sewer service areas. And finally, an additional 67 square miles, or 14 percent of the primary environmental corridors, were protected through local land use regulations. The latter includes protection through local conservancy zoning and, in the case of Waukesha County, through its review of proposed land divisions. In total, then, about 426 square miles, representing 92 percent of the primary environmental corridors in the Region, were substantially protected from incompatible urban development in 2000. Primary environmental corridor lands that were not protected from urban development encompassed just over 36 square miles, or about 8 percent of the remaining primary environmental corridors in the Region, in 2000."

    2a) According to the 2006 regional land use plan only 4.8 square miles, or about one percent, of the 426 square miles of primary environmental corridor in the region were lost to development between 1990 and 2000 (this was off-set by 5.5 square of miles of new area being designated as primary environmental corridor in the same time period). This indicates that land use controls in place such as floodplain and shoreland zoning are an effective—though not infallible—protection of privately owned primary environmental corridor.

    Most of the primary environmental corridor in the Pebble Creek corridor is either wetland or floodplain or both and therefore protected by floodplain and shoreland-wetland zoning. As noted in the previous paragraph these zoning measures appear to provide effective protection against conversion to urban development given the small (one percent) amount of primary environmental corridor that was lost to development between 1990 and 2000.

    2b) Waukesha County and WisDOT have to reason to believe areas held in public ownership might change land use as a result of the proposed project. The indirect and cumulative effects analysis interviews with city, town and county planning staff and meeting with the expert panel did not indicate a potential for publically owned land to change land use as a result of this project.

    3) Responses 2a and 2b document the relatively effective protection that zoning provides for primary environmental corridor that is either wetland or floodplain.

    According to the *Pebble Creek Watershed Protection Plan* (page 60), under Section 59.692 of the Wisconsin Statutes, within their unincorporated areas, counties in Wisconsin are required to adopt zoning regulations within statutorily defined shoreland areas, which are defined as those lands within 1,000 feet of a navigable lake, pond, or flowage; 300 feet of a navigable stream; or

to the landward side of the floodplain, whichever distance is greater. Minimum standards for county shoreland zoning ordinances are set forth in Chapter NR 115. The Town of Waukesha has its own floodplain zoning ordinance.

Chapter NR 115 requires that counties place all wetlands five acres or larger and within the statutory shoreland zoning jurisdiction area into a wetland conservancy zoning district to ensure their preservation after completion of appropriate wetland inventories by the WDNR. In 1982, the State Legislature extended shoreland-wetland zoning requirements to cities and villages in Wisconsin. Under Sections 62.231 and 61.351, respectively, of the Wisconsin Statutes, cities and villages in Wisconsin are required to place wetlands five acres or larger and located in statutory shorelands into a shoreland wetland conservancy zoning district to ensure their preservation.

Additional measures beyond zoning, such as purchasing development rights or conservation easements on privately held primary environmental corridor, will be considered on a case-by-case basis. Neither Waukesha County or WisDOT can use their eminent domain authority to acquire property rights as a mitigation measure.

17. Using land use data provided by SEWRPC, the project team developed the 2010 directly connected imperviousness for the Pebble Creek Watershed. The project's preferred alternative was then added to the 2010 baseline to determine the project's potential impact on water quality. The directly connected percentage in the Pebble Creek Watershed with the preferred alternative is 9 percent as compared to the 8.6 percent in 2005. By remaining below the 10 percent threshold for connected imperviousness, which at least one study indicates is the level below which the health of the stream will be maintained, it is reasonable to expect that the Waukesha Bypass' preferred alternative would not be expected to adversely affect water quality in Pebble Creek to an extent that it would adversely affect the health of the creek or its fishery.

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The cumulative impacts analysis assumes build-out of those transportation projects included in the SEWRPC 2035 regional transportation system plan, such as new arterials and collectors, improvements to existing arterials and collectors, new interchanges along existing freeways or new arterials, and improvements to existing interchanges.

> **Recommendation:** We believe the cumulative impacts analysis would be more complete if the Final EIS contained an exhibit showing the location of those transportation projects included in the 2035 regional transportation system plan. We recommend resource impact estimates from the transportation projects included in the 2035 plan be included in the cumulative effects analysis for affected resources. For example, wetland type(s) and acreage affected as a result of the widening of WIS 59 along a 5-mile-long corridor should be estimated to include a comprehensive cumulative effects analysis. 18

The Draft EIS indicates that, cumulatively, the proposed project and other foreseeable actions could reduce habitat for the Blanding's turtle and the Butler's gartersnake. Additionally, the Sunset-to-County X Alternative would affect the state-listed seaside crowfoot, which is the only known population of seaside crowfoot in Waukesha County and may be the largest known population in the State. Likewise, the Draft EIS states the WIS 83 widening project will affect threatened and endangered species habitat north of US 18, but the extent of the impact is not known. These statements are too vague to provide decision makers and the public with an understanding of the extent of habitat reduction for these species.

> **Recommendation:** We strongly recommend the Final EIS include more specific information, including an estimate of habitat (acreage) for the three species that could be lost as a result of the proposed project and other foreseeable actions. Converting that estimate to a percentage allows reviewers to easily understand the extent of potential change. We also recommend a discussion focused on suitable sites for transplanting the seaside crowfoot via coordination with the WDNR and SEWRPC be included in the Final EIS. If a suitable site(s) is located, we urge the project proponents to commit to working with the WDNR and/or SEWRPC to transplant the seaside crowfoot. Lastly, a conclusion as to whether remaining habitat for the Blanding's turtle and the Butler's gartersnake will be sufficient to allow for sustainable populations of the state-listed species should be provided via consultation with WDNR and SEWRPC. 19

In EPA's opinion, the following statement was not substantiated by the information found in the Cumulative Effects Analysis: "Implementing mitigation measures would result in a *minimal* cumulative impact on the Blanding's turtle and Butler's gartersnake, and Little Brown Bat." (emphasis added)

> **Recommendation:** Mitigation measures were not discussed in the Cumulative Impacts Analysis section. We reiterate our immediately preceding Recommendation regarding percentages of suitable habitat remaining, suitable habitat that will be lost as a result of foreseeable projects, etc. be added to this section. 20

18. Exhibit 3-4 has been added to the Final EIS and illustrates the Waukesha County transportation projects in SEWRPC's 2035 regional transportation plan. It is beyond the scope of this cumulative impacts analysis to estimate the resource impacts of all the transportation projects included in SEWRPC's regional transportation plan. The purpose of developing a cumulative effects study area boundary is to focus the analysis on a relevant area. However, SEWRPC estimated the impacts of the projects included in its 2035 regional transportation plan (SEWRPC Newsletter 5, April 2007). The estimated wetland impact if all the projects in the 2035 regional transportation plan are implemented would be 157 acres of wetland filled (there are 273,100 acres of wetland in the region). Other resource impacts of implementing all the projects in the 2035 regional transportation plan are:

    - Primary environmental corridor: 237 acres (out of 296,000 acres in the region)
    - Farmland: 686 acres
    - Natural areas: 7.8 acres

    The study team has estimated the potential wetland impacts of the planned 5-mile-long WIS 59 widening to be 13 to 25 acres. This information, by wetland type, has been added to Section 3.4.5.

19. DNR informed Waukesha County and WisDOT that they do not have Blanding's turtle habitat data. While no exact figure for Blanding's turtle habitat loss is available, the species can move considerable distances between terrestrial foraging areas in woodlands and meadows during mid- to late-summer. WisDOT and Waukesha County estimated the extent of Blanding's habitat within 1,500 feet of the Pebble Creek West Alternative to be 495 acres (assuming all primary environmental corridor, wetland, and areas within 100 feet of a stream are Blanding's habitat). Using the same criteria to assess habitat loss, WisDOT and Waukesha County estimate 18 acres of Blanding's habitat, or about 4 percent of the habitat within 1,500 feet of the Pebble Creek Alternative, would be lost. See Section 3.4.8.

    Section 3.19.2 notes the 14.3 acres of Tier 3 Butler's garter snake habitat (including the segment north of the Wisconsin & Southern Railroad). There are 1,230 acres of Tier III habitat in the Pebble Creek watershed according to the DNR SE Region.

    Section 3.19.2 notes the 0.2-acre impact to the seaside crowfoot. The seaside crowfoot only exists at this one location in Waukesha County.

    A discussion of WisDOT's success transplanting the seaside crowfoot on the I-94 North-South project and other projects has been added to Section 3.19.3.

20. At a March 5, 2013 meeting the DNR Bureau of Endangered Resources said the Butler's garter snake and Blanding turtle's pending removal from the DNR's protected species list is evidence that suitable habitat for these species will remain after the project is constructed. DNR considers the impact to the Little Brown bat to be a temporary impact during construction. Notes from this meeting are in Appendix C, Page C61.

Direct Impacts to Resources

As stated in the Environmental Corridor and Natural Area Impacts section, several small acreages (i.e., 0.2 – 1.0 acre) of environmental corridor, isolated natural resource area, prairie/wetlands natural areas, and upland buffer adjacent to wetlands will be impacted by proposed build alternatives. The Draft EIS is not clear whether reducing the width of the proposed median and/or inside or outside shoulders or bicycle/pedestrian walkway would avoid any of these small acreage impacts. Reducing or eliminating small acreage impacts by reducing the size of the median would offer several benefits: reduce edge impacts and further fragmentation of remaining resources, support long-term success of the resources, remove additional stressors to wildlife, and reduce mitigation obligations. Several unique and high-quality plant communities largely devoid of major invasive plant infestations exist throughout the project area. The quality and diversity of species depends on available habitat. To maintain these varied ecosystems, fragmentation should be avoided; construction can increase the population of non-native invasive species via ground disturbance. 21

> **Recommendation:** We request the Final EIS address whether small acreage impacts can be further reduced or eliminated by reducing typical cross-sections. If this is possible, we strongly urge FHWA, WisDOT, and Waukesha County commit to incorporating these actions in the ROD.

Threatened or Endangered Species

The Draft EIS states WisDOT will evaluate the feasibility of reconstructing bridges over Pebble Creek in winter to avoid the little brown bat's May-September roosting period. 22

> **Recommendation:** We request FHWA, WisDOT, and Waukesha County commit to demolishing any bridges during the winter months to avoid the little brown bat's roosting period.

WDNR's Butler's Gartersnake Conservation Strategy (DNR 2005) (Strategy) developed categories for species habitat in southeast Wisconsin based on site size and quality. According to the Strategy, Tier 3 sites could support large populations and are critical to the long-term conservation of the species. Additionally, the Draft EIS indicates that the loss of a population at a Tier 3 site would jeopardize the status of this species. There is a large block of Tier 3 habitat in the study area; presumably, this is the habitat in the western half of Pebble Creek Park north of Sunset Drive, which is stated as providing habitat for state threatened reptile species. 23

The Draft EIS also indicates that, for Tier 3 sites, all suitable habitat must either be maintained or the equivalent of any lost suitable habitat must be restored elsewhere within the habitat patch so there is no net loss. Proposed mitigation includes development of a specific management plan to mitigate for habitat loss for the Blanding's turtle and Butler's gartersnake in consultation with WDNR in a future design phase. This statement is clouded by another statement in the same paragraph (see page 3-139): "*If necessary*, WisDOT and Waukesha County will identify suitable

21. Is it unlikely that these small-acreage impacts will be avoided, but WisDOT and Waukesha County will continue to refine the roadway design to minimize impacts. Potential areas include shifting the roadway alignment south of Madison Street to minimize impacts to the primary environmental corridor on the west side of the road. Another potential area is the location of the bridge over Pebble Creek and the Glacial Drumlin Trail. Lastly, the box culvert that would carry Pebble Creek under the roadway north of Summit Avenue could be daylighted in the median or have median inlets, which have been used on previous projects to accomplish the same objectives.

    This information has been added to Section 3.13.3 of the Final EIS.

22. WisDOT and Waukesha County would demolish the County X bridge over Pebble Creek in winter months per the DNR's Little Brown bat incidental take authorizations. At the March 5, 2013 meeting with DNR, the Bureau of Endangered Resources said this is a construction issue; post-construction the Bureau of Endangered Resources does not see any impact to the Little Brown bat.

    This information has been added to Section 3.19.3 of the Final EIS.

23. The term "if necessary" was used because the Butler's garter snake and Blanding's turtle were moving through the DNR's de-listing process at the time the Draft EIS was approved. As of January 2014 the de-listing of these two species is complete. WisDOT and Waukesha County will not develop a specific management plan to mitigate habitat loss for these two species.

    See Section 3.19.3 of the Final EIS.

habitat to add to the Tier 3 habitat between the Wisconsin & Southern Railroad and WIS 59 to mitigate for the 6.5 – 8.3 acre impact in that area." (emphasis added)

> **Recommendation:** It is difficult to determine whether WisDOT and Waukesha County are planning to provide suitable habitat per the Strategy. Additionally, proposed mitigation, including development of a specific management plan to mitigate for habitat loss for these two species, should be part of the Final EIS. We request the above information be included in the Final EIS following consultation with the WDNR. We also request that correspondence with WDNR on this issue be added to the Final EIS as an appendix. 23

The Draft EIS indicates that ecopassages will be evaluated at all stream crossings and at other strategic locations in wetland and upland areas. Two ecopassages will be evaluated for the Pebble Creek West and Pebble Creek Far West Alternatives between Sunset Drive and WIS 59 to reduce fragmentation of the environmental corridor and maintain habitat connectivity. Further, *during the design phase*, WisDOT and Waukesha County will evaluate the *need* for wildlife barriers on both sides of the new roadway from Sunset Drive to WIS 59 to keep wildlife off the roadway and direct their movement toward ecopassages. For the Sunset Drive-to-County X Alternative, WisDOT and Waukesha County will evaluate two ecopassages on Sunset Drive as well as wildlife barriers on both sides of Sunset Drive from County X to the Wisconsin & Southern Railroad. (emphasis added)

> **Recommendation:** We recommend that FHWA, WisDOT, and Waukesha County coordinate with WDNR to determine location, number, and characteristics of ecopassages and wildlife barriers. We recommend coordination with WDNR, since WDNR is the agency that authored the Strategy and is responsible for implementing conservation strategies for state-listed species. Potential locations of ecopassages and/or wildlife barriers should be included in the Final EIS per coordination with WDNR, rather than determined during the design phase, to inform decision makers and the public regarding potential mitigation measures and the extent of impact. We also request that correspondence with WDNR on this issue be added to the Final EIS as an appendix. Lastly, we urge FHWA, WisDOT, and Waukesha County commit to follow WDNR's recommendations regarding ecopassages and wildlife barriers. 24

Snake and turtle exclusion barriers are designed to minimize movement into work areas and allow removal of animals from works areas to reduce mortality during construction. The Draft EIS indicates that WDNR's Strategy provides detailed specifications for snake exclusion fencing.

> **Recommendation:** We request FHWA, WisDOT, and Waukesha County commit in the ROD to following the detailed specifications for exclusion fencing found in WDNR's Strategy. 25

The potential for adverse impacts to threatened mussel and fish species is expected to be minimal because of the location and type of construction involving waterways. WisDOT and Waukesha 26

24. WisDOT and Waukesha County met with DNR on March 5, 2013 to discuss the need, design, and location of eco-passages (Appendix C, page C61). Three locations were discussed. The County X bridge over Pebble Creek could serve as an eco-passage with some design features to accommodate terrestrial species. The planned land bridge near Hawthorne Hollow Drive would not need any design modifications to serve as an eco-passage. A third location between the land bridge and Sunset Drive was discussed. It would be built specifically as an eco-passage; no bridges are planned in the location. The eco-passages were initially proposed as a mitigation measure for the Butler's garter snake and Blanding's turtle. Now that the Butler's garter snake and Blanding's turtle are de-listed DNR may still recommend that the eco-passages be built but it would not be a requirement (see DNR May 1, 2013 letter in Appendix C, Page C67).
25. Because these species are no longer protected WisDOT and Waukesha County will not erect snake and turtle exclusion barriers.
26. WisDOT and Waukesha County will avoid in-stream construction work between late May and mid-July, per DNR's May 1, 2013 letter (Appendix C, page C67).

County will avoid in-stream work between March 1 and June 15 of any construction year to protect fish spawning. The Draft EIS further states that WisDOT will coordinate with WDNR if it is unable to avoid in-stream work during that period. 26

> **Recommendation:** We request FHWA, WisDOT, and Waukesha County commit in the ROD to avoiding in-stream work between March 1 and June 15 to protect fish spawning.

WisDOT and Waukesha County will conduct field surveys for potential threatened and endangered plant species that could be affected. If a particular plant species is found within the project's area of potential effect, further measures to avoid or minimize impacts will be evaluated. Where avoidance is not possible, WisDOT and Waukesha County will coordinate with WDNR on possible mitigation measures such as transplanting affected plants outside the area of potential effect. 27

> **Recommendation:** We request FHWA, WisDOT, and Waukesha County commit in the ROD to following all such mitigation measures proposed by the WDNR, including transplanting when appropriate.

Non-Native Invasive Species

The Draft EIS indicates that, given the amount of new right-of-way to be acquired from the edges of wetlands north and south of Sunset Drive compared to the size of the wetlands, the project would have minimal impact on floral quality. However, just a "foothold" for some invasives is enough to compromise large portions of certain wetlands, especially if associated with construction site runoff, siltation, and sedimentation. Additionally, upland buffers adjacent to several wetlands (4, 7, and 8) will be disrupted by the Pebble Creek alternatives. A small upland (0.12 acre impact to upland U-18(NW)) that will be affected contains 80 percent dominant native species, indicating high quality habitat with low disturbance. 28

> **Recommendation:** Based on the above information, we strongly recommend FHWA, WisDOT, and Waukesha County draft and commit to implementing a NNIS monitoring/eradication plan, particularly for high quality parcels. We recommend FHWA, WisDOT, and Waukesha County coordinate the drafting of a monitoring/eradication schedule with WDNR and SEWRPC, to capitalize on the experience gained by these two entities. We also request that correspondence with WDNR and SEWRPC on this issue be added to the Final EIS as an appendix.

Voluntary Tree Mitigation

The Draft EIS indicates that the Pebble Creek West and Far West Alternatives would have notable visual changes. From Sunset Drive south to near Hawthorne Hollow, this alternative would be on new alignment through a densely-wooded area west of the Pebble Creek wetlands. The Draft EIS does not contain quantitative information concerning the amount of upland habitat that will be impacted by the proposed alternatives. 29

27. WisDOT and Waukesha County will commit to those mitigation measures that have been agreed to between the DNR, WisDOT and Waukesha County at the time the ROD is approved.
28. WisDOT and Waukesha County will not commit to a non-native invasive species monitoring/eradication plan at this time but are willing to discuss this issue with USEPA, DNR and SEWRPC. WisDOT has not done this in the past, with one exception where DNR developed and implemented an invasive species control plan for a WisDOT project.
29. Table 3-30 provides information on upland habitat loss. The Aerial Photo Exhibit (Exhibit E) at the back of the EIS illustrates the location of the upland areas noted in Table 3-30. The potential wetland mitigation site may have an upland buffer that could be used for tree loss mitigation.

Recommendation: We recommend the Final EIS include quantitative information regarding the amount of upland habitat that could be affected by each alternative and an exhibit which illustrates location of impacted upland habitat. We also urge FHWA, WisDOT, and Waukesha County to voluntarily mitigate for tree loss using native species. A native species list can be coordinated with WDNR and SEWRPC and included as an appendix to the Final EIS. As previously stated, we recommend mitigation in areas that would enhance the riparian buffer of the Pebble Creek Watershed as a priority. 29

Air Quality

According to the Draft EIS, EPA is proposing to determine that the Milwaukee-Racine area, of which Waukesha County is a part, has attained the 2006 $PM_{2.5}$ air quality standard (April, 2012). The Milwaukee-Racine area has been recently re-designated by EPA to attainment status for 8-hour ozone (July, 2012). Nevertheless, the National Institute for Occupational Safety and Health (NIOSH) has determined that diesel exhaust is a potential occupational carcinogen, based on a combination of chemical, genotoxicity, and carcinogenicity data. Acute exposures to diesel exhaust have been linked to health problems such as eye and nose irritation, headaches, nausea, asthma, and other respiratory system issues. Based on this information, EPA recommends the following measures be implemented by FHWA, WisDOT, Waukesha County, and its contractors to further reduce impacts to human health from diesel emissions during construction.

Recommendation: In the Final EIS, please indicate whether any of the following recommended mitigation measures have been included. We urge FHWA, WisDOT, and Waukesha County to commit to implementing as many of the following BMPs as possible. 30

- Use ultra low-sulfur diesel fuel.
- Retrofit engines with an exhaust filtration device to capture diesel particulate matter before it enters the construction site.
- Position the exhaust pipe so that diesel fumes are directed away from the operator and nearby workers, thereby reducing the exposure of personnel to concentrated fumes.
- Use catalytic converters to reduce carbon monoxide, aldehydes, and hydrocarbons in diesel fumes. These devices must be used with low sulfur fuels.
- Attach a hose to the tailpipe of diesel vehicles running indoors and exhaust the fumes outside, where they cannot reenter the workplace. Inspect hoses regularly for defects and damage.
- Use enclosed, climate-controlled cabs pressurized and equipped with high efficiency particulate air (HEPA) filters to reduce the operators' exposure to diesel fumes. Pressurization ensures that air moves from inside to outside. HEPA filters ensure that any incoming air is filtered first.
- Regularly maintain diesel engines, which is essential to keep exhaust emissions low. Follow the manufacturer's recommended maintenance schedule and procedures. Smoke color can signal the need for maintenance. For example, blue/black smoke indicates that an engine requires servicing or tuning.

30. See Section 3.27.3 Construction Impacts, subsection on Air Quality and Dust.

- Reduce exposure through work practices and training, such as turning off engines when vehicles are stopped for more than a few minutes, training diesel-equipment operators to perform routine inspection, and maintaining filtration devices.
- Purchase new vehicles that are equipped with the most advanced emission control systems available.
- With older vehicles, use electric starting aids such as block heaters to warm the engine to reduce diesel emissions.
- Use respirators, which are only an interim measure to control exposure to diesel emissions. In most cases, an N95 respirator is adequate. Workers must be trained and fit-tested before they wear respirators. Depending on work being conducted, and if oil is present, concentrations of particulates present will determine the efficiency and type of mask and respirator. Personnel familiar with the selection, care, and use of respirators must perform the fit testing. Respirators must bear a NIOSH approval number.

Webb, Charlie/MKE

From: Kowal, Kathleen [kowal.kathleen@epa.gov]
Sent: Friday, July 12, 2013 8:52 AM
To: GEvans@waukeshacounty.gov; Douglas.Cain@dot.wi.gov; mark.chandler@dot.gov; Jay.Waldschmidt@dot.wi.gov; Scott.Lee@dot.wi.gov
Cc: Rebecca.M.Graser@usace.army.mil; Marie.H.Kopka@usace.army.mil; Dupies, Dan/MKE; Webb, Charlie/MKE; MichaelC.Thompson@Wisconsin.gov; DREED@SEWRPC.org; karla.leithoff@dot.wi.gov
Subject: USEPA Comments concerning June 2013 draft sections of the WWB FEIS

Greetings,

This email is being sent is response to the June 20, 2013 email from Charlie Webb forwarding draft language for two sections of the Final EIS - Selection of a Preferred Alternative and Wetlands – Only Practicable Alternative Finding. The preferred alternative, as stated in the draft FEIS language, is the Pebble Creek West Alternative.

We appreciate the opportunity to review draft language explaining the agencies' rationale for selecting a preferred alternative and draft language analyzing impacts to aquatic resources. After reviewing the draft sections, EPA has the following comments.

<u>Alternatives</u>
Pg. 3-122, lines 41 & 42 – EPA requests the statement regarding PCW being preferable to the PCFW alternative be stricken from the draft.

<u>Wetlands</u>

1. Pg. 2-42, Wetland Impacts Summary (chart) – This chart indicates that 0.01 acre of Sedge Fen would be impacted with the PCFW alternative and 0.32 acre would be impacted with the PCW alternative. Sedge Fens are a unique wetland type, and impacts to Sedge Fens are difficult to successfully mitigate. The draft language (pg. 3-121) states "Effectively mitigating impacts to fens is not feasible because the combination of groundwater seeps and wetland hydrology is difficult to create." This begs several questions:
   1) According to sequencing outlined in CWA Section 404(b)(1) guidance, avoidance of aquatic impacts must be demonstrated followed by minimization. However, the draft language does not address the issues of avoidance or minimization of impacts to the Sedge Fen. The draft language needs to clearly address efforts to avoid and minimize impacts.
   2) Pg. 3-121 indicates that CWA guidelines provide ratios for wetland replacement versus wetland loss, depending on whether the mitigation is to be provided. The draft language also indicates that replacement ratios increase with the mitigation site's distance from the affected wetland with typical onsite mitigation at a 1.5:1 ratio, with 2:1 for ADID wetlands. However, this language fails to consider that a Sedge Fen is a unique wetland resource that is difficult to successfully mitigate. What ratio is being considered to mitigate for impacts to the Sedge Fen? What type of mitigation is proposed for direct impacts to the Sedge Fen? Will there be efforts to mitigate/manage indirect impacts to groundwater and hydrology? EPA acknowledges that inter-agency discussions are taking place to develop viable mitigation options, but mitigation for fen impacts has not been addressed during discussions at the mitigation site visits. Mitigation to replace lost functions and values of the Sedge Fen must be done at a ratio greater than 1.5:1 or 2:1. We also recommend consideration of preservation or enhancement of an existing fen, and recommend looking to the Pebble Creek Complex for possibilities to mitigate in kind for the direct and indirect impacts to the Sedge Fen.

2. Pg. 2-41 – approximately 1.41 acre impact to W-4 is noted for the PCW alternative and 1.45 acre impact for the PCFW alternative. On pg. 2-46, the draft language indicates that a several-hundred foot land bridge would avoid impacts to root zone groundwater, which supports W-4. Please explain how use of a land bridge will avoid impacts to the ground water that is providing hydrology to W-4.

3. Initial projections for roadway elevations appear to have changed. If this is correct, updated direct and indirect wetland impacts for the three alternatives should be included in the draft language.

Groundwater

Overall, presentation of information concerning groundwater flow and impacts to groundwater from the three alternatives is unclear. We have included comments to specific areas of the draft language.

1. Pg. 2-45, lines 7 & 8 – The groundwater information provided in the draft sections does not support the conclusion that the Pebble Creek Alternatives are not expected to encounter groundwater. Additionally, lines 31-33 on page 2-46 state "… additional groundwater data will be obtained during the design phase *to determine whether drains will be will effective in carrying groundwater* to the east side of the road and the portion of the wetland fen not filled by the PCW alternative." (emphasis added) The information contained in the Final EIS needs to clearly demonstrate that groundwater feeding the Pebble Creek wetland complex will not be impacted by either the PCW or the PCFW alternative. Also, as stated above, the Sedge Fen that will be impacted by the PCW alternative is of special concern; potential groundwater impacts to the Sedge Fen (e.g., changes to hydrology) need to be explicitly stated. The information contained in the draft document does not clearly explain these concepts. This information is important to the selection of a preferred alternative resulting in the lowest amount of impacts that can be successfully mitigated.

2. Initial projections concerning groundwater appear to differ from data collected by GRAEF. EPA recommends the groundwater analysis (e.g., groundwater monitoring well data and initial road elevations) be revised to clearly indicate potential impacts from each of the three alternatives. To that end, we recommend creation of a diagram showing:
   1) wetlands,
   2) monitoring wells,
   3) groundwater flow levels investigated by GRAEF,
   4) the proposed PCW footprint and depth of road cuts or fills, and
   5) the proposed PCFW footprint and depth of road cuts or fills.

   We also recommend creation of a groundwater profile to illustrate depth and direction of groundwater flows to the east. The diagram and the profile will aid the reviewer in understanding the location of resources and the location of potential impacts. Similar to the exhibit shown on page 2-45 for PCW, exhibits for PCFW and Sunset-to-County X alternatives should be included to inform the reader of the full extent of impacts and to understand why the preferred alternative was ultimately selected.

Miscellaneous

Pg. 3-125, lines 3-5 – The draft language indicates that measures to minimize impact to wetlands include a land bridge over W-4 and use of a 14-foot median rather than a 30-foot median south of Sunset Drive. Previous discussions revised plans south of Sunset Drive eliminating a planned bicycle route. Please clarify on pg. 3-125, and elsewhere as appropriate, that the bike route has been eliminated to further minimize impact to wetlands.

Pg. 3-125, Wetland Finding – The language that a determination has been made that there is no practicable alternative to the proposed construction in wetlands and that the preferred alternative includes all practicable measures to minimize harm to wetlands should be deleted. USACE and EPA will make the determination of compliance with Section 404(b)(1) of the CWA. Additionally, final mitigation requirements, including ratios, will be determined in the 404 permitting process.

In summary, we are asking for updated direct and indirect impacts to wetlands, particularly from groundwater flow impacts that could result from the current roadway footprint. Table formats are recommended to summarize the impacts of each alternative and the criteria used to eliminate alternatives. Without understanding the extent of impacts

to groundwater and hydrology of remaining wetlands, we cannot concur with the preferred alternative. We are available to discuss these comments at your convenience. Thank you again for the opportunity to review draft language concerning the alternatives and potential impacts to aquatic resources.

Kathy and Sue

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

REPLY TO
ATTENTION OF

JUL 18 2013

Operations
Regulatory (2010-00746-DJP)

Mr. Gary Evans, PE
Waukesha County Department of Public Works
515 Moreland Boulevard
Waukesha, Wisconsin 54303

Dear Mr. Evans:

This letter is in response to the April 24, 2013 and June 20, 2013 e-mail communication from Charlie Webb, CH2M Hill, which identified the selection of the preferred alternative (i.e. the Pebble Creek West Alternative) for the West Waukesha Bypass project. We have reviewed the draft language of Section 2.7 "Selection of a Preferred Alternative" and Section 3.16.4 "Wetlands-Only Practicable Alternative Finding" of the Final EIS that was provided and offer the following comments:

We concur with the lead agency finding that the TT-2 alternative proposed for the northern segment represents the least environmentally damaging practicable alternative (LEDPA). Based on the level of service and road safety audit discussion outlined in draft Section 2.7.2.1, we concur that that the Sunset-to-County X Alternative should be dismissed. However, we are unable to concur that the Pebble Creek West (PCW) alternative represents the LEDPA.

Based on the Wetland Impacts Summary table on Page 2-42, the Pebble Creek Far West (PCFW) alternative appears to have fewer impacts to aquatic resource than the PCW alternative. The PCW alternative would impact approximately 3 additional acres of wetlands than the PCFW alternative. In addition, the PCW alternative is anticipated to impact an additional acre of high functioning/ADID wetlands than the PCFW alternative. The 404(b)(1) guidelines of the Clean Water Act allow our agency to consider permitting an alternative that would have a greater impact to the aquatic ecosystem when the alternative with lesser aquatic resource impact has other significantly adverse environmental consequences. It is not clear that the PCFW alternative would result in significantly adverse environmental consequences as compared to the PCW alternative.

In the discussion of environmental impacts, it appears that the elimination of the PCFW alternative is related to an increased potential for groundwater interception and impacts to an additional four acres of upland hardwood forest when compared to the PCW alternative. The ground water flow discussion does not adequately describe the location(s) of the increased potential for groundwater interception, nor does the narrative quantify the extent of indirect wetland impacts which would occur because of the effects to groundwater. Also, the Environmental Factors Summary table on Page 2-47 depicts the same groundwater flow impacts for both PCW and PCFW alternatives. The groundwater discussion must be more robust for us

to support dismissal of the PCFW alternative.

To facilitate our continued evaluation of this NEPA concurrence point, we request that the following items be addressed:

1. On Page 2-46, lines 17-20, the narratives states that the cut area for PCFW near well 4 would leave one foot of earth above groundwater elevation. However, it is not explained if this cut is anticipated to intercept groundwater. It would be useful to clarify this and also describe if the road in this location could be modified slightly (as the design was modified for the PCW alternative near well 5) to decrease the cut proposed and thus the anticipated impacts to groundwater.

2. The direct and indirect impacts to Wetland 8 (sedge fen) are unclear for the PCW and PCFW alternatives. According to Exhibit 2-21 "Pebble Creek Alternatives" of the draft EIS, the slope intercept required for PCFW is outside the Wetland 8 boundary, suggesting direct and indirect wetland impact avoidance. In contrast, Section 2.7.2.3 indicates that PCFW would intercept the perched groundwater seep feeding Wetland 8 but does not provide any information to support this determination. It appears that PCW has a much greater capacity to intercept the hydrology feeding Wetland 8 than the PCFW alternative. It is our understanding that the roadway elevations and cuts for the PCW and PCFW alternatives have changed or may be modified. We request updated exhibits/diagrams and narrative for both Pebble Creek alternatives that clarify the effects to groundwater and quantify the direct and indirect effects to wetlands.

Lastly, we appreciate the information that was provided in Section 3.16.4; however, it is our agency's responsibility to evaluate compliance with the 404(b)(1) guidelines for the proposed project. We recommend that the text in this section be revised to reflect the Federal Highway Administration's responsibility to comply with E.O. 11990 only.

Thank you for your continued coordination efforts involving this project. If you have any questions and/or would like to schedule a meeting to discuss these comments, please contact Marie Kopka in our Waukesha office at (651) 290-5733. In any correspondence or inquiries, please refer to the Regulatory number shown above.

Sincerely,

Tamara E. Cameron
Chief, Regulatory Branch

Electronic copy furnished:
Charlie Webb, Dan Dupies, CH2M Hill
Mark Chandler, Federal Highway Administration
Kathleen Kowal and Sue Elston, U.S. Environmental Protection Agency
Doug Cain, Karla Leithoff, Scott Lee, Wisconsin Department of Transportation
Mike Thompson, Wisconsin Department of Natural Resources

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

REPLY TO
ATTENTION OF
Operations
Regulatory (2010-00746-DJP)

MAY 05 2014

Mr. Gary Evans, PE
Waukesha County Department of Public Works
515 Moreland Boulevard
Waukesha, Wisconsin 54303

Dear Mr. Evans:

This is in response to your April 3, 2014 letter regarding selection of the Pebble Creek West (PCW) corridor as a preferred alternative in the Environmental Impact Statement (EIS) being prepared for the West Waukesha Bypass project.

We concur with the lead agency finding that the PCW alternative proposed for the southern segment represents the least environmentally damaging practicable alternative. The 404(b)(1) guidelines of the Clean Water Act allow our agency to consider permitting an alternative that would have a greater impact to the aquatic ecosystem when the alternative with lesser aquatic resource impact has other significantly adverse environmental consequences.

The information you provided clearly demonstrates that the Pebble Creek Far West alternative, while anticipated to result in a lesser wetland impact than PCW, would also include upland interior forest habitat loss. This loss has been adequately characterized as a significantly adverse environmental consequence. 1

We highly recommend that the additional discussion of the preferred alternative in your letter be clearly incorporated in the final EIS. We also believe that the legal protection of the remaining upland forest resources and preservation of an existing fen in the watershed are critical elements to a compensatory mitigation plan for the PCW alternative and should be included in the final document.

Thank you for your continued coordination efforts involving this project. If you have any questions, please contact Marie Kopka in our Waukesha office at (651) 290-5733. In any correspondence or inquiries, please refer to the Regulatory number shown above.

Sincerely,

Tamara E. Cameron
Chief, Regulatory Branch

Response to Corps of Engineers May 5, 2014 letter

1. Please see Waukesha County response to Corps of Engineers letter, Appendix C, page C55.

E-mail copy furnished:
Mark Chandler and Ian Chidister, Federal Highway Administration
Elizabeth Poole and Sue Elston, U.S. Environmental Protection Agency
Doug Cain, Karla Leithoff, Scott Lee, Wisconsin Department of Transportation
Mike Thompson, Wisconsin Department of Natural Resources
Charlie Webb, Dan Dupies, CH2M Hill

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

MAY 07 2014

REPLY TO THE ATTENTION OF:

E-19J

Ian Chidister
Federal Highway Administration - Wisconsin
535 Junction Road, Suite 8000
Madison, Wisconsin 53717

Dear Mr. Chidister:

The U.S. Environmental Protection Agency has reviewed the letter and supporting documentation dated April 3, 2014 from Gary Evans of Waukesha County regarding the selection of Pebble Creek West as the preferred alternative for part of the West Waukesha Bypass Corridor Study. The Federal Highway Administration (FHWA) and the Wisconsin Department of Transportation (WisDOT) support the selection of Pebble Creek West, and the Wisconsin Department of Natural Resources (WDNR) has provided its concurrence.

EPA appreciates the additional information provided and agrees that this information is adequate enough to make a determination on the least environmentally damaging practicable alternative (LEDPA), which is part of the Clean Water Act – Section 404 permitting process. EPA expects the information dated April 3, 2014 to be, at minimum, memorialized in the Final Environmental Impact Statement (EIS). However, in addition to several clarifications, we continue to have concerns about the identification of and commitment to mitigation measures. Therefore, we concur with Pebble Creek West as the preferred alternative for this segment, under the condition that the mitigation measures discussed below are incorporated into the project and committed to in the Record of Decision (ROD). 1

EPA recommends the following mitigation measures be incorporated into the overall mitigation package. These measures should be included in the Final EIS. Our concurrence is contingent upon the assurance that these mitigation measures will be included as a part of the project. A commitment to undertake these measures needs to be included in the ROD.

- Permanent, legal protection of the remaining wooded upland; EPA does not view property owner participation in the state forest management program as sufficient permanent, legal protection.
- Tree mitigation for any loss of trees in the upland area at a 1:1 ratio.

Response to USEPA May 7, 2014 letter

1. Please see Waukesha County response to Corps of Engineers letter, Appendix C, page C55.

- Preservation of a fen, offsite but within the Upper Fox River watershed to mitigate for impacts to Wetland-8. We recommend WisDOT and FHWA mitigate for the entire acreage of the fen, regardless of actual acreage of direct impacts, to account for indirect impacts. 1

EPA also recommends the following clarifications are made to the memo in the Final EIS:

- The discussion under *Wetlands* on page 2 includes a matrix of "functions" and "significance" for Wetland-8, the sedge fen immediately south of Sunset Drive. The current discussion concludes that the fen is of overall medium/low quality. However, fens don't exhibit three of the eight functions listed, including flood/stormwater attenuation, water quality protection, and shoreline protection. Wetland-8 is rated low in two of these functions and medium in the other. EPA recommends that the discussion in the Final EIS reflect that fens do not provide these functions and the functional significance of this fen should be revised accordingly. 2
- The discussion under *Impacts* and number 5 under *Conclusion* on page 7 states that an area of 0.5 acres of interior forest habitat will continue to provide forest interior habitat. This statement should be documented. The enclosed memorandum from the Southeastern Wisconsin Regional Planning Commission (SEWRPC) cites this information as coming from personal communication with Michael Mossman (Bureau of Science Services, WDNR, November 2013). EPA recommends the Final EIS include any scientific research or literature to verify this information. Alternatively, if none exists, the Final EIS should so indicate. 3

Finally, please note that EPA retains the right to provide addition comments on design specifics during the Clean Water Act – Section 404 permitting stage.

Sincerely,

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

cc: Marie Kopka, U.S. Army Corps of Engineers
Mark Chandler, Federal Highway Administration - Wisconsin
Douglas Cain, Wisconsin Department of Transportation
Michael C. Thompson, Wisconsin Department of Natural Resources
Gary Evans, Waukesha County
Charlie Webb, CH2M Hill
Don Reed, Southeastern Wisconsin Regional Planning Commission

2. WisDOT and Waukesha County do not disagree with USEPA's statement. However, the memo their letter refers to (in Appendix D) and the Final EIS reflect SEWRPC's wetland functional assessment. SEWRPC had the opportunity to rate those functions as "NA" as it did with some other wetlands in Table 3-26. Waukesha County and WisDOT will not modify SEWRPC's assessment.

3. The Final EIS Section 3.18.2 notes that there is no scientific research or literature to confirm or refute this statement. Rather, the statement is based on the input of Wisconsin-based ornithologists.

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Daniel P. Vrakas
County Executive

Allison Bussler
Director of Public Works

Waukesha
COUNTY
DEPARTMENT OF PUBLIC WORKS

May 14, 2014

Ms. Tamara Cameron
Chief, Regulatory Branch
St. Paul District, Corps of Engineers
Assurance
180 Fifth Street, Suite 700
Region 5
St. Paul, MN 55101-1678

Mr. Kenneth Westlake
Chief, NEPA Implementation Section
Office of Enforcement and Compliance

U.S. Environmental Protection Agency,

77 West Jackson Boulevard
Chicago, IL 60604-3590

Subject: West Waukesha Bypass Study, Waukesha County, Wisconsin

Dear Ms. Cameron and Mr. Westlake:

Waukesha County, the Wisconsin Department of Transportation and the Federal Highway Administration received and reviewed the May 5, 2014 letter from the Corps of Engineers and the May 7, 2014 letter from the U.S. Environmental Protection Agency regarding your agencies' concurrence with the lead agencies preferred alternative for this project. Thank you for the time and effort your agencies have committed to this project and working through the concurrence on the preferred alternative.

Both of your letters recommend the following mitigation measures be included in the project:

- Permanent legal protection of the remaining upland woodland
- Preservation of an existing fen offsite but in the Upper Fox River watershed
- U.S. EPA also asked that loss of trees in the upland area be mitigated at a 1:1 ratio

Waukesha County and WisDOT are investigating all three of these mitigation recommendations.

Waukesha County has met with the owner of the upland area. His intention is to donate this land, with appropriate deed restrictions, to the Waukesha County Land Conservancy. We believe this action will satisfy the intent of the requested mitigation. Waukesha County will continue to coordinate with the land owner in an effort to provide your agencies with the appropriate documentation that this transfer will occur.

Waukesha County has begun to work with SEWRPC and the Wisconsin DNR to identify fens in the Upper Fox River watershed that currently have no legal protection. We intend to locate and protect a fen offsite to meet this mitigation requirement, as part of the compensatory wetland mitigation plan for the project.

Waukesha County and WisDOT are also investigating tree mitigation and are consulting with the Wisconsin DNR Forestry Specialists on the appropriate form of tree plantings for this mitigation. We are also assessing the location of suitable open space and the ownership of these areas that could be used for tree mitigation which provides a direct benefit to the upland interior forest habitat resource.

515 W. Moreland Blvd., Rm. 220
Waukesha, Wisconsin 53188
Phone: (262) 548-7740
Fax: (262) 896-8097
www.waukeshacounty.gov

Waukesha County, WisDOT and FHWA intend to implement the mitigation measures your agencies have requested, and are investigating ways to achieve these goals. The three agencies will use the powers available to them in the effort to implement these mitigation measures. However, we believe it is important you understand that If property owners are unwilling sellers, neither Waukesha County, WisDOT or FHWA have powers of eminent domain to acquire a parcel that will be used for mitigation.

The Final EIS and Record of Decision will document the general plan for implementing the mitigation measures.

Again, thank you for your involvement in the project.

Sincerely,

Allison Bussler

Allison Bussler
Director of Public Works

Cc: Mark Chandler, *FHWA -Madison*
Ian Chidister, *FHWA - Madison*
Dan Scudder, *WisDOT - Madison*
Jay Waldschmidt, *WisDOT - Madison*
Don Berghammer, *WisDOT, Waukesha*
Scott Lee, *WisDOT – Waukesha*
Karla Leithoff, *WisDOT - Waukesha*
Ben Eruchalu, *WisDOT – Waukesha*
Doug Cain, *WisDOT – Waukesha*
Charlie Webb, *CH2M Hill – Milwaukee*
Dan Dupies, *CH2M Hill – Milwaukee*
Gary Evans, *Waukesha County*
Karen Braun, *Waukesha County*

From: Peter Fasbender [mailto:peter_fasbender@fws.gov]
Sent: Monday, May 19, 2014 2:12 PM
To: Dupies, Dan/MKE
Subject: RE: West Waukesha Bypass maps we discussed this morning

Dan –

Based on the 6 bypass maps of the project, and the description below, the US Fish and Wildlife Service is not aware of any Poweshiek skipperling occurrences within the area. Therefore, the project as described will have no effect on that species. If the project expands or changes, you should contact us to evaluate project related impacts to listed species. Thank you -

Peter J. Fasbender
U.S. Fish and Wildlife Service
Minnesota-Wisconsin Ecological Services Field Office
2661 Scott Tower Drive
New Franken, Wisconsin 54229
920/866-1725

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
2300 N. Dr. Martin Luther King, Jr. Drive
Milwaukee WI 53212-3128

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

December 10, 2012

Mr. Gary Evans
Waukesha County Department of Public Works
15 W Moreland Boulevard
Waukesha WI 53188

Dear Mr. Evans:

Thank you for the opportunity to comment on the West Waukesha Bypass Study's Draft Environmental Impact Statement (EIS). The Study is evaluating alternatives to provide a north-south arterial highway between I-94 and STH 59 on the west side of Waukesha. The EIS describes the project's purpose and need, alternatives considered, and potential impacts. The Pebble Creek West, Pebble Creek Far West, and Sunset-to-CTH X four-lane build alternatives between the railroad and STH 59 have been retained for further consideration.

The Department suggests the EIS:

- Briefly describe how the West Waukesha Bypass affects reasonably foreseeable future improvements to Sunset Drive and the potential cumulative wetland, floodplain, and storm water impacts the two transportation projects may have on the Pebble Creek area. 1

- Describe how pedestrians and bicyclists between Sunset Drive and STH 59 can access the Glacial Drumlin Trail. 2

These descriptions should not affect the Study's schedule. Please contact me if I can help in any way. I would be glad to meet or speak with you.

Sincerely,

Michael C. Thompson
Environmental Analysis Team Supervisor
(414) 303-3408
MichaelC.Thompson@Wisconsin.gov

Cc: Marie Kopka, USACE
Kathleen Kowal, USEPA
Doug Cain, DOT
Jim D'Antuono, DNR
Paul Sandgren, DNR

Response to DNR December 10, 2012 letter

1. The West Waukesha Bypass would not affect reasonably foreseeable improvements to Sunset Drive and therefore the cumulative impact discussion does not discuss wetland, floodplain, and storm water impacts the two transportation projects may have on the Pebble Creek area. Waukesha County's adopted 2013 budget identifies the capital projects for the five-year period 2013 through 2017. Capital projects are defined as "an active or proposed non-recurrent expenditure in one or more specified years of an amount usually in excess of $100,000…" Under the transportation category, there is no Sunset Drive project. Whether a Sunset Drive project is proposed for the next five-year cycle (2018-2022) has not been determined by the County. Because it is unknown, improvements to Sunset Drive are not considered reasonably foreseeable. SEWRPC's 2035 regional transportation plan recommends that Sunset Drive remain a 2-lane roadway west of County X.
2. It is easier for bicyclists between WIS 59 and Sunset Drive to access the Glacial Drumlin Trail than for pedestrians. Bicyclists would be able to use the 8-foot-wide paved outside shoulder on the proposed Waukesha Bypass between WIS 59 and Sunset Drive. At Sunset Drive, bicyclists and pedestrians would be able to access the multi-use path which will connect to the Glacial Drumlin State Trail and east entrance to the box culvert under the proposed roadway. While pedestrians would be able to use the 8-foot-wide shoulder, it is less likely that pedestrians would be comfortable using the shoulder. Another option for bicyclists and pedestrians would be to use Merrill Hills Road from WIS 59 to the Glacial Drumlin State Trail. Also, the Fox River Trail intersects Sunset Drive just east of County X and connects to the Glacial Drumlin State Trail.

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West Waukesha Bypass

DNR Input on Water Quality, Eco-passages, and T&E Species

ATTENDEES:
Zach Pilichowski/WisDOT
Bryan Hartsook/DNR
Hans Hallanger/WisDOT
Craig Webster/DNR SE Region
Scott Lee/WisDOT
Mike Thompson/DNR SE Region
Dan Dupies/CH2M HILL
Charlie Webb/CH2M HILL
Doug Cain/WisDOT
Ben Heussner/DNR SE Region
Maureen McBroom/DNR SE Region
Karla Leithoff/WisDOT (by phone)
Julie Lindholm/DNR BER (by phone)
Lisie Kitchel/DNR BER (by phone)
Tim Lizotte/DNR SE Region

COPY TO: Gary Evans/Waukesha County

PREPARED BY: Charlie Webb/CH2M HILL

DATE: March 5, 2013

The purpose of the meeting was to solicit input from DNR staff on Pebble Creek water quality, thermal impacts, threatened and endangered species habitat and eco-passage considerations that US EPA had commented on in the December 10, 2012 comments on the Draft EIS.

The meeting was broken into three parts. Most of the attendees were present for all three parts, unless noted.

Water Quality

Charlie Webb gave an overview of the project including the Pebble Creek West alternative which has been identified by Waukesha County and WisDOT as their preferred alternative.

The group then discussed likely total suspended solids (TSS) removal goals for the project. Mike Thompson asked if state statute TRANS 401 would require 40 percent TSS removal as a minimum. Zach Pilichowski said that 80 percent may be the requirement on the off-alignment potions of the project, and possibly the whole project. The segments of "new" construction (off-alignment segments) would have to meet the 2-year/24-hour peak flow.

Zach said there is a FDM requirement for 40 percent TSS reduction when converting a rural cross-section to urban in on-alignment areas. He also noted there is a swale exclusion for transportation projects, meaning its assumed swales will provide 80 percent TSS removal. [1]

Scott Lee asked if the TSS removal requirement will be an average over the length of the project like the I-94 North-South corridor in Milwaukee, Racine and Kenosha Counties. Scott recalled that there were some areas on that project where it was possible to get more TSS removal and other areas where right-of-way constraints limited the ability to get much TSS reduction. Therefore DNR and WisDOT agreed that the TSS removal would be assessed at the overall project level, in other words an average of TSS removal at different locations. Mike Thompson said the TSS removal requirements can be determined during the design phase. He suggested that WisDOT plan on at

[1] After the meeting Zach clarified in a March 26, 2013 e-mail that WisDOT's position is that the minimum TSS removal should be 40 percent averaged over the length of the project with a commitment to get as much TSS removal as possible. He noted is may be possible to get 60 percent TSS removal. At an April 2 discussion between Doug Cain, Gary Evans and Mike Thompson it was agreed the goal will be 40 percent TSS removal north of Kame Terrace and 60 percent TSS removal south of Kame Terrace. DNR will work with the project team on reasonable measures to achieve higher TSS removal during the design process.

least 40 percent TSS removal for the on alignment segment and that DNR may request 80 percent TSS removal on the off-alignment segment, particularly south of the railroad.

Hans Hallanger said that in 2004-2005 he designed the stormwater system for Rolling Ridge Subdivision (south of Northview Road) which had a goal of avoiding wet ponds. In the end, the plan used small wet ponds that discharged into dry ponds. Hans noted the plan for the subdivision was developed before Waukesha County developed a requirement for infiltration.

Bryan Hartsook said DNR will want to see how the project team divides the study area into sub-drainage areas and whether any of those drainage areas directly outfalls to Pebble Creek. Having lots of small outfalls draining lots of small sub-basins would reduce the potential for thermal impacts to Pebble Creek. Given the several hundred foot setback between the roadway and Pebble Creek (under the Pebble Creek West Alternative), Bryan does not see a "slug of hot pavement run-off" making its way into Pebble Creek. WisDOT should strive to get run-off into the ground as soon as possible. Bryan's preference would be to not use wet ponds.

Dan Dupies asked if DNR gathers Pebble Creek water quality data on a regular basis since the *Pebble Creek Watershed Protection Plan* was completed. Mike Thompson said DNR would check.

The discussion then turned to water quantity. Zach said typically WisDOT is required to meet 2-year/24-hour peak flows for new construction and there is no water quantity requirement for reconstruction. DNR SE Region policy is to try and meet peak flow. Bryan said that as of Jan 1 2011, the NR 151 general condition has gone from the 2-year storm standard to the 1-year storm. But on transportation projects it is still the 2-year storm. The group thought 1-year or 2-year storm doesn't change peak flow much.

Zach mentioned flat-bottomed ditches with ditch checks as a common water quantity BMP on highway projects. He noted they can sometimes have increases beyond the 2-year event. DNR sometimes allows them anyway if there is no risk of residential flooding. Lisie Kitchel cautioned that on the Mukwonago project a high ground-water table precluded infiltration in ponds, perched ditches and wider ditches. She cautioned the project team to check conditions to prevent this issue from occurring on this project.

Dan Dupies asked if DNR is aware of fish problems in Pebble Creek from thermal increases. Ben Heussner said DNR has not seen a decline in species diversity or richness but more pollution-tolerant species have been recorded.

Maureen McBroom said that wet ponds discharging to a sand or rock infiltration area can be an effective BMP.

Bryan said that if the project does not maintain the relatively cool groundwater flow to Pebble Creek then it doesn't really matter how the pavement run-off is treated. Bryan reiterated the need for dividing up the run-off into many small basins with many discharge points; maintain historic flow as much as possible, infiltrate where possible and overflow into a wet pond. Bryan said that Maureen McBroom is the stormwater person for this part of Waukesha County.

Ben looked up fish data during the meeting and said data for '09, '10, '11 and '12 indicate good species diversity. Ben said that highlights the need to protect groundwater flow to Pebble Creek.

Ecopassages

[Karla Leithoff, Lisie Kitchel and Julie Lindholm joined the meeting by phone. Tim Lazotte joined the meeting. Maureen McBroom and Bryan Hartsook left the meeting.]

Charlie Webb gave an overview of the project including the recommended locations for eco-passages developed by Gary Casper: at the County X bridge over Pebble Creek, at the location of the land bridge south of Sunset Drive, and between the land bridge and Sunset Drive in the vicinity of the old field. In two of the locations bridges are already planned, so the study team sees the bridges also acting as an eco-passage; therefore only one true eco-passage is proposed.

Craig Webster said that the County X bridge over Pebble Creek would need to be longer to accommodate an eco-passage. Zach said that the eco-passage would need to be on a ledge above the stream level, and that the surface

of the eco-passage is important. WisDOT should avoid using riprap to amour the embankments if we want the ecopassage to be functional. Julie Lindholm and Lisie said that a pebble or gravel surface is appropriate. Mike Thompson said DNR likes the County X bridge location, and encouraged the project team to make it wildlife friendly.

Lisie Kitchel said a median opening would be beneficial to allow daylight in the eco-passage.

Charlie Webb said the proposed land bridge south of Sunset Drive would likely be less than 10 feet above the wetland, about 80 feet wide and 250 to 400 feet long. Julie said that 2 feet or more off the ground is enough clearance for Butler's garter snakes and Blandings turtles. Craig Webster said we should think about the habitat under the land bridge to increase the chances that it will attract wildlife. Lisie Kitchel noted that we are trying to keep snakes and turtles off the road so the land bridge is a real plus. The group discussed bridge inspection difficulties when the structure is only a couple feet off the ground.

In response to a question from Mike Thompson, Doug Cain said a fence will not be placed along the roadway right-of-way. Mike followed up by asking if human access to the eco-passages needs to be precluded. Tim Lazotte said that since the both sides of the old field eco-passage (site 3) will be adjacent to private land, he does not see a need to preclude human access.

Lisie said that if the wetland east of the eco-passage and the uplands west of it are not Butler's or Blandings habitat then she does not see a need for an eco-passage in that location. Lisie will assess whether it is good habitat or not and report back to the project team. She said the study team should still consider installing fencing along the road in locations where there is good turtle habitat on both sides of the road. Mike Thompson asked whether WisDOT would consider buying the old field south of Sunset Drive as turtle mitigation. Doug Cain said he could not comment on that possibility yet.

Lisie does not see the need for additional eco-passages south of the railroad beyond those discussed.

Mike Thompson asked if there is a need for eco-passages north of the railroad. Zach suggested that the three box culverts planned north of the railroad be designed as aquatic organism passages (AOP). FHWA HEC guidance describes AOP.

Endangered Resources

[Dan Dupies, Zach Pilichowski, Scott Lee and Hans Hallanger left the meeting]

Mike Thompson asked what happens if the Butler's garter snake and Blandings turtle are de-listed. Lisie Kitchel outlined the remaining steps in the de-listing process. A public comment period, legislative committee sign-off and governor's sign-off have been completed. Public hearings will be held this week or next and then the issue goes back to the legislature. No opposition to the de-listed has arisen, and Lisie expects the de-listing process to be completed this fall. After de-listing occurs both species will become species of special concern. No 'incidental take' permit will be required for either species but DNR will recommend the bridge/eco-passage design features talked about earlier in the meeting. DNR will ask that eco-passages allow for the Butler's and Blandings and other species and exclusion fencing (including turnarounds at the ends) but it will be a recommendation, not a requirement.

Charlie asked for input on US EPA's question about whether enough habitat for the Butler's garter snake and Blandings turtle will remain. Charlie added that he and Dan Dupies viewed the de-listing process for both species as strong evidence that enough of their habitat will remain. Lisie said she concurred with that position; the de-listing process tells us all we need to know about these two species' sustainability. Lisie added that there are talking points on the DNR website about why it is appropriate to de-list the two species. WDNR agreed the Pebble Creek watershed boundary seemed appropriate for comparison of habitat loss acreage.

Karla said she would like to acquire part of the Christoph parcel to serve as a buffer adjacent to Pebble Creek. Lisie noted that acquiring the property would also protect wetland on the property.

Other T&E species were discussed:

Mussels: DNR will check under the County X bridge for mussels this summer. Lisie stressed the need for really clean erosion control.

Little Brown bat: the bat occasionally uses the County X bridge over Pebble Creek. Winter bridge demolition would be best. Lisie said it's a construction issue; post-reconstruction she did not see any issues with the bat.

Seaside crowfoot: Karla noted the success WisDOT has had transplanting the plant on the I-94 North-South project. Lisie concurred with Karla's assessment. Charlie confirmed that the Pebble Creek West Alternative would not affect the seaside crowfoot.

In response to Lisie's question, Charlie outlined the reasons WisDOT and Waukesha County prefer the Pebble Creek West Alternative. Lisie said her biggest concern related to the Pebble Creek West Alternative is potential groundwater impact in the area south of Sunset Drive.

WISCONSIN
HISTORICAL
SOCIETY

March 12, 2013

Mr. Jason Kennedy
Wisconsin Department of Transportation
Environmental Services Section
4802 Sheboygan Ave., Room 451
Madison, WI 53707

RE: WisDOT ID 2788-01-00 / WHS# 11-0526 / WK
West Waukesha Bypass, Waukesha
Waukesha County

Dear Mr. Kennedy:

We have reviewed the Documentation for Determination of No Adverse Effect and have identified the potential for adverse effect. This project proposes to realign CTH X and expand it to four lanes in front of the National Register-listed **Barney House**. It will also result in closing CTH TT just beyond the driveway of the National Register-eligible **Ward Brown Farmstead**, ending it in a cul-de-sac that will cut into the historic boundary by 16 feet. This project has the potential to adversely affect both properties.

The Barney House historically was a farmhouse located along a rural two-lane road. Development and road expansions around the property have steadily chipped away at its historic setting, leaving only the listed acreage and the rural route that passes in front of it as remnants of its historic setting. Expanding CTH X to four lanes will dramatically alter what remains of the rural historic character of this property.

The road in front of the Ward Brown Farmstead will remain two lanes, but will terminate in a cul-de-sac constructed immediately south of the entrance bollards, cutting into the historic boundary by 16 feet. Are there any alternatives in the cul-de-sac location or size that might minimize its impact on the entrance to the farm?

I look forward to continuing to work with you on avoiding, minimizing, or mitigating the effects on these properties. Please contact me if you have any questions or concerns, 608-264-6493 or kimberly.cook@wisconsinhistory.org.

Thank you,

Kimberly Zunker Cook
Wisconsin Historical Society
Division of Historic Preservation – Public History

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State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Scott Walker, Governor
Cathy Stepp, Secretary

101 S. Webster St.
Box 7921
Madison, Wisconsin 53707-7921
Telephone 608-266-2621
FAX 608-267-3579
TTY 608-267-6897

May 1, 2013

Charlie Webb
CH2M Hill
135 South 84th Street, Suite 325
Milwaukee, Wisconsin 53214

SUBJECT: Response to EPA concerns regarding T&E species in Draft West Waukesha Bypass EIS

The following information addresses comments provided by the US EPA on the Draft EIS for the West Waukesha Bypass clarifying endangered resources issues.

The five threatened or endangered species addressed in the comments were the Seaside Crowfoot (*Ranunculus cymbalaria*), Blanding's turtle (*Emydoidea blandingii*), Butler's gartersnake (*Thamnophis butleri*), Longear sunfish (*Lepomis megaliths*), and Little Brown Bat (*Myotis lucifugas*).

The need to address potential impacts to state threatened or endangered species in the EIS is complicated by that fact that two of the species (Blanding's turtle and Butler's gartersnake) are proposed for delisting in Fall 2013 and presumably will no longer be listed by the time of construction of this project. The following comments take into consideration their conservation regardless of their status, since should either or both species still be listed at the time of construction, an Incidental Take Authorization would be issued for the project to proceed with the same requirements as listed below

Cumulative impacts and loss of habitat for both Blanding's and Butler's are valid issues, however, if impacts to wetlands are minimized and future development in the watershed is evaluated those impacts can be minimized and possibly mitigated. Adequately designed stream crossings and ecopassages can provide mitigation by allowing connectivity at all waterway and wetland crossings in the project corridor, and barriers (permanent fencing) can be placed if deemed appropriate. Wetland mitigation onsite would be most beneficial in replacing wetlands and habitat as well as providing riparian protection for Pebble Creek.

Concern was expressed if remaining habitat was sufficient to allow for sustainability of the populations of Blanding's turtle and Butler's gartersnake. As a result of their status review it has become apparent that both species are more abundant and widespread than previously determined. The Blanding's turtle may still be slightly declining in Wisconsin, but its large population numbers and wide distribution do not appear to indicate it is at risk of extinction in the state. Previously we had limited data on this species, and as more information has become available we have found it to be more widespread, therefore impacts within the West Waukesha Bypass, although resulting in loss of wetland habitat, are not considered a significant of habitat for eh species statewide, especially if wetland impacts are minimized and aquatic organism passage and ecopassages are constructed.

Whether the conservation requirements of the Butler's Gartersnake Conservation Strategy would be met by the project as proposed are linked to the proposed delisting. A study to determine the extent of hybridization of Butler's was undertaken after they Conservation Strategy was published in 2005. The results of the genetic and distribution studies indicated the species was more abundant, had a wider range and had less hybridization than had been previously understood and therefore supported delisting. A revised Conservation Strategy would likely have been developed if the species was not proposed for

delisting, as such the conservation requirements of the existing Strategy would no longer be applicable with delisting. Therefore, the impacts from the West Waukesha Bypass on Butler's gartersnake, although resulting in loss of habitat, are not considered a significant habitat loss statewide, if wetlands impacts are minimized and ecopassages are constructed.

Although design details still need to be worked out, the WDNR supports the two land bridges as ecopassages, with the third ecopassage still under consideration. All stream and wetland crossings should meet aquatic organism passage requirements.

Impacts to the Little Brown Bat can be avoided by winter demolition of the bridge they are presently using for summer roosting. During construction they will find other roosting habitat and may use the new bridge once construction is complete.

The time of year restriction in the Draft EIS for instream work to avoid fish spawning only covers the period required for sport fish, and does not extend to cover the period for spawning of the Longear sunfish, which is late May through mid-July (and sporadically to August). It is not known whether Longear sunfish spawn in Pebble Creek or if there is suitable spawning habitat for this species in the project area. This information should be determined this summer, if not already available.

Impacts to the Seaside crowfoot should be avoided if possible and minimized to the maximum extent possible. If there are still impacts to this species which cannot be avoided, the WDNR can authorize an Incidental Take Authorization for the relocation of the species to suitable habitat. A Relocation and Monitoring Plan would be required with the authorization. WDNR and WDOT have had good success in transplanting this species in the past.

Of great concern in the project area is quality and quantity of water in Pebble Creek, including disruption of the hydrology to Pebble Creek and surrounding wetlands. Infiltration of stormwater should be designed whenever possible. No direct stormwater outfalls (including bridge drains) to the creek would also protect water quality both with regard to contaminants and temperature. If existing stormwater outfalls drain to Pebble Creek area this would be the opportunity to improve them. Erosion prevention will be the key to protecting Pebble Creek during construction, especially on steep slopes.

This letter does not address all of the endangered resource concerns yet to be worked out for the project, but the information provided should address the comments provided by the US EPA regarding threatened or endangered species in the Draft EIS for the West Waukesha Bypass.

Please contact me at 608-266-5248 or by email at Lisie.Kitchel@wisconsin.gov if you have any questions.

Sincerely,

Lisie Kitchel

Endangered Resources Program
Wisconsin Department of Natural Resources

cc: Mike Thompson – WDNR/Milwaukee
Dan Dupies/CH2MHill
Gary Evans – Waukesha County
Karla Leithoff – WDOT
Douglas Cain – WDOT
Scott Lee - WDOT

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
2300 N. Dr. Martin Luther King, Jr. Drive
Milwaukee WI 53212-3128

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

May 24, 2013

Mr. Gary Evans
Waukesha County Department of Public Works
15 W Moreland Boulevard
Waukesha WI 53188

Dear Mr. Evans:

Thank you for the opportunity to comment on the West Waukesha Bypass Pebble Creek West preferred alternative. After considering a range of Build/No Build alternatives, Pebble Creek West, with four-lane capacity expansion, was selected as the best long term solution to provide a north-south roadway between Interstate 94 and STH 59 on the west side of the City of Waukesha. The roadway will address safety concerns, tight curves, steep hills, narrow lanes, lack of shoulders, deteriorating pavement, and future traffic demand.

The Department contributed information for the alternatives considered and the analysis to avoid and minimize adverse impacts and concurs with the Pebble Creek West preferred alternative. Design refinements will further reduce impacts, mitigate wetland loss, manage stormwater quality, temperature, and volume, and protect valuable resources in the Pebble Creek watershed.

I look forward to reviewing the Final Environmental Impact Statement and further environmental coordination.

Sincerely,

Michael C. Thompson
Environmental Analysis Team Supervisor
(414) 303-3408
MichaelC.Thompson@Wisconsin.gov

Cc: Marie Kopka, USACE
Kathleen Kowal, USEPA
Doug Cain, DOT
Ms. Lloyd Eagan, DNR
Sharon Gayan, DNR
Jim D'Antuono, DNR
Sue Beyler, DNR
Paul Sandgren, DNR
Lisie Kitchel, DNR
Tim Lizotte, DNR

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State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
101 S. Webster Street
Box 7921
Madison WI 53707-7921

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

December 3, 2013

Mr. Gary Evans
Waukesha County Department of Public Works
15 W Moreland Boulevard
Waukesha WI 53188

Dear Mr. Evans:

The Wisconsin Department of Natural Resources (Department) has reviewed and concurs with the findings of the *September 9, 2013, Interagency Memorandum, Waukesha Bypass: Upland Woods Located in the New Modified Pebble Creek West and Pebble Creek Far West Alternative Rights-of-Way,* and *November 12, 2013, Preliminary Draft - Impacts to Forest Interior Breeding Bird Habitat Documents* (attached) prepared by the Southeastern Wisconsin Regional Planning Commission (SEWRPC). The documents describe an upland woods plant community with 1.29 acres of interior nesting bird habitat - that portion of the essentially closed forest canopy 300 feet inward from the forest edge.

Forest interior habitat suitability has three components: the patch size of the forest, the percent of forest in a larger landscape, and the connectivity between patches. The 1.29-acre interior nesting bird habitat is part of a larger 42-acre upland woods and wildlife habitat area with a large number of trees that produce nuts useful for feeding wildlife located in a primary environmental corridor. The interior habitat is especially valuable because of its proximity to Pebble Creek and sustains Red-Headed Woodpecker *Melanerpes erythrocephalis*, a State of Wisconsin Special Concern species, and Pileated Woodpecker *Dryocopus pileatus*, a spring/fall migrant species within the Waukesha urbanized area. Small forest interior fragments – even as small as 0.5 acre - provide important foraging habitat and refugia for migrating forest interior birds. Such habitat fragments become particularly important in regions where interior habitat is limited.

When making a decision regarding a regulated wetland impact, the Department considers:

- All practicable measures to avoid and minimize wetland impacts.
- The direct, cumulative, and secondary impacts of the proposed project to wetland functional values.
- The impact on functional values resulting from the mitigation that is required.
- The net positive or negative environmental impact of the proposed project and that the proposed project represents the least environmentally damaging practicable alternative.
- The proposed project will not result in significant adverse impacts to water quality, or in other significant adverse environmental consequences.

The Department, after consultation with water resources, forestry, and wildlife habitat specialists, determined that the Pebble Creek West Alternative has the least adverse environmental impact because of the significant wildlife and nesting habitat of the upland woods compared to the limited functional value of the farmed wetland north of Sunset Drive (7 of 8 functional values are rated “low” or “N/A” according to SEWRPC 2012 rapid assessment methodology) and considering that wetland No. 8 (sedge fen) has low or medium functional value for 7 of the 8 functional values (only groundwater has a high functional value) (SEWRPC 2012 rapid assessment methodology) and considering that the Pebble Creek West Alternative minimizes upland habitat fragmentation and would leave approximately 0.5-acre of forest interior—the minimum amount to provide foraging habitat and refugia—whereas

the Pebble Creek Modified West and Far West Alternatives would eliminate virtually all foraging habitat and refugia.

Alternative	Total area of wetland lost between Railroad to STH 59	Losses to the 1.1-acre Wetland No. 8 sedge fen	Class I and II Wildlife Habitat Area lost	Upland Woods area lost	Impacts to 1.29-acre Forest Interior Nesting Bird Habitat
West	9.11 acres (4 acre farmed wetland with low functional value)	0.24 acre	7.7 acres	7.3 acres	0.1 acre direct impact, about 1.2 acres remain. Of that 0.7 acre has reduced nesting value.
Modified	8.99 acres (estimate 3.5 acre farmed wetland with low functional value)	0.05 acre	estimate 8.5 acres	estimate 7.9 acres	All nesting habitat effectively eliminated
Far West	6.50 acres (estimate 1.9 acre farmed wetland with low functional value	0.02 acre	10.2 acres	9.8 acres	All nesting habitat effectively eliminated.

Thank you for the opportunity to provide information about minimizing Waukesha Bypass adverse environmental impacts. The Department encourages the Study Team to continue to look for refinements - including urban cross section design - that further reduce impacts, mitigate wetland loss, provide adequate real estate to construct stormwater management facilities to control runoff quality, temperature, and volume, provide buffers, and protect valuable habitat and resources in the Pebble Creek watershed.

The Department looks forward to reviewing the Final Environmental Impact Statement and further environmental coordination.

Sincerely,

Michael C. Thompson
Environmental Analysis Team Supervisor
(414) 303-3408
MichaelC.Thompson@Wisconsin.gov

email cc:

Marie Kopka, USACE
Kathleen Kowal, USEPA
Bethaney Bacher-Gresock, FHWA
Don Reed, SEWRPC
Doug Cain, DOT
Scott Lee, DOT
Jim D'Antuono, DNR
Sue Beyler, DNR
Paul Sandgren, DNR
Lisie Kitchel, DNR
Tim Lizotte, DNR
Mike Sieger, DNR

Attachment 1: *September 9, 2013, Interagency Memorandum, Waukesha Bypass: Upland Woods Located in the New Modified Pebble Creek West and Pebble Creek Far West Alternative Rights-of-Way*
Attachment 2: *November 12, 2013, Preliminary Draft - Impacts to Forest Interior Breeding Bird Habitat Document*
Attachment 3: Rapid Assessment for Wetland Functional Values - Plant Community Areas No. 8 and 12
Link to Wetland Delineation Report:
http://www.waukeshabypass.org/docs/SEWRPC_Rapid_Assessment_of_Wetland_Functional_Values.pdf

MEMORANDUM OF AGREEMENT

BETWEEN THE FEDERAL HIGHWAY ADMINISTRATION AND

THE WISCONSIN STATE HISTORIC PRESERVATION OFFICER

Prepared

Pursuant to 36 CFR § 800.6(c)

Regarding

WISCONSIN DOT I.D. 2788-01-00

WHS # 11-0526/WK

WAUKESHA WEST BYPASS

WAUKESHA COUNTY

WHEREAS, the Federal Highway Administration (FHWA) has been requested to participate in a project to construct the Waukesha West Bypass, in the cities of Waukesha and Pewaukee and in the Town of Waukesha; and

WHEREAS, the FHWA is the lead agency on this project with responsibility for completing the requirements of Section 106; and

WHEREAS, the FHWA has established the Waukesha West Bypass project's area of potential effects, as defined at 36 CFR § 800.16(d), to include those structures immediately adjacent to the existing and proposed project roadways; and

WHEREAS, the FHWA pursuant to 36 CFR 800.4(c) has determined that the project will have an adverse effect on the setting of the National Register-listed Sabina Barney House at W262 S3641 Saylesville Road; and

WHEREAS, the FHWA pursuant to 36 CFR 800.4(c) has determined that the project will have no adverse effect on the Ward Brown Farmstead located at W272 S2137 Merrill Hills Road; and

WHEREAS, the FHWA has consulted with the Wisconsin State Historic Preservation Officer (SHPO) in accordance with Section 106 of the National Historic Preservation Act, 15 USC § 470 (NHPA), and its implementing regulations (36 CFR Part 800) to resolve any adverse effect of the Waukesha West Bypass project on historic properties; and

WHEREAS, the FHWA intends to use the provisions of this Memorandum of Agreement (MOA) to address applicable requirements of Section 110(b) of NHPA, 16 USC 470h-2(b); and

WHEREAS, WisDOT participated in the consultation and has been invited to concur in this MOA; and

WHEREAS, this undertaking is not on federal or tribal land as defined by National Historic Preservation Act [NHPA]; therefore, all inadvertent human remain discoveries will be addressed in accordance with Wisconsin s.s. 157.70, and

WHEREAS, post-review discoveries of non-human remain cultural resources will be treated in accordance with 36 CFR 800.13(b), and

NOW, THEREFORE, the FHWA, and the Wisconsin SHPO agree that, upon acceptance of this MOA, and upon the FHWA's decision to proceed with Waukesha West Bypass Project, the FHWA shall ensure that the following stipulations are implemented in order to take into account the effect of the undertaking on historic properties.

STIPULATIONS

1. Sabina Barney House

The FHWA will ensure that the following measures are carried out:

a. Photographic Recordation

The house and its setting will be photographically recorded within 60 days of being advised by the WisDOT project manager that the MOA has been fully executed—assuming that no snow is on the ground when notification is made. Should there be snow on the ground, photographs will be taken within thirty days of its melting in Spring, but no later than 01 May 2014. Photographic recordation will be completed with digital images, the production of which will be consistent with the requirements of SHPO. Prior to the project's initiation, WisDOT or its agent will prepare and deliver to SHPO two copies of twelve to fifteen, high quality, color, digital photographs, as well as a CD with those images. A set of the images, along with a CD, will also be provided to the Waukesha County Historical Society and to Mr. Kutil, the property owner. The standards to be used for this activity are found in Appendix A.

b. Potential Plantings

Once 90% plans have been accepted and final design is started, the WisDOT project manager, or his designee, will contact Mr. Kutil within 30 days in order to discuss a landscape plan in which trees and bushes will be planted in the WisDOT-owned setback between the relocated CTH X and his property. Such plantings will further obscure Mr. Kutil's property from the roadway. Within 30 days of Mr. Kutil's acceptance of the plan, it will be submitted to SHPO for review and concurrence. SHPO will respond and concur within 30 days. If no response is received from SHPO within those 30 days, the plan will be considered accepted and implementation will be planned for the season in which the CTH X/STH 59 intersection is reconstructed. Landscaping costs will not exceed $25,000 and consist of trees and/or shrubs.

c. National Register Narratives for Properties in the Non-Incorporated Areas of Waukesha County

There are 14 non-archaeological National Register-listed properties in non-incorporated areas of Waukesha County, including the Barney House, that do not have summaries posted on the Wisconsin Historical Society website. These summaries provide awareness of the significance for listed properties and are required for every National Register nomination submitted to the Wisconsin Historical Society. Accordingly, the WisDOT project manager, or his designee, will ensure that summaries for the 14 properties are written and submitted to the WHS. The standards to be used for this activity are found in Appendix B, along with a list of the 14 properties. This component will be completed within 270 days of the signing of this MOA.

2. Dispute Resolution

Should any signatory to this MOA (including any invited signatory), per 36 CFR 800.6(c)(1) and (2), object in writing at any time prior to termination to any actions proposed or the manner in which the terms of this MOA are implemented, WisDOT and FHWA shall consult with such party to resolve the objection. The objection must specify how the actions or manner of implementation is counter to the goals, objectives or specific stipulation of this MOA. If FHWA determines that such objection cannot be resolved, FHWA will:

a. Forward all documentation relevant to the dispute, including the FHWA's proposed resolution, to the Advisory Council on Historic Preservation (ACHP). The ACHP shall provide FHWA with its advice on the resolution of the objection within 30 days of receiving adequate documentation. Prior to reaching a final decision on the dispute, FHWA shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP and signatories, and provide them with a copy of this written response. FHW A will then proceed according to its final decision.

b. If the ACHP does not provide its advice regarding the dispute within the 30 day period, FHWA may make a final decision on the dispute and proceed accordingly. Prior to proceeding, FHWA shall notify the parties to this MOA of its decision regarding the dispute.

c. It is FHWA's responsibility to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute.

3. Amendments

Any signatory to this agreement may propose to the agency that the agreement be amended. Whereupon the agency shall consult with the other signatory parties [including invited signatories per 36 CFR 800.6(c)(1) and (2)] to this agreement to consider such an amendment. 36 CFR 800.6(c)(1) and (7) shall govern the execution of any such amendment.

4. Professional Qualifications

WisDOT shall ensure that all historic preservation work carried out pursuant to this agreement is carried out by or under the supervision of a person or persons meeting at a minimum the *Secretary of the Interior's Professional Qualifications Standards* in the field of architectural history, as published in 36 CFR Part 61.

5. Termination

If any signatory to this MOA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other signatories to attempt to develop an amendment. If within thirty (30) days (or another time period agreed to by all signatories) an amendment cannot be reached, any signatory may terminate the MOA upon written notification to the other signatories.

6. Sunset Clause

This agreement shall be null and void if all terms are not carried out within twelve (12) years from the date of its execution, unless the signatories agree in writing to an extension for carrying out its terms.

Execution of this MOA by FHWA and the Wisconsin SHPO, and implementation of its terms, evidences that FHWA has complied with Section 106 on the Waukesha West Bypass Project and its effects on historic properties and that the FHWA have taken into account the effects of the project on historic properties.

FEDERAL HIGHWAY ADMINISTRATION

By: _____ Date: November 19, 2013

Ian Chidister, Environmental Program Manager

WISCONSIN STATE HISTORIC PRESERVATION OFFICER

By: _____ Date: 12/13/13

James R. Draeger, State Historic Preservation Officer

INVITED SIGNATORY:

WISCONSIN DEPARTMENT OF TRANSPORTATION

By: _____ Date: 4/2/14
Rebecca Burkel, WisDOT Historic Preservation Officer

APPENDIX A (Photographic Standards)

Standards for Digital Photo Documentation:

- Photographic documentation will include twelve to sixteen digital images that meet SHPO and National Park Service (NPS) requirements (detailed below).
- WisDOT or its agent will submit digital images to SHPO, the Waukesha County Historical society and Mr. John Kutil, the property owner, on an archival CD, per SHPO and NPS requirements.
- WisDOT or its agent will provide two sets of commercially produced prints to SHPO, labeled per SHPO standards.
- WisDOT is aware of and will bear the cost of fulfilling this stipulation.

SHPO and NPS Requirements for Digital Photographs:

- Images will be taken with a digital SLR camera set to the highest quality.
- Each image will be at least 2,000 pixels on the longest side or at least 300 pixels per inch.
- Image file sizes will exceed 3MB (uncompressed).
- Images will be saved as uncompressed JPEGs and will not be cropped, compressed, up-sampled, or otherwise digitally altered.
- CDs should be "closed out" and readable on multiple computers.
- Photologs will be submitted that record the structure name, location, date of photograph, photographer and direction of photo.
- All color prints will be labeled on the back with date, project name, structure name, direction of the photograph, and the image file name that corresponds with the digital images and the photolog.

Appendix B (Standards for the Historic Property Summaries)

The summaries will be submitted on a disk to the Wisconsin Historical Society-Division of Historic Preservation and Public History, c/o the National Register Coordinator. Each summary will be:

- Written by a qualified National Register consultant.
- 200 to 300 words for each property. Entries for large districts, complexes or exceptionally significant properties may be longer.
- Include content that relays the history of the property, as well as discusses its physical appearance and its significance.
- Written for the general public, be engaging and fun to read, and will avoid using National Register jargon or overly academic terminology.

Include content from the National Register Nomination for each property.

The 14 properties for which summaries will be written are:

National Register #	*Listing Name*	*Address*	*County*	*Civil Town*
88000454	**Statesan Historic District**	Boys School Rd.	Waukesha	Delafield
73000097	**Turck, Christian, House**	Off WI 59 in Old World Wisconsin	Waukesha	Eagle
73000095	**Koepsel House**	Old World Wisconsin, off WI 59	Waukesha	Eagle
03000225	**Saylesville Historic District**	Saylesville Road from west bank of Genesee Creek to S52 W28731 Saylesville Road	Waukesha	Genesee
82000723	**Johnston, William, Lime Kiln**	E of Genesse Depot	Waukesha	Genesee
73000094	**Booth, J. C., House**	About 1 mi. SW of Saylesville on Saylesville Rd.	Waukesha	Genesee
81000065	**Genesee Town Hall**	Genesee St.	Waukesha	Genesee
77000058	**Beaumont Hop House**	Address Restricted	Waukesha	Merton
89002033	**Pabst, Gustave, Estate**	36100 Genesee Lake Rd.	Waukesha	Summit

72000067	**Chapel of St. Mary the Virgin**	2 mi. SW of Nashotah on Nashotah House Rd.	Waukesha	Summit
82000719	**Cobb, George N., House**	S of Oconomowoc at 1505 N. Golden Lake Rd.	Waukesha	Summit
80000204	**Haseltine Cobblestone House**	N of Big Bend on Big Bend Dr.	Waukesha	Vernon
98001595	**Reformed Presbyterian Church of Vernon**	W234 S7710 Big Bend Rd.	Waukesha	Vernon
94001250	**Barney House**	W264 S3641 Saylesville Rd.	Waukesha	Waukesha

From: "Ritchie, Jim M - DNR" <Jim.Ritchie@wisconsin.gov>
Date: June 23, 2014, 9:48:27 AM CDT
To: "Charlie.Webb@CH2M.com" <Charlie.Webb@CH2M.com>
Cc: "Thompson, Michael C - DNR" <MichaelC.Thompson@wisconsin.gov>, "Webster, Craig M - DNR" <Craig.Webster@wisconsin.gov>
Subject: RE: Glacial Drumlin Trail at Waukesha Bypass

Charlie and Mike,
The Glacial Drumlin Trail received Land and Water Conservation Fund assistance for land acquisition (LWCF project number 55-01626). Potential impacts to the trail therefore need to be reviewed for 6(f) conversions.
Project plans have not been reviewed, but as explained below and further discussed with Charlie, the trail will remain in its current location and will cross under the new roadway in a box culvert. This action is not considered a 6(f) conversion.
As the project plans are developed, if impacts to the trail will occur, or taking of DNR property is expected, please contact us to discuss in more detail.
Please continue to work with Paul Sandgren and Brigit Brown, as I understand you have been, regarding the design considerations for the trail and roadway crossing, so that any potential impacts on the use of the trail are mitigated.
Thank you for contacting me for this review.
Jim

Jim Ritchie
Southeast & South Central Regions Government Outreach Team Supervisor
Bureau of Community Financial Assistance
Wisconsin Department of Natural Resources

(☎) phone: (414) 263-8610
(✉) e-mail: Jim.Ritchie@Wisconsin.gov
Learn more about DNR grants and loans by going to http://dnr.wi.gov and entering the keywords "grants and loans"
You can also follow the Wisconsin DNR online:
"Take a moment to enjoy Wisconsin's outdoors."
We are committed to service excellence.
Visit our survey at http://dnr.wi.gov/u/?q=85 to evaluate how I did.

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SCHOOL DISTRICT OF WAUKESHA

Business Office

Lindholm Building 222 Maple Avenue, Waukesha, WI 53186 ☎262-970-1040
Fax: 262-970-1020

November 20, 2012

Attn: Gary Evans
Waukesha County Engineering Services
515 W. Moreland Blvd
Waukesha, WI 53188

RE: West Waukesha Bypass

Thanks to you and Charlie Webb for attending the District's Facilities and Finance meeting and providing an update on the status of the West Waukesha Bypass project. As a whole, the District is supportive of the project and would like to see it proceed and become a reality in the reasonably near future. We would like to go on record with a couple concerns that we would like to see addressed and remedied as the project design is finalized.

The District owns a 127 acre parcel on the west side of County TT (Merrill Hills Road) across from MacArthur Road that has 928 feet of road frontage on County TT. The District intends to develop this site in the future for another school or schools as the need arises and as the west side develops. We anticipate the need for multiple access points to the property once it is developed. The bypass drawings show the new road crossing the property to the west of TT so the bypass would become the main access to the site. Traffic congestion near school sites is always a concern and the need to move buses, cars and pedestrians to and from the school from the neighborhoods that it will serve is of the utmost importance.

The District also has Meadowbrook Elementary School located at 3130 Rolling Ridge Drive which is just east of the proposed bypass. The entire subdivision west and south of the school falls within its attendance area and we would like every consideration to be placed on the safety of those students needing to cross the bypass walking to and from school.

Finally, we support the most direct route for connecting the bypass to/from Hwy 59 to the south. The most direct route would mean shorter bus routes, less time for students to spend on buses and safer traveling.

Please take our issues into consideration as you work toward finalizing the plans for the West Waukesha Bypass. On behalf of the Board of Education I thank you.

Sincerely,

Lauri Clifton
CFO/Director of Business Service

Waukesha County

NOV 26 2012

Dept of Public Works

Serving the cities of Waukesha, Brookfield
and the towns of Waukesha, Brookfield, Delafield, Genesee and Pewaukee

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CITY OF PEWAUKEE
The City in the Country

Administration

W240N3065 Pewaukee Road
Pewaukee, WI 53072
(262) 691-0770 Fax: 691-1798

November 21, 2012

Allison Bussler, Director
Waukesha County Department of Public Works
515 W. Moreland Blvd.
Waukesha, WI 53188

Ms. Bussler:

Enclosed please find a copy of Resolution #12-11-46 in support of the construction of the proposed Waukesha West Bypass on the Meadowbrook/Merrill Hills Road and Pebble Creek-West alternative alignment which was adopted by the City of Pewaukee Common Council at their regularly scheduled meeting held on Monday, November 19, 2012.

Sincerely,

Tammy LaBorde

Tammy LaBorde
Administrator, ICMA-CM

Enclosure

cc: Kelly Tarczewski, Clerk/Treasurer

Waukesha County
NOV 26 2012
Dept of Public Works

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STATE OF WISCONSIN CITY OF PEWAUKEE WAUKESHA COUNTY

RESOLUTION NO. 12-11-46

A RESOLUTION IN SUPPORT OF THE CONSTRUCTION OF THE PROPOSED WAUKESHA WEST BYPASS ON THE MEADOWBROOK/MERRILL HILLS ROAD AND PEBBLE CREEK-WEST ALTERNATIVE ALIGNMENT

WHEREAS, the Southeastern Wisconsin Regional Planning Commission (SEWRPC), which was duly created by the Governor of the State of Wisconsin in accordance with Section 66.0309(2) of the Wisconsin Statutes on the 8th day of august 1960, upon petition of the Counties of Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Washington, and Waukesha, has the function and duty of making and adopting a master plan for the physical development of the Southeastern Wisconsin Region; and

WHEREAS, the SEWRPC adopted, on June 21, 2006, a newly revised transportation system plan for the Region to the year 2035, which plan is one of the primary elements of the required regional master plan (aka comprehensive plan) which includes an arterial highway on the west side of the City of Waukesha; and

WHEREAS, the City of Pewaukee Common Council adopted, on May 7, 2007, a resolution endorsing the Regional Transportation System Plan for Southeastern Wisconsin 2035 as a valuable guide to local development; and

WHEREAS, the City of Pewaukee Common Council approved on March 19, 2009, an ordinance adopting the Comprehensive Plan for the City of Pewaukee for the year 2035, which Plan includes those elements of the Regional Transportation System Plan located within the City of Pewaukee; and

WHEREAS, the location and construction of a surface transportation arterial highway located on the west side of the City of Waukesha and specifically located within the City of Waukesha, the Town of Waukesha and the Town (now City) of Pewaukee and connecting IH-94 with what is now STH 164 south of the City of Waukesha has been a part of transportation planning at all levels of government within Waukesha County since the early 1960's; and

WHEREAS, the City of Pewaukee Common Council believes that while the proposed routing of the western "bypass" of the City of Waukesha only directly impacts the City of Pewaukee for a short distance, the route when completed will serve a large segment of the City's residential development and the City has, even when it was the Town of Pewaukee, embraced

the concept of the need of an arterial highway on the west side of the City of Waukesha that directs "through" traffic away from and around the congested, densely developed areas within the City of Waukesha and environs.

NOW, THEREFORE, BE IT RESOLVED, that the City of Pewaukee Common Council on the 19th day of November, 2012, hereby supports, based on the City's adopted Comprehensive Plan, the construction of the proposed arterial highway known as the west bypass of the City of Waukesha on the Meadowbrook Road/CTH TT/Pebble Creek-West alternative alignment.

BE IT FURTHER RESOLVED that the City Clerk/Treasurer transmit a certified copy of this resolution to the SEWRPC, Waukesha County Department of Public Works, City of Waukesha, Town of Waukesha, Town of Genesee, Town of Delafield, and the City's County Board Representatives.

CITY OF PEWAUKEE

Scott Klein, Mayor

ATTEST:

Kelly Tarczewski, Clerk/Treasurer

CITY OF PEWAUKEE CORPORATE SEAL WISCONSIN

CERTIFICATE

STATE OF WISCONSIN)
:ss
WAUKESHA COUNTY)

I, Kelly Yaeger, Deputy County Clerk in and for the County of Waukesha, State of Wisconsin, DO HEREBY CERTIFY that the attached Enrolled Resolution 167-6, was adopted by the Waukesha County Board of Supervisors in regular session on the 27th day of November, 2012.

CERTIFIED this 11th day of December, A.D., 2012.

Kelly Yaeger
Deputy County Clerk, CERA

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ENROLLED RESOLUTION 167-6

APPROVE WEST WAUKESHA BYPASS

WHEREAS, the completion of the Waukesha Bypass has been planned for fifty years and the western portion of the bypass, commonly known as the West Waukesha Bypass, is the final element yet to be constructed, and

WHEREAS, Waukesha County, the City of Waukesha, the Town of Waukesha and the Wisconsin Department of Transportation have signed a Memorandum of Understanding to complete the construction of the West Waukesha Bypass, and

WHEREAS, the terms of the Memorandum of Understanding commit Waukesha County to be the lead agency for the project, and

WHEREAS, Waukesha County in cooperation with the Wisconsin Department of Transportation, City of Waukesha and Town of Waukesha has conducted an Environmental Impact Statement (EIS) for the project, and

WHEREAS, the EIS study has enumerated various alignments for the West Waukesha Bypass route and has reduced the number of alternates to four: the no build alternate and three build alternates, these are the alternates referred to as Pebble Creek West, Pebble Creek far West and the alternate referred to as CTH X and Sunset Drive, and

WHEREAS, the results of further study of those alternates has shown that, based on factors such as environmental impacts, ground water impact, safety, cost and traffic efficiency, the alternate referred to as Pebble Creek West is the preferred alignment for the West Waukesha Bypass.

IT IS HEREBY RESOLVED THAT the County Board of Supervisors of the County of Waukesha supports the construction of the West Waukesha Bypass.

BE IT FURTHER RESOLVED THAT the County Board of Supervisors of the County of Waukesha recommends to the Wisconsin Department of Transportation and the Federal Highway Administration the alternate known as Pebble Creek West for the selected alignment of the West Waukesha Bypass.

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ENROLLED RESOLUTION 160-6

SUPPORT AND REQUEST THE STATE OF WISCONSIN TO ACCEPT THE TRANSFER TO THE STATE TRUNK HIGHWAY SYSTEM OF COUNTY HIGHWAY TT FROM NORTHVIEW ROAD TO MACARTHUR ROAD

WHEREAS Waukesha County has examined and planned for a major highway corridor on the west side of the City of Waukesha since 1951 and has incorporated this highway corridor in adopted jurisdictional plans and regional transportation plans since the mid-1970's, and

WHEREAS on July 25, 1995 Waukesha County adopted (Enrolled Ordinance 150-26) a "Waukesha County Jurisdictional Highway System Plan – 2010," and on December 15, 1998, Waukesha County adopted (Enrolled Ordinance 153-103) "A Regional Transportation Plan for Southeastern Wisconsin: 2020," and

WHEREAS these jurisdictional and regional plans recommend that County Highway "TT" from Northview Road to MacArthur Road be transferred to the state trunk highway system and be improved by the State of Wisconsin to a four lane highway, and

WHEREAS on September 25, 1990, after a Task Force completed a "West Waukesha Transportation Study," Waukesha County (Enrolled Resolution 145-26) solicited the Wisconsin Department of Transportation to construct a four lane highway from State Highway 59/CTH "X," on a CTH "TT" alignment, to the interchange of Interstate 94 at Meadowbrook Road, and

WHEREAS, because of the completion of a major interchange improvement of Interstate 94 at Meadowbrook Road and furthered by recent transfers of portions of STH 164 to Waukesha County and portions of CTH "J" to the State of Wisconsin, the Wisconsin Department of Transportation is strategically positioned to re-route STH 164 to the west Waukesha transportation corridor, and

WHEREAS, after 55 years of study and 40 years of planning, it is time for the State of Wisconsin to take jurisdiction of County Highway "TT" and to construct a four lane major connector of highways I-94, STH 18, STH 59, and to designate this connector STH 164, and

WHEREAS the Waukesha County Board of Supervisors desires to express its strong, concerted show of support for this transfer and encourages local units of government to demonstrate similar support.

BE IT HEREBY RESOLVED BY THE WAUKESHA COUNTY BOARD OF SUPERVISORS that the State of Wisconsin, in accordance with Southeastern Wisconsin Regional Planning Commission jurisdictional and regional transportation plans, accept jurisdiction of County Highway "TT" from Northview Road to MacArthur Road.

BE IT FURTHER RESOLVED that the Waukesha County Board requests that the County Executive negotiate the unilateral transfer of County Highway "TT" with the Wisconsin Department of Transportation.

BE IT FURTHER RESOLVED that the Waukesha County Clerk mail certified copies of this Enrolled Resolution to: Secretary Busalacchi and District Director Johnson, Wisconsin Department of Transportation; Executive Director Evenson, Southeastern Wisconsin Regional Planning Commission; Mayor Lombardi, City of Waukesha; Mayor Nowak, City of Pewaukee; Chairman Stilwell, Town of Waukesha; and all Wisconsin State Senators and Representatives in the Waukesha County delegation.

Referred on: 06/13/05	File Number: 160-R-006	Referred to: EX – PW

SUPPORT AND REQUEST THE STATE OF WISCONSIN TO ACCEPT THE TRANSFER TO THE STATE TRUNK HIGHWAY SYSTEM OF COUNTY HIGHWAY TT FROM NORTHVIEW ROAD TO MACARTHUR ROAD

Presented by:
Executive Committee

James T. Dwyer, Chair

Patricia A. Haukohl

Walter L. Kolb

Richard L. Manke

William A. Mitchell

Duane E. Paulson

Duane Stamsta

Approved by:
Public Works Committee

Richard L. Manke, Chair

James R. Behrend

Absent
Peter Gundrum

James Jeskewitz

Karl Nilson

Rodell L. Singert

David W. Swan

The foregoing legislation adopted by the County Board of Supervisors of Waukesha County, Wisconsin, was presented to the County Executive on:

Date: July 1, 2005, Kathy Nickolaus
Kathy Nickolaus, County Clerk

The foregoing legislation adopted by the County Board of Supervisors of Waukesha County, Wisconsin, is hereby:
Approved: ✓
Vetoed:

Date: 7-6-05, Daniel M. Finley
Daniel M. Finley, County Executive

160-R-006

Town Of WAUKESHA

Chairman - Rod Stilwell
Supervisor - Robert Tallinger Sr.
Supervisor - Stephen A. Smart
Town Clerk - Michaelene R. Knoebel
Treasurer - Josephine T. Diekfuss
Building Inspector - Independent Inspections Ltd.
Assessor - Cole • Layer • Trumble Company
Constable - Howard A. Garvens
Deputy Clerk - Debra Schueler

IN THE OFFICE. OF THE CLERK OF THE TOWN OF WAUKESHA, COUNTY OF WAUKESHA, STATE OF WISCONSIN

I, Michaelene R. Knoebel, Town Clerk of the Town of Waukesha, of the County of Waukesha, of the State of Wisconsin, do hereby certify that the attached copy of the Resolution regarding the proposed west highway corridor and the transfer of CTH "TT" and Meadowbrook Road to Wisconsin Department of Transportation Jurisdiction, adopted at the November 10, 2005 Town Board meeting, is an exact copy of the original. In testimony whereof, I have hereunto set my hand and affixed the seal for the Town of Waukesha, in said County and State this 13th day of December 2005.

TOWN OF WAUKESHA
Official Seal
WAUKESHA, WISCONSIN

Michaelene R. Knoebel, Town Clerk
Town of Waukesha, County of Waukesha,
State of Wisconsin

RECEIVED
DEC 16 2005
WAUKESHA COUNTY BOARD

W250S3567 Center Road • Waukesha, WI 53189 • (262) 542-5030 • Fax (262) 542-7870

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RESOLUTION

Whereas, the Town of Waukesha has been aware a problem has existed on the west side of the Town of Waukesha since 1971 and Waukesha County placed the proposed highway corridor on the Town of Waukesha map in 1971, and

Whereas, the Waukesha County Jurisdictional Highway System Plan - 2010, dated May 1995, recommends that a facility in the same general location as the proposed west side highway corridor be improved to a four lane highway by the State of Wisconsin Department of Transportation, and

Whereas, the proposed west side highway corridor generally follows the alignment of Meadowbrook Road between I-94 and Northview Road, and the alignment of County Trunk Highway "TT" from Northview Road to Sunset Drive, with a continuation from Sunset Drive to the intersection of State Trunk Highway 59 and County Trunk Highway "X", and

Whereas, traffic volumes along the existing County Trunk Highway "TT" and Meadowbrook Road have increased steadily to a point where additional capacity is needed, and

Whereas, the additional traffic volumes and the conditions on the existing CTH "TT" in some areas present a safety concern for motorists, and

Whereas, new development and proposed development in the area of the proposed west side highway corridor have created traffic congestion on other streets on the west side of the City of Waukesha, and

Whereas, the Town of Waukesha Town Board wishes to express its strong support for the transfer of jurisdiction to the Wisconsin Department of Transportation and the early scheduling of the improvements.

BE IT HEREBY RESOLVED BY THE TOWN OF WAUKESHA TOWN BOARD that the State of Wisconsin, in accordance with the Southeastern Wisconsin Regional Planning Commission jurisdictional and regional transportation plans, accept jurisdiction of Meadowbrook Road from I-94 to Northview Road and jurisdiction of C.T.H. "TT" from Northview Road to Sunset Drive.

BE IT FURTHER RESOLVED that the Town of Waukesha Town Board directs the appropriate Town Officials to negotiate the transfer of Meadowbrook Road with the Wisconsin Department of Transportation.

BE IT FURTHER RESOLVED that the Waukesha Town Clerk mail certified copies of this resolution to: Secretary Busalarchi and Regional Director Johnson, Wisconsin Department of Transportation; Executive Director Evenson, Southeastern Wisconsin Regional Planning Commission; Mayor Nowak, City of Pewaukee; Mayor Lombardi, City of Waukesha; Waukesha County Executive and Waukesha County Board Chairperson, and all Wisconsin State Senators and Representatives in the Waukesha County delegation.

TOWN OF WAUKESHA
Official
Seal
WAUKESHA, WISCONSIN

ADOPTED this 10 th Day of November 2005.

Chairman Rodney T. Stilwell

Supervisor Robert J. Tallinger, Sr.

Supervisor Stephen Smart

Town Clerk Michaelene R. Knoebel

RECEIVED
DEC - 5 2005
WAUKESHA COUNTY BOARD

OFFICE OF CLERK/TREASURER

CITY OF WAUKESHA

CITY HALL – 201 DELAFIELD ST.
WAUKESHA WI 53188-3692
CLERK 262-524-3550
TREASURER 262-524-3850
FAX 262-524-3888

THOMAS E. NEILL
CLERK/TREASURER

IN THE OFFICE OF THE CLERK OF THE CITY OF WAUKESHA, COUNTY OF WAUKESHA, STATE OF WISCONSIN

I, MARIE BIEBER, Deputy Clerk/Treasurer of the City of Waukesha, of the County of Waukesha, of the State of Wisconsin do hereby certify that the attached copy of Resolution 80-05, Transfer of C.T.H. "TT" and Meadowbrook Road to Wisconsin Department of Transportation Jurisdiction, adopted at the December 6, 2005 meeting of the Common Council of the City of Waukesha has been compared by me with the original on file in the office of Clerk of said City of Waukesha, and that the same is a true and correct copy of the original, and of the whole thereof, as the same now remains on file and of record in the Clerk's office.

In testimony whereof I have hereunto set my hand and affixed the seal of said City of Waukesha, in said County and State this 8th day of December, 2005.

Marie Bieber
Deputy Clerk/Treasurer
of the City of Waukesha,
of the County of Waukesha,
of the State of Wisconsin

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WAUKESHA COUNTY BOARD

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RESOLUTION 80-05

TRANSFER OF C.T.H. "TT" AND MEADOWBROOK ROAD TO WISCONSIN DEPARTMENT OF TRANSPORTATION JURISDICTION

WHEREAS, the City of Waukesha has planned for a major arterial highway on the west side of the City of Waukesha since 1971 and placed the proposed highway corridor on the official City of Waukesha map in 1971, and

WHEREAS, the Waukesha County Jurisdictional Highway System Plan - 2010, dated May, 1995, recommends that a facility in the same general location as the proposed west side highway corridor be improved to a four lane highway by the State of Wisconsin Department of Transportation, and

WHEREAS, the proposed west side highway corridor generally follows the alignment of Meadowbrook Road between I-94 and Northview Road, and the alignment of County Trunk Highway "TT" from Northview Road to Sunset Drive, with a continuation from Sunset Drive to the intersection of State Trunk Highway 59 and County Trunk Highway "X", and

WHEREAS, traffic volumes along the existing County Trunk Highway "TT" and Meadowbrook Road have increased steadily to a point where additional capacity is needed, and

WHEREAS, the additional traffic volumes and the conditions on the existing CTH "TT" in some areas present a safety concern for motorists, and

WHEREAS, new development and proposed development in the area of the proposed west side highway corridor have created traffic congestion on other streets on the west side of the City of Waukesha, and

WHEREAS, the City of Waukesha Common Council wishes to express its strong support for the transfer of jurisdiction to the Wisconsin Department of Transportation and the early scheduling of the improvements.

BE IT HEREBY RESOLVED BY THE CITY OF WAUKESHA COMMON COUNCIL that the State of Wisconsin, in accordance with the Southeastern Wisconsin Regional Planning Commission jurisdictional and regional transportation plans, accept jurisdiction of Meadowbrook Road from I-94 to Northview Road and jurisdiction of C.T.H. "TT" from Northview Road to Sunset Drive.

BE IT FURTHER RESOLVED that the City of Waukesha Common Council directs the appropriate City Officials to negotiate the transfer of Meadowbrook Road with the Wisconsin Department of Transportation.

BE IT FURTHER RESOLVED that the Waukesha City Clerk mail certified copies of this resolution to: Secretary Busalacchi and Regional Director Johnson, Wisconsin Department of Transportation; Executive Director Evenson, Southeastern Wisconsin Regional Planning Commission; Mayor Klein, City of Pewaukee; Chairman Stilwell, Town of Waukesha; County Executive Vrakas and County Board Chairman Dwyer, Waukesha County; and all Wisconsin State Senators and Representatives in the Waukesha County delegation.

PASSED and APPROVED this 6 day of December, 2005

Carol J. Lombardi

Carol J. Lombardi, Mayor
City of Waukesha

Attest:

Thomas E. Neill

Thomas E. Neill, City Clerk

Robin/Paulf/Resolution TT and Meadowbrook 72705

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STATE OF WISCONSIN WAUKESHA COUNTY TOWN OF WAUKESHA

RESOLUTION NO. 12-05-2012A

Resolution Regarding the "West Waukesha Bypass", "County TT I-94 to Wis. 59
Project ID. 2788-01-00

Whereas, In 1951, Waukesha County first proposed a new north-south arterial roadway bypass on Waukesha's west side.

Whereas, The Town of Waukesha Board of Supervisors passed by unanimous vote Resolution #06-15-11B, which a copy of is hereby attached to this resolution, notifying all parties that the Memorandum of Understanding for the project was not duly executed by an authorized agent of the Town of Waukesha pursuant to Wis. Stat.§60.24 and that the Town of Waukesha Board of Supervisors wished to go on record because all proposed routes have varying degrees of adverse impacts on the citizens and property owners of the Town of Waukesha as well as the quality of life in the town.

Whereas, the Environmental Impact Statement draft describes The Build Alternatives cost to be between $53 million and $55 million (2011 dollars) ($60 to $62 million in 2015/2016 dollars, the anticipated years of construction) to construct, including real estate acquisition, engineering, construction, construction management, and mitigation costs.

Whereas the Purpose of and need for the project known as the "West Waukesha Bypass", "County TT I-94 to Wis. 59 project ID.2788-01-00 is stated in the "Environmental Impact Statement" draft currently open for public comment through December 10, 2012 as;

Purpose of and Need for the Project

The purpose of the West Waukesha Bypass is to provide a safe and efficient north-south arterial roadway on the west side of the City of Waukesha to complete the long-planned circumferential route around Waukesha; to accommodate growing traffic volumes along the corridor; and to improve roadway deficiencies that include tight curves, steep hills, narrow lanes, and lack of shoulders. The proposed improvements address two major needs:

- Improve safety by providing a roadway that meets current design standards.
- Accommodate traffic demand generated by existing and planned development within and outside the study corridor.

Whereas, The 4-Lane Alternative would address the lack of shoulders, steep hills and tight curves on County TT and improve the capacity of intersections on County TT. It would meet all elements of the project's purpose and need by accomplishing the following:

- Provide a safe and efficient north-south arterial roadway on the west side of the City of Waukesha to complete the long-planned circumferential route around Waukesha consistent with City of Waukesha, Waukesha County and SEWRPC transportation plans. The 4-Lane Alternative would meet this criterion by providing the 4-lane roadway called for in local and regional transportation plans.
- Accommodate growing traffic volumes along the corridor. Under the 4-Lane Alternative, County TT would operate at level of service C north of Summit Avenue and B south of Summit Avenue during the design year peak hour. Unsignalized intersections at

Fiddlers Creek Drive, Kisdon Hill Court, Kame Terrace, MacArthur Road and Green Lane would operate at level of service B or C. Average delays on these roads would be about 15 to 25 seconds.

- Improve safety by decreasing crashes. The 4-Lane Alternative would improve safety by adding a median and protect left-turn lanes in the median. A study by the Transportation Research Board found that converting a 2-lane undivided roadway to a 4-lane divided roadway would on average decrease crashes 40 to 60 percent (Council and Stewart, Transportation Research Record 1665, Paper No. 99-0327).
- Improve roadway deficiencies that include tight curves, steep hills, narrow lanes, and lack of shoulders. The 4-Lane Alternative would address roadway deficiencies and meet desirable design standards.

Whereas, the Environmental Impact Statement draft identifies the project into segments known as;

- I-94 to Summit Avenue
- Summit Avenue to Wisconsin & Southern Railroad
- Wisconsin & Southern Railroad to WIS 59

Whereas, the Environmental Impact Statement draft identifies in TABLE 2-3 the Build Alternatives Still under Consideration as:

- I-94 to Summit Avenue segment
    - 4-Lane current road alignment
- Summit Avenue to Wisconsin & Southern Railroad
    - 4-Lane Off-Alignment
- Wisconsin & Southern Railroad to WIS 59
    - 4-Lane Pebble Creek Far West
    - 4-Lane Pebble Creek West
    - 4-Lane Sunset-to-County X

Whereas, the Environmental Impact Statement draft identifies the project also maintains a "NO BUILD" alternative, but does not reflect a "NO BUILD- IMPROVE" alternative

Whereas, According to the Code of Federal Regulations (CFR), indirect effects are defined as being "caused by the action and are occurring later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems" (40 CFR 1508.8).

Whereas, Case law has defined reasonably foreseeable as "meaning that the impact is sufficiently likely to occur that a person of ordinary prudence would take it into account in making a decision" (Sierra Club v. Marsh, 976 F. 2d (1st Cir. 1992)).

Whereas, The National Cooperative Highway Research Program (NCHRP) Report 466: Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects provides three broad categories of indirect effects (NCHRP 2002):

- Alteration of the behavior and functioning of the affected environment caused by project

encroachment (physical, chemical, biological) on the environment

- Project-influenced development effects (e.g., the land use effect)
- Effects related to project-influenced development effects (i.e., effects of the change in land use on the human and natural environment)

Whereas, the Pebble Creek West and Pebble Creek Far West Alternatives, convert the land use of roughly 29 acres of land between the railroad tracks and the WIS 59/County X intersection from primarily open space to highway right-of-way. This section of the bypass is on new alignment and would acquire residential and agricultural land as well as wetlands. The Pebble Creek Alternative would not be expected to spur new development to the east of the roadway because of a wide swath of wetlands west of Pebble Creek and the Waukesha County greenway east of the Creek. No new development is expected west of the roadway, because the existing development would prevent access to Merrill Hills Road. In addition, no access would be allowed to the highway between Sunset Drive and WIS 59

Whereas, Sunset-to-County X Alternative. Under the Sunset-to-County X Alternative, 21 acres of land between the railroad tracks and the WIS 59/County X intersection would be converted to highway right-of-way. Between the railroad crossing and Sunset Drive, the proposed bypass alignment would be on new alignment and acquire right-of-way from agricultural land. Along Sunset Drive and County X the right-of-way acquired would consist of strips of land adjacent to existing right-of-way. Land acquired would consist of residential, commercial, and industrial land along with public open space that contains wetlands.

Whereas, Section 3.3.4 of the Environmental Impact Statement identifies that The West Waukesha Bypass would not have a big impact on development patterns on the west side of the Town of Waukesha. Under the Sunset-to-County X Alternative, commercial development could be stimulated on County X south of Sunset Drive, in an area currently developed as residential. Commercial uses along Sunset Drive west of County X in the project corridor could also develop.

Whereas, The Town of Waukesha felt that the Sunset-to-County X Alternative would have a beneficial indirect impact on commercial development on Sunset Drive and County X

Whereas, the Environmental Impact Statement draft states a Walgreens store has been proposed in the southwest quadrant of the Sunset Drive/County X intersection and does not inform the reader that this project was denied by the Town of Waukesha for a necessary Certified Survey Map and subsequent zoning changes and that the Town Board for the Town of Waukesha sent written correspondence to the County requesting all changes on this parcel be delayed.

Whereas, The group thought that if the Pebble Creek Alternative was selected for the bypass route, it would decrease traffic at the Sunset/County X intersection and would not enhance economic development potential for the Town at that intersection

Whereas, The Pebble Creek Alternative that straddles the transition between upland and wetland would degrade the ability of the Pebble Creek corridor to support threatened and endangered turtle and snake habitat. Conversely, Sunset Drive already exists, that habitat

has already been severed. In effect, the damage has already been done. The Sunset-toCounty X alternative for the Waukesha Bypass was not specifically addressed in the plan, but is wholly consistent with the plan according to Tom Slawski/SEWRPC, the Pebble Creek Watershed Protection Plan's main author and expert panel participant.

Whereas,The Pebble Creek Alternatives, which would lie on the west edge of the Pebble Creek corridor between the Wisconsin & Southern Railroad and WIS 59, would decrease the habitat value of the corridor by limiting the connection between upland and wetland for those species that travel back and forth from wetland to upland.

Whereas, The wetland impact is 5.6 acres associated with the improvements north of the Wisconsin & Southern Railroad, 8.4 acres under the Pebble Creek West Alternative, 5.7 acres under the Pebble Creek Far West Alternative and 6.5 acres under the Sunset-to-County X Alternative.

Whereas, The impacts of the Build Alternatives on Upper and Lower Pebble creeks generally are related to the potential for increased sedimentation, reduced infiltration, increased run-off volumes and peak flows, siltation, and suspended solids loads associated with construction and operation of the proposed roadway. Because there would be more construction adjacent to Lower Pebble Creek and its adjacent wetlands than to Upper Pebble Creek, there is a higher potential for the project to affect Lower Pebble Creek than Upper Pebble Creek. Lower Pebble Creek has the highest quality habitats, biologically most diverse reaches, highest quality substrate, macroinvertebrate and fishery quality in the Pebble Creek watershed. This is an important finding since all direct and indirect short- and long-term impacts associated with the project would affect the highest quality habitats and biologically most diverse reaches of the Pebble Creek watershed, specifically Lower Pebble Creek

Whereas, The Pebble Creek West and Far West Alternatives would be routed through part of the primary environmental corridor associated with Pebble Creek. The Pebble Creek West Alternative would acquire 15.1 acres of primary environmental corridor north and south of Sunset Drive. The Pebble Creek Far West Alternative would acquire 15.9 acres of primary environmental corridor north and south of Sunset Drive. The Sunset-to-County X Alternative also would acquire 7.8 acres of primary environmental corridor associated with Pebble Creek along Sunset Drive

Whereas, The Build Alternative north of the Wisconsin & Southern Railroad would affect 17 individual wetlands, totaling 5.59 acres, of the 32 wetlands evaluated during the wetland study. South of the railroad, the Pebble Creek West Alternative would affect 9 wetlands totaling 8.43 acres, the Pebble Creek Far West Alternative would affect 9 wetlands totaling 5.73 acres, and the Sunset-to-County X Alternative would affect 5 wetlands totaling 6.49 acres. Impacts to ADID wetlands would be 4.23 acres north of the railroad, 8.02 acres under the Pebble Creek West Alternative, 5.25 acres under the Pebble Creek Far West Alternative, and 6.02 acres under the Sunset-to-County X Alternative

Whereas, the Environmental Impact Statement describes the Upland Habitat Impacts South of the Wisconsin & Southern Railroad as follows:

- the Pebble Creek West Alternative would affect about 12 acres of uplands and

- the Pebble Creek Far West Alternative about 16 acres and
- The Sunset-to-County X Alternative would affect 2 acres of upland habitat

Because the Pebble Creek West and Pebble Creek Far West Alternatives would be on new alignment north and south of Sunset Drive, several upland areas would be severed. Most of the impact would be to U-18 (NW), a mature oak woodland between Sunset Drive and the end of Hawthorne Hollow Drive, which contains 80 percent dominant native species. U-18 (NW), which would be affected by the Pebble Creek Far West Alternative (10 acres) and to a lesser extent by the Pebble Creek West Alternative (6 acres) consists of 80 percent dominant native plant species, and is thus a relatively intact upland given the disturbances to uplands throughout the project area. Severing U-18 (NW) not only would have wildlife habitat impacts, it also would create more forest edge environment and increase the likelihood that invasive/nuisance plant species will gain a footing in the soil.

The Sunset-to-County X Alternative would affect 2 acres of upland habitat south of the Wisconsin & Southern Railroad. Most of the impacts are small areas along Sunset Drive that are not wetland, that range from 25 to 33 percent dominant native species. A small upland (0.12 acre) that would be affected contains 80 percent dominant native species. Impacts would occur on the edge of upland U-18 (NW).

Whereas, the Environmental Impact Statement describes Habitat Loss/Wildlife Impacts
The No-Build Alternative would not cause the additional loss of wildlife habitat, but vehicle-animal collisions would likely increase as traffic volumes increase. This would also happen under the Build Alternative, especially in the Pebble Creek corridor between the Wisconsin & Southern Railroad and WIS 59. The remaining alternative north of the Wisconsin & Southern Railroad would cause the conversion of 9.3 acres of wildlife habitat to roadway use. Of the wildlife habitat converted, 2.6 acres would be Class 1, 4.3 acres would be Class 2, and 2.4 acres would be Class 3.
South of the Wisconsin & Southern Railroad, the Pebble Creek West alternative would cause the conversion of 16.8 acres of wildlife habitat to roadway use. Of the wildlife habitat converted, 9.6 acres would be Class 1 habitat and 7.2 acres would be Class 2. The Pebble Creek Far West alternative would cause the conversion of 20 acres of wildlife habitat to roadway use. Of the wildlife habitat converted, 9.4 acres would be Class 1 and 10.6 acres would be Class 2. The Sunset-to-County X alternative would cause the conversion of 6.1 acres of wildlife habitat to roadway use. Of the wildlife habitat converted, 5.1 acres would be Class 1 and 1 acre would be Class 2

Whereas, The Environmental Impact Statement draft states the impact on the fen present in Wetland 8 south of Sunset Drive. The Pebble Creek West Alternative would fill 0.32 acre of the 1-acre Wetland 8 just south of Sunset Drive. The Sunset-to-County X Alternative and the Pebble Creek Far West Alternative would not place fill into Wetland 8. Both Pebble Creek Alternatives would affect upland that is upslope (west) of Wetland 8

Whereas the Environmental Impact Statement draft documents under section 3.4.10 Conclusions "The project would have a cumulative effect on wetlands... Fens impacted as part of the project would likely not be effectively mitigated therefore the cumulative effects study area would have fewer acres of this type of wetland." And that, "The Waukesha Bypass would contribute to a cumulative impact on water quality in the Pebble Creek watershed. The Pebble Creek watershed is at the threshold of impervious area and urbanization at which studies suggest water quality will be greatly diminished.

Whereas, the loss of naturally vegetated floodplains may aggravate the flood hazard through loss of their ability to slow floodwaters and reduce flood velocities and peaks
all of the floodplain impact would occur in the south end of the project, between the Wisconsin & Southern railroad and WIS 59.

Whereas, The Pebble Creek Far West Alternative which joins the Pebble Creek West Alternative at Hawthorne Hollow Drive cul-de-sac, shares most of the characteristics of the Pebble Creek West Alternative. The distinguishing differences between the two alternatives are impacts to wetlands and potential impacts to groundwater. The Pebble Creek Far West Alternative has 5.7 acres of wetland impacts as compared to 8.4 acres with the Pebble Creek West Alternative. Being located higher on the slope than the Pebble Creek West Alternative, the Pebble Creek Far West Alternative would require an approximately 32-foot cut immediately SOUTH of Sunset Drive. A cut of that depth has the potential to interrupt the groundwater that follows east toward the Pebble Creek wetland complex.
and the Wisconsin & Southern Railroad.

Whereas, The Pebble Creek Far West Route would require a substantial cut, up to 32 feet deep and extending upslope for 300 feet. Large retaining walls would be required with this alternative to maintain the integrity of the cut slope.

Whereas the Environmental Impact Statement identifies that "there would be a degradation in the quality of the Pebble Creek wetland if the project is built" and that "The primary indirect effect of the project would be from runoff that would degrade water quality, no matter what mitigation measures are put in place."

Whereas, The expert panel expressed concern about runoff from the roadway adversely affecting Pebble Creek's Class II brook and brown trout, as well as a warmwater fishery where longear sunfish (State threatened species) are documented to exist... Runoff from the new roadway would contain pollutants that would be carried into adjacent wetland, and potentially Pebble Creek

Whereas, The Sunset-to-County X Alternative would create 9 acres of impervious area south of the Wisconsin & Southern Railroad, compared to 13 acres of impervious area for both the remaining Pebble Creek Alternatives. Therefore, pollutants in the associated run-off would be greater under either of the Pebble Creek Alternatives compared to the Sunset-to-County X Alternative. In addition, the estimated 4 acres of less impervious area needed to construct the Sunset-to County X Alternative, compared to the other alternatives, would also provide an additional 4 acres of local groundwater recharge that would promote infiltration and reduce stormwater runoff, both of which are important for the long-term protection of Pebble Creek.

Now therefore be it resolved that the Town of Waukesha Town Board on the 5th day of December 2012 does hereby **NOT** support the planning and construction of the road project known as the "West Waukesha Bypass", "County TT I-94 to Wis. 59 project ID.2788-01-00 and does so by describing the preferred selected route for each segment as listed below:

- I-94 to Summit Avenue segment
    - 4-Lane current road alignment

- Summit Avenue to Wisconsin & Southern Railroad
    - 4-Lane Off-Alignment
- Wisconsin & Southern Railroad to WIS 59
    - 4-Lane Pebble Creek Far West

Be it further resolved that the Town Board hereby directs the Town of Waukesha Clerk-Treasurer to provide a copy of this resolution to all interested parties listed under Section 6 of the Environmental Impact Statement draft with the express exclusion of the CSS Advisory Group and the Public Libraries. In addition to the aforementioned list the following parties shall also be sent a copy.

- Walter Kolb, County Supervisor
- Allison Bussler, Waukesha County, Director of Public Works
- Gary Evans, Waukesha County, Highway Engineering Manager
- A Certified Letter containing the Resolution shall be sent to Gary Evans prior to December 10, 2012 for inclusion in the Official Record to:

Gary Evans
Waukesha Co. Engineering Services Manager
515 West Moreland Blvd.
Waukesha WI 53188

Adopted this 5th day of December, 2012.

TOWN OF WAUKESHA

By:_____
Angie E. Van Scyoc, Town Chairman

By:_____
Joe Banske, Town Supervisor 1

By:_____
Everett E. German, Town Supervisor 2

By: Mike Laska
Mike Laska, Town Supervisor 3

By:_____
Brian Tom Fischer, Town Supervisor 4

ATTEST:
Jamie Salentine
Jamie Salentine, Town of Waukesha Clerk/Treasurer

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STATE OF WISCONSIN TOWN OF WAUKESHA WAUKESHA COUNTY

RESOLUTION #06-15-11B

RESOLUTION

The Town Board of the Town of Waukesha, Waukesha County, Wisconsin

HEREBY RESOLVES:

1. That this resolution is adopted to clarify the Waukesha Town Board's position with respect to the Memorandum of Understanding pertaining to the West Waukesha Bypass ("Bypass Resolution") dated April 6, 2009 and attached to this resolution.

2. That the Town Board has caused its records to be searched and it has determined that there is an absence of any record wherein the Town Board of Waukesha in the past engaged in any discussion about the Bypass Resolution.

3. That the Town Board has caused its records to be searched and it has determined that there is an absence of any record wherein the Town Board of Waukesha in the past extended any authorization to any agent to sign the Bypass Resolution on its behalf or that of the Town pursuant to Wis. Stats. 60.24.

4. That the Town Board seeks to go on record with respect to the Bypass Resolution because all of the routes that have been proposed to date will have varying degrees of adverse impacts on the citizens and property owners of the Town of Waukesha as well as the quality of life in the Town.

5. That the Town Board wishes to acknowledge that it has been granted a belated opportunity to join discussions concerning certain impacts that the potential routing and implementation of the construction of the West Waukesha Bypass may have.

6. That by taking part in the discussions referenced in paragraph 5, above, the Town Board of Waukesha has not and does not consent to any potential route, the ultimate construction of the West Waukesha Bypass at any location or commit to any financial or other obligation in any respect.

7. That the Town Board wishes to continue to engage in a co-operative and positive fashion in the current on-going discussions as stated in paragraph 5, above, while reserving the right to consider and take a position on all issues relating to the West Waukesha Bypass after it is satisfied that it is informed sufficiently to take a position in the best interests of its citizens regarding such matters.

8. That the Town Board hereby directs its Clerk-Treasurer to provide a copy of this resolution to all the parties engaged in the discussion referenced in paragraph 5, above.

This Resolution was passed and adopted by the Town of Waukesha Town Board this 15th day of June, 2011 by a vote of 5 ayes and 0 nays.

APPROVED
TOWN OF WAUKESHA

By: _____
Angie E. Van Scyoc, Town Chairman

By: _____
Joe Banske, Supervisor 1

By: _____
Everett E. German, Supervisor 2

By: Mike Laska
Mike Laska, Supervisor 3

By: Brian Tom Fischer
Brian Fischer, Supervisor 4

ATTEST

Jamie Salentine
Jamie Salentine, Town Clerk/Treasurer

STATE OF WISCONSIN WAUKESHA COUNTY TOWN OF WAUKESHA

RESOLUTION NO. 12-05-2012B

Resolution Regarding the "West Waukesha Bypass", "County TT I-94 to Wis. 59
Project ID. 2788-01-00

Whereas, In 1951, Waukesha County first proposed a new north-south arterial roadway bypass on Waukesha's west side.

Whereas, The Town of Waukesha Board of Supervisors passed by unanimous vote Resolution #06-15-11B, which a copy of is hereby attached to this resolution, notifying all parties that the Memorandum of Understanding for the project was not duly executed by an authorized agent of the Town of Waukesha pursuant to Wis. Stat.§60.24 and that the Town of Waukesha Board of Supervisors wished to go on record because all proposed routes have varying degrees of adverse impacts on the citizens and property owners of the Town of Waukesha as well as the quality of life in the town.

Whereas, the Environmental Impact Statement draft describes The Build Alternatives cost to be between $53 million and $55 million (2011 dollars) ($60 to $62 million in 2015/2016 dollars, the anticipated years of construction) to construct, including real estate acquisition, engineering, construction, construction management, and mitigation costs.

Whereas the Purpose of and need for the project known as the "West Waukesha Bypass", "County TT I-94 to Wis. 59 project ID.2788-01-00 is stated in the "Environmental Impact Statement" draft currently open for public comment through December 10, 2012 as;

Purpose of and Need for the Project

The purpose of the West Waukesha Bypass is to provide a safe and efficient north-south arterial roadway on the west side of the City of Waukesha to complete the long-planned circumferential route around Waukesha; to accommodate growing traffic volumes along the corridor; and to improve roadway deficiencies that include tight curves, steep hills, narrow lanes, and lack of shoulders. The proposed improvements address two major needs:

- Improve safety by providing a roadway that meets current design standards.
- Accommodate traffic demand generated by existing and planned development within and outside the study corridor.

Whereas, The 4-Lane Alternative would address the lack of shoulders, steep hills and tight curves on County TT and improve the capacity of intersections on County TT. It would meet all elements of the project's purpose and need by accomplishing the following:

- Provide a safe and efficient north-south arterial roadway on the west side of the City of Waukesha to complete the long-planned circumferential route around Waukesha consistent with City of Waukesha, Waukesha County and SEWRPC transportation plans. The 4-Lane Alternative would meet this criterion by providing the 4-lane roadway called for in local and regional transportation plans.
- Accommodate growing traffic volumes along the corridor. Under the 4-Lane Alternative, County TT would operate at level of service C north of Summit Avenue and B south of Summit Avenue during the design year peak hour. Unsignalized intersections at

Fiddlers Creek Drive, Kisdon Hill Court, Kame Terrace, MacArthur Road and Green Lane would operate at level of service B or C. Average delays on these roads would be about 15 to 25 seconds.

- Improve safety by decreasing crashes. The 4-Lane Alternative would improve safety by adding a median and protect left-turn lanes in the median. A study by the Transportation Research Board found that converting a 2-lane undivided roadway to a 4-lane divided roadway would on average decrease crashes 40 to 60 percent (Council and Stewart, Transportation Research Record 1665, Paper No. 99-0327).
- Improve roadway deficiencies that include tight curves, steep hills, narrow lanes, and lack of shoulders. The 4-Lane Alternative would address roadway deficiencies and meet desirable design standards.

Whereas, the Environmental Impact Statement draft identifies the project into segments known as;

- I-94 to Summit Avenue
- Summit Avenue to Wisconsin & Southern Railroad
- Wisconsin & Southern Railroad to WIS 59

Whereas, the Environmental Impact Statement draft identifies in TABLE 2-3 the Build Alternatives Still under Consideration as:

- I-94 to Summit Avenue segment
    - 4-Lane current road alignment
- Summit Avenue to Wisconsin & Southern Railroad
    - 4-Lane Off-Alignment
- Wisconsin & Southern Railroad to WIS 59
    - 4-Lane Pebble Creek Far West
    - 4-Lane Pebble Creek West
    - 4-Lane Sunset-to-County X

Whereas, the Environmental Impact Statement draft identifies the project also maintains a "NO BUILD" alternative, but does not reflect a "NO BUILD- IMPROVE" alternative

Whereas, According to the Code of Federal Regulations (CFR), indirect effects are defined as being "caused by the action and are occurring later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems" (40 CFR 1508.8).

Whereas, Case law has defined reasonably foreseeable as "meaning that the impact is sufficiently likely to occur that a person of ordinary prudence would take it into account in making a decision" (Sierra Club v. Marsh, 976 F. 2d (1st Cir. 1992)).

Whereas, The National Cooperative Highway Research Program (NCHRP) Report 466: Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects provides three broad categories of indirect effects (NCHRP 2002):

- Alteration of the behavior and functioning of the affected environment caused by project

encroachment (physical, chemical, biological) on the environment

- Project-influenced development effects (e.g., the land use effect)
- Effects related to project-influenced development effects (i.e., effects of the change in land use on the human and natural environment)

Whereas, the Pebble Creek West and Pebble Creek Far West Alternatives, convert the land use of roughly 29 acres of land between the railroad tracks and the WIS 59/County X intersection from primarily open space to highway right-of-way. This section of the bypass is on new alignment and would acquire residential and agricultural land as well as wetlands. The Pebble Creek Alternative would not be expected to spur new development to the east of the roadway because of a wide swath of wetlands west of Pebble Creek and the Waukesha County greenway east of the Creek. No new development is expected west of the roadway, because the existing development would prevent access to Merrill Hills Road. In addition, no access would be allowed to the highway between Sunset Drive and WIS 59

Whereas, Sunset-to-County X Alternative. Under the Sunset-to-County X Alternative, 21 acres of land between the railroad tracks and the WIS 59/County X intersection would be converted to highway right-of-way. Between the railroad crossing and Sunset Drive, the proposed bypass alignment would be on new alignment and acquire right-of-way from agricultural land. Along Sunset Drive and County X the right-of-way acquired would consist of strips of land adjacent to existing right-of-way. Land acquired would consist of residential, commercial, and industrial land along with public open space that contains wetlands.

Whereas, Section 3.3.4 of the Environmental Impact Statement identifies that The West Waukesha Bypass would not have a big impact on development patterns on the west side of the Town of Waukesha. Under the Sunset-to-County X Alternative, commercial development could be stimulated on County X south of Sunset Drive, in an area currently developed as residential. Commercial uses along Sunset Drive west of County X in the project corridor could also develop.

Whereas, The Town of Waukesha felt that the Sunset-to-County X Alternative would have a beneficial indirect impact on commercial development on Sunset Drive and County X

Whereas, the Environmental Impact Statement draft states a Walgreens store has been proposed in the southwest quadrant of the Sunset Drive/County X intersection and does not inform the reader that this project was denied by the Town of Waukesha for a necessary Certified Survey Map and subsequent zoning changes and that the Town Board for the Town of Waukesha sent written correspondence to the County requesting all changes on this parcel be delayed.

Whereas, The group thought that if the Pebble Creek Alternative was selected for the bypass route, it would decrease traffic at the Sunset/County X intersection and would not enhance economic development potential for the Town at that intersection

Whereas, The Pebble Creek Alternative that straddles the transition between upland and wetland would degrade the ability of the Pebble Creek corridor to support threatened and endangered turtle and snake habitat. Conversely, Sunset Drive already exists, that habitat

has already been severed. In effect, the damage has already been done. The Sunset-toCounty X alternative for the Waukesha Bypass was not specifically addressed in the plan, but is wholly consistent with the plan according to Tom Slawski/SEWRPC, the Pebble Creek Watershed Protection Plan's main author and expert panel participant.

Whereas,The Pebble Creek Alternatives, which would lie on the west edge of the Pebble Creek corridor between the Wisconsin & Southern Railroad and WIS 59, would decrease the habitat value of the corridor by limiting the connection between upland and wetland for those species that travel back and forth from wetland to upland.

Whereas, The wetland impact is 5.6 acres associated with the improvements north of the Wisconsin & Southern Railroad, 8.4 acres under the Pebble Creek West Alternative, 5.7 acres under the Pebble Creek Far West Alternative and 6.5 acres under the Sunset-to-County X Alternative.

Whereas, The impacts of the Build Alternatives on Upper and Lower Pebble creeks generally are related to the potential for increased sedimentation, reduced infiltration, increased run-off volumes and peak flows, siltation, and suspended solids loads associated with construction and operation of the proposed roadway. Because there would be more construction adjacent to Lower Pebble Creek and its adjacent wetlands than to Upper Pebble Creek, there is a higher potential for the project to affect Lower Pebble Creek than Upper Pebble Creek. Lower Pebble Creek has the highest quality habitats, biologically most diverse reaches, highest quality substrate, macroinvertebrate and fishery quality in the Pebble Creek watershed. This is an important finding since all direct and indirect short- and long-term impacts associated with the project would affect the highest quality habitats and biologically most diverse reaches of the Pebble Creek watershed, specifically Lower Pebble Creek

Whereas, The Pebble Creek West and Far West Alternatives would be routed through part of the primary environmental corridor associated with Pebble Creek. The Pebble Creek West Alternative would acquire 15.1 acres of primary environmental corridor north and south of Sunset Drive. The Pebble Creek Far West Alternative would acquire 15.9 acres of primary environmental corridor north and south of Sunset Drive. The Sunset-to-County X Alternative also would acquire 7.8 acres of primary environmental corridor associated with Pebble Creek along Sunset Drive

Whereas, The Build Alternative north of the Wisconsin & Southern Railroad would affect 17 individual wetlands, totaling 5.59 acres, of the 32 wetlands evaluated during the wetland study. South of the railroad, the Pebble Creek West Alternative would affect 9 wetlands totaling 8.43 acres, the Pebble Creek Far West Alternative would affect 9 wetlands totaling 5.73 acres, and the Sunset-to-County X Alternative would affect 5 wetlands totaling 6.49 acres. Impacts to ADID wetlands would be 4.23 acres north of the railroad, 8.02 acres under the Pebble Creek West Alternative, 5.25 acres under the Pebble Creek Far West Alternative, and 6.02 acres under the Sunset-to-County X Alternative

Whereas, the Environmental Impact Statement describes the Upland Habitat Impacts South of the Wisconsin & Southern Railroad as follows:

- the Pebble Creek West Alternative would affect about 12 acres of uplands and

- the Pebble Creek Far West Alternative about 16 acres and
- The Sunset-to-County X Alternative would affect 2 acres of upland habitat

Because the Pebble Creek West and Pebble Creek Far West Alternatives would be on new alignment north and south of Sunset Drive, several upland areas would be severed. Most of the impact would be to U-18 (NW), a mature oak woodland between Sunset Drive and the end of Hawthorne Hollow Drive, which contains 80 percent dominant native species. U-18 (NW), which would be affected by the Pebble Creek Far West Alternative (10 acres) and to a lesser extent by the Pebble Creek West Alternative (6 acres) consists of 80 percent dominant native plant species, and is thus a relatively intact upland given the disturbances to uplands throughout the project area. Severing U-18 (NW) not only would have wildlife habitat impacts, it also would create more forest edge environment and increase the likelihood that invasive/nuisance plant species will gain a footing in the soil.

The Sunset-to-County X Alternative would affect 2 acres of upland habitat south of the Wisconsin & Southern Railroad. Most of the impacts are small areas along Sunset Drive that are not wetland, that range from 25 to 33 percent dominant native species. A small upland (0.12 acre) that would be affected contains 80 percent dominant native species. Impacts would occur on the edge of upland U-18 (NW).

Whereas, the Environmental Impact Statement describes Habitat Loss/Wildlife Impacts
The No-Build Alternative would not cause the additional loss of wildlife habitat, but vehicle-animal collisions would likely increase as traffic volumes increase. This would also happen under the Build Alternative, especially in the Pebble Creek corridor between the Wisconsin & Southern Railroad and WIS 59. The remaining alternative north of the Wisconsin & Southern Railroad would cause the conversion of 9.3 acres of wildlife habitat to roadway use. Of the wildlife habitat converted, 2.6 acres would be Class 1, 4.3 acres would be Class 2, and 2.4 acres would be Class 3.
South of the Wisconsin & Southern Railroad, the Pebble Creek West alternative would cause the conversion of 16.8 acres of wildlife habitat to roadway use. Of the wildlife habitat converted, 9.6 acres would be Class 1 habitat and 7.2 acres would be Class 2. The Pebble Creek Far West alternative would cause the conversion of 20 acres of wildlife habitat to roadway use. Of the wildlife habitat converted, 9.4 acres would be Class 1 and 10.6 acres would be Class 2. The Sunset-to-County X alternative would cause the conversion of 6.1 acres of wildlife habitat to roadway use. Of the wildlife habitat converted, 5.1 acres would be Class 1 and 1 acre would be Class 2

Whereas, The Environmental Impact Statement draft states the impact on the fen present in Wetland 8 south of Sunset Drive. The Pebble Creek West Alternative would fill 0.32 acre of the 1-acre Wetland 8 just south of Sunset Drive. The Sunset-to-County X Alternative and the Pebble Creek Far West Alternative would not place fill into Wetland 8. Both Pebble Creek Alternatives would affect upland that is upslope (west) of Wetland 8

Whereas the Environmental Impact Statement draft documents under section 3.4.10 Conclusions "The project would have a cumulative effect on wetlands... Fens impacted as part of the project would likely not be effectively mitigated therefore the cumulative effects study area would have fewer acres of this type of wetland." And that, "The Waukesha Bypass would contribute to a cumulative impact on water quality in the Pebble Creek watershed. The Pebble Creek watershed is at the threshold of impervious area and urbanization at which studies suggest water quality will be greatly diminished.

Whereas, the loss of naturally vegetated floodplains may aggravate the flood hazard through loss of their ability to slow floodwaters and reduce flood velocities and peaks
all of the floodplain impact would occur in the south end of the project, between the Wisconsin & Southern railroad and WIS 59.

Whereas, The Pebble Creek Far West Alternative which joins the Pebble Creek West Alternative at Hawthorne Hollow Drive cul-de-sac, shares most of the characteristics of the Pebble Creek West Alternative. The distinguishing differences between the two alternatives are impacts to wetlands and potential impacts to groundwater. The Pebble Creek Far West Alternative has 5.7 acres of wetland impacts as compared to 8.4 acres with the Pebble Creek West Alternative. Being located higher on the slope than the Pebble Creek West Alternative, the Pebble Creek Far West Alternative would require an approximately 32-foot cut immediately SOUTH of Sunset Drive. A cut of that depth has the potential to interrupt the groundwater that follows east toward the Pebble Creek wetland complex.
and the Wisconsin & Southern Railroad.

Whereas, The Pebble Creek Far West Route would require a substantial cut, up to 32 feet deep and extending upslope for 300 feet. Large retaining walls would be required with this alternative to maintain the integrity of the cut slope.

Whereas the Environmental Impact Statement identifies that "there would be a degradation in the quality of the Pebble Creek wetland if the project is built" and that "The primary indirect effect of the project would be from runoff that would degrade water quality, no matter what mitigation measures are put in place."

Whereas, The expert panel expressed concern about runoff from the roadway adversely affecting Pebble Creek's Class II brook and brown trout, as well as a warmwater fishery where longear sunfish (State threatened species) are documented to exist... Runoff from the new roadway would contain pollutants that would be carried into adjacent wetland, and potentially Pebble Creek

Whereas, The Sunset-to-County X Alternative would create 9 acres of impervious area south of the Wisconsin & Southern Railroad, compared to 13 acres of impervious area for both the remaining Pebble Creek Alternatives. Therefore, pollutants in the associated run-off would be greater under either of the Pebble Creek Alternatives compared to the Sunset-to-County X Alternative. In addition, the estimated 4 acres of less impervious area needed to construct the Sunset-to County X Alternative, compared to the other alternatives, would also provide an additional 4 acres of local groundwater recharge that would promote infiltration and reduce stormwater runoff, both of which are important for the long-term protection of Pebble Creek.

Now therefore be it resolved that the Town of Waukesha Town Board on the 5th day of December 2012 does hereby **NOT** support the planning and construction of the road project known as the "West Waukesha Bypass", "County TT I-94 to Wis. 59 project ID.2788-01-00 and does so by describing the preferred selected route for each segment as listed below:

- I-94 to Summit Avenue segment
    - 4-Lane current road alignment

- Summit Avenue to Wisconsin & Southern Railroad
    - 4-Lane Off-Alignment
- Wisconsin & Southern Railroad to WIS 59
    - 4-Lane Pebble Creek West

Be it further resolved that the Town Board hereby directs the Town of Waukesha Clerk-Treasurer to provide a copy of this resolution to all interested parties listed under Section 6 of the Environmental Impact Statement draft with the express exclusion of the CSS Advisory Group and the Public Libraries. In addition to the aforementioned list the following parties shall also be sent a copy.

- Walter Kolb, County Supervisor
- Allison Bussler, Waukesha County, Director of Public Works
- Gary Evans, Waukesha County, Highway Engineering Manager
- A Certified Letter containing the Resolution shall be sent to Gary Evans prior to December 10, 2012 for inclusion in the Official Record to:

  Gary Evans
  Waukesha Co. Engineering Services Manager
  515 West Moreland Blvd.
  Waukesha WI 53188

Adopted this 5th day of December, 2012.

TOWN OF WAUKESHA

By:_____
Angie E. Van Scyoc, Town Chairman

By:_____
Joe Banske, Town Supervisor 1

By:_____
Everett E. German, Town Supervisor 2

By: Mike Laska
Mike Laska, Town Supervisor 3

By:_____
Brian Tom Fischer, Town Supervisor 4

ATTEST:
Jamie Salentine
Jamie Salentine, Town of Waukesha Clerk/Treasurer

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STATE OF WISCONSIN TOWN OF WAUKESHA WAUKESHA COUNTY

RESOLUTION #06-15-11B

RESOLUTION

The Town Board of the Town of Waukesha, Waukesha County, Wisconsin

HEREBY RESOLVES:

1. That this resolution is adopted to clarify the Waukesha Town Board's position with respect to the Memorandum of Understanding pertaining to the West Waukesha Bypass ("Bypass Resolution") dated April 6, 2009 and attached to this resolution.

2. That the Town Board has caused its records to be searched and it has determined that there is an absence of any record wherein the Town Board of Waukesha in the past engaged in any discussion about the Bypass Resolution.

3. That the Town Board has caused its records to be searched and it has determined that there is an absence of any record wherein the Town Board of Waukesha in the past extended any authorization to any agent to sign the Bypass Resolution on its behalf or that of the Town pursuant to Wis. Stats. 60.24.

4. That the Town Board seeks to go on record with respect to the Bypass Resolution because all of the routes that have been proposed to date will have varying degrees of adverse impacts on the citizens and property owners of the Town of Waukesha as well as the quality of life in the Town.

5. That the Town Board wishes to acknowledge that it has been granted a belated opportunity to join discussions concerning certain impacts that the potential routing and implementation of the construction of the West Waukesha Bypass may have.

6. That by taking part in the discussions referenced in paragraph 5, above, the Town Board of Waukesha has not and does not consent to any potential route, the ultimate construction of the West Waukesha Bypass at any location or commit to any financial or other obligation in any respect.

7. That the Town Board wishes to continue to engage in a co-operative and positive fashion in the current on-going discussions as stated in paragraph 5, above, while reserving the right to consider and take a position on all issues relating to the West Waukesha Bypass after it is satisfied that it is informed sufficiently to take a position in the best interests of its citizens regarding such matters.

8. That the Town Board hereby directs its Clerk-Treasurer to provide a copy of this resolution to all the parties engaged in the discussion referenced in paragraph 5, above.

This Resolution was passed and adopted by the Town of Waukesha Town Board this 15th day of June, 2011 by a vote of 5 ayes and 0 nays.

APPROVED
TOWN OF WAUKESHA

By: _____
Angie E. Van Scyoc, Town Chairman

By: _____
Joe Banske, Supervisor 1

By: _____
Everett E. German, Supervisor 2

By: Mike Laska
Mike Laska, Supervisor 3

By: Brian Tom Fischer
Brian Fischer, Supervisor 4

ATTEST

Jamie Salentine
Jamie Salentine, Town Clerk/Treasurer

STATE OF WISCONSIN WAUKESHA COUNTY TOWN OF WAUKESHA

RESOLUTION NO. 12-05-2012C

Resolution Regarding the "West Waukesha Bypass", "County TT I-94 to Wis. 59
Project ID. 2788-01-00

Whereas, In 1951, Waukesha County first proposed a new north-south arterial roadway bypass on Waukesha's west side.

Whereas, The Town of Waukesha Board of Supervisors passed by unanimous vote Resolution #06-15-11B, which a copy of is hereby attached to this resolution, notifying all parties that the Memorandum of Understanding for the project was not duly executed by an authorized agent of the Town of Waukesha pursuant to Wis. Stat.§60.24 and that the Town of Waukesha Board of Supervisors wished to go on record because all proposed routes have varying degrees of adverse impacts on the citizens and property owners of the Town of Waukesha as well as the quality of life in the town.

Whereas, the Environmental Impact Statement draft describes The Build Alternatives cost to be between $53 million and $55 million (2011 dollars) ($60 to $62 million in 2015/2016 dollars, the anticipated years of construction) to construct, including real estate acquisition, engineering, construction, construction management, and mitigation costs.

Whereas the Purpose of and need for the project known as the "West Waukesha Bypass", "County TT I-94 to Wis. 59 project ID.2788-01-00 is stated in the "Environmental Impact Statement" draft currently open for public comment through December 10, 2012 as;

Purpose of and Need for the Project

The purpose of the West Waukesha Bypass is to provide a safe and efficient north-south arterial roadway on the west side of the City of Waukesha to complete the long-planned circumferential route around Waukesha; to accommodate growing traffic volumes along the corridor; and to improve roadway deficiencies that include tight curves, steep hills, narrow lanes, and lack of shoulders. The proposed improvements address two major needs:

- Improve safety by providing a roadway that meets current design standards.
- Accommodate traffic demand generated by existing and planned development within and outside the study corridor.

Whereas, The 4-Lane Alternative would address the lack of shoulders, steep hills and tight curves on County TT and improve the capacity of intersections on County TT. It would meet all elements of the project's purpose and need by accomplishing the following:

- Provide a safe and efficient north-south arterial roadway on the west side of the City of Waukesha to complete the long-planned circumferential route around Waukesha consistent with City of Waukesha, Waukesha County and SEWRPC transportation plans. The 4-Lane Alternative would meet this criterion by providing the 4-lane roadway called for in local and regional transportation plans.
- Accommodate growing traffic volumes along the corridor. Under the 4-Lane Alternative, County TT would operate at level of service C north of Summit Avenue and B south of Summit Avenue during the design year peak hour. Unsignalized intersections at

Fiddlers Creek Drive, Kisdon Hill Court, Kame Terrace, MacArthur Road and Green Lane would operate at level of service B or C. Average delays on these roads would be about 15 to 25 seconds.

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- Improve roadway deficiencies that include tight curves, steep hills, narrow lanes, and lack of shoulders. The 4-Lane Alternative would address roadway deficiencies and meet desirable design standards.

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- I-94 to Summit Avenue
- Summit Avenue to Wisconsin & Southern Railroad
- Wisconsin & Southern Railroad to WIS 59

Whereas, the Environmental Impact Statement draft identifies in TABLE 2-3 the Build Alternatives Still under Consideration as:

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    - 4-Lane Off-Alignment
- Wisconsin & Southern Railroad to WIS 59
    - 4-Lane Pebble Creek Far West
    - 4-Lane Pebble Creek West
    - 4-Lane Sunset-to-County X

Whereas, the Environmental Impact Statement draft identifies the project also maintains a "NO BUILD" alternative, but does not reflect a "NO BUILD- IMPROVE" alternative

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- Alteration of the behavior and functioning of the affected environment caused by project

encroachment (physical, chemical, biological) on the environment

- Project-influenced development effects (e.g., the land use effect)
- Effects related to project-influenced development effects (i.e., effects of the change in land use on the human and natural environment)

Whereas, the Pebble Creek West and Pebble Creek Far West Alternatives, convert the land use of roughly 29 acres of land between the railroad tracks and the WIS 59/County X intersection from primarily open space to highway right-of-way. This section of the bypass is on new alignment and would acquire residential and agricultural land as well as wetlands. The Pebble Creek Alternative would not be expected to spur new development to the east of the roadway because of a wide swath of wetlands west of Pebble Creek and the Waukesha County greenway east of the Creek. No new development is expected west of the roadway, because the existing development would prevent access to Merrill Hills Road. In addition, no access would be allowed to the highway between Sunset Drive and WIS 59

Whereas, Sunset-to-County X Alternative. Under the Sunset-to-County X Alternative, 21 acres of land between the railroad tracks and the WIS 59/County X intersection would be converted to highway right-of-way. Between the railroad crossing and Sunset Drive, the proposed bypass alignment would be on new alignment and acquire right-of-way from agricultural land. Along Sunset Drive and County X the right-of-way acquired would consist of strips of land adjacent to existing right-of-way. Land acquired would consist of residential, commercial, and industrial land along with public open space that contains wetlands.

Whereas, Section 3.3.4 of the Environmental Impact Statement identifies that The West Waukesha Bypass would not have a big impact on development patterns on the west side of the Town of Waukesha. Under the Sunset-to-County X Alternative, commercial development could be stimulated on County X south of Sunset Drive, in an area currently developed as residential. Commercial uses along Sunset Drive west of County X in the project corridor could also develop.

Whereas, The Town of Waukesha felt that the Sunset-to-County X Alternative would have a beneficial indirect impact on commercial development on Sunset Drive and County X

Whereas, the Environmental Impact Statement draft states a Walgreens store has been proposed in the southwest quadrant of the Sunset Drive/County X intersection and does not inform the reader that this project was denied by the Town of Waukesha for a necessary Certified Survey Map and subsequent zoning changes and that the Town Board for the Town of Waukesha sent written correspondence to the County requesting all changes on this parcel be delayed.

Whereas, The group thought that if the Pebble Creek Alternative was selected for the bypass route, it would decrease traffic at the Sunset/County X intersection and would not enhance economic development potential for the Town at that intersection

Whereas, The Pebble Creek Alternative that straddles the transition between upland and wetland would degrade the ability of the Pebble Creek corridor to support threatened and endangered turtle and snake habitat. Conversely, Sunset Drive already exists, that habitat

has already been severed. In effect, the damage has already been done. The Sunset-toCounty X alternative for the Waukesha Bypass was not specifically addressed in the plan, but is wholly consistent with the plan according to Tom Slawski/SEWRPC, the Pebble Creek Watershed Protection Plan's main author and expert panel participant.

Whereas,The Pebble Creek Alternatives, which would lie on the west edge of the Pebble Creek corridor between the Wisconsin & Southern Railroad and WIS 59, would decrease the habitat value of the corridor by limiting the connection between upland and wetland for those species that travel back and forth from wetland to upland.

Whereas, The wetland impact is 5.6 acres associated with the improvements north of the Wisconsin & Southern Railroad, 8.4 acres under the Pebble Creek West Alternative, 5.7 acres under the Pebble Creek Far West Alternative and 6.5 acres under the Sunset-to-County X Alternative.

Whereas, The impacts of the Build Alternatives on Upper and Lower Pebble creeks generally are related to the potential for increased sedimentation, reduced infiltration, increased run-off volumes and peak flows, siltation, and suspended solids loads associated with construction and operation of the proposed roadway. Because there would be more construction adjacent to Lower Pebble Creek and its adjacent wetlands than to Upper Pebble Creek, there is a higher potential for the project to affect Lower Pebble Creek than Upper Pebble Creek. Lower Pebble Creek has the highest quality habitats, biologically most diverse reaches, highest quality substrate, macroinvertebrate and fishery quality in the Pebble Creek watershed. This is an important finding since all direct and indirect short- and long-term impacts associated with the project would affect the highest quality habitats and biologically most diverse reaches of the Pebble Creek watershed, specifically Lower Pebble Creek

Whereas, The Pebble Creek West and Far West Alternatives would be routed through part of the primary environmental corridor associated with Pebble Creek. The Pebble Creek West Alternative would acquire 15.1 acres of primary environmental corridor north and south of Sunset Drive. The Pebble Creek Far West Alternative would acquire 15.9 acres of primary environmental corridor north and south of Sunset Drive. The Sunset-to-County X Alternative also would acquire 7.8 acres of primary environmental corridor associated with Pebble Creek along Sunset Drive

Whereas, The Build Alternative north of the Wisconsin & Southern Railroad would affect 17 individual wetlands, totaling 5.59 acres, of the 32 wetlands evaluated during the wetland study. South of the railroad, the Pebble Creek West Alternative would affect 9 wetlands totaling 8.43 acres, the Pebble Creek Far West Alternative would affect 9 wetlands totaling 5.73 acres, and the Sunset-to-County X Alternative would affect 5 wetlands totaling 6.49 acres. Impacts to ADID wetlands would be 4.23 acres north of the railroad, 8.02 acres under the Pebble Creek West Alternative, 5.25 acres under the Pebble Creek Far West Alternative, and 6.02 acres under the Sunset-to-County X Alternative

Whereas, the Environmental Impact Statement describes the Upland Habitat Impacts South of the Wisconsin & Southern Railroad as follows:

- the Pebble Creek West Alternative would affect about 12 acres of uplands and

- the Pebble Creek Far West Alternative about 16 acres and
- The Sunset-to-County X Alternative would affect 2 acres of upland habitat

Because the Pebble Creek West and Pebble Creek Far West Alternatives would be on new alignment north and south of Sunset Drive, several upland areas would be severed. Most of the impact would be to U-18 (NW), a mature oak woodland between Sunset Drive and the end of Hawthorne Hollow Drive, which contains 80 percent dominant native species. U-18 (NW), which would be affected by the Pebble Creek Far West Alternative (10 acres) and to a lesser extent by the Pebble Creek West Alternative (6 acres) consists of 80 percent dominant native plant species, and is thus a relatively intact upland given the disturbances to uplands throughout the project area. Severing U-18 (NW) not only would have wildlife habitat impacts, it also would create more forest edge environment and increase the likelihood that invasive/nuisance plant species will gain a footing in the soil.

The Sunset-to-County X Alternative would affect 2 acres of upland habitat south of the Wisconsin & Southern Railroad. Most of the impacts are small areas along Sunset Drive that are not wetland, that range from 25 to 33 percent dominant native species. A small upland (0.12 acre) that would be affected contains 80 percent dominant native species. Impacts would occur on the edge of upland U-18 (NW).

Whereas, the Environmental Impact Statement describes Habitat Loss/Wildlife Impacts
The No-Build Alternative would not cause the additional loss of wildlife habitat, but vehicle-animal collisions would likely increase as traffic volumes increase. This would also happen under the Build Alternative, especially in the Pebble Creek corridor between the Wisconsin & Southern Railroad and WIS 59. The remaining alternative north of the Wisconsin & Southern Railroad would cause the conversion of 9.3 acres of wildlife habitat to roadway use. Of the wildlife habitat converted, 2.6 acres would be Class 1, 4.3 acres would be Class 2, and 2.4 acres would be Class 3.
South of the Wisconsin & Southern Railroad, the Pebble Creek West alternative would cause the conversion of 16.8 acres of wildlife habitat to roadway use. Of the wildlife habitat converted, 9.6 acres would be Class 1 habitat and 7.2 acres would be Class 2. The Pebble Creek Far West alternative would cause the conversion of 20 acres of wildlife habitat to roadway use. Of the wildlife habitat converted, 9.4 acres would be Class 1 and 10.6 acres would be Class 2. The Sunset-to-County X alternative would cause the conversion of 6.1 acres of wildlife habitat to roadway use. Of the wildlife habitat converted, 5.1 acres would be Class 1 and 1 acre would be Class 2

Whereas, The Environmental Impact Statement draft states the impact on the fen present in Wetland 8 south of Sunset Drive. The Pebble Creek West Alternative would fill 0.32 acre of the 1-acre Wetland 8 just south of Sunset Drive. The Sunset-to-County X Alternative and the Pebble Creek Far West Alternative would not place fill into Wetland 8. Both Pebble Creek Alternatives would affect upland that is upslope (west) of Wetland 8

Whereas the Environmental Impact Statement draft documents under section 3.4.10 Conclusions "The project would have a cumulative effect on wetlands... Fens impacted as part of the project would likely not be effectively mitigated therefore the cumulative effects study area would have fewer acres of this type of wetland." And that, "The Waukesha Bypass would contribute to a cumulative impact on water quality in the Pebble Creek watershed. The Pebble Creek watershed is at the threshold of impervious area and urbanization at which studies suggest water quality will be greatly diminished.

Whereas, the loss of naturally vegetated floodplains may aggravate the flood hazard through loss of their ability to slow floodwaters and reduce flood velocities and peaks
all of the floodplain impact would occur in the south end of the project, between the Wisconsin & Southern railroad and WIS 59.

Whereas, The Pebble Creek Far West Alternative which joins the Pebble Creek West Alternative at Hawthorne Hollow Drive cul-de-sac, shares most of the characteristics of the Pebble Creek West Alternative. The distinguishing differences between the two alternatives are impacts to wetlands and potential impacts to groundwater. The Pebble Creek Far West Alternative has 5.7 acres of wetland impacts as compared to 8.4 acres with the Pebble Creek West Alternative. Being located higher on the slope than the Pebble Creek West Alternative, the Pebble Creek Far West Alternative would require an approximately 32-foot cut immediately SOUTH of Sunset Drive. A cut of that depth has the potential to interrupt the groundwater that follows east toward the Pebble Creek wetland complex.
and the Wisconsin & Southern Railroad.

Whereas, The Pebble Creek Far West Route would require a substantial cut, up to 32 feet deep and extending upslope for 300 feet. Large retaining walls would be required with this alternative to maintain the integrity of the cut slope.

Whereas the Environmental Impact Statement identifies that "there would be a degradation in the quality of the Pebble Creek wetland if the project is built" and that "The primary indirect effect of the project would be from runoff that would degrade water quality, no matter what mitigation measures are put in place."

Whereas, The expert panel expressed concern about runoff from the roadway adversely affecting Pebble Creek's Class II brook and brown trout, as well as a warmwater fishery where longear sunfish (State threatened species) are documented to exist... Runoff from the new roadway would contain pollutants that would be carried into adjacent wetland, and potentially Pebble Creek

Whereas, The Sunset-to-County X Alternative would create 9 acres of impervious area south of the Wisconsin & Southern Railroad, compared to 13 acres of impervious area for both the remaining Pebble Creek Alternatives. Therefore, pollutants in the associated run-off would be greater under either of the Pebble Creek Alternatives compared to the Sunset-to-County X Alternative. In addition, the estimated 4 acres of less impervious area needed to construct the Sunset-to County X Alternative, compared to the other alternatives, would also provide an additional 4 acres of local groundwater recharge that would promote infiltration and reduce stormwater runoff, both of which are important for the long-term protection of Pebble Creek.

Now therefore be it resolved that the Town of Waukesha Town Board on the 5th day of December 2012 does hereby **NOT** support the planning and construction of the road project known as the "West Waukesha Bypass", "County TT I-94 to Wis. 59 project ID.2788-01-00 and does so by describing the preferred selected route for each segment as listed below:

- I-94 to Summit Avenue segment
    - 4-Lane current road alignment

- Summit Avenue to Wisconsin & Southern Railroad
    - 4-Lane Off-Alignment
- Wisconsin & Southern Railroad to WIS 59
    - 4-Lane Sunset-to-County X

Be it further resolved that the Town Board hereby directs the Town of Waukesha Clerk-Treasurer to provide a copy of this resolution to all interested parties listed under Section 6 of the Environmental Impact Statement draft with the express exclusion of the CSS Advisory Group and the Public Libraries. In addition to the aforementioned list the following parties shall also be sent a copy.

- Walter Kolb, County Supervisor
- Allison Bussler, Waukesha County, Director of Public Works
- Gary Evans, Waukesha County, Highway Engineering Manager
- A Certified Letter containing the Resolution shall be sent to Gary Evans prior to December 10, 2012 for inclusion in the Official Record to:

  Gary Evans
  Waukesha Co. Engineering Services Manager
  515 West Moreland Blvd.
  Waukesha WI 53188

Adopted this 5th day of December, 2012.

TOWN OF WAUKESHA

By:_____
Angie E. Van Scyoc, Town Chairman

By:_____
Joe Banske, Town Supervisor 1

By:_____
Everett E. German, Town Supervisor 2

By: Mike Laska
Mike Laska, Town Supervisor 3

By:_____
Brian Tom Fischer, Town Supervisor 4

ATTEST:
Jamie Salentine
Jamie Salentine, Town of Waukesha Clerk/Treasurer

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STATE OF WISCONSIN TOWN OF WAUKESHA WAUKESHA COUNTY

RESOLUTION #06-15-11B

RESOLUTION

The Town Board of the Town of Waukesha, Waukesha County, Wisconsin

HEREBY RESOLVES:

1. That this resolution is adopted to clarify the Waukesha Town Board's position with respect to the Memorandum of Understanding pertaining to the West Waukesha Bypass ("Bypass Resolution") dated April 6, 2009 and attached to this resolution.

2. That the Town Board has caused its records to be searched and it has determined that there is an absence of any record wherein the Town Board of Waukesha in the past engaged in any discussion about the Bypass Resolution.

3. That the Town Board has caused its records to be searched and it has determined that there is an absence of any record wherein the Town Board of Waukesha in the past extended any authorization to any agent to sign the Bypass Resolution on its behalf or that of the Town pursuant to Wis. Stats. 60.24.

4. That the Town Board seeks to go on record with respect to the Bypass Resolution because all of the routes that have been proposed to date will have varying degrees of adverse impacts on the citizens and property owners of the Town of Waukesha as well as the quality of life in the Town.

5. That the Town Board wishes to acknowledge that it has been granted a belated opportunity to join discussions concerning certain impacts that the potential routing and implementation of the construction of the West Waukesha Bypass may have.

6. That by taking part in the discussions referenced in paragraph 5, above, the Town Board of Waukesha has not and does not consent to any potential route, the ultimate construction of the West Waukesha Bypass at any location or commit to any financial or other obligation in any respect.

7. That the Town Board wishes to continue to engage in a co-operative and positive fashion in the current on-going discussions as stated in paragraph 5, above, while reserving the right to consider and take a position on all issues relating to the West Waukesha Bypass after it is satisfied that it is informed sufficiently to take a position in the best interests of its citizens regarding such matters.

8. That the Town Board hereby directs its Clerk-Treasurer to provide a copy of this resolution to all the parties engaged in the discussion referenced in paragraph 5, above.

This Resolution was passed and adopted by the Town of Waukesha Town Board this 15th day of June, 2011 by a vote of 5 ayes and 0 nays.

APPROVED
TOWN OF WAUKESHA

By: _____
Angie E. Van Scyoc, Town Chairman

By: _____
Joe Banske, Supervisor 1

By: _____
Everett E. German, Supervisor 2

By: Mike Laska
Mike Laska, Supervisor 3

By: Brian Tom Fischer
Brian Fischer, Supervisor 4

ATTEST

Jamie Salentine
Jamie Salentine, Town Clerk/Treasurer

STATE OF WISCONSIN WAUKESHA COUNTY TOWN OF WAUKESHA

RESOLUTION NO. 12-05-2012D

Resolution Regarding the "West Waukesha Bypass", "County TT I-94 to Wis. 59
Project ID. 2788-01-00

Whereas, In 1951, Waukesha County first proposed a new north-south arterial roadway bypass on Waukesha's west side.

Whereas, The Town of Waukesha Board of Supervisors passed by unanimous vote Resolution #06-15-11B, which a copy of is hereby attached to this resolution, notifying all parties that the Memorandum of Understanding for the project was not duly executed by an authorized agent of the Town of Waukesha pursuant to Wis. Stat.§60.24 and that the Town of Waukesha Board of Supervisors wished to go on record because all proposed routes have varying degrees of adverse impacts on the citizens and property owners of the Town of Waukesha as well as the quality of life in the town.

Whereas, the Environmental Impact Statement draft describes The Build Alternatives cost to be between $53 million and $55 million (2011 dollars) ($60 to $62 million in 2015/2016 dollars, the anticipated years of construction) to construct, including real estate acquisition, engineering, construction, construction management, and mitigation costs.

Whereas the Purpose of and need for the project known as the "West Waukesha Bypass", "County TT I-94 to Wis. 59 project ID.2788-01-00 is stated in the "Environmental Impact Statement" draft currently open for public comment through December 10, 2012 as;

Purpose of and Need for the Project

The purpose of the West Waukesha Bypass is to provide a safe and efficient north-south arterial roadway on the west side of the City of Waukesha to complete the long-planned circumferential route around Waukesha; to accommodate growing traffic volumes along the corridor; and to improve roadway deficiencies that include tight curves, steep hills, narrow lanes, and lack of shoulders. The proposed improvements address two major needs:

- Improve safety by providing a roadway that meets current design standards.
- Accommodate traffic demand generated by existing and planned development within and outside the study corridor.

Whereas, The 4-Lane Alternative would address the lack of shoulders, steep hills and tight curves on County TT and improve the capacity of intersections on County TT. It would meet all elements of the project's purpose and need by accomplishing the following:

- Provide a safe and efficient north-south arterial roadway on the west side of the City of Waukesha to complete the long-planned circumferential route around Waukesha consistent

with City of Waukesha, Waukesha County and SEWRPC transportation plans. The 4-Lane Alternative would meet this criterion by providing the 4-lane roadway called for in local and regional transportation plans.

- Accommodate growing traffic volumes along the corridor. Under the 4-Lane Alternative, County TT would operate at level of service C north of Summit Avenue and B south of Summit Avenue during the design year peak hour. Unsignalized intersections at Fiddlers Creek Drive, Kisdon Hill Court, Kame Terrace, MacArthur Road and Green Lane would operate at level of service B or C. Average delays on these roads would be about 15 to 25 seconds.
- Improve safety by decreasing crashes. The 4-Lane Alternative would improve safety by adding a median and protect left-turn lanes in the median. A study by the Transportation Research Board found that converting a 2-lane undivided roadway to a 4-lane divided roadway would on average decrease crashes 40 to 60 percent (Council and Stewart, Transportation Research Record 1665, Paper No. 99-0327).
- Improve roadway deficiencies that include tight curves, steep hills, narrow lanes, and lack of shoulders. The 4-Lane Alternative would address roadway deficiencies and meet desirable design standards.

Whereas, the Environmental Impact Statement draft identifies the project into segments known as;

- I-94 to Summit Avenue
- Summit Avenue to Wisconsin & Southern Railroad
- Wisconsin & Southern Railroad to WIS 59

Whereas, the Environmental Impact Statement draft identifies in TABLE 2-3 the Build Alternatives Still under Consideration as:

- I-94 to Summit Avenue segment
    - 4-Lane current road alignment
- Summit Avenue to Wisconsin & Southern Railroad
    - 4-Lane Off-Alignment
- Wisconsin & Southern Railroad to WIS 59
    - 4-Lane Pebble Creek Far West
    - 4-Lane Pebble Creek West
    - 4-Lane Sunset-to-County X

Whereas, the Environmental Impact Statement draft identifies the project also maintains a "NO BUILD" alternative, but does not reflect a "NO BUILD- IMPROVE" alternative

Whereas, According to the Code of Federal Regulations (CFR), indirect effects are defined as being "caused by the action and are occurring later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth

rate, and related effects on air and water and other natural systems, including ecosystems" (40 CFR 1508.8).

Whereas, Case law has defined reasonably foreseeable as "meaning that the impact is sufficiently likely to occur that a person of ordinary prudence would take it into account in making a decision" (Sierra Club v. Marsh, 976 F. 2d (1st Cir. 1992)).

Whereas, The National Cooperative Highway Research Program (NCHRP) Report 466: Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects provides three broad categories of indirect effects (NCHRP 2002):

- Alteration of the behavior and functioning of the affected environment caused by project encroachment (physical, chemical, biological) on the environment
- Project-influenced development effects (e.g., the land use effect)
- Effects related to project-influenced development effects (i.e., effects of the change in land use on the human and natural environment)

Whereas, the Pebble Creek West and Pebble Creek Far West Alternatives, convert the land use of roughly 29 acres of land between the railroad tracks and the WIS 59/County X intersection from primarily open space to highway right-of-way. This section of the bypass is on new alignment and would acquire residential and agricultural land as well as wetlands. The Pebble Creek Alternative would not be expected to spur new development to the east of the roadway because of a wide swath of wetlands west of Pebble Creek and the Waukesha County greenway east of the Creek. No new development is expected west of the roadway, because the existing development would prevent access to Merrill Hills Road. In addition, no access would be allowed to the highway between Sunset Drive and WIS 59

Whereas, Sunset-to-County X Alternative. Under the Sunset-to-County X Alternative, 21 acres of land between the railroad tracks and the WIS 59/County X intersection would be converted to highway right-of-way. Between the railroad crossing and Sunset Drive, the proposed bypass alignment would be on new alignment and acquire right-of-way from agricultural land. Along Sunset Drive and County X the right-of-way acquired would consist of strips of land adjacent to existing right-of-way. Land acquired would consist of residential, commercial, and industrial land along with public open space that contains wetlands.

Whereas, Section 3.3.4 of the Environmental Impact Statement identifies that The West Waukesha Bypass would not have a big impact on development patterns on the west side of the Town of Waukesha. Under the Sunset-to-County X Alternative, commercial development could be stimulated on County X south of Sunset Drive, in an area currently developed as residential. Commercial uses along Sunset Drive west of County X in the project corridor could also develop.

Whereas, The Town of Waukesha felt that the Sunset-to-County X Alternative would have a beneficial indirect impact on commercial development on Sunset Drive and County X

Whereas, the Environmental Impact Statement draft states a Walgreens store has been proposed in the southwest quadrant of the Sunset Drive/County X intersection and does not inform the reader that this project was denied by the Town of Waukesha for a necessary Certified Survey Map and subsequent zoning changes and that the Town Board for the Town of Waukesha sent written correspondence to the County requesting all changes on this parcel be delayed.

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Whereas, The Pebble Creek Alternative that straddles the transition between upland and wetland would degrade the ability of the Pebble Creek corridor to support threatened and endangered turtle and snake habitat. Conversely, Sunset Drive already exists, that habitat has already been severed. In effect, the damage has already been done. The Sunset-toCounty X alternative for the Waukesha Bypass was not specifically addressed in the plan, but is wholly consistent with the plan according to Tom Slawski/SEWRPC, the Pebble Creek Watershed Protection Plan's main author and expert panel participant.

Whereas,The Pebble Creek Alternatives, which would lie on the west edge of the Pebble Creek corridor between the Wisconsin & Southern Railroad and WIS 59, would decrease the habitat value of the corridor by limiting the connection between upland and wetland for those species that travel back and forth from wetland to upland.

Whereas, The wetland impact is 5.6 acres associated with the improvements north of the Wisconsin & Southern Railroad, 8.4 acres under the Pebble Creek West Alternative, 5.7 acres under the Pebble Creek Far West Alternative and 6.5 acres under the Sunset-to-County X Alternative.

Whereas, The impacts of the Build Alternatives on Upper and Lower Pebble creeks generally are related to the potential for increased sedimentation, reduced infiltration, increased run-off volumes and peak flows, siltation, and suspended solids loads associated with construction and operation of the proposed roadway. Because there would be more construction adjacent to Lower Pebble Creek and its adjacent wetlands than to Upper Pebble Creek, there is a higher potential for the project to affect Lower Pebble Creek than Upper Pebble Creek. Lower Pebble Creek has the highest quality habitats, biologically most diverse reaches, highest quality substrate, macroinvertebrate and fishery quality in the Pebble Creek watershed. This is an important finding since all direct and indirect short- and long-term impacts associated with the project would affect the highest quality habitats and biologically most diverse reaches of the Pebble Creek watershed, specifically Lower Pebble Creek

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Alternative would acquire 15.1 acres of primary environmental corridor north and south of Sunset Drive. The Pebble Creek Far West Alternative would acquire 15.9 acres of primary environmental corridor north and south of Sunset Drive. The Sunset-to-County X Alternative also would acquire 7.8 acres of primary environmental corridor associated with Pebble Creek along Sunset Drive

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Whereas, the Environmental Impact Statement describes the Upland Habitat Impacts South of the Wisconsin & Southern Railroad as follows:

- the Pebble Creek West Alternative would affect about 12 acres of uplands and
- the Pebble Creek Far West Alternative about 16 acres and
- The Sunset-to-County X Alternative would affect 2 acres of upland habitat

Because the Pebble Creek West and Pebble Creek Far West Alternatives would be on new alignment north and south of Sunset Drive, several upland areas would be severed. Most of the impact would be to U-18 (NW), a mature oak woodland between Sunset Drive and the end of Hawthorne Hollow Drive, which contains 80 percent dominant native species. U-18 (NW), which would be affected by the Pebble Creek Far West Alternative (10 acres) and to a lesser extent by the Pebble Creek West Alternative (6 acres) consists of 80 percent dominant native plant species, and is thus a relatively intact upland given the disturbances to uplands throughout the project area. Severing U-18 (NW) not only would have wildlife habitat impacts, it also would create more forest edge environment and increase the likelihood that invasive/nuisance plant species will gain a footing in the soil.

The Sunset-to-County X Alternative would affect 2 acres of upland habitat south of the Wisconsin & Southern Railroad. Most of the impacts are small areas along Sunset Drive that are not wetland, that range from 25 to 33 percent dominant native species. A small upland (0.12 acre) that would be affected contains 80 percent dominant native species. Impacts would occur on the edge of upland U-18 (NW).

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The No-Build Alternative would not cause the additional loss of wildlife habitat, but vehicle-animal collisions would likely increase as traffic volumes increase. This would also happen under the Build Alternative, especially in the Pebble Creek corridor between the Wisconsin & Southern Railroad and WIS 59. The remaining alternative north of the Wisconsin & Southern Railroad would cause the conversion of 9.3 acres of wildlife habitat to

roadway use. Of the wildlife habitat converted, 2.6 acres would be Class 1, 4.3 acres would be Class 2, and 2.4 acres would be Class 3.
South of the Wisconsin & Southern Railroad, the Pebble Creek West alternative would cause the conversion of 16.8 acres of wildlife habitat to roadway use. Of the wildlife habitat converted, 9.6 acres would be Class 1 habitat and 7.2 acres would be Class 2. The Pebble Creek Far West alternative would cause the conversion of 20 acres of wildlife habitat to roadway use. Of the wildlife habitat converted, 9.4 acres would be Class 1 and 10.6 acres would be Class 2. The Sunset-to-County X alternative would cause the conversion of 6.1 acres of wildlife habitat to roadway use. Of the wildlife habitat converted, 5.1 acres would be Class 1 and 1 acre would be Class 2

Whereas, The Environmental Impact Statement draft states the impact on the fen present in Wetland 8 south of Sunset Drive. The Pebble Creek West Alternative would fill 0.32 acre of the 1-acre Wetland 8 just south of Sunset Drive. The Sunset-to-County X Alternative and the Pebble Creek Far West Alternative would not place fill into Wetland 8. Both Pebble Creek Alternatives would affect upland that is upslope (west) of Wetland 8

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Whereas, the loss of naturally vegetated floodplains may aggravate the flood hazard through loss of their ability to slow floodwaters and reduce flood velocities and peaks
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Whereas, The Pebble Creek Far West Alternative which joins the Pebble Creek West Alternative at Hawthorne Hollow Drive cul-de-sac, shares most of the characteristics of the Pebble Creek West Alternative. The distinguishing differences between the two alternatives are impacts to wetlands and potential impacts to groundwater. The Pebble Creek Far West Alternative has 5.7 acres of wetland impacts as compared to 8.4 acres with the Pebble Creek West Alternative. Being located higher on the slope than the Pebble Creek West Alternative, the Pebble Creek Far West Alternative would require an approximately 32-foot cut immediately SOUTH of Sunset Drive. A cut of that depth has the potential to interrupt the groundwater that follows east toward the Pebble Creek wetland complex.
and the Wisconsin & Southern Railroad.

Whereas, The Pebble Creek Far West Route would require a substantial cut, up to 32 feet deep and extending upslope for 300 feet. Large retaining walls would be required with this alternative to maintain the integrity of the cut slope.

Whereas the Environmental Impact Statement identifies that "there would be a degradation in the quality of the Pebble Creek wetland if the project is built" and that "The primary indirect effect of the project would be from runoff that would degrade water quality, no matter what mitigation measures are put in place."

Whereas, The expert panel expressed concern about runoff from the roadway adversely affecting Pebble Creek's Class II brook and brown trout, as well as a warmwater fishery where longear sunfish (State threatened species) are documented to exist... Runoff from the new roadway would contain pollutants that would be carried into adjacent wetland, and potentially Pebble Creek

Whereas, The Sunset-to-County X Alternative would create 9 acres of impervious area south of the Wisconsin & Southern Railroad, compared to 13 acres of impervious area for both the remaining Pebble Creek Alternatives. Therefore, pollutants in the associated run-off would be greater under either of the Pebble Creek Alternatives compared to the Sunset-to-County X Alternative. In addition, the estimated 4 acres of less impervious area needed to construct the Sunset-to County X Alternative, compared to the other alternatives, would also provide an additional 4 acres of local groundwater recharge that would promote infiltration and reduce stormwater runoff, both of which are important for the long-term protection of Pebble Creek.

Now therefore be it resolved that the Town of Waukesha Town Board on the 5th day of December 2012 does hereby **NOT** support the planning and construction of the road project known as the "West Waukesha Bypass", "County TT I-94 to Wis. 59 project ID.2788-01-00 and does so by selecting to support a **NO BUILD** option as described within the Environmental Impact Statement Draft.

Be it further resolved that the Town Board hereby directs the Town of Waukesha Clerk-Treasurer to provide a copy of this resolution to all interested parties listed under Section 6 of the Environmental Impact Statement draft with the express exclusion of the CSS Advisory Group and the Public Libraries. In addition to the aforementioned list the following parties shall also be sent a copy.

- Walter Kolb, County Supervisor
- Allison Bussler, Waukesha County, Director of Public Works
- Gary Evans, Waukesha County, Highway Engineering Manager
- A Certified Letter containing the Resolution shall be sent to Gary Evans prior to December 10, 2012 for inclusion in the Official Record to:

  Gary Evans
  Waukesha Co. Engineering Services Manager
  515 West Moreland Blvd.
  Waukesha WI 53188

Adopted this 5th day of December, 2012.

TOWN OF WAUKESHA

By:_____
Angie E. Van Scyoc, Town Chairman

By:_____
Joe Banske, Town Supervisor 1

By:_____
Everett E. German, Town Supervisor 2

By: Mike Laska
Mike Laska, Town Supervisor 3

By:_____
Brian Tom Fischer, Town Supervisor 4

ATTEST:
Jamie Salentine
Jamie Salentine, Town of Waukesha Clerk/Treasurer

STATE OF WISCONSIN TOWN OF WAUKESHA WAUKESHA COUNTY

RESOLUTION #06-15-11B

RESOLUTION

The Town Board of the Town of Waukesha, Waukesha County, Wisconsin

HEREBY RESOLVES:

1. That this resolution is adopted to clarify the Waukesha Town Board's position with respect to the Memorandum of Understanding pertaining to the West Waukesha Bypass ("Bypass Resolution") dated April 6, 2009 and attached to this resolution.

2. That the Town Board has caused its records to be searched and it has determined that there is an absence of any record wherein the Town Board of Waukesha in the past engaged in any discussion about the Bypass Resolution.

3. That the Town Board has caused its records to be searched and it has determined that there is an absence of any record wherein the Town Board of Waukesha in the past extended any authorization to any agent to sign the Bypass Resolution on its behalf or that of the Town pursuant to Wis. Stats. 60.24.

4. That the Town Board seeks to go on record with respect to the Bypass Resolution because all of the routes that have been proposed to date will have varying degrees of adverse impacts on the citizens and property owners of the Town of Waukesha as well as the quality of life in the Town.

5. That the Town Board wishes to acknowledge that it has been granted a belated opportunity to join discussions concerning certain impacts that the potential routing and implementation of the construction of the West Waukesha Bypass may have.

6. That by taking part in the discussions referenced in paragraph 5, above, the Town Board of Waukesha has not and does not consent to any potential route, the ultimate construction of the West Waukesha Bypass at any location or commit to any financial or other obligation in any respect.

7. That the Town Board wishes to continue to engage in a co-operative and positive fashion in the current on-going discussions as stated in paragraph 5, above, while reserving the right to consider and take a position on all issues relating to the West Waukesha Bypass after it is satisfied that it is informed sufficiently to take a position in the best interests of its citizens regarding such matters.

8. That the Town Board hereby directs its Clerk-Treasurer to provide a copy of this resolution to all the parties engaged in the discussion referenced in paragraph 5, above.

This Resolution was passed and adopted by the Town of Waukesha Town Board this 15th day of June, 2011 by a vote of 5 ayes and 0 nays.

APPROVED
TOWN OF WAUKESHA

By: _____
Angie E. Van Scyoc, Town Chairman

By: _____
Joe Banske, Supervisor 1

By: _____
Everett E. German, Supervisor 2

By: Mike Laska
Mike Laska, Supervisor 3

By: Brian Tom Fischer
Brian Fischer, Supervisor 4

ATTEST

Jamie Salentine
Jamie Salentine, Town Clerk/Treasurer

RESOLUTION NO. 69-12

A RESOLUTION IN SUPPORT OF THE CONSTRUCTION OF THE PROPOSED WAUKESHA WEST BYPASS ON THE MEADOWBROOK/MERRILL HILLS ROAD

WHEREAS, the Southeastern Wisconsin Regional Planning Commission (SEWRPC) adopted, on June 21, 2006, a newly revised transportation system plan for the Southeastern Wisconsin Region to the year 2035, which plan is one of the primary elements of the required regional master plan which includes an arterial highway on the west side of the City of Waukesha; and

WHEREAS, the City of Waukesha Common Council approved on November 3, 2009, an ordinance adopting the Comprehensive Plan for the City of Waukesha for the year 2035, which Plan includes those elements of the regional transportation system Plan located within the City of Waukesha; and

WHEREAS, the location and construction of a surface transportation arterial highway (West Waukesha Bypass) located on the west side of the City of Waukesha and specifically located within the City of Waukesha, the Town of Waukesha and the City of Pewaukee and connecting I-94 with what is now STH 164 south of the City of Waukesha has been a part of transportation planning at all levels of government within Waukesha County since the early 1960's; and

WHEREAS, on April 6, 2009, the City of Waukesha entered into a Memorandum of Understanding (MOU) with Waukesha County, the Wisconsin Department of Transportation and the Town of Waukesha. The MOU sets forth the obligations of the aforementioned parties to proceed with the funding, design and construction for the West Waukesha Bypass; and

WHEREAS, the City of Waukesha Common Council believes that the proposed routing of the West Waukesha Bypass of the City of Waukesha, when completed, will serve a large segment of the City's residential development and the City has embraced the concept of the need of an arterial highway on the west side of the City of Waukesha that directs "through" traffic away from and around the congested, densely developed areas within the City of Waukesha and environs.

NOW, THEREFORE, BE IT RESOLVED, that the City of Waukesha Common Council on the 6th day of December, 2012, hereby supports, based on the City's adopted Comprehensive Plan, the construction of the proposed arterial highway known as the west bypass of the City of Waukesha on the Meadowbrook Road.

BE IT FURTHER RESOLVED that the City Clerk/Treasurer transmit a certified copy of the resolution to the SEWRPC, Waukesha County Department of Public Works, City of Pewaukee, Town of Waukesha, Town of Genesee, Town of Delafield and the City's County Board Representatives.

CITY OF WAUKESHA

Jeff Scrima, Mayor

ATTEST:

Thomas E. Neill, Clerk/Treasurer

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Daniel P. Vrakas
County Executive

Dale R. Shaver
Director

Waukesha
COUNTY

DEPARTMENT OF
PARKS AND LAND USE

DATE: May 20, 2013

TO: Dan Dupies, Project Planner
CH2MHill

FROM: Dale R. Shaver
Director

SUBJECT: Waukesha West By-Pass Related to the Pebble Creek Greenway

This correspondence is submitted to respond to the U.S. Department of the Interior review of the Draft Environmental Impact Statement for the West Waukesha Bypass County TT, from I-94 to Wisconsin State Highway (WIS) 59, Waukesha County, Wisconsin. Specifically, the Department of Interior had questions regarding the Pebble Creek Greenway as identified in the Waukesha County Park and Open Space Plan.

The *Waukesha County Park and Open Space Plan*, which is part of *A Comprehensive Development Plan for Waukesha County* (February 4, 2009) describes the County's vision for the 11 greenways under its ownership, including the Pebble Creek Greenway. Greenways are generally located along a stream or river, environmental corridor, ridgeline, or other linear natural feature and are intended to provide aesthetic and natural resource continuity. The primary purpose of greenways is to protect natural resources features and water quality rather than primarily for recreation.

I hope this clarification is helpful. Should you have any questions, please feel free to contact me.

cc. Allison Bussler, Director, Waukesha County Department of Public Works

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PARKS, RECREATION & FORESTRY Ron Grall, Director
1900 AVIATION DRIVE rgrall@ci.waukesha.wi.us
WAUKESHA, WISCONSIN 53188-2471
TELEPHONE 262/524-3737 FAX 262/524-3713

MEMORANDUM

DATE: October 25, 2013

TO: Gary Evans, Engineering Services Manager
Waukesha County Public Works Department

FROM: Ron Grall, Director of Parks, Recreation & Forestry
City of Waukesha

SUBJECT: Waukesha West By-Pass access to future Meadowview Community Park

---

As per previous discussions and meetings on the subject matter, the following action was taken by the City of Waukesha Parks, Recreation & Forestry Board at their regular meeting held on September 9, 2013:

Motion to approve removal of the existing Meadowbrook Road access point associated with the future Meadowview Community Park site and proposed West By-Pass Project, per recommendation received from the City of Waukesha Engineering Department, Waukesha County Public Works Department and State of Wisconsin Department of Transportation. Approval is contingent upon support received from said agencies to assure at least two ingress and egress access points along Northview Road that are agreeable to City Parks, Recreation & Forestry Department staff to best support future park development.

The above stated motion was approved unanimously.

In regard to the matter of a temporary limited easement (TLE), staff is aware of the need and the associated grading work that is proposed for the subject property and currently has no concerns on the matter. Please note that the TLE would require Board and Common Council approval.

If you have any questions or require further information, please feel free to contact me at (262) 524-3734 or rgrall@ci.waukesha.wi.us

c. Ed Henschel, City Administrator
Paul Day, City Engineer
PRFB Members

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Appendix D
Natural Resource Reports Prepared After Draft EIS Availability

D-1, Preferred Alternative Summary to USEPA and Corps of Engineers, March 2014
D-15, Impacts to Forest Interior Breeding Bird Habitat (SEWRPC), November 2013
D-39, Waukesha Bypass Percent Connected Impervious Calculation, October 2013
D-49, Groundwater Investigation and Modeling – 2013, Waukesha Bypass Corridor, June 2013

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Daniel P. Vrakas
County Executive

Allison Bussler
Director of Public Works

Waukesha
COUNTY
DEPARTMENT OF PUBLIC WORKS

March 31, 2014

Ms. Marie Kopka
U.S. Army Corps of Engineers (Regulatory Branch)
20711 Watertown Rd., Suite F
Waukesha, WI 53186

Elizabeth Poole
Sue Elston
US EPA Region 5
77 W Jackson Street
Chicago, IL 60305

RE: Selection of Preferred Alternative
West Waukesha Bypass Corridor Study
Waukesha County
Project ID 2788-01-00

Dear Ms. Kopka, Poole and Elston:

Executive Summary

Waukesha County and WisDOT have selected the Pebble Creek West Alternative as the preferred alternative. The Wisconsin Department of Natural Resources has concurred with this recommendation. It is our belief that the Pebble Creek West Alternative meets the definition of the least environmentally damaging practicable alternative as it minimizes impacts to a medium/low quality fen and retains a high quality upland interior forest bird habitat. In contrast, the Pebble Creek Far West Alternative avoids impacting this fen but will eliminate the interior forest bird habitat, which would be a significant adverse effect. The high-quality and size of the 50-acre upland area and its relative rarity adjacent to an urban area compared to the medium/low quality of the 1.1-acre sedge fen is a key factor of this recommendation.

The second key factor of this recommendation is that the Pebble Creek West Alternative preserves both the forest interior bird habitat and the sedge fen.

Finally, the Pebble Creek West Alternative is preferred by the adjacent property owners.

Introduction

This letter summarizes why Waukesha County, WisDOT and the Department of Natural Resources support the Pebble Creek West Alternative as the preferred alternative for this corridor study. It is the final coordination step in identifying the preferred alternative that began nearly a year ago in April 2013 when Waukesha County sent a preferred alternative technical memorandum to your agencies. Since then, there has been a very productive exchange of ideas and information between your agencies and the project

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team. Additional groundwater, uplands and wildlife habitat studies and engineering analysis were completed following discussions with the Environmental Protection Agency and the U.S. Army Corps of Engineers. These studies guided us in evaluating alternatives that address the transportation deficiencies in the corridor while minimizing impacts to the extent practicable in the environmentally sensitive Pebble Creek corridor.

This memorandum focuses on the information that was important to our project team in making the difficult comparison of the environmental benefits of the fen (and wetlands in general) and the interior forest bird habitat that led to our selection of the Pebble Creek West Alternative as the preferred alternative. We acknowledge the importance of both habitat types and the difficulty in comparing these resources and making value judgments about them.

Three exhibits are attached to this memorandum. One shows the general location of the Pebble Creek West and Far West Alternative and the other two exhibits show the impacts of the two alternatives in more detail. SEWRPC's memorandum *Impacts to Forest Interior Breeding Habitat* (November 2013) and various supporting documentation received later is attached. Wisconsin Department of Natural Resources' December 2013 memorandum concurring with SEWRPC's analysis is found near the end of this document as is a letter from the forester that wrote the management plan for the upland hardwoods on the Buzz Hardy property located south of Sunset Drive. The final letter in this document is from the Wisconsin Woodland Owners Association expressing support for the preservation of the upland hardwoods on the Buzz Hardy property.

Wetlands

Background

The wetlands that are important in comparing the Pebble Creek West and Far West alternatives are found in Table 1 below and include Wetland-8, the sedge fen immediately south of Sunset Drive (and in the attached exhibit, *Pebble Creek Corridor*). All the functions that received a "high" rating from SEWRPC are identified in Table 1 (see next page).

While Wetland-8 (the fen) received a high rating for groundwater, it received low ratings for shoreline protection and flood/stormwater attenuation and medium ratings for floral diversity, wildlife habitat, fishery habitat, water quality protection and aesthetics. The table below lists the eight functional values SEWRPC evaluated during the rapid assessment methodology they conducted during the wetland delineations. Overall the fen is of medium/low quality as shown below:

Function	Significance
Floral Diversity	Medium
Wildlife Habitat	Medium
Fishery Habitat	Medium
Flood/Stormwater Attenuation	Low
Water Quality Protection	Medium
Shoreline Protection	Low
Groundwater	High
Aesthetics/Recreation/Education	Medium

Table 1. Wetland Impacts Summary South of Wisconsin & Southern Railroad Alternatives

Functional Value	Wetland Type	Pebble Creek West (acre)	Pebble Creek Far West (acre)
W-13. No functional value rated as high.	Atypical (farmed) wetland	1.17	0.66
W-12. No functional value rated as high.	Fresh (Wet) Meadow and atypical (farmed) wetland	2.53	0.58
W-11 (ADID wetland). Floral diversity, wildlife habitat, fishery habitat, stormwater attenuation, water quality protection, groundwater, and aesthetic, recreation, and education rated as high.	Shallow Marsh, Southern Sedge Meadow, Fresh (Wet) Meadow, Wet-Mesic Prairie, Shrub-Carr (willow thicket) and second growth Southern Wet to Wet-Mesic Lowland Hardwoods	0.64	0.36
W-9 (ADID wetland). Floral diversity, wildlife habitat, fishery habitat, water quality protection, and groundwater rated as high.	Southern Sedge Meadow, Fresh (Wet) Meadow, Shrub-Carr, and second growth, Southern Wet to Wet-Mesic Lowland Hardwoods	0.92	0.55
W-8 (ADID wetland). Low or medium quality for seven of the eight functional values. **Groundwater rated as high.**	Sedge Fen and second growth Southern Wet to Wet-Mesic Lowland Hardwoods	0.38	0.02
W-7 (ADID wetland). Low or medium quality for seven of the eight functional values. Groundwater rated as high.	Fresh (Wet) Meadow, Shrub-Carr (willow thicket), and second growth, Southern Wet to Wet-Mesic Lowland Hardwoods	0.20	
W-6 (ADID wetland). No functional value rated as high.	Second growth Southern Wet to Wet-Mesic Lowland Hardwoods		0.04
W-5 (ADID wetland). No functional value rated as high.	Second growth Southern Wet to Wet-Mesic Lowland Hardwoods	0.37	0.22
W-4 (ADID wetland). Floral diversity, wildlife habitat, fishery habitat, water quality protection, groundwater rated as high.	Shallow Marsh, Southern Sedge Meadow, atypical (mowed) wetland, Fresh (Wet) Meadow, and second growth Southern Wet to Wet-Mesic Lowland Hardwoods	1.12	1.14
W-1(ADID wetland). Wildlife habitat, fishery habitat, water quality protection, groundwater rated as high.	Shallow Marsh, Fresh (Wet) Meadow, Shrub-Carr, and second growth Southern Wet to Wet-Mesic Lowland Hardwoods	1.27	1.27
Total		**8.60**	**4.84**

Of the 10 wetlands affected south of the Wisconsin & Southern Railroad, four had more functional values rated as “high” than Wetland-8. The two farmed wetlands on the Christoph property north of Sunset Drive each received one medium rating for groundwater and the remaining functional ratings were all low. These are the only affected wetlands that are not Advanced Identification of Wetland Disposal Areas (ADID).

According to SEWRPC, groundwater discharge-dominated wetlands (fens) as a whole are not an uncommon resource in southeastern Wisconsin. As shown in Table-2, there are 7 sedge fens within the project area.

Table 2. Fens In and Adjacent to the Pebble Creek Watershed

	Sedge Fens		Prairie Fens		Calcareous Fens		Total	
Area	**Acreage**	**# of Stands**	**Acreage**	**# of Stands**	**Acreage**	**# of Stands**	**Acreage**	**# of Stands**
Project Area	6.3	7	0	0	0	0	**6.3**	7
Total Watershed	6.3	7	2.3	1	0	0	**8.6**	8
Adjacent to Watershed	0	0	0	0	25.9	2	25.9	2
Totals[1]	6.3	7	2.3	1	25.9	2	34.5	10

Source: SEWRPC November 2013 memo to Waukesha County. "Project Area" in this table refers to an area developed by SEWRPC and illustrated in their November 2013 memo.

[1] Columns are *not* cumulative as the project area values are included within the total watershed area.

Impacts

South of the Wisconsin & Southern Railroad, the Pebble Creek West Alternative affects 8.60 acres of wetlands and the Pebble Creek Far West Alternative would affect 4.84 acres (see Table 1 and the *Pebble Creek West* and *Pebble Creek Far West* exhibits). The majority of the 3.76-acre difference between the two alternatives is 2.46 acres impact to Wetland-12 and Wetland-13, which are low quality farmed wetlands.

The Pebble Creek West Alternative affects 0.38 acre of the 1.1-acre Wetland-8. The roadway profile has been placed such that its construction will not interfere with groundwater flows. In SEWRPC's opinion, this will allow groundwater to continue to maintain the function of the unaffected portion of the fen. The Pebble Creek Far West Alternative would have a minor impact to Wetland-8.

Uplands

Background

A large upland hardwood forest south of Sunset Drive is part of a primary environmental corridor. This upland hardwood forest provides a buffer for the adjacent Pebble Creek wetland complex and habitat for a range of birds, mammals and herptiles. According to DNR forestry staff this is an exceptionally high quality woods that has been actively managed for the past 20 years in the DNR's Managed Forest Lands Program. This upland hardwood forest is large enough to provide interior forest habitat. Interior forest habitat is defined in SEWRPC's November 2013 memorandum as a microclimate condition created by 70 percent or more forest cover, an essentially closed canopy, and approximately 300 feet distance from the canopy edge. A select group of species are particularly sensitive to this forest interior habitat environment, including the forest interior breeding birds. Forest interior breeding birds have been declining in North America over the past 40 to 50 years due, in part, to the loss and fragmentation of forests.

According to SEWRPC's November 2013 memorandum, smaller forest interior fragments—even as small as 0.5 acre - provide important foraging habitat and refuge for migrating forest interior birds. Such habitat fragments become particularly important in regions where interior habitat is limited, such as southeastern Wisconsin. The interior forest bird habitat provided west of the Pebble Creek wetlands is one of two such stands in the project area, totaling about 3 acres. Within the Pebble Creek watershed, there are 21 wooded stands totaling 76 aces that provide similar habitat to the uplands along the

Pebble Creek Far West Alternative (Table 3). In DNR's memo concurring with SEWRPC's findings of the importance of interior forest habitat in general and the high quality interior forest habitat within the Pebble Creek Far West Alternative, it states "the forest interior habitat is especially valuable because of its proximity to Pebble Creek and sustains Red-Headed Woodpecker Melanerpes erythrocephalis, a State of Wisconsin Special Concern species, and Pileated Woodpecker *Dryocopus pileatus,* a spring/fall migrant species within the Waukesha urbanized area."

Table 3 - Woodlands In and Adjacent to the Pebble Creek Watershed

	Woodlands		Forest Interior Habitat	
Area	**Acres**	**# of Stands**	**Acres**	**# of Stands**
Project Area	281	32	3	2
Total Watershed	1,734	161	**76**	**21**
Adjacent to Watershed	2,404	162	41	16

Impacts

The Pebble Creek West Alternative impacts 7.3 acres of primary environmental corridor woodland west of Pebble Creek just south of Sunset Drive. This alternate directly impacts 0.8 acre of the 1.3 acres of forest interior habitat. A 0.5-acre area of forest interior habitat is preserved, which as noted by SEWRPC in its attached memorandum "Impacts to Forest Interior Breeding Bird Habitat", is an area that continues to provide habitat for forest interior birds. The interior forest habitat affected by the Pebble Creek West Alternative is shown on the attached upland exhibit and quantified in Table 4.

The Pebble Creek Far West Alternative would impact 9.8 acres of primary environmental corridor woodland west of Pebble Creek and just south of Sunset Drive. Even with minimization measures, the Pebble Creek Far West Alternative would result in the loss of 1.2 acres of the 1.3 acres of forest interior habitat. This would eliminate the forest interior habitat. The interior forest habitat affected by the Pebble Creek Far West Alternative is shown on the attached upland exhibit and quantified in Table 4.

Table 4. Upland Impacts

	Existing (ac.)	Pebble Creek West		Pebble Creek Far West	
		Impact (ac.)	**Remaining (ac.)**	**Impact (ac.)**	**Remaining (ac.)**
Interior Forest Habitat	1.3	0.8	0.5	1.2	0.1
Upland Hardwood Forest	50	7.3	42.7	9.8	40.2

Mitigation

During the February 25, 2014 conference call with your agencies and FHWA, USEPA asked the project team to consider the mitigation measures listed below.

- Legal, permanent protection of the remaining wooded upland.
- Tree mitigation of any take of trees in the upland area as a result of the preferred alternative.
- Preservation of a fen, offsite but within the watershed to mitigate impacts to the fen.

As you are aware, the requested mitigation measures are not the norm on projects like this and will require coordination between Waukesha County and WisDOT to determine how to accomplish the mitigation within the legal authority each agency has. The Retzer Nature Center property may provide opportunities to address the second and third bullets.

Public Input

As part of Waukesha County's public outreach, staff has had numerous contacts with adjacent property owners indicating a strong preference to minimize impacts to the forest interior habitat and are committed to its preservation. Adjacent property owners are actively involved in managing these lands and were instrumental in making them a part of the DNR's managed forest program. These residents have benefitted from the natural setting and recreational opportunities this forest provides.

Discussion

In selecting the Pebble Creek West Alternative as the preferred alternative the project team agreed with the thought process presented by Don Reed in Insert A (Comparison of Fens to Forest Interior Habitat: Waukesha West Bypass) of his November 2013 memorandum. The memorandum notes the importance of remnant forest interior habitat stands such as the one along the Pebble Creek Far West Alternative that are located within the urban-agricultural matrix of the Lake Michigan migratory bird flyway to resident and migratory bird species. The memorandum further points out that discharge-dominated wetlands (fens), as a whole, are not an uncommon resource in southeastern Wisconsin, and that, while from a regulatory perspective, the functional values of wetlands have taken on a more critical role due to their relationship to public health and safety, from a resource management view, the wetland functional values are no more or less important than the upland habitat functional values, particularly when there is a mixture of wetland and upland functional values present.

The value of interior forest habitat that would be lost with the Pebble Creek Far West Alternative, which Waukesha County views as a significant adverse environmental effect, coupled with the relative similarity between the Pebble Creek West and Far West alternatives in impacts to ADID wetlands tilted the balance from a resource management view in favor of the Pebble Creek West Alternative. Clearly, there is a difference between the two alternatives in wetland acres south of the railroad that would be affected, and clearly there is a difference in the impacts to the fen (Table 1). However, because about 2.5 acres of the 3.8-acre wetland impact difference is to farmed wetlands, and the likelihood that the unaffected portion of wetland 8 will continue to function as a fen, Waukesha County does not view the wetland impacts of the Pebble Creek West Alternative and the interior forest habitat impacts of the Pebble Creek Far West Alternative as equivalents from a resource management standpoint. Rather, we view the Pebble Creek West Alternative as an environmental middle ground that, with wetland and upland mitigation measures yet to be finalized with the agencies, will minimize impacts to and preserve both resources rather than minimizing wetland impacts to the complete detriment of interior forest habitat. Stated slightly differently, we do not think the tradeoff between reducing wetland impacts by about 3.8 acres and eliminating interior forest habitat is environmentally prudent particularly because the wetlands will be mitigated in the same watershed at Retzer Nature Center.

Conclusion

1. Based on the reports, surveys and studies by ornithologists, arborists, and wetland biologists from the DNR, SEWRPC, consultants and other agencies both Wetland-8 (the fen) and forest interior habitat are important resources.
2. Within the project area there are 7 stands of sedge fen totaling 6.3 acres and 2 stands of interior forest habitat totaling 3 acres.
3. According to SEWRPC, Wetland-8 is of medium/low quality, whereas according to Wisconsin Department of Natural Resources, the adjacent upland hardwood forest is of an exceptionally high quality.
4. Neither the Pebble Creek West nor the Pebble Creek Far West Alternatives will have an impact to groundwater.
5. Both the Pebble Creek West and the Pebble Creek Far West Alternatives have impacts to Wetland-8 (the fen) and forest interior habitat.
6. The forest interior habitat will remain viable as long as it is 0.5 acres or larger in size.
7. The Pebble Creek West Alternative will allow both Wetland-8 (the fen) and the forest interior habitat to remain viable
8. The Pebble Creek Far West Alternative will eliminate the forest interior habitat
9. Wetlands 12 and 13 are low quality farmed areas that do not function as typical wetlands due to drainage and tiling.
10. Adjacent residents support the Pebble Creek West alternative.

Recommendation

Based on the findings and conclusions stated above, Waukesha County selects the Pebble Creek West as the preferred alternative for the Waukesha West Bypass and we request concurrence from your agency.

Sincerely,

Gary Evans, P.E.
Project Manager

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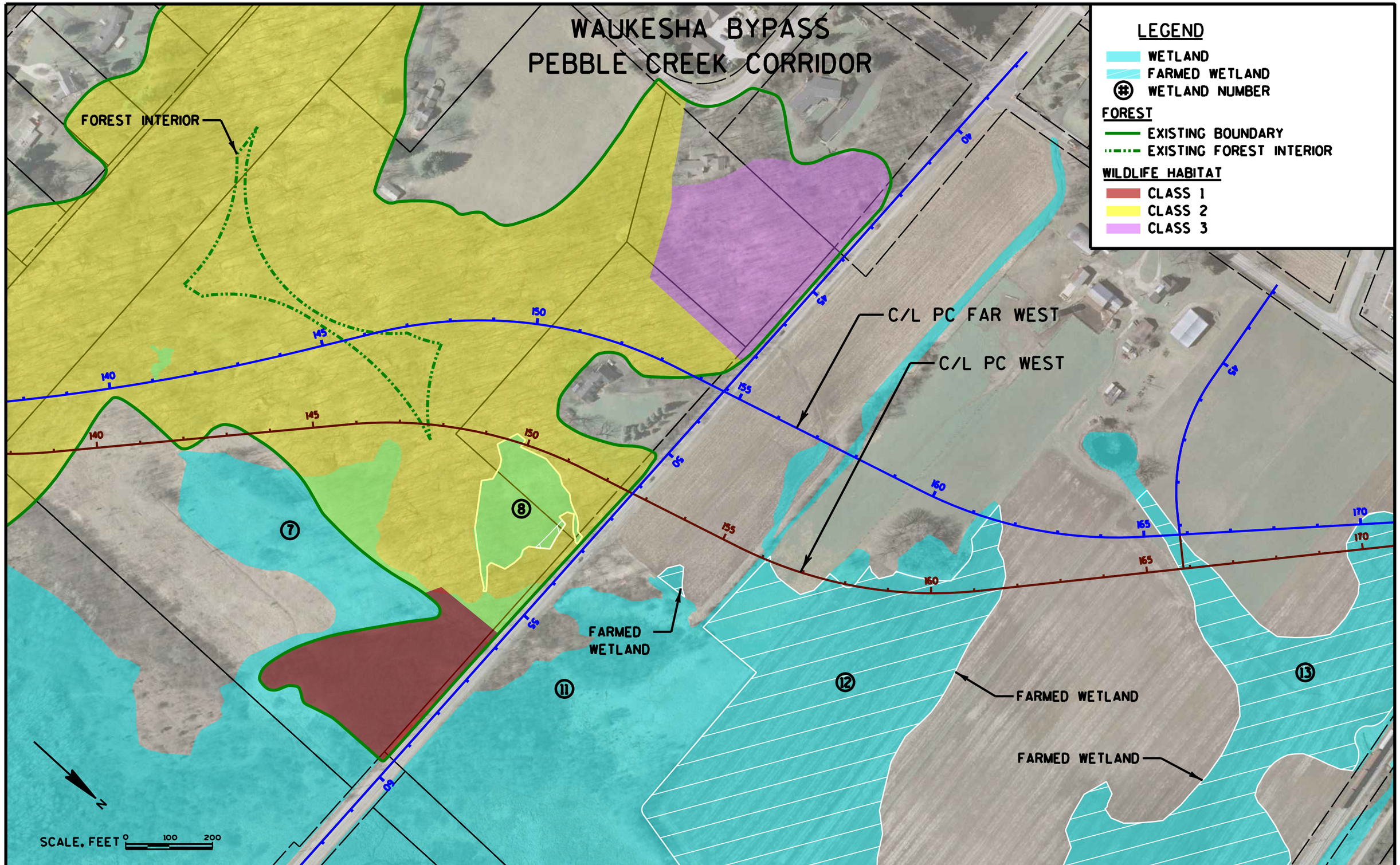
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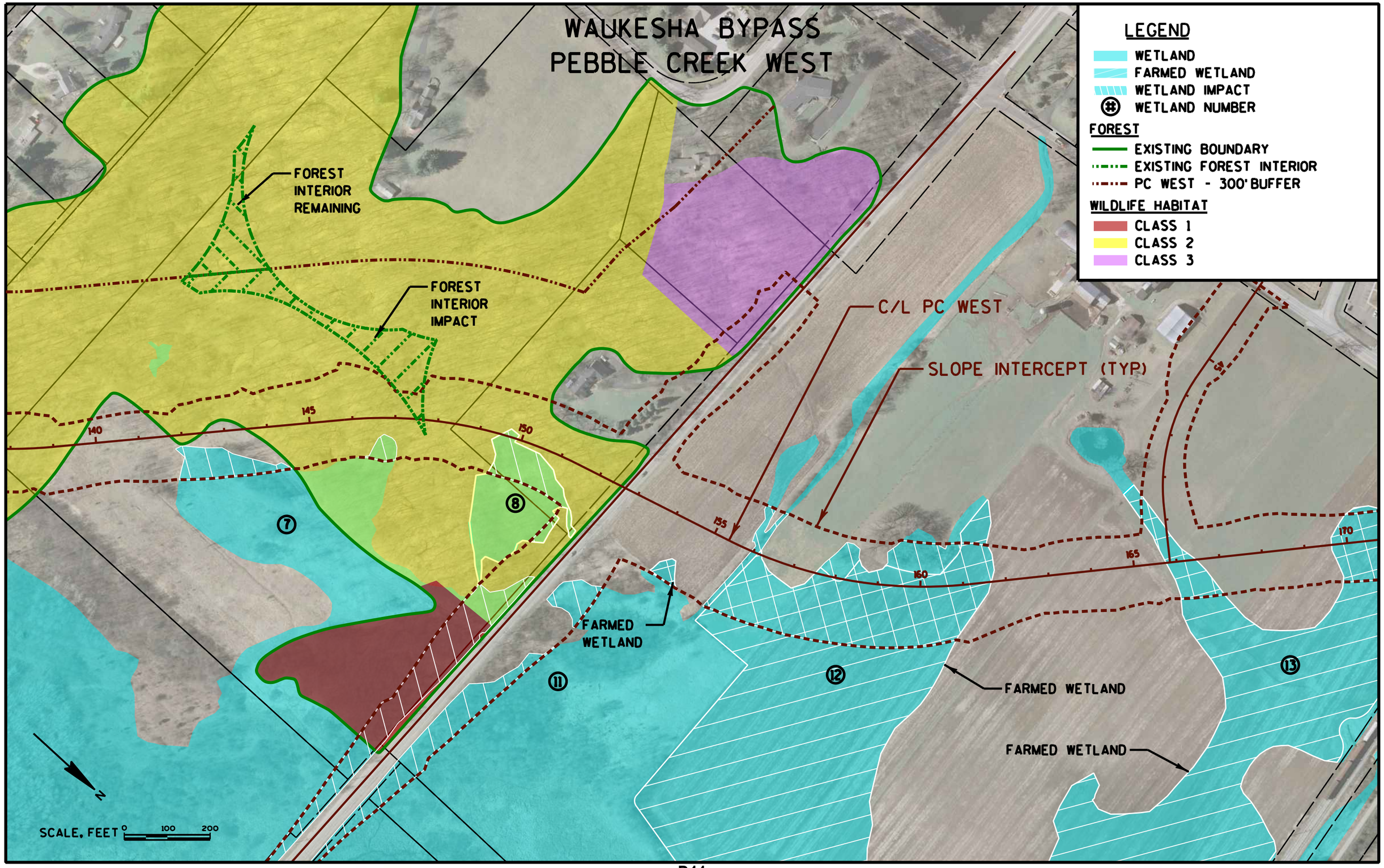
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PC WEST - 300' BUFFER
WILDLIFE HABITAT
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CLASS 2
CLASS 3
FOREST INTERIOR REMAINING
FOREST INTERIOR IMPACT
C/L PC WEST
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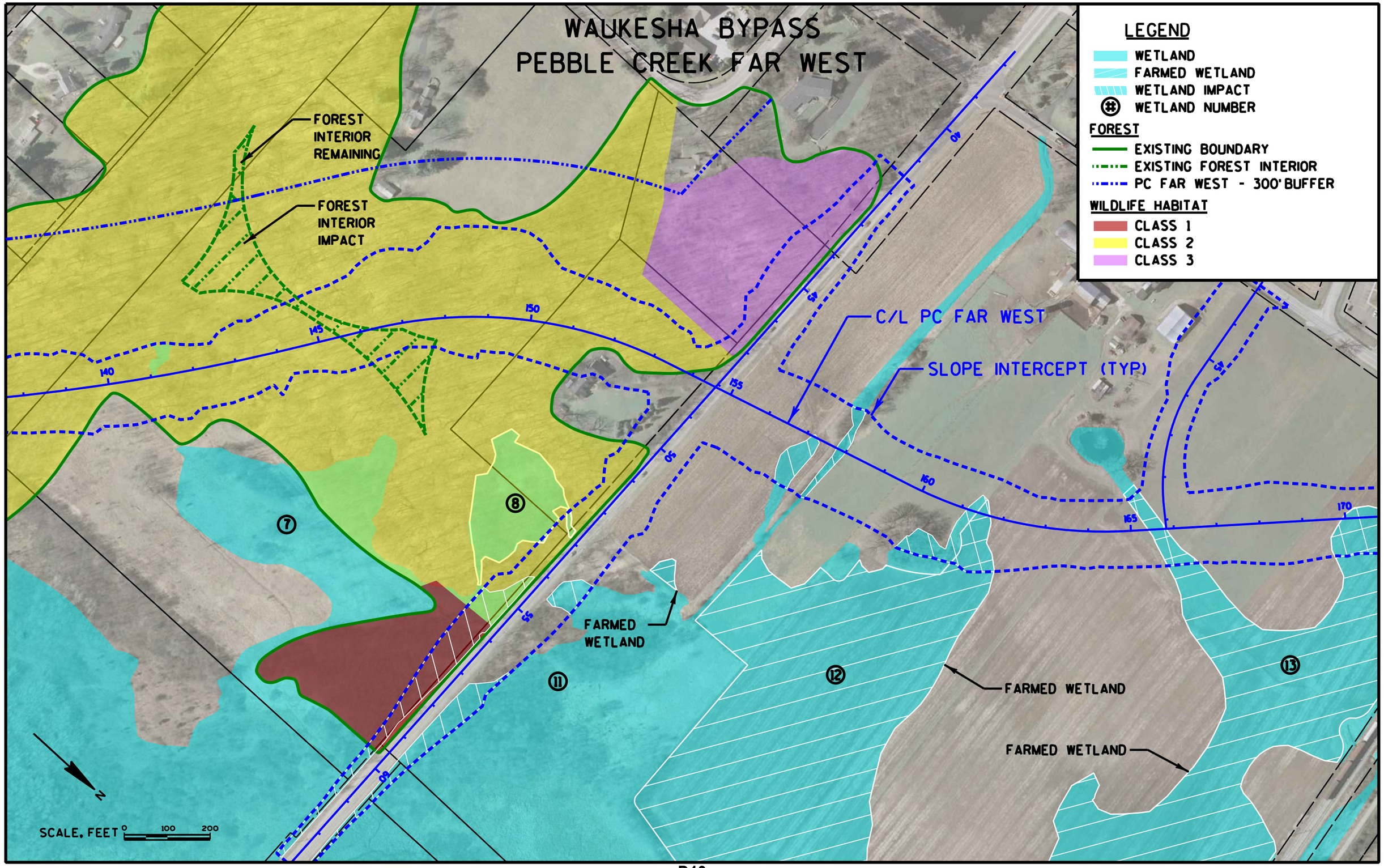
WAUKESHA BYPASS
PEBBLE CREEK FAR WEST
LEGEND
WETLAND
FARMED WETLAND
WETLAND IMPACT
WETLAND NUMBER
FOREST
EXISTING BOUNDARY
EXISTING FOREST INTERIOR
PC FAR WEST - 300' BUFFER
WILDLIFE HABITAT
CLASS 1
CLASS 2
CLASS 3
FOREST INTERIOR REMAINING
FOREST INTERIOR IMPACT
C/L PC FAR WEST
SLOPE INTERCEPT (TYP)
FARMED WETLAND
FARMED WETLAND
FARMED WETLAND
7
8
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140
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SCALE, FEET 0 100 200
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IMPACTS TO FOREST INTERIOR BREEDING BIRD HABITAT

Forest interior is the core habitat environment within woodlands that is sheltered and secluded from the influence of forest edges and open habitats. It is a remnant natural environment that remains from the once extensive and continuous forest of the Presettlement landscape. The forest interior habitat is defined by a microclimate condition created by 70% or more forest cover, an essentially closed canopy, and an approximately 300 ft. (100 m.) distance interiorly from the canopy edge (Farabaugh, 2008; Jones, McCann, and McConville, 2000; Landowner Resource Center, 2000; Rosenberg, K.V., et al, 1999; and Temple and Cary, 1988). A select group of species are particularly sensitive to this forest interior habitat environment, including the forest interior breeding birds. A list of forest interior breeding birds known to occur within Southeastern Wisconsin is attached to Table 1 (Cutright, Harrison, and Howe, 2006).

Forest interior breeding birds have been declining in North America over the past 40 to 50 years (Jones, McCann, and McConville, 2000). Many factors, including Brown-headed cowbird nest parasitism and buckthorn invasions, have contributed to their decline (Brittingham and Temple, 1983; Robbinson, S.K., et al, 1995; Cutright, Harrison, and Howe, 2006). However, the loss and fragmentation of forests appears to be the major factor in their decline. Suitable forest interior habitat for successful breeding bird nesting ranges in size from about 25 acres (Cutright, per. com. 2013) to 70 acres (Temple, per. com. 2013). Certainly the larger forest interior habitat area is more likely to support the full diversity of Wisconsin's forest interior breeding birds. Never the less, smaller forest interior fragments – even as small as 0.5 acre - provide important foraging habitat and refugia for migrating forest interior birds (Mossman, per. com. 2013). Such habitat fragments become particularly important in regions where interior habitat is limited, such as southeastern Wisconsin.

The Waukesha Bypass project area contains a total of approximately 281 acres of woodland distributed among 32 sites. This represents approximately 16 percent of the total 1734 acres of woodland within the Pebble Creek Watershed (161 forest stands). The total woodland area includes both upland and lowland stands.

Within a select number of the larger stands, a total of 76 acres (21 stands) of forest interior breeding bird habitat occurs within the Pebble Creek Watershed (Map 1). Two such stands containing approximately 3 acres of forest interior breeding bird habitat, occur within the Waukesha Bypass Project area (Map 2).

Three of the proposed alternatives – the Pebble Creek west, modified Pebble Creek west, and Pebble Creek far west, as presently aligned - would impact the existing 1.29 acre forest interior breeding bird habitat located to the south of West Sunset Drive(see Map 3 and Table 2). Efforts to reduce the impact to the forest interior are also identified in Table 2.

Under the Pebble Creek west alternative, without re-foresting the slopes, only about 0.3 acres of such habitat would remain under this alternative, a net loss of slightly over 1 acre. Using an urban highway cross section, the impacts for this alternative could be reduced such that slightly over 0.5 acres would

remain (a forest interior habitat loss of just under 0.8 acres or 62%). This alternative would have the least impact of the three alternatives on forest interior habitat.

The modified Pebble Creek west alternative would impact 1.22 acres (95%) of the existing forest interior habitat. Accordingly, less than 0.1 acres of forest interior habitat would remain under this alternative. With re-foresting the slopes or the construction of a rural highway cross section with a retaining wall, the impact to the forest interior habitat under this alternative would only be reduced by about 0.03 acres for a total of 0.1 acres of such habitat remaining, a 92% habitat loss.

Under the Pebble Creek far west alternative, a total of only 0.05 acres of forest interior breeding bird habitat would remain, which represents a 96% habitat loss. With re-forestation of the slopes or the construction of a rural highway cross section with a retaining wall, the impact to the forest interior habitat under this alternative would only be reduced by about 0.03 acres for a total of 0.08 acres of interior habitat remaining, a 94% habitat loss.

DMR/ck
11/12/13
Doc. # 00214609

Literature Cited

Brittingham, M.C., and S.A. Temple, 1983. *Have Cowbirds Caused Forest Songbirds To Decline?* Bioscience 33: 31-35

Cutright,N., B. Harrison, and R. Howe, editors, 2006. *Atlas of the Breeding Birds of Wisconsin*. Wisconsin Society for Ornithology, 602 pages.

Farabaugh, C.S., 2008. *Assessment of Potential Relationships between Microclimatic Variables Measured within a Forest Patch and the Presence of interior Forest Birds*. Dissertation, George Mason University.

Jones C., J. McCann, and S. McConville, 2000. *A Guide to the Conservation of Forest Interior Dwelling Birds in the Chesapeake Bay Critical Area*. Critical Area Commission for the Chesapeake and Atlantic Coastal Bays. 58 pages.

Ontario Ministry of Natural Resources, 2000. Landowner Resource Center, Ontario Extension Notes: *Conserving the Forest interior: A Threatened Wildlife Habitat*. LRC 70. 12 pages.

Robbins, C.S., D.K. Dawson, and B.A. Dowell, 1989. *Habitat Area Requirements of Breeding Forest Birds of the Middle Atlantic States*. Wildlife Monograph no. 103. Wildlife Society. Blacksburg, VA.

Robbinson, S.K., F.R. Thompson, III, T.M. Donovan, D.R. Whitehead, and J. Faaborg, 1995. *Regional forest Fragmentation and the Nesting Success of Migratory Birds*, Science 267: 1987 – 1990.

Rosenberg, K.V., R.W. Rohrbaugh, Jr., S.E. Barker, J.D. Lowe, R.S. Hames, and A.A. Dhondt. 1999. *A land managers guide to improving habitat for scarlet tanagers and other forest-interior birds*. The Cornell Lab of Ornithology. 24 pages.

Temple, S.A. and J.R. Cary, 1988. *Modeling Dynamics of Habitat-Interior Bird Populations in Fragmented Landscapes*, Conservation Biology 2: 340-347.

Personal Communications

Noel Cutright, WSO, October 2013.

Stanley A. Temple, UW-Madison, October 31 and November 1, 2013.

Michael Mossman, Bureau of Science Services, Wisconsin DNR, November 2013.

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TABLE 1

List of Forest Interior Dwelling Bird Species (FIDS) that Potentially Breed[a] in Forest Interior Habitats of Southeastern Wisconsin

Common Name	Scientific Name	Safe Date[b]	Migratory Class[c]
Red-shouldered Hawk[d,e]	Buteo lineatus	May 1- Aug 31	Temperate
Broad-winged Hawk[d]	Buteo platypterus	June 5 – Aug 10	Neotropical
Barred Owl[d]	Strix varia	Jan 15 – Aug 31	Nonmigratory
Whip-poor-will	Caprimulgus vociferous	May 10 – July 15	Neotropical
Red-headed Woodpecker[e]	Melanerpes erythrocephalus	Mar 15 – Aug 31	Nonmigratory
Hairy Woodpecker	Picoides villosus	Mar 15 – Aug 31	Nonmigratory
Pileated Woodpecker	Dryocopus pileatus	Mar 15 – Aug 31	Nonmigratory
Acadian Flycatcher	Empidopax virescens	May 25 – Aug 5	Neotropical
Brown Creeper[d]	Certhia americana	May 15 – Aug 31	Temperate; winter range
Veery	Catharus fuscescens	June 10 – Aug 31	Neotropical
Wood Thrush	Hylocichla mustelina	May 25 – Aug 20	Neotropical
Yellow-throated Virco	Vireo flavifrons	May 25 – Aug 15	Neotropical
Red-eyed Vireo	Vireo oliyaceus	June 1 – July 31	Neotropical
Black-throated Green Warbler[d]	Dendroica virens	June 10 – Aug 5	Neotropical
Cerulean Warbler[d,e]	Dendroica cerulea	May 25 – Aug 5	Neotropical
Black-and-white Warbler[d]	Mniotilta varia	May 15 – July 25	Neotropical
American Redstart[d]	Setophaga ruticilla	June 10 – July 20	Neotropical
Prothonotary Warbler[e,f]	Protonotaria citrea	May 10 – July 20	Neotropical
Worm-eating Warbler[d,e,f]	Helmitheros vermivorus	May 20 – July 20	Neotropical
Ovenbird	Seiurus aurocapilla	May 20 – Aug 5	Neotropical
Louisiana Waterthrush[d]	Seiurus motacilla	May 1 – July 10	Neotropical
Kentucky Warbler[d,e,f]	Oporornis formosus	May 25 – July 25	Neotropical
Hooded Warbler[d,c]	Wilsonia citrina	May 25 – July 25	Neotropical
Scarlet Tanager	Piranga olivacea	May 25 – Aug 10	Neotropical

[a] Documentation of breeding evidence based on Cutright, Harrison, and Howe (2006) and Robbins, Dawson, and Dowell (1989).

[b] Safe dates indicate the time of year when a species can be assumed to occupy a breeding territory.

[c] Migratory classes: "neotropical" migrant – breeds in temperate North America and winters primarily in Central and South America; "temperate" migrant – breeds and winters primarily in temperate North America; "nonmigratory" – year-round resident with no migratory movements; "Temperate – winter range" – does not breed in Southeastern Wisconsin.

[d] These species are highly area-sensitive and most vulnerable to forest loss, fragmentation and overall habitat degradation.

[e] State-listed as Special Concern, Threatened, or Endangered in Wisconsin.

[f] Occurrence as a breeding species in Southeastern Wisconsin listed as probable, but not confirmed.

DMR/lgh
(00214505).DOC

TABLE 2

IMPACTS TO FOREST INTERIOR HABITAT:
WAUKESHA BYPASS ALTERNATIVES

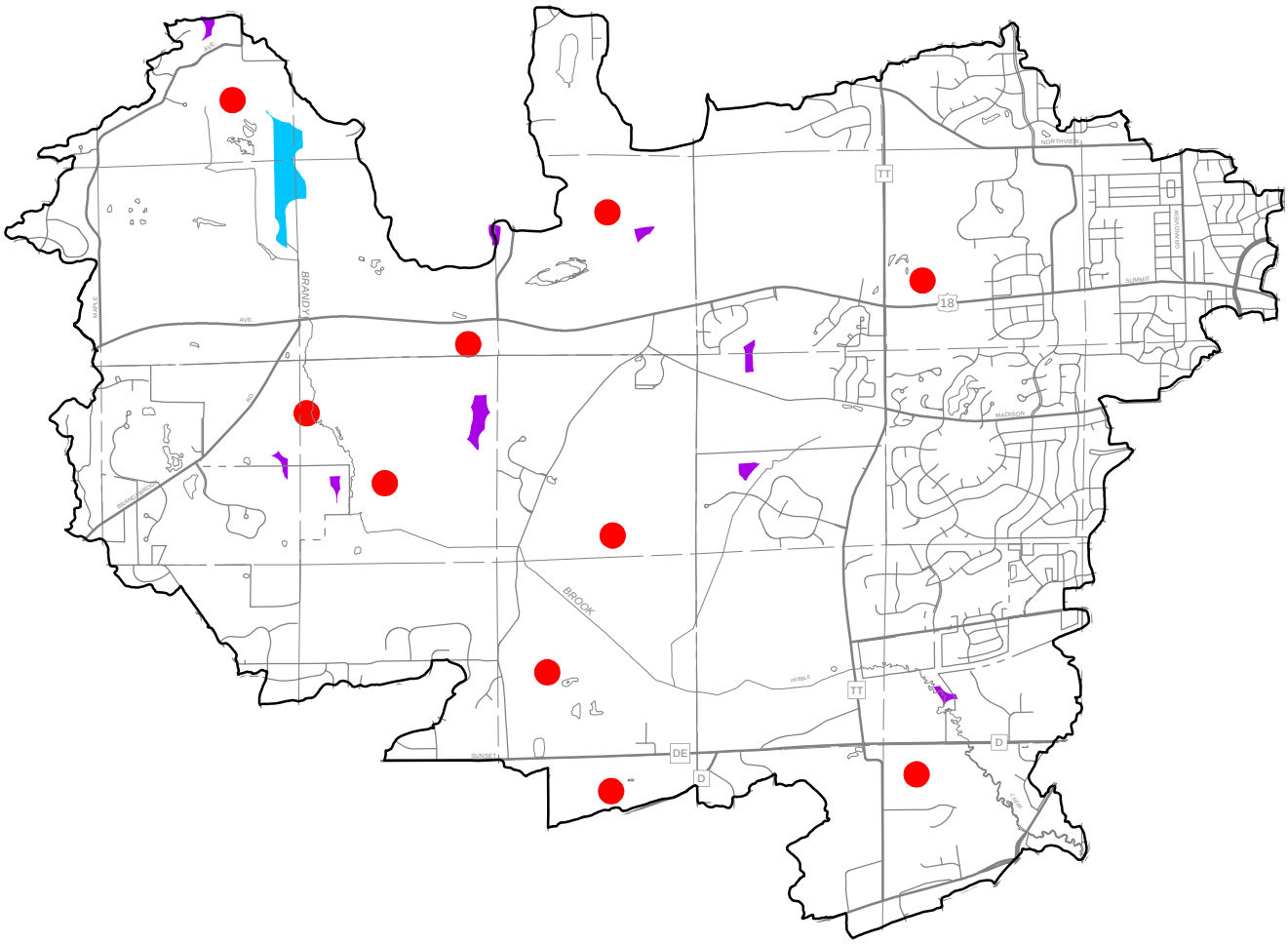
	Forest Interior Habitat Area Remaining (acres)			
Alternative	Without re-foresting slopes	With re-foresting slopes OR Rural section w/ Ret. Wall	With Urban section & Ret. Wall at Clear Zone	With Urban Section, Beam guard & Ret. Wall
Existing Conditions	1.29	--	--	--
Pebble Creek West	0.29	0.44	0.497	0.530
Modified Pebble Creek West	0.07	0.10	--	--
Pebble Creek Far West	0.05	0.08	--	--

Source: CH2M Hill

DMR
11/19/13
(00214860).DOC

Map 1

Forest Interior Habitat Remaining in the Pebble Creek Watershed: 2010



Greater than 500 acres (none)

100 - 500 acres (none)

50 - 100 acres (none)

25 - 50 acres

2 - 25 acres

Less than 2 acres

N

0 0.5 1 2 Miles

Source: SEWRPC

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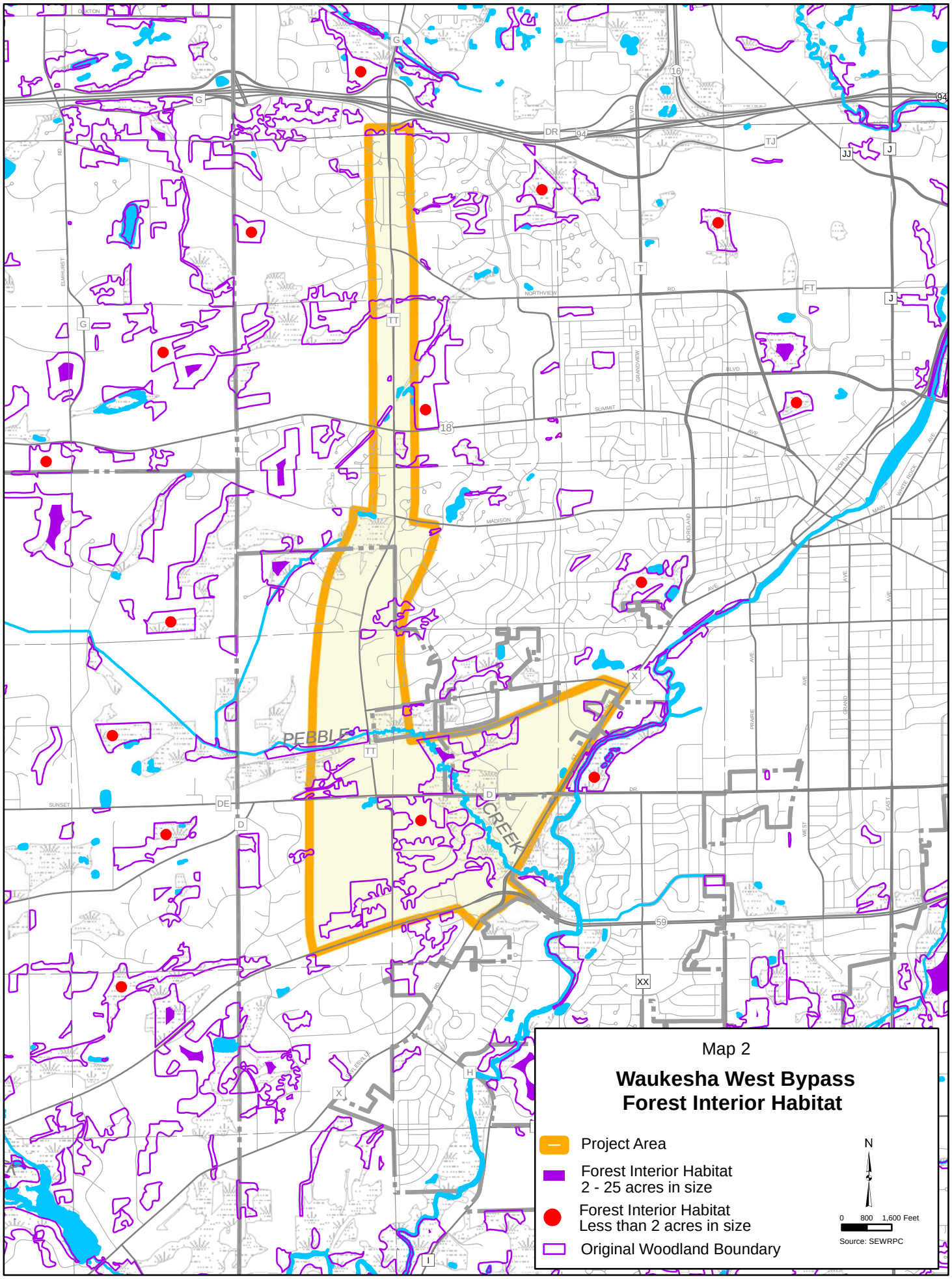
Map 2
Waukesha West Bypass
Forest Interior Habitat
Project Area
Forest Interior Habitat
2 - 25 acres in size
Forest Interior Habitat
Less than 2 acres in size
Original Woodland Boundary
N
0 800 1,600 Feet
Source: SEWRPC
PEBBLE
CREEK

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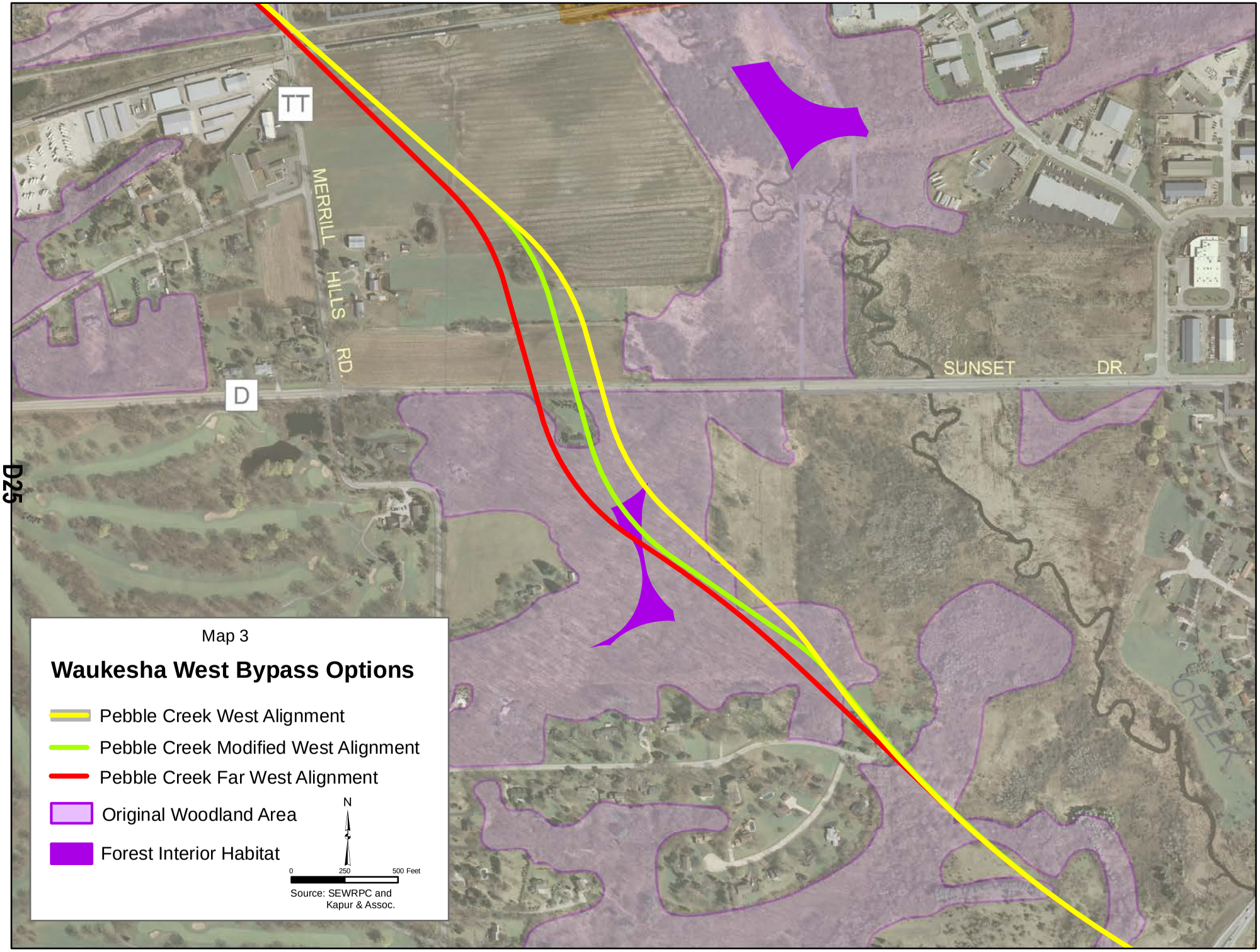
TT
MERRILL HILLS RD.
D
SUNSET DR.
CREEK
Map 3
Waukesha West Bypass Options
Pebble Creek West Alignment
Pebble Creek Modified West Alignment
Pebble Creek Far West Alignment
Original Woodland Area
Forest Interior Habitat
N
0
250
500 Feet
Source: SEWRPC and
Kapur & Assoc.

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Insert A

Comparison of Fens to Forest Interior Habitat: Waukesha West Bypass

A tabular comparison of fens, woodlands, and forest interior habitat areas (see Tables 1 and 2), indicate that approximately 6.3 acres of sedge fen, distributed among seven sites, occur in the project area versus 3.0 acres of forest interior habitat, distributed between two sites. Accordingly, in this context, slightly less forest interior habitat is available for forest interior-dependent species within the project area.

The significance of the lower number and sizes of forest interior habitats is more keenly felt in the urbanized and intensively farmed portions of the Southeastern Wisconsin Region. Such land uses tend to have greater impacts on all natural resources located toward the eastern and southern portions of this region, as it is this part of the region where these land uses are more concentrated. From a statewide, national, and even international prospective, these land use-related impacts align with a major portion of the Lake Michigan migratory bird flyway. While western portions of said region certainly contain more and larger forest interior habitat stands, the more critical locations, relative to the migratory flyway do not. Accordingly, remnant forest interior habitat stands located within the urban-agricultural matrix become significantly more important to resident and transitory (migratory) bird species.

Calcareous and prairie fens, which are located outside the project area, are rare habitats. However, groundwater discharge-dominated wetlands (fens), as a whole, are not an uncommon resource in southeastern Wisconsin. The sedge/skunk cabbage and, the more northerly located, white cedar / hardwood-dominated fens still maintain a much higher presence – both in number and size - than the aforementioned rare fen types within southeastern Wisconsin. It should be noted that the forested fens can and do contribute to forest interior habitat. However, the more open fen habitat relationships to migratory routes are seemingly less consequential than the forest interior habitats.

All of these resources, fen, woodland, and forest interior habitat, support a suite of important functional values. From a regulatory perspective, the functional values of wetlands have taken on a more critical role due to their relationship to public health and safety. However, from a resource management view, the wetland functional values are no more or less important than the upland habitat functional values, particularly when there is a mixture of wetland and upland functional values present. Forest interior habitats maintain wildlife habitat, floral quality and diversity, micro-climate, sediment and nutrient load reduction[1] – particularly in riparian zones, aesthetic,

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[1] *See SEWRPC Planning Report No. 50, A Regional Water Quality Management Plan Update for the Greater Milwaukee Watersheds, Part 2 Appendices, December 2007; specifically, Appendix O, "Riparian Buffer Effectiveness Analysis" and its citations.*

educational, and scientific functional values that are affected by their habitat size, frequency, and juxtaposition with other resources and landscape features. However, unlike wetlands, their functional values are not codified in the Statutes or Administrative Rules. Never-the-less, this makes the functional values of woodland and forest interior habitats no less important. And, as such, upland habitats, including forest interior habitat, need to be appropriately considered and compared to other resource related impacts and losses in any environmental assessment.

INSERT A - COMPARISON OF FENS TO FOREST INTERIOR HABITAT (00215932).DOC
490-1003
DMR/pk
01/15/14

Insert B

Invasive Species Issues: Plants

A total of 20 alien, or nonnative, plant species have been identified within the upland woods located in the Pebble Creek Far West and the new modified Pebble Creek West alternative rights-of-way (see the SEWRPC Interagency Memorandum of September 9, 2013). Management practices by the current landowners have substantially maintained limited outbreaks of the more aggressive woodland invaders, including Buckthorn (*Rhamnus cathartica*), multiflora rose (*Rosa multiflora*), European high bush cranberry (*Viburnum opulus*), Amur honeysuckle (*Lonicera maackii*), and the Hybrid honeysuckle (*Lonicera x bella*). This effort has been critical to maintaining the small, but good quality, forest interior habitat area. Under each of the aforementioned alternatives, the forest canopy would be opened and the existing native vegetation and soil conditions removed and/or altered. The unpaved and cleared portions of the rights-of-way, as well as, adjacent forested areas, would over time, be expected to experience an increase in the more-aggressive invasive herbaceous species, such as Dame's Rocket (*Hesperis matronalis*), Garlic mustard (*Alliaria officinalis*), and Canada thistle (*Cirsium arvense*), and shrubs, such as *Rhamnus cathartica*, *Viburnum opulus*, *Lonicera maackii*, and *Lonicera x bella*. In addition, aggressive native forest-edge related species that also occur within the subject upland woods, including Prickly ash (*Zanthoxylum americanum*) and Poison ivy (*Rhus radicans*), would be expected to increase under disturbance conditions associated with each of the alternative highway rights-of-way. To reduce the impacts of these undesirable species within the rights-of-way and remaining upland forest area, an annual inspection program, combined with an aggressive management effort, would be necessary to detect and eradicate any outbreaks of these and other invasive species. To be effective, this effort will need to be perpetual. While current management efforts control the invasion of alien, nonnative species, particularly the more shrubby species, the opening of the canopy and establishment of a highway right-of-way significantly exacerbates the invasion problem and provides a vector conduit for the dispersal of seed from the entire suite of invasive species in and near the subject upland woods.

A total of nine alien, or nonnative, plant species have been identified within and adjacent to the sedge fen identified as Pebble Creek Area No. 8 (see Exhibit A of the Proposed Waukesha West Bypass Route Wetland Delineation). The more aggressive alien plants colonizing this fen include Reed canary grass (*Phalaris arundinacea*), Japanese hedge parsley (*Torilis japonica*), *Alliaria officinalis*, *Hesperis matronalis*, and *Rhamnus cathartica*. Any significant disturbance to the native wetland plant community, the soils, and/or the sites hydrology, will contribute to an increase, over time, in these invasive plant species within the remaining portions of the wetland in and adjacent to the proposed highway right-of-way. Further, the establishment of a highway right-of-way will provide a vector conduit for the dispersal of seed from the entire suite of invasive species in and adjacent to the subject fen. Of particular concern would be the establishment of Common reed grass (*Phragmites*

australis) and Purple loosestrife (*Lythrum salicaria*). As with the forest impacts, a similar annual inspection and aggressive management effort would be necessary to detect and eradicate any of these and other invasive species.

INSERT B - INVASIVE SPECIES ISSUES: PLANTS (00216027).DOC
490-1003
DMR/pk
01/20/14

Table 1

Fens In and Adjacent to the Pebble Creek Watershed

Area	Sedge Fens		Prairie Fens		Calcareous Fens		Total	
	Acreage	# of Stands	Acreage	# of Stands	Acreage	# of Stands	Acreage	# of Stands
Project Area	6.3	7	0	0	0	0	6.3	7
Total Watershed	6.3	7	2.3	1	0	0	8.6	8
Adjacent to Watershed	0	0	0	0	25.9	2	25.9	2
Totals[1]	6.3	7	2.3	1	25.9	2	34.5	10

[1]Columns are not cumulative as the project area values are included within the total watershed area.

Source: SEWRPC

DMR/dad
#215587v2

Table 2

Woodlands In and Adjacent to the Pebble Creek Watershed: 2010

Area	Woodland		Forest Interior Habitat	
	Acreage	# of Stands	Acreage	# of Stands
Project Area	281	32	3.0	2
Total Watershed	1,734	161	76	21
Adjacent to Watershed	2,404	162	41	16
Totals[1]	4,138	323	117	37

[1]Columns are not cumulative as the project area values are included within the total watershed area.

Source: SEWRPC

DMR/dad
#215587v2

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
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Box 7921
Madison WI 53707-7921

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

December 3, 2013

Mr. Gary Evans
Waukesha County Department of Public Works
15 W Moreland Boulevard
Waukesha WI 53188

Dear Mr. Evans:

The Wisconsin Department of Natural Resources (Department) has reviewed and concurs with the findings of the *September 9, 2013, Interagency Memorandum, Waukesha Bypass: Upland Woods Located in the New Modified Pebble Creek West and Pebble Creek Far West Alternative Rights-of-Way,* and *November 12, 2013, Preliminary Draft - Impacts to Forest Interior Breeding Bird Habitat Documents* (attached) prepared by the Southeastern Wisconsin Regional Planning Commission (SEWRPC). The documents describe an upland woods plant community with 1.29 acres of interior nesting bird habitat - that portion of the essentially closed forest canopy 300 feet inward from the forest edge.

Forest interior habitat suitability has three components: the patch size of the forest, the percent of forest in a larger landscape, and the connectivity between patches. The 1.29-acre interior nesting bird habitat is part of a larger 42-acre upland woods and wildlife habitat area with a large number of trees that produce nuts useful for feeding wildlife located in a primary environmental corridor. The interior habitat is especially valuable because of its proximity to Pebble Creek and sustains Red-Headed Woodpecker *Melanerpes erythrocephalis*, a State of Wisconsin Special Concern species, and Pileated Woodpecker *Dryocopus pileatus*, a spring/fall migrant species within the Waukesha urbanized area. Small forest interior fragments – even as small as 0.5 acre - provide important foraging habitat and refugia for migrating forest interior birds. Such habitat fragments become particularly important in regions where interior habitat is limited.

When making a decision regarding a regulated wetland impact, the Department considers:

- All practicable measures to avoid and minimize wetland impacts.
- The direct, cumulative, and secondary impacts of the proposed project to wetland functional values.
- The impact on functional values resulting from the mitigation that is required.
- The net positive or negative environmental impact of the proposed project and that the proposed project represents the least environmentally damaging practicable alternative.
- The proposed project will not result in significant adverse impacts to water quality, or in other significant adverse environmental consequences.

The Department, after consultation with water resources, forestry, and wildlife habitat specialists, determined that the Pebble Creek West Alternative has the least adverse environmental impact because of the significant wildlife and nesting habitat of the upland woods compared to the limited functional value of the farmed wetland north of Sunset Drive (7 of 8 functional values are rated “low” or “N/A” according to SEWRPC 2012 rapid assessment methodology) and considering that wetland No. 8 (sedge fen) has low or medium functional value for 7 of the 8 functional values (only groundwater has a high functional value) (SEWRPC 2012 rapid assessment methodology) and considering that the Pebble Creek West Alternative minimizes upland habitat fragmentation and would leave approximately 0.5-acre of forest interior—the minimum amount to provide foraging habitat and refugia—whereas

the Pebble Creek Modified West and Far West Alternatives would eliminate virtually all foraging habitat and refugia.

Alternative	Total area of wetland lost between Railroad to STH 59	Losses to the 1.1-acre Wetland No. 8 sedge fen	Class I and II Wildlife Habitat Area lost	Upland Woods area lost	Impacts to 1.29-acre Forest Interior Nesting Bird Habitat
West	9.11 acres (4 acre farmed wetland with low functional value)	0.24 acre	7.7 acres	7.3 acres	0.1 acre direct impact, about 1.2 acres remain. Of that 0.7 acre has reduced nesting value.
Modified	8.99 acres (estimate 3.5 acre farmed wetland with low functional value)	0.05 acre	estimate 8.5 acres	estimate 7.9 acres	All nesting habitat effectively eliminated
Far West	6.50 acres (estimate 1.9 acre farmed wetland with low functional value	0.02 acre	10.2 acres	9.8 acres	All nesting habitat effectively eliminated.

Thank you for the opportunity to provide information about minimizing Waukesha Bypass adverse environmental impacts. The Department encourages the Study Team to continue to look for refinements - including urban cross section design - that further reduce impacts, mitigate wetland loss, provide adequate real estate to construct stormwater management facilities to control runoff quality, temperature, and volume, provide buffers, and protect valuable habitat and resources in the Pebble Creek watershed.

The Department looks forward to reviewing the Final Environmental Impact Statement and further environmental coordination.

Sincerely,

Michael C. Thompson
Environmental Analysis Team Supervisor
(414) 303-3408
MichaelC.Thompson@Wisconsin.gov

email cc:

Marie Kopka, USACE
Kathleen Kowal, USEPA
Bethaney Bacher-Gresock, FHWA
Don Reed, SEWRPC
Doug Cain, DOT
Scott Lee, DOT
Jim D'Antuono, DNR
Sue Beyler, DNR
Paul Sandgren, DNR
Lisie Kitchel, DNR
Tim Lizotte, DNR
Mike Sieger, DNR

Attachment 1: *September 9, 2013, Interagency Memorandum, Waukesha Bypass: Upland Woods Located in the New Modified Pebble Creek West and Pebble Creek Far West Alternative Rights-of-Way*
Attachment 2: *November 12, 2013, Preliminary Draft - Impacts to Forest Interior Breeding Bird Habitat Document*
Attachment 3: Rapid Assessment for Wetland Functional Values - Plant Community Areas No. 8 and 12
Link to Wetland Delineation Report:
http://www.waukeshabypass.org/docs/SEWRPC_Rapid_Assessment_of_Wetland_Functional_Values.pdf

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November 20, 2012

Charlie Webb
135 South 84th Street
Suite 325
Milwaukee WI 53214

Dear Mr. Webb,

I'm writing in regards to the property owned by LB "Buzz" Hardy in the Town of Waukesha just south of Sunset Drive. As you are aware, there are various proposals for a West Waukesha Bypass that would impact Mr. Hardy's woodlands if selected. I wanted to write and provide my thoughts on this for your consideration.

I started working for the Wisconsin DNR in 1991, and Buzz was one of my first contacts. I've worked with him at various times since then in the management of his hardwood woodlands. He has always been enjoyable to work with because he is very concerned about taking proper care of his forest, doing harvests when needed and appropriate, and investing time and money to help the woodland develop well. I wrote the management plan that he has followed since 1993, as he has that land enrolled in Wisconsin's Managed Forest Law (MFL). I've always found the woods fascinating, in that it is such a wonderful, high quality oak woodland so close to Waukesha, that he easily could have sold to a developer long ago but didn't because he wanted the woods more than the money.

And it is a very nice woods. Northern red and white oak dominate the site, with a good number of black cherry, shagbark hickory, black walnut, slippery elm, bigtooth and quaking aspen, and white ash included as well. The red oak and walnut in particular grow very well here, showing excellent growth and vigor, developing large quality trees. These trees offer terrific wildlife habitat both in the food (acorns, hickory nuts, walnuts, cherries and more) and habitat, in the general round cover, but also den trees (which oaks are strongly preferred for), and canopy cover that is used by many bird species. To have this kind of habitat so close to Waukesha is quite rare. In addition, a property like this offers wonderful aesthetics to the area, taking away the "city" or urban feel. Cutting a portion of this hardwood stand off would significantly diminish its wildlife potential, as well as harm the aesthetic appeal it now provides.

It should also be remembered that much of Buzz's land is hilly and often quite steep. Any roadway development affecting this woods would have to involve significant land disturbance because of this terrain, which would dramatically increase the potential for soil erosion.

I think this woods has much to offer the area intact as it is, and I'd strongly urge you to consider any options further east in more open terrain. If you have questions or wish to discuss what I have said here, please contact me. Thank you.

Sincerely,

Michael Sieger

Michael Sieger
Forester, Wisconsin DNR
(262) 594-6209

Waukesha County
NOV 26 2012
Dept of Public Works

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Wisconsin Woodland Owners Association, Inc.

P.O. Box 285, Stevens Point, WI 54481-0285
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April 11, 2013

Gary Evans
Waukesha County Department of Public Works
515 Moreland Boulevard
Waukesha, WI 53188

Dear Mr. Evans,

The Wisconsin Woodland Owners Association has become aware of the West Waukesha Bypass Study through our member, Buzz Hardy.

WWOA understands that project planning and funding will take several years before work on the ground is started. During this project planning phase, we hope that Waukesha County will take into consideration the environmental and scenic values that Mr. Hardy's well managed woodlands have provide for decades. Tracts of forested land in Waukesha County are quickly becoming a resource of the past. Studies have shown that forest lands adjacent to and within communities greatly improve the community in a number of ways. Forested lands surrounding wetland areas help to absorb large storm runoff events and prevent downstream flooding, provide habitat for numerous wildlife species, and sequester carbon to provide clean air for urban communities. Economically, forested areas significantly improve the values of the surrounding real estate and if sustainably managed provide for local jobs. In addition, forests create desired landscape aesthetics for citizens and visitors to the community.

We hope that the effects of this project design on Mr. Hardy's woodlands can be minimized to prevent damage to his remaining woodlands. Please consider erecting barriers to prevent scarring of the live tree boles and perhaps a retaining wall can be designed to protect the roots of these trees while decreasing soil erosion into the wetlands. Mr. Hardy greatly values his woodlands and anything that you can do to work with him on this project and to minimize damage to his woodlands is greatly appreciated.

Sincerely,

Nancy C Bozek

Nancy C. Bozek
Executive Director

cc. L. B. Hardy

Waukesha County
APR 15 2013
Dept of Public Works

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Waukesha Bypass Percent Connected Impervious Calculation

PREPARED FOR: Gary Evans, P.E./Waukesha County Doug Cain, P.E./ WisDOT

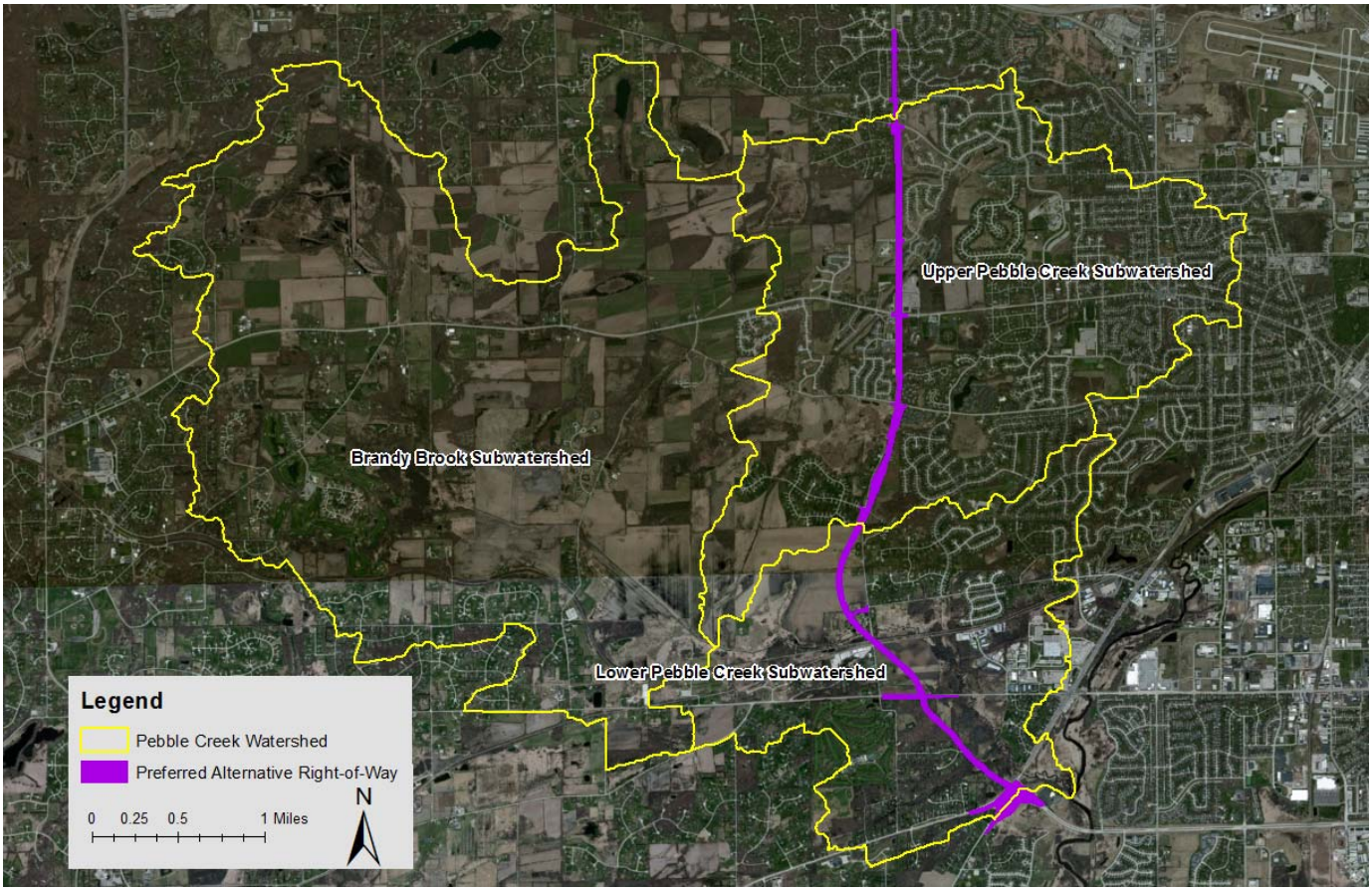
PREPARED BY: Anjulie Cheema/CH2M HILL Dan Dupies/CH2M HILL

DATE: October 11, 2013

Introduction

The "Water Quality" discussion in the Cumulative Effects Analysis of the Draft EIS identifies the additional impervious surface the reasonable alternatives would add to the Pebble Creek watershed south of the Wisconsin & Southern Railroad. The discussion notes that, as a result of increasing urbanization in the Pebble Creek Watershed, water quality in Pebble Creek has declined. The *Pebble Creek Watershed Protection Plan (*Waukesha County Department of Parks and Land Use and SEWRPC, 2008) states that, as of 2005, about 41 percent of the watershed was urbanized, which equates to about 9 percent overall directly connected imperviousness. Connected impervious surfaces have a direct connection to a stormwater drainage system and, ultimately, to a stream (like Pebble Creek) without the potential for infiltration into pervious surfaces or facilities specifically designed to infiltrate runoff. Eight to 12 percent overall connected impervious surface in a watershed can cause subtle changes in physical and chemical properties of a stream that may lead to a decline in its biological components. The plan cites a stream study in Wisconsin that found a threshold of about 10 percent directly connected impervious cover in the areas tributary to the streams beyond which the quality of the fishery community (abundance, diversity, ability of species to tolerate pollution) declines because of adverse impacts on water quality. Figure 1 shows the location of the Waukesha Bypass preferred alternative within the Pebble Creek Watershed.

FIGURE 1
Preferred Alternative Location



In its comments on the Draft EIS, USEPA asked the project team to determine the percent of directly connected imperviousness in the Pebble Creek Watershed and anticipated percent urbanization for each reasonable alternative so that judgments could be made about the project's impact on water quality. To determine the project's potential impact on the percentage of connected impervious surfaces (directly connected imperviousness) in the study area, the project team obtained the spreadsheet SEWRPC used to calculate percent directly connected imperviousness in the Pebble Creek watershed in 2000and 2035 (projected by SEWRPC). SEWRPC began the process of identifying the connected imperviousness in the Pebble Creek watershed by estimating the percent connected imperviousness for urban land use categories in the watershed. The total percent connected imperviousness for the watershed was calculated using land use data and the connected imperviousness percentages for each land use category estimated by SEWRPC. The percent connected imperviousness for the watershed and urban land uses in the watershed for 2000and 2035 from the *Pebble Creek Watershed Protection Plan* are found in Appendix A.

This memorandum describes the stepped process CH2M HILL followed using SEWRPC land use data to estimate the preferred alternative's impact on the Pebble Creek Watershed directly connected imperviousness, and by extension, its potential impact on water quality.

Step 1—Refine 2010 Land Use Data for Pebble Creek Watershed

Rather than using the 2000 land use data in the *Pebble Creek Watershed Protection Plan* as the base condition, CH2M HILL obtained SEWRPC's 2010 land use data for Waukesha County. CH2M HILL completed several geoprocessing steps to determine the total acreage per land use category within the Pebble Creek Watershed. SEWRPC's 2010 Land Use Inventory contains a land use category, "Transportation: Off-Street Parking", not found in the 2000 data. Land use data from 2000 in the *Pebble Creek Watershed Protection Plan* combined areas containing the right-of-way and parking lots into the land use category "Transportation: Motor Vehicle Related." Distinguishing between right-of-way and parking lots increases the accuracy of the percent imperviousness calculation because parking lots have an estimated 100 percent connected imperviousness while the right-of-way has an estimated 50 to 60 percent connected imperviousness. Table 1 displays the total acreage by land use category for 2000, 2010, and 2035 (estimated by SEWRPC). As shown, urban land area within the watershed increased by 4.9 percent between 2000 and 2010, and rural land uses decreased by 4.9 percent. The increase in urban land uses was mainly caused by over 200 acres of additional recreational land and an increase in residential land.

Step 2—Develop Connected Imperviousness for Pebble Creek Watershed (2010)

After updating the land use data in the Pebble Creek Watershed, CH2M HILL calculated the watershed's 2010 connected imperviousness percentage for the Pebble Creek Watershed following the methodology SEWRPC used to develop the 2000and 2035 data. The 2010 estimated percent imperviousness was calculated first by sub-watershed (see Appendix A) and then for the entire watershed. Each urban land use category was assigned the same estimated connected imperviousness percentage SEWRPC used in the 2000calculations. Table 2 lists the 2010 estimated connected impervious percentage for each land use category in the Pebble Creek Watershed. The increase in urban area and decrease in rural land uses within the Pebble Creek Watershed between 2000 and 2010resulted in an increase connected imperviousness of 1.2 percent from 2000 to 8.7 percent.

Step 3—Refine the 2010 Connected Imperviousness with the Preferred Alternative

The 2010 Pebble Creek Watershed's connected imperviousness (8.7 percent) was used as the baseline to determine the effect of the Waukesha Bypass' preferred alternative on connected imperviousness in the watershed. CH2M HILL adjusted the watershed's 2010 land use acreage to incorporate the preferred alternative's proposed right-of-way. The proposed right-of-way area was estimated using ESRI ArcMap. The preferred alternative's right-of-way acreage is 131 acres, 67 acres in undeveloped land and 63 acres in developed land.

TABLE 1
Land Use in the Pebble Creek Watershed: 2000–2035

	2000		2010		Planned 2035	
Land Use Category	**Acres**	**% of Total**	**Acres**	**% of Total**	**Acres**	**% of Total**
Urban						
Suburban density single-family residential	146	1	192.5	1.7	156	1
Low density single-family residential	1,333	12	1,457.0	12.6	2,635	23
Medium density single-family residential	993	9	1,044.7	9.1	1,576	14
High density residential	83	1	166.0	1.4	160	1
Commercial	32	< 1	30.7	0.3	79	1
Industrial	68	1	53.9	0.5	91	1
Governmental and institutional	150	1	143.7	1.2	232	2
Transportation: motor vehicle related	873	8	880.5	7.6	1,255	11
Transportation: rail related	19	< 1	16.9	0.1	—	—
Transportation: off-street parking	NA	NA	98.7	0.9	NA	NA
Communication and utilities	17	< 1	16.6	0.1	—	—
Recreational	285	2	497.6	4.3	666	6
Subtotal	**4,000**	**35**	**4,598.7**	**39.9**	**6,850**	**60**
Rural						
Agricultural and related	4,532	39	3,676.6	31.9	2,264	20
Water	40	< 1	62.5	0.5	40	< 1
Wetlands	1,419	12	1,645.3	14.3	1,387	12
Woodlands	727	6	815.0	7.1	691	6
Open lands	809	7	728.2	6.3	294	2
Subtotal	**7,526**	**65**	**6,927.6**	**60.1**	**4,676**	**40**
Total	**11,526**	**100**	**11,526.3**	**100.0**	**11,526**	**100**

2000 & 2035 Source: Waukesha County & SEWRPC, 2008
2010 Source: CH2M HILL calculation based on SEWRPC land use data

TABLE 2
Connected Impervious Percentage in the Pebble Creek Watershed: 2010

Urban Land Use Category	Acres	Estimated % Connected Impervious	Estimated Connected Impervious Area	Overall Estimated % Connected Impervious	Estimated % Connected Impervious For Urban Land
Suburban single-family residential	192.5	7	13.48		
Low density single-family residential	1,457.03	11	160.27		
Medium density single-family residential	1,044.74	13	135.82		
High density residential	165.96	23	38.17		
Commercial	30.67	73	22.39		
Industrial	53.9	60	32.34		
Government & institutional	143.69	28	40.23		
Transportation (motor vehicle-related)	880.54	50	440.27		
Transportation (rail-related)	16.86	4	0.67		
Transportation (off-street parking)	98.66	100	98.66		
Communication & utilities	16.59	4	0.66		
Recreational	497.6	4	19.94		
Total	**4,598.74**		**1002.87**	**8.70**	**21.81**

Portions of the preferred alternative's right-of-way overlap existing rights-of-way and other land use area. Table 3 displays the 2010 urban land use category areas that overlap the proposed pavement area. Overlapping areas were subtracted from the 2010 land use areas to determine the adjusted land use areas with the preferred alternative. The preferred alternative's right of way (131 acres of right-of-way) was separated into paved area (66.1 acres) and unpaved area (64.74) and added to Table 3 as separate land use categories. The proposed paved right-of-way area was assigned an estimated percent connected impervious of 100 percent, while the proposed unpaved right-of-way area was assigned an estimated connected impervious of 5 percent.

Conclusion

CH2M HILL followed the methodology SEWRPC used in developing the percent connected imperviousness percentages described in the *Pebble Creek Watershed Protection Plan* to estimate the watershed's 2010 connected imperviousness without and with the Waukesha Bypass' preferred alternative. With the Waukesha Bypass preferred alternative, direct connected imperviousness in the Pebble Creek watershed will increase by 0.3 percent to 9.0 percent. Table 4 compares the Pebble Creek Watershed's percent imperviousness for 2000and 2035 developed by SEWRPC and the 2010 percent imperviousness calculated by CH2M HILL.

By remaining below the 10 percent threshold described in the *Pebble Creek Watershed Protection Plan*, it is reasonable to expect that the Waukesha Bypass' preferred alternative would not be expected to adversely affect water quality in Pebble Creek to an extent that it would adversely affect the health of the creek's fishery.

References

Waukesha County Department of Parks and Land Use and Southeastern Wisconsin Regional Planning Commission (Waukesha County and SEWRPC). June 2008. *Pebble Creek Watershed Protection Plan, Part One.* Community Assistance Planning Report Number 284.

TABLE 3
2010 Connected Impervious in the Pebble Creek Watershed with the Preferred Alternative

Urban Land Use Category	Area Right-of-Way Overlap	Adjusted Acres	Estimated % Connected Impervious	Estimated Connected Impervious Area	Estimated % Connected Impervious For Urban Land	Overall Estimated % Connected Impervious For Watershed
Suburban single-family residential	0.00	192.50	7	13.48		
Low density single-family residential	3.95	1453.08	11	159.84		
Medium density single-family residential	0.21	1044.53	13	135.79		
High density residential	0.01	165.95	23	38.17		
Commercial	0.00	30.67	73	22.39		
Industrial	0.00	53.90	60	32.34		
Government and institutional	0.02	143.67	28	40.23		
Transportation (motor vehicle-related)	58.65	821.89	50	410.95		
Transportation (rail-related)	0.00	16.86	4	0.67		
Transportation (off-street parking)	0.03	98.63	100	98.63		
Communication and utilities	0.46	16.13	4	0.65		
Recreational	0.10	497.50	4	19.90		
Proposed Waukesha Bypass ROW – Paved Area	-	66.06	100	66.06		
Proposed Waukesha Bypass ROW – Unpaved Area	-	64.74	5	3.24		
Total	**63.44**	**4,666.1**		**1042.32**	**22.34**	**9.0**

TABLE 4
Summary of Percent Connected Imperviousness

Year	Overall Watershed Percent Connected Imperviousness	Percent Connected Imperviousness for Urban Land
2000	7.5	21.5
2010 without Preferred Alternative	8.7	21.81
2010 with Preferred Alternative	9.0	22.34
Planned 2035	12.8	21.6

2000 & 2035 Source: Waukesha County and SEWRPC, 2008
2010 values: CH2M HILL calculation

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Appendix A
Calculations of Percent Connected Imperviousness

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Year 2010 Percent Connected Imperviousness Calculation (by CH2M HILL)

	Brandy Brook Subwatershed				Lower Pebble Creek Subwatershed				Upper Pebble Creek Subwatershed				Pebble Creek Watershed				
Urban Land Use Category	Acres	Estimated % Connected Impervious	Estimated Connected Impervious Area (acres)	Overall Estimated % Connected Impervious	Acres	Estimated % Connected Impervious	Estimated Connected Impervious Area (acres)	Overall Estimated % Connected Impervious	Acres	Estimated % Connected Impervious	Estimated Connected Impervious Area (acres)	Overall Estimated % Connected Impervious	Acres	Estimated % Connected Impervious	Estimated Connected Impervious Area (acres)	Overall Estimated % Connected Impervious	Estimated % Connected Impervious For Urban Land
Suburban single-family residential	192.5	7	13.48		0	7	0		0	7	0.00		192.5	7	13.475		
Low density single-family residential	667.64	11	73.44		431.04	11	47.4144		358.35	11	39.42		1,457.03	11	160.2733		
Medium density single-family residential	28.05	13	3.65		211.85	13	27.5405		804.84	13	104.63		1,044.74	13	135.8162		
High density residential	1.19	23	0.2737		0	23	0		164.77	23	37.90		165.96	23	38.1708		
Commercial	4.74	73	3.4602		12.32	73	8.9936		13.61	73	9.94		30.67	73	22.3891		
Industrial	5.05	60	3.03		48.7	60	29.22		0.15	60	0.09		53.9	60	32.34		
Government and institutional	11.18	28	3.1304		6.02	28	1.6856		126.49	28	35.42		143.69	28	40.2332		
Transportation (motor vehicle-related)	224.11	50	112.055		194.35	50	97.175		462.08	50	231.04		880.54	50	440.27		
Transportation (rail-related)	2.47	4	0.0988		14.39	4	0.5756		0	4	0.00		16.86	4	0.6744		
Transportation (off-street parking)	8.26	100	8.26		34.98	100	34.98		55.42	100	55.42		98.66	100	98.66		
Communication and utilities	3.63	4	0.1452		3.06	4	0.1224		9.9	4	0.40		16.59	4	0.6636		
Recreational	221.76	4	8.8704		198.47	4	7.9388		77.37	4	3.09		497.6	4	19.904		
Total	**1,370.58**	**—**	**229.89**	**3.93**	**1,155.18**	**—**	**255.65**	**12.03**	**2,072.98**	**—**	**517.34**	**14.55**	**4,598.74**	**—**	**953.54**	**8.70**	**21.81**

Year 2000 and Planned Year 2035 Percent Connected Imperviousness (from *Pebble Creek Watershed Protection Plan;* spreadsheet provided by SEWRPC)

	2000					Planned 2035				
Land Use Category	Acres	Estimated % Connected Impervious[a]	Estimated Connected Impervious Area	Overall Estimated % Connected Impervious[a]	Estimated % Connected Impervious for Urban Land	Acres	Estimated % Connected Impervious[a]	Estimated Connected Impervious Area	Overall Estimated % Connected Impervious[a]	Estimated % Connected Impervious For Urban Land
Urban										
Suburban density single-family residential	146	7	10			156.43	8	13		
Low density single-family residential	1,333	11	147			2,595	12	311		
Medium density single-family residential	993	13	129			1,530	15	230		
High density residential	83	23	19			160.39	28	45		
Commercial	32	73	23			78.73	79	62		
Industrial	68	60	41			90.75	62	56		
Governmental and institutional	150	28	42			231.57	28	65		
Transportation: motor vehicle related	873	50	437			1,341.14	50	671		
Transportation: rail related	19	4	1			—	4	—		
Communication and utilities	17	4	1			—	4	—		
Recreational	285	4	11			666.09	4	27		
Subtotal	**4,000**		**861**	**7.5**	**21.5**	**6,850.1**		**1,479**	**12.8**	**21.6**

[a]Based on total watershed area of 11,526 acres.

Groundwater Investigation and Modeling - 2013

Waukesha Bypass Corridor
Merrill Hills Road to Genesee Road

June 2013

Prepared for
Waukesha County / CH2M Hill

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EXECUTIVE SUMMARY

CH2M Hill and Waukesha County asked GRAEF to evaluate the possible impacts to the mapped areas of groundwater discharge and groundwater supported plant communities on the hill slopes west of Pebble Creek due to the potential construction of the West Waukesha Bypass within the area extending from the County Highway TT bridge over Pebble Creek on the north and State Highway 59 on the south. This evaluated alternative is referred to in the text as the Pebble Creek West Alternative. The purpose of this study was to evaluate potential impacts to the groundwater system at three specific transects within the above described area. Soil borings, monitoring wells and groundwater modeling techniques were used to expand the knowledge base of subsurface hydrogeological conditions within this area, and assess direct impacts resulting from grading and paving at those transects.

GRAEF reviewed and evaluated the following information as part of this study:

- Soils encountered in ten geotechnical borings drilled in 2013
- Groundwater elevations measured spring 2013 at six monitoring wells
- Multiple iterations of plan and profile sheets, and cross sections for the Pebble Creek West Alternative,
- Local glacial geology and topography,
- Soils encountered in eleven CH2M Hill geotechnical borings drilled in 2011,
- The soils encountered in the 29 hand auger holes dug in 2010 - 2011,
- Groundwater levels measured in 2010 at data logging well points
- The plant communities observed in the field,
- The mapped groundwater discharge areas, and
- The wetland mapping by SEWRPC.

Based on the reviewed information and evaluation GRAEF has the following interpretations:

- Sediments were highly variable both horizontally and vertically,
- Upward groundwater flows were noted at Transects 1 and 3.
- Sandy sediments appear to be in discontinuous beds in the uplands related to multiple glacial depositional processes.
- Ground water sensitive plant communities appear to be located where layers of sandy sediments intersect the hill slope.
- Sandy sediments make up the base of the Pebble Creek valley south of Sunset Drive.
- The approximate groundwater flow direction south of Sunset Drive is from southwest to northeast toward the hill slope wetlands and Pebble Creek.

The initial conceptualization of sediment geometry in the area of investigation was that beds of granular material, such as sand, were layered between clayey sediments and that the granular beds were on the

order of 5 to 10 feet thick. An alternative explanation was that the deposits of granular sediments were in the form of a blanket deposit, paralleling the land surface. Ten borings were drilled to evaluate alternative concepts, and six monitoring wells were installed to measure groundwater elevations in deeper intervals than were previously measured by the data logging well points during the initial investigation. The findings in these recent boreholes and wells do not fit uniformly into either of these alternative concepts.

Three calibrated groundwater models were prepared for transects where monitoring well water levels and aquifer properties were estimated. The modeled changes to the groundwater levels from changing local recharge to simulate worst case impacts from paving were on the order of 0.1 feet or less. Modeled changes in groundwater discharge were on the order of 1 percent or less.

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APPENDIX

Appendix A SEWRPC Mapping of Groundwater Dependent Wetlands
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I. INTRODUCTION

GRAEF was asked by CH2M Hill and Waukesha County to study the possible impacts to the shallow groundwater system from the Pebble Creek West Alternative in the area studied in 2010 and 2011. The section of the proposed West Waukesha Bypass between the County Highway TT bridge over Pebble Creek on the north and State Highway 59 on the south was identified during a previous phase of groundwater investigations as having significant interactions with Pebble Creek and groundwater fed wetlands on the valley side slopes and lands adjoining the creek. The location of the Pebble Creek West Alternative is shown in Figure 1. The study consisted of background information evaluation, field investigation, evaluation of the data obtained through the background and field phases and groundwater modeling. The following paragraphs document the results of these efforts.

The purpose of this investigation was to evaluate potential impacts to shallow ground water associated with a possible alignment, which is referred to in this text as the Pebble Creek West Alternative. The 2010 groundwater investigation identified areas of groundwater discharge on the valley slopes. In fall 2011 the Southeastern Wisconsin Regional Planning Commission (SEWRPC) delineated wetlands and mapped areas of groundwater discharge and groundwater supported plant communities on the hill slopes west of Pebble Creek, north of WIS 59 and east of Merrill Hills Road. The SEWRPC mapping of groundwater discharge areas and ground water supported plant communities is shown in Appendix A.

II. BACKGROUND

A. Regional Geology and Hydrogeology

The bedrock geology of southeastern Wisconsin consists of a series of nearly level, horizontally bedded sedimentary rocks that were deposited over Precambrian crystalline basement rocks. The Precambrian crystalline bedrock occurs at depths of 1,000 to 1,500 feet below grade. Above the Precambrian crystalline basement rocks are sedimentary rocks deposited during the Paleozoic Era from approximately 540 to 380 million years ago, including the Cambrian, Ordovician, Silurian and Devonian times. The Paleozoic Era bedrocks include sandstones, shales, limestones, and dolomites. These rocks have a gentle dip to the east toward the Michigan Basin.

The bedrock strata dip gently to the east, toward the Michigan Basin. The uppermost bedrock on the western side of the City of Waukesha consists of Silurian-age dolomites. In the project area, the bedrock consists of Niagaran Series, and these dolomites subcrop approximately 100 to 200 feet below ground surface (bgs), that is, at around 670 to 840 feet msl. Bedrock units do not directly impact on the geology of the study area.

Overlying the Niagaran Series dolomites are deposits resulting from the erosional and depositional processes of repeated continental glaciation that characterized Wisconsin during the Pleistocene time. During the most recent major glaciation, the Wisconsinan, glaciation ice sheets moved west out of the Lake Michigan basin and southwest out of Green Bay. These two ice sheets met in western Waukesha County resulting in deposition of the Kettle Interlobate Moraine. In general, as glaciers flowed out of the lake basin sands and gravels were deposited by meltwater at the glacier termini, and clay rich sediments were deposited beneath the ice. Repeated pulses of glacial advance and retreat resulted in very complex distributions of sediments both horizontally and vertically.

Figure 1. Approximate location of the Pebble Creek West Alternative within the project area is highlighted in yellow.

Topographically, Pebble Creek flows through a valley between adjacent glaciated uplands. Glacial drumlin hills are located adjacent to the flood plain and adjacent to the Brady Brook flood plain (a tributary to Pebble Creek) to the west. The drumlin hills tend to have comparatively lower permeability soils and the glacial outwash sands and gravels in the valleys tend to have comparatively higher permeability soils.

In southeastern Wisconsin there are three aquifers. The deepest being the sandstone aquifer in the Cambrian and Ordovician sandstones. This aquifer is typically utilized for high capacity wells. Located above the deep sandstone aquifer is the upper bedrock aquifer in the Silurian dolomite. This aquifer is used for both high capacity wells and low capacity private supply wells. The uppermost aquifer is the glacial aquifer in sands and gravels. Utilization of the sand and gravel aquifer depends on the nature of the deposits and the extent to which the deposits yield sufficient water for supply wells.

Figure 2. Groundwater contour map of the project area.
Mapped coutour interval is 20 feet.

The groundwater flow patterns in the dolomite and sand and gravel aquifers in Waukesha County were mapped in the 1970's and again in the 2000's based on water levels in reported in supply wells and the elevations of streams. Figure 2 is a water table map from the Waukesha County internet mapping site for the area from CTH TT to STH 59.

The groundwater elevations are highest at the along STH 59 in the southwest quadrant of the map, and lowest along Pebble Creek. The mapped contours reflect interactions of Pebble Creek and the groundwater system. The flow patterns presented on the Waukesha County GIS Internet mapping site, USGS (1975) and SEWRPC (2002) publications have Pebble Creek receiving groundwater flow from both sides of the stream. The groundwater system is recharged in the adjacent uplands, groundwater flows from the uplands toward the creek, and then discharges to the adjoining wetlands and creek adding to base flow.

B. Previous Investigations

1. 2010 Investigation

During 2010 groundwater evaluations began on a possible alignment of the West Waukesha Bypass from State Highway 59 (Genesee Road) on the south to the County Hwy TT (Merrill Hills Road) bridge over Pebble Creek on the. At the time of the study in 2010 the evaluated alignment south of Sunset Drive was to be constructed approximately parallel to Pebble Creek. North of Sunset Drive the creek trends more northerly than the proposed roadway and diverges to the east.

In this study south of Sunset Drive areas of ground water discharge at the land surface on the side slope of the hill to the west of Pebble Creek were observed. The groundwater discharge areas were extensive zones and isolated in seeps that drained toward the creek. A similar pattern of discharge on the slope of the hill upslope from the creek was not observed north of Sunset Drive. The hill slope north of Sunset Drive was actively farmed and may be drained by agricultural tile lines. The surface discharge and overland flow into the creek precluded accurate determination of direct groundwater flow into the creek by stream gauging.

Variation in soil textures were noted between and among the areas investigated with the hand augers and well points. Groundwater hydrographs recorded in data logging well points likely reflect the nature of the hydrology and the relative importance of the various additions to and subtractions from the local water budgets. In areas dominated by groundwater discharge there was comparably less variation in water level than areas supplied by local infiltration. The side slopes of the valley appeared

to be both recharge and flow through areas supplying ground water to down slope groundwater discharge and discharge to the creek. Recharge and flow through also supplied root zone waters to plants farther down slope, as evidenced by the evapotranspiration patterns in the hydrographs of wells lower on the slopes.

North of Sunset Drive, Pebble Creek is designated a Class II Trout Stream, and south of Sunset Drive Pebble the creek is classified as a warmwater sport fishery. Groundwater base flow was interpreted to be a likely significant element sustaining the thermal regime of Pebble Creek. Changes to the thermal regime of the stream could be a negative impact due to it being a key component of its ecology.

The conclusion was reached that the type and magnitude of the impacts to groundwater from construction of the proposed bypass would depend on the selected alignment. Impacts to the deeper regional groundwater system from construction of the proposed bypass are not anticipated to be significant. Possible impacts are likely to be localized and restricted to the wetlands adjacent to and down flow from pavement. At these locations the impacts are likely to be changes in the quantity and quality of the ground water supplied to the wetlands.

The other possible impacts are potential impacts to Pebble Creek. Specifically, changes to the temperature, quality and quantity of the ground water supplies to the local base flow of Pebble Creek

2. 2011 Investigation

During 2011 an additional groundwater study performed to supplement the 2010 study. At that time it was interpreted that the surface distribution of sandy soils was discontinuous based on the 29 hand auger holes from 2010 and 2011. If the distribution of the sand layers encountered in the eleven 2011 geotechnical borings were laterally continuous, the surface expression would likely be laterally continuous areas of sandy soils, not spatially discontinuous areas. The areas of groundwater discharge or groundwater dependent plant communities were associated with areas where sandy soils were found at or were near the ground surface.

Areas of groundwater discharge on the hill slopes west of the creek appear to be connected to layers of sandy materials that extend beneath the uplands to the west. The general groundwater flow direction south of Sunset Drive is from southwest to northeast toward the hill slope wetlands and Pebble Creek. The areas of groundwater discharge and Pebble Creek were interpreted to be recharged by an

area of contribution that extended approximately 4,000 feet to the southwest based on flownet evaluation. The approximate foot print of the Pebble Creek West and Far West Alternative locations within the ground water contribution area represents approximately five percent of the contribution area.

Figure 3. Approximate area of groundwater contribution to Pebble Creek from the west on the south of Sunset Drive based on flownet evaluation.

A flow path to an approximately 425 foot wide zone along Pebble Creek north of Sunset Drive was evaluated using groundwater flownet analysis. Construction alternatives were found to potentially reduce infiltration to the area on the order of two percent.

III. METHODS OF INVESTIGATION - 2013

The subsurface investigation included geotechnical borings, groundwater monitoring wells, slug tests and groundwater models. The wells and borings were generally located along the proposed alignment of the Pebble Creek West Alternative.

A. Drilling and Sampling

Ten geotechnical borings were completed from March 4 to 7, 2013 to evaluate soil conditions and install groundwater monitoring wells. The boreholes were advanced to termination depths of 20 to 38 feet bgs. A track-mounted drill rig was used to advance boreholes using hollow stem augers. Soil sampling was performed in accordance with

ASTM D 1586. The soil was sampled 1.5-foot intervals, skipping 1.0-foot intervals between samples. Field boring logs prepared and maintained by a Gestra drilling technician included lithological descriptions, visual-manual soil classifications (ASTM D 2488), and Standard Penetration Test (SPT) results recorded as blows per 6 inches of penetration (Appendix B). A GRAEF environmental scientist reviewed soil samples from the upper five feet for signs of redoximorphic features to estimate seasonal high water tables. A GRAEF environmental scientist to direct installation of the monitoring wells.

The boreholes not used for monitoring wells were backfilled with bentonite at the completion of drilling and the surface was restored as close as possible to the original condition. Groundwater observations were made during drilling operations within the augers. The wells were developed by Gestra to remove fine grained sediments from the well screens and improve the hydraulic connection between the well and the surrounding formation.

B. Groundwater Elevations

Groundwater elevations were measured using an electronic measuring tape accurate of 0.01 feet. Depths to groundwater were measured in each well from the north side of the PVC well casings to the groundwater within the well. Elevations were determined from the measured depths and the surveyed elevations of the PVC well casings. Wells were surveyed by Kapur and Associates. The elevations were reported to 0.001 feet.

C. Hydraulic Conductivity Testing

Hydraulic conductivity is a measure of the relative ease with which water can move through geological material, and is expressed as a distance per unit time. The smaller the number the greater the resistance to the movement of water and harder it is for water to move through the material. The larger the number the less resistance is to the movement of water in the material. Hydraulic conductivity values in glacial materials can be expected to vary over at least eight orders of magnitude. Testing hydraulic conductivity in monitoring wells is typically limited by the size of the well and equipment that can easily be utilized. A typical method is to introduce or remove a controlled volume into a well and measure the water level response. This method is typically referred to as slug testing and was the method used to test the six wells installed in this study. Slug testing has the disadvantage in that it only tests a small area immediately adjacent to the well, but has the advantage that the method is relatively short in duration.

D. Groundwater Modeling

Groundwater models were prepared at each of the three well transects. The purpose of modeling the groundwater system as transects was to capture the essence of the groundwater flow system, but reduce the complexity of full three dimensional aquifer simulation. Groundwater modeling allows for testing hypothesis as to the geometry and extent of subsurface deposits between boreholes, and allows for the testing of changes to the natural system. Details of the groundwater modeling efforts are described in detail in section 6.

IV. INVESTIGATION RESULTS

A. Stratigraphy

1. Area Data Review

Private supply well construction logs from the area adjacent to the study area were obtained from the WDNR internet site. The logs were located using Waukesha County tax records. The elevations of the wells were then interpreted from Waukesha County topographic data. The lithological profile can be generalized as clayey glacial tills interbedded with sand and gravel glacial outwash over dolomite bedrock, based on a review of construction logs from private supply wells in the vicinity of the study area (Appendix C). The sequence of sediments in the project area was generally tills over outwash over tills over bedrock. The profile is more complex in the Pebble Creek valley where stream alluvium was encountered, and to the north of Sunset Drive where glacial lake sediments were encountered.

Clayey sediments, likely a glacial till was generally reported immediately above the bedrock as shown in Figure 4. The thickness of this material ranged from 14 to 162 feet thick and averaged 66 feet thick in general vicinity of the study area. The elevation of bedrock immediately to west of the study area is approximately 740 feet msl, and immediately to the east it is approximately 675 feet msl. The slope of the bedrock surface appears to the east as shown in Figure 4.

The Wisconsin Geological and Natural History Survey mapped the Pleistocene geology of Waukesha County (Clayton, 2001). The sediments in the study area south of Sunset Drive along Pebble Creek were mapped as modern stream sediments described as a few meters of overbank silt and clay over a few meters of channel sands and gravelly sands. Along the axes of the Pebble Creek drainage, sands and gravels originating as glacial fluvial channel deposits occur beneath the stream deposits.

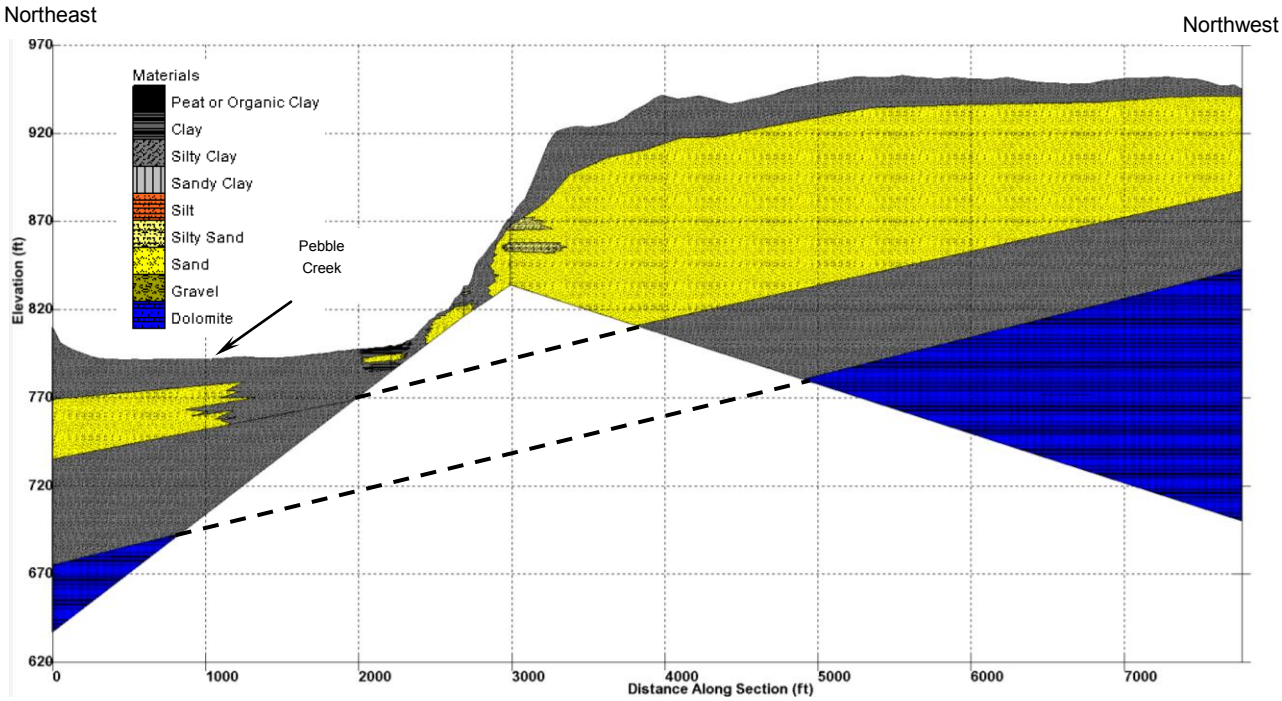

Figure 4. Generalized geological cross section through the study area from the northeast to the southwest. Contacts dashed where inferred.

2. Site Specific Investigations

The locations of the geotechnical borings, wells and cross sections are shown on Figure 5. Geological cross sections were prepared from the 2011 and 2013 borings. The 2011 borings were numbered B-1 through B-11. The 2013 borings continued the numbering sequence, starting at B-12 and ending at B-21. In 2011 a cross section was prepared along the alignment of Pebble Creek at the soil borings closest to the creek. This cross section was revised and extended to the northwest to include MW-1 (B-14), S-13 and B-12. The additional borings were located relatively farther away from the creek and up slope compared to the other borings. These new boring did not have the peaty surface deposits of the clayey sediments as a deposit closest to the surface The revised cross section is shown in Figure 6.

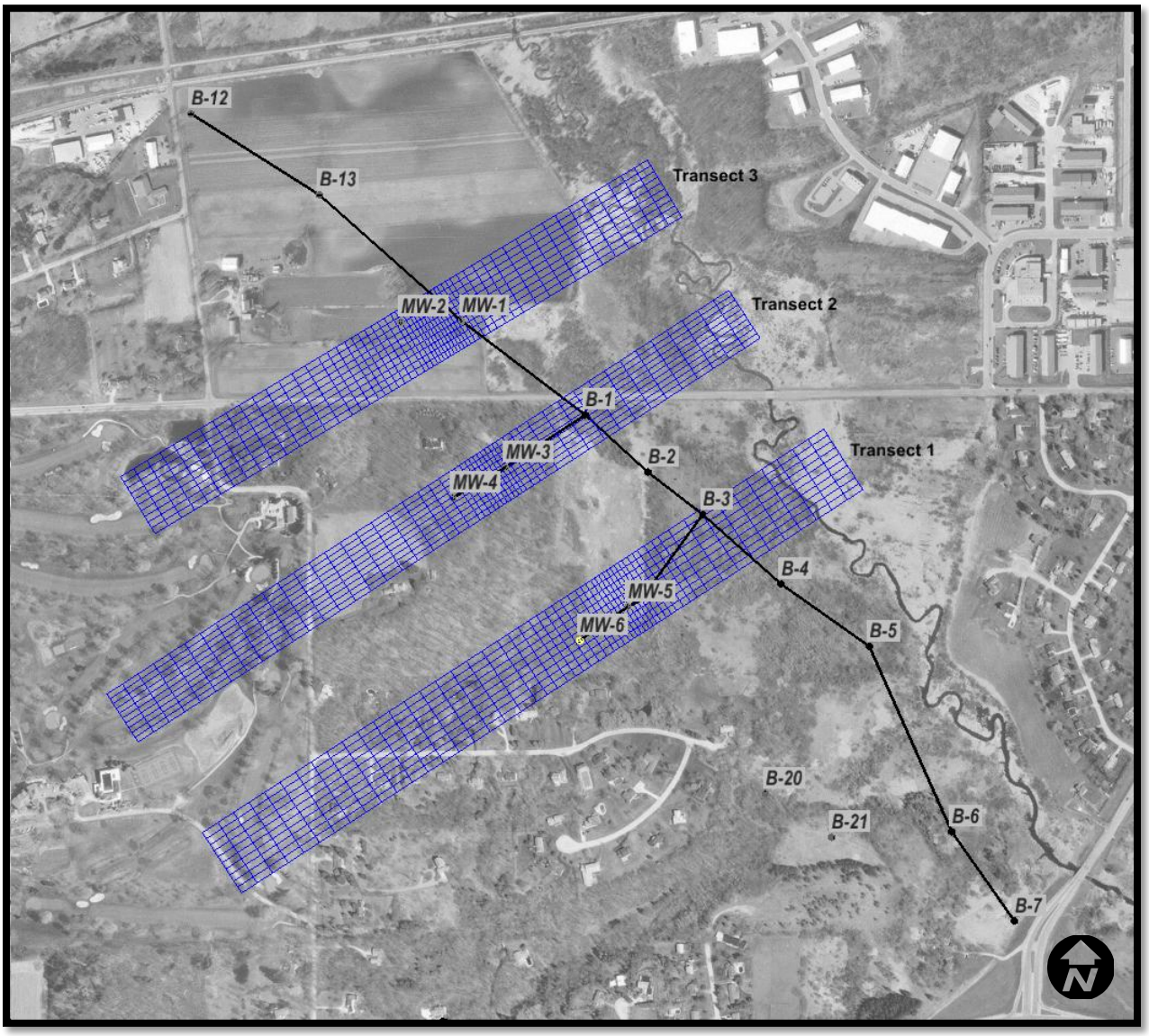

Figure 5. Study area map showing the locations of geotechnical soil borings, monitoring wells and geolgical cross sectoins.

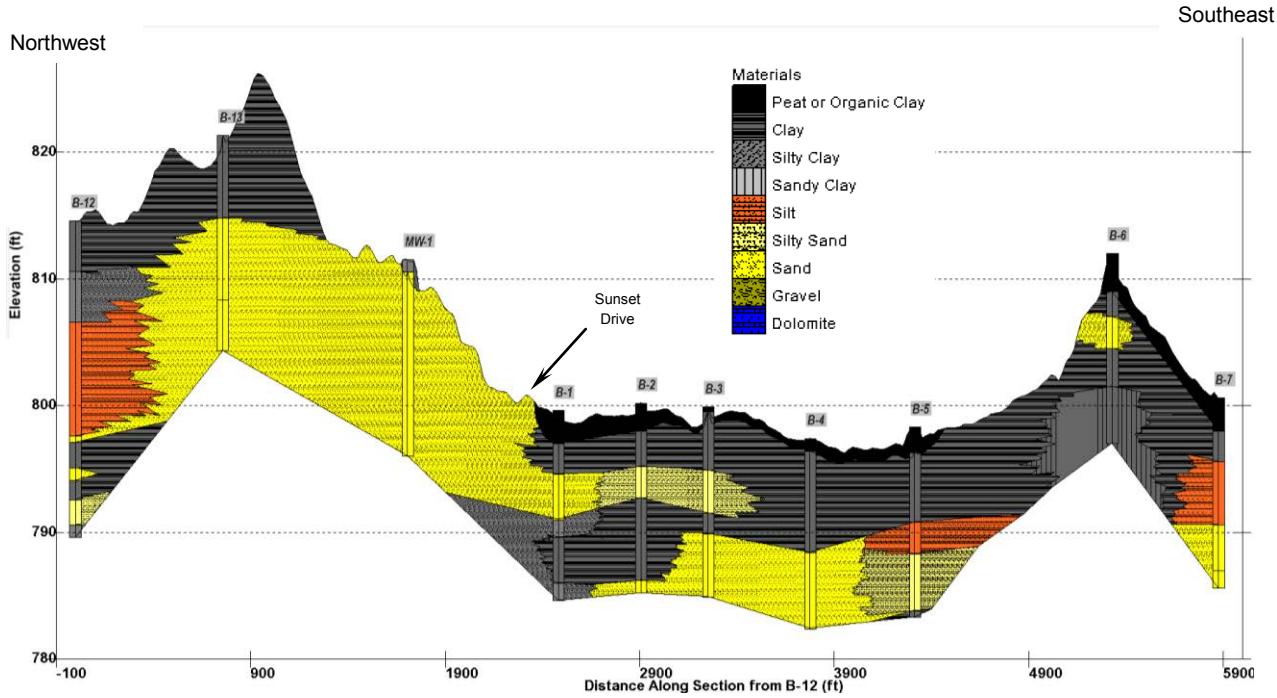

Figure 6. Geological cross section extending from B12 on the north to B-7 on the south

The sandy soils anticipated based on the mapping by the Geological Survey mapping can be noted in the bases of the geotechnical borings B-1 through B-7. The sediments encountered at MW-1 were consistent with the reported proglacial lake depositional environment. Thin layers of fine to medium sands were interbedded with thin clayey layers. The sand layers were on the order of one foot and the clay layers were several inches thick. Over fifteen feet of these alternating layers were observed at MW-1. Such sediments have the bulk hydraulic property that groundwater can move horizontally through the sands orders of magnitude easier than vertically through the clays. Similar conditions were noted at MW-2, but sediments were generally sandier.

To the northwest of MW-1 at SB-13 a thicker sand unit is also present and is interpreted to be connected to the sands at MW-1 and MW-2, Moving farther to the northwest to SB-13 sediments are finer grained are more variable than at SB-13 and likely reflecting deposition by modern fluvial processes.

A geological cross section was prepared for the location of the groundwater model at Transect 2 (Figure 7). At the locations of both MW-3 and MW-4 sandy sediments were encountered beneath clayey sediments. In contrast to the sandy sediments at

MW-1, thin layers of clays were not noted interbedded with the sands at either MW-3 or MW-4. Clayey sediments at the MW-4 were interpreted to be glacial tills.

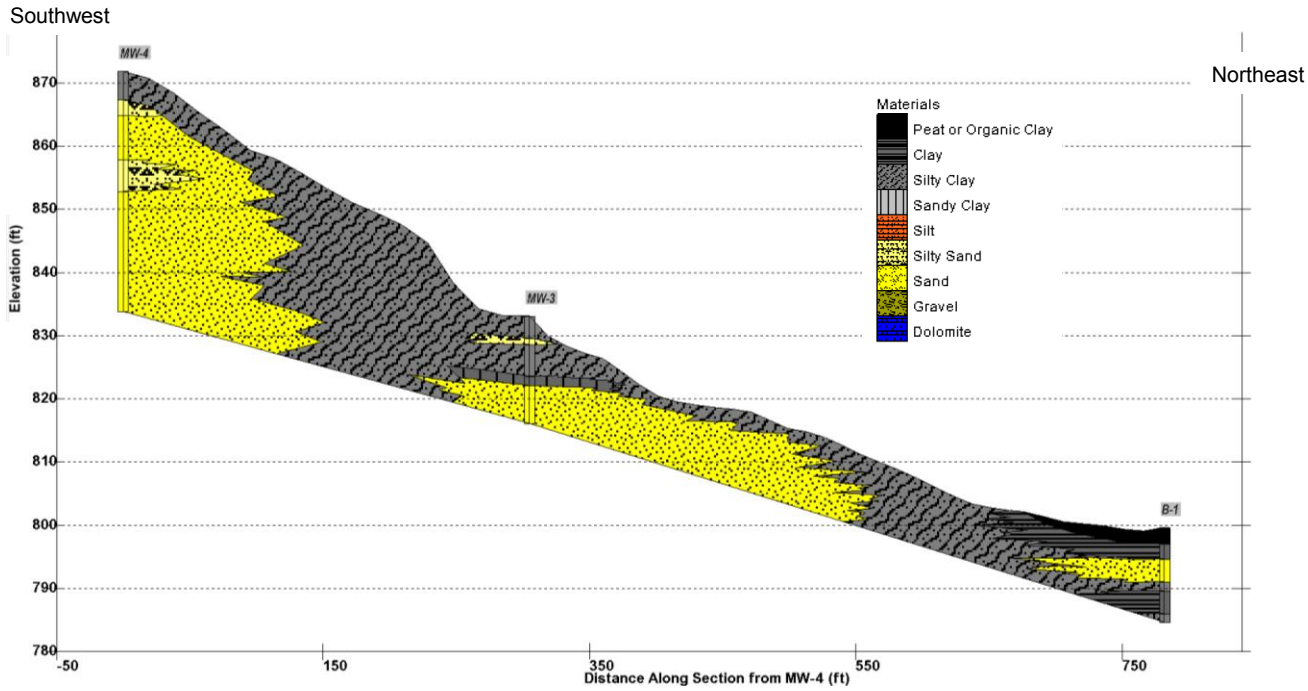

Figure 7. Geological cross section through B-1, MW-3 (B-16) and MW-4 (B-17)

The sandy sediments at MW-4 are likely outwash sediments, based on the topographic position, the nature of the sands, the thickness of the deposit and the till deposited above the sands. The sands and clays at MW-3 were interpreted to be glacial lake deposits. The sands in the base of MW-3 were initially interpreted to be connected to the sands at MW-4. It was inferred from the groundwater modeling results that these two deposits were not directly connected because the model could not be calibrated with a direct connection between the two deposits (discussed in Section 7).

A geological cross section was prepared for the location of the groundwater model at Transect 1 (Figure 8). At MW-5 clayey sediments were found over sandy sediments that were over silt. At MW-6 sandy sediments were encountered over clayey sediments that were over silt. The sediments at MW-6 were interpreted to be outwash deposits. At MW-5 the sediments were interpreted to be glacial lake sediments. The silts at MW-5 and MW-6 were not interpreted to be connected to the sandy sediments beneath the creek.

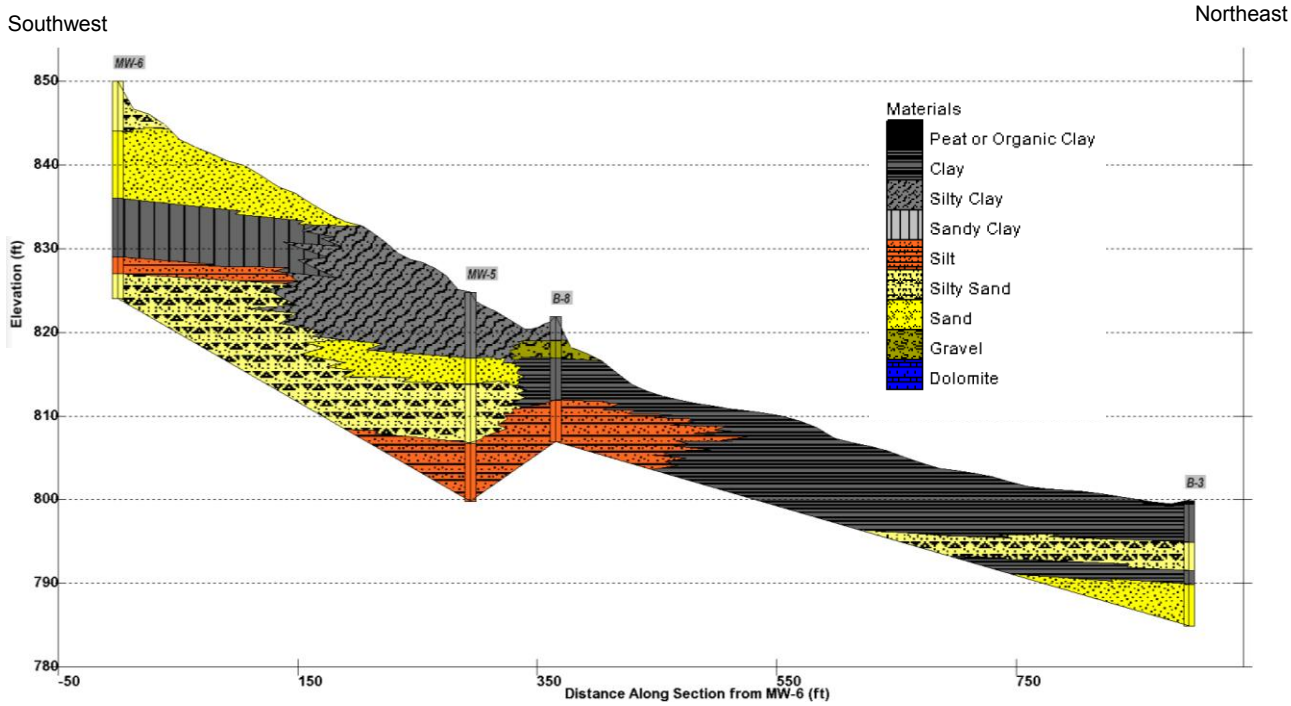

Figure 8. Geological cross section through B-3, MW-5 (B-18) and MW-6 (B-19)

B. Groundwater Elevations

Groundwater elevations were measured on four occasions at all six wells following well development. The elevations were measured on March 11, April 2, May 3 and May 30, 2013. At the time the wells were installed, the water levels in the boreholes were reported at lower depths than the subsequent well measurements. Larger differences were noted at the wells lower on the topography. For example, at MW-1 the water level in the borehole was reported as five feet below grade, and the water level in the well was over two feet above grade, a greater than seven foot difference. At MW-2 the water level was reported at six feet below grade and was measured at approximately five feet below grade in the well, a one foot difference.

The groundwater elevations generally increased from those noted in March through those measured in early May, and were variable from early to late May, as can be noted in Figure 9. The water levels at well MW-1 are only approximate because the well overflowed if allowed to remain open for over a half hour, and the actual water elevations should have been above the elevation of the well casing. At MW-1 the recorded levels remained approximately the same. The water levels increased by 1.64 feet at MW-2, 3.06 feet at MW-3, 2.94 feet at MW-4, 4.68 feet at MW-5 and 3.98 feet at MW-6. The average increase observed in the wells was 3.26 feet, not including MW-1.

The continued increase at MW-4 possibly results from the time required to recharge infiltration through the till and thick sand sequence above the water table in contrast to the other wells that showed decreases over the same time period (May 2 to May 30). Based on the nature of recent precipitation it is possible that the wells were close to their seasonal maximum water levels during May 2013.

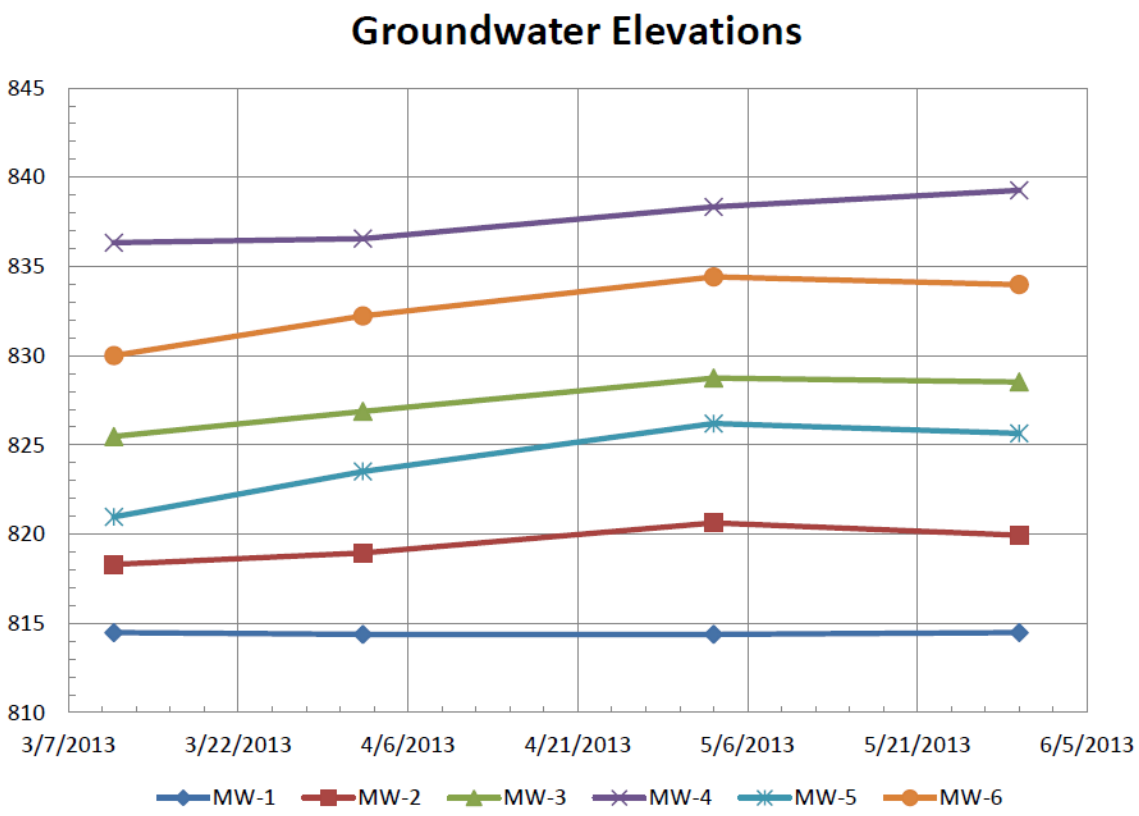

Figure 9. Graph of groundwater elevations measured at monitoring wells. Well MW-1 overflows its casing and the elevation at MW-1 reflects the elevation of the top of the well casing rather than the actual groundwater elevation. The actual elevation at MW-1 was above the recorded elevation.

The groundwater elevations measured on May 2, 2013 were contoured to produce a map of the shallow groundwater elevations. The elevations were contoured using a program that implements a distance weighted interpolation scheme. The results were similar to the regional groundwater elevation mapping in terms of general pattern, but were approximately 10 to 20 feet higher in the southwest quadrant of the map. The

higher elevations reflect the shallower depths of the monitoring wells compared to the depths of private supply wells, which are typically over 200 feet deep in the study area. In general, there is a downward flow from the glacial sediments into the dolomite aquifer, and a downward flow from the dolomite aquifer into the deep sandstone aquifer. The difference in elevations between the monitoring wells and the levels reported in supply well construction records reflects this downward flow.

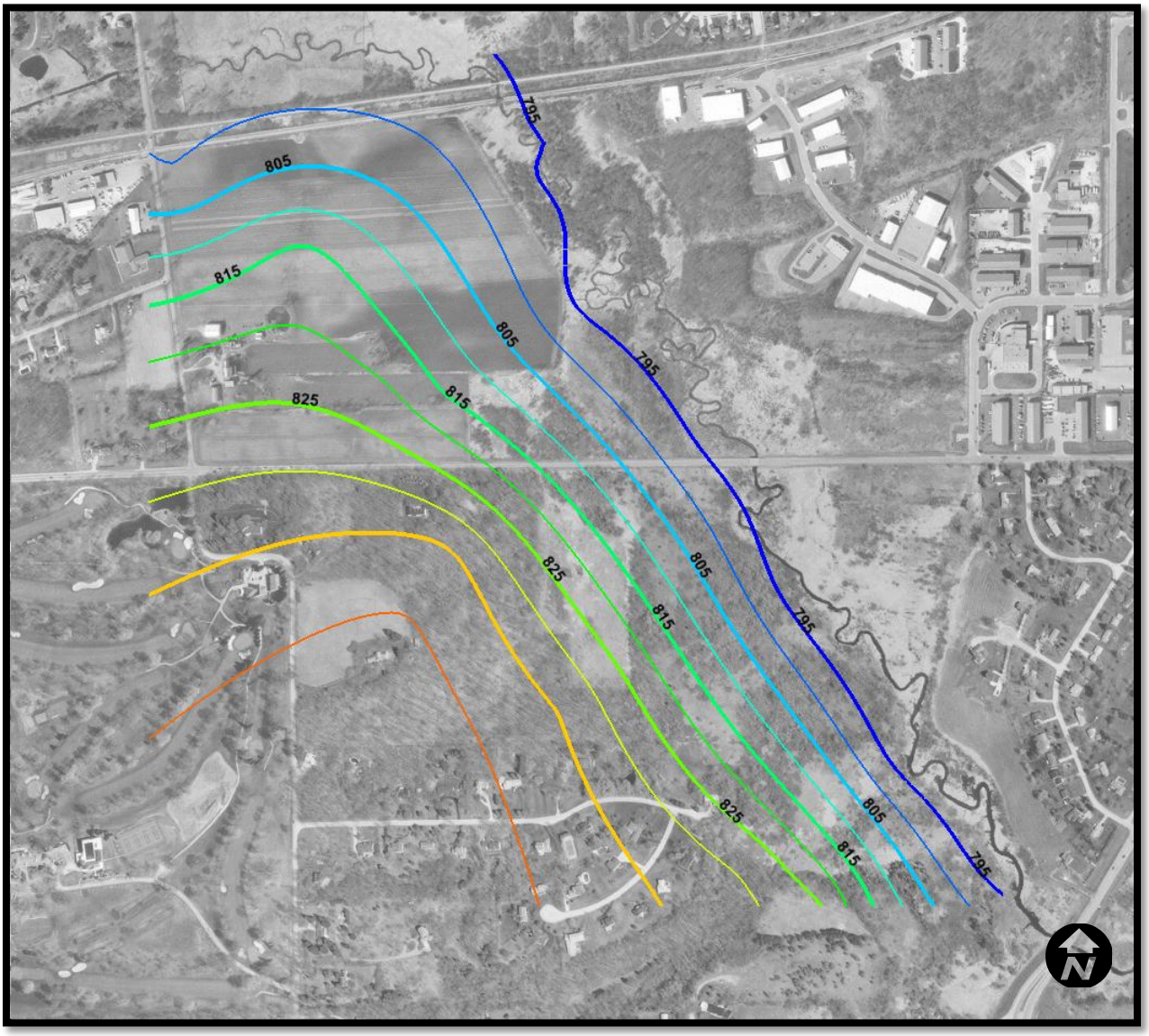

Figure 10 Contour map of groundwater elevatons measured on May 2, 2013 in project monitoring wells. The mapped contour interval is five feet. The flow direction is to the east and north away from the southwest quadrant of the figure.

The flow was generally from the uplands toward Pebble Creek – to the northeast on the southern half of the study area, to the north on the western side of the study area, and transitional in between. Based on the contoured groundwater elevations, it is likely that the area of groundwater contribution from the shallow sediments to the groundwater discharge areas, wetlands and Pebble Creek extends farther to the west. There are not sufficient shallow wells to determine the detailed groundwater contours to the west and south of the study area that would be necessary to determine area of groundwater contribution in the shallow sediments. A larger area of groundwater contribution means that the proposed highway pavement represents a smaller percentage of the area of contribution, and as a result will intercept a smaller percentage of the recharge to the groundwater system, and represent a smaller increase in impervious surface within the area of groundwater contribution.

C. Aquifer Testing

In order to estimate the hydraulic conductivity of the sediments at the site, Monitoring Wells MW-1 through MW-6 were tested using slug test methodologies. This method entails recording the water level changes within a well that result from the addition or removal of controlled volume of water. When the slug is added to a well the method is typically referred to as “slug in” and stresses the unsaturated and saturated media in the immediate vicinity of a water table well, or only the saturated media in the vicinity of a piezometer well. After the slug is introduced into a well and the water level has returned to static conditions the slug is then removed from the well. This method is typically referred to as “slug out.” The slug out test stresses only the saturated media in the immediate vicinity of a water table well or piezometer. The tests were evaluated using the Bouwer and Rice (1976) method as implemented within spreadsheets available from the United States Geological Survey. The testing documents are in Appendix D.

The testing results are presented in Table 1. The results can be grouped for the sediments encountered in the interval screened by the well – sands, silts and clays. The average horizontal hydraulic conductivity of the sandy sediments was 28 ft/day (9.8E-3 cm/sec). The average horizontal hydraulic conductivity of the silty sediments was 4.2 ft/day (1.5E-3 cm/sec). The average horizontal hydraulic conductivity of the clayey sediments was 0.16 ft/day (5.7E-5 cm/sec).

Table 1

Table of Measured Horizontal Hydraulic Conductivities

	Slug-In		Slug-Out	
	(ft/day)	(cm/sec)	(ft/day)	(cm/sec)
MW-1	0.48	1.7E-04	0.013	4.6E-06
MW-2	30	1.1E-02	0.096	3.4E-05
MW-2 (late data)	0.057	2.0E-05		
MW-3	29	1.0E-02	25	8.8E-03
MW-4	37	1.3E-02	18	6.4E-03
MW-5	5.6	2.0E-03	5.3	1.9E-03
MW-6	2.9	1.0E-03	2.8	9.9E-04

The results were used as the starting points for calibrating the groundwater models.

V. CONCEPTUAL MODELING

After groundwater elevations were measured at the monitoring wells, possible grading elevations were compared with the measured groundwater elevations. The grading elevations were adjusted to eliminate grading into the water table through an iterative process. Elevations of groundwater at the four soil borings where monitoring wells were not installed were adjusted based on average increase in groundwater elevation noted at the wells and the field observations at the time the borings were drilled. The elevations measured on May 2 2013 were used for the most recent conceptual model used to evaluate the grading elevations. The current conceptual model can be found in Appendix E.

VI. GROUNDWATER MODELING

A. Modeling Approach and Limitations

These groundwater models and the conclusions derived from the output of the modeling were prepared exclusively for Waukesha County and CH2M Hill, Inc. The models were built and used to understand of the groundwater system sustaining (1) the wetlands

adjacent to and upslope from Pebble Creek, (2) groundwater discharge from the slope paralleling Pebble Creek and (3) flow to Pebble Creek; evaluate the possible changes in groundwater levels resulting from localized decreases in recharge along the modeled transects resulting from construction of the bypass; and to evaluate changes to the groundwater system resulting from grading along the modeled transects for the proposed bypass.

A total of three models were prepared, one for each transect. The models was prepared using industry standard methodologies and is considered by the preparers to be accurate within the limits of the available budget and schedule assigned to the project.

B. Conceptual Model

The groundwater system at the West Waukesha Bypass was conceptualized as a granular medium. The system is a non-confined system under water table conditions. The eastern boundary of the water table flow system within the glacial sediments was considered to be Pebble Creek. The western boundary of the flow system was conceptualized as the flow divide interpreted from the Waukesha County groundwater contours.

The groundwater elevations (head) within the dolomite aquifer reported in supply well construction reports, are lower than the groundwater elevations within the glacial sediments as determined in this study. As such there will be a downward component to the local groundwater flow system. Significant groundwater seeps and discharge area were observed during site visits and locally, groundwater elevations are greater than the land elevations.

C. Modeling Program

1. GMS Model

The Groundwater Modeling System (GMS 8.3) software platform was used to develop the conceptual models and input files for the groundwater models. GMS was developed by Brigham Young University. The GMS platform was selected because of the conceptual model approach built into the software. Using this approach, a conceptual model can be designed and built within GMS using imported graphics, such as aerial photographs and topographic mapping; CAD type tools: and GIS feature objects such as points, arcs, and polygons. Within the conceptual model features such as model boundary conditions, water sources, water extractions, and material property zones are defined for a model. The model data can then be projected into MODFLOW files.

2. Computer Codes

The models were implemented using the US Geological Survey model MODFLOW as described above. GMS implements the MODFLOW 2000, 2005 or NWT software codes within the GMS environment. MODFLOW 2000 was used to implement the models of the site.

D. Model Structure and Inputs

1. Model Grids

The entire three dimensional modeled area is called the model domain. The long dimensions of the domains were aligned with approximate directions of groundwater flow, with the long axis of the model aligned southwest to northeast. The model domains were divided into smaller sections along a grid. The model grids represent the boundaries of blocks within the model. The material properties of the modeled materials, such as sands or clays, were defined within each block, and were constant for that block. The initial model grids was a uniform 10 blocks wide and 40 blocks long. Following evaluation of several model runs, the east-west spacing of the grids in the areas of the wells were decreased to allow for greater detail. The models were structured as transects extending from the approximate location of the groundwater flow divide to the west to Pebble Creek on the east. The horizontal grids for the three models are shown in Figures 11 through 13.

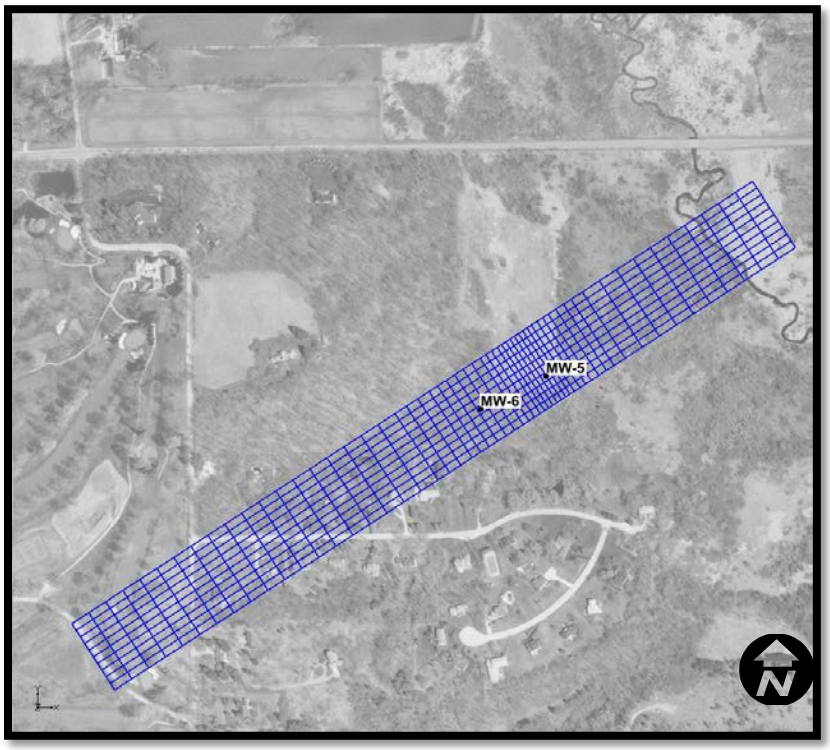

Figure 11. Layer 1 model grid at Transect 1 shown in blue.

Figure 12. Layer 1 model grid at Transect 2 shown in blue.

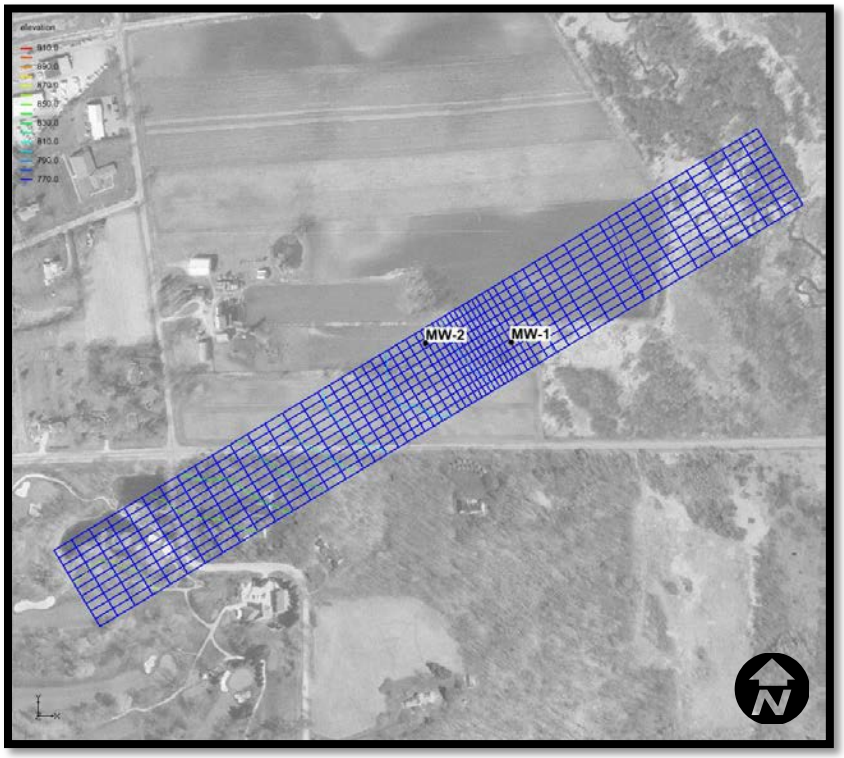

Figure 13. Layer 1 model grid at Transect 3 shown in blue.

The model grid layering was conceptualized as a series of slices approximately paralleling the lithological units. From two to six layers were included in the models. The vertical layering of the model grids are shown in Figures 14 through 16. The elevations of the top layers in all three transects reflects the local topography. The base of the top layers was set at 10 feet below the elevations of the topography. In Transects 1 and 2 the base of the second layer was set at 20 feet below the land surface.

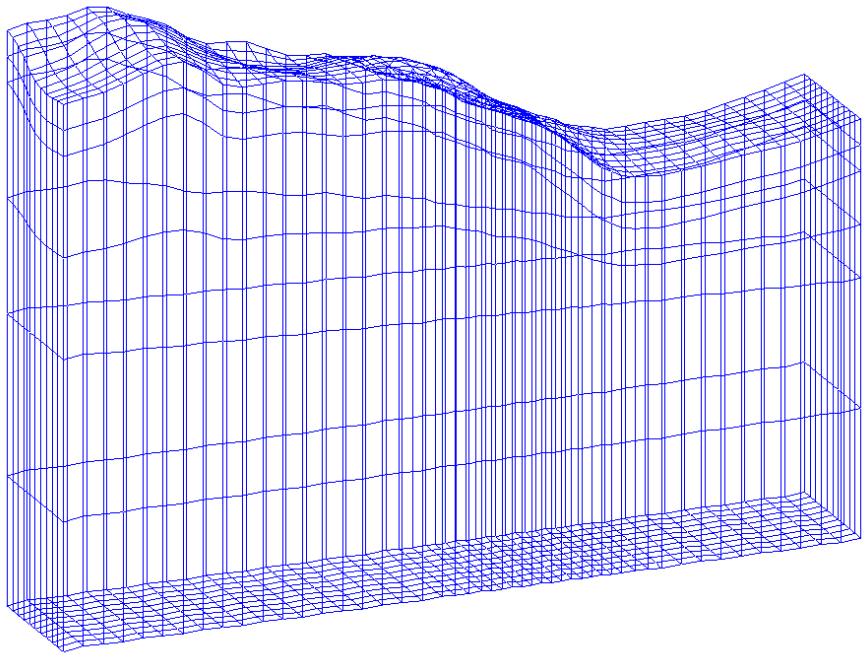

Figure 14. The vertical spacing of the six layers in the Transect 1 model grid are shown in blue. The lines representing the rows and columns of the grid are only shown on the top and the bottom model layers

The elevations of the top of the lowest layer in Transects 1 and 2 were based on the elevations of the bedrock surface mapped from private supply well construction reports (Appendix C). The elevations were projected into the transects. The lowest layer in these two transects was set to an arbitrary thickness of 50 feet to simulate the downward flow into the bedrock. The thickness of the next lowest layer in Transects 1 and 2 was set to be equal to an approximately uniform till thickness of 60 feet, and added to the elevations of the top of the bedrock layer. The space between the bottom of the second layer ant the top of the till layer was split into equally spaced intervals in Transect 1 in order to effectively model the stratigraphy encountered in the soil borings. The same interval in the grid of Transect 2 was not split because the stratigraphy did not require a sixth model layer.

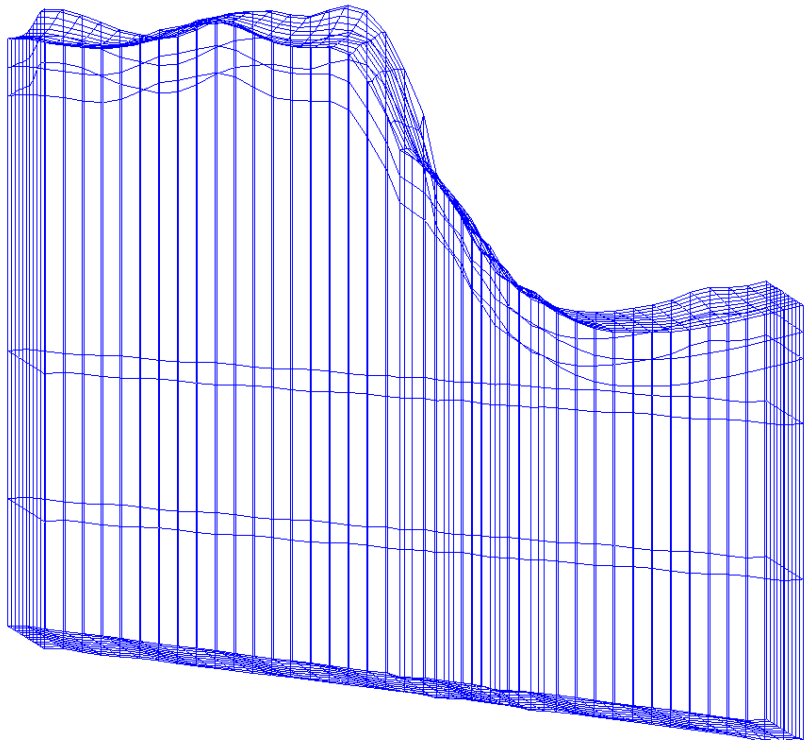

Figure 15. The vertical spacing of the five layers in the Transec 2 model grid are shown in blue.

The grid for Transect 3 did not include a layer for the bedrock or the till interval to simplify the model.

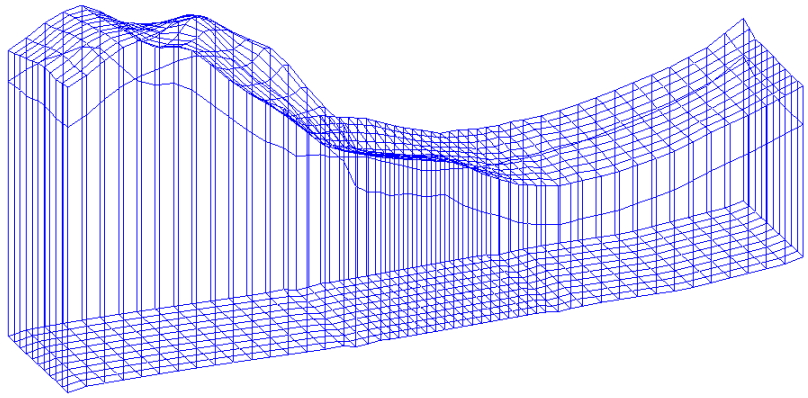

Figure 16. The vertical spacing of the two layers in the Transec 3 model grid are shown in blue.

2. Model Boundaries

The assumption of no-flow perpendicular the long side boundaries is inherent in the conceptualization of a transect model. The long sides of transects are no-flow boundaries. In areas where groundwater is conceptualized as flowing parallel to a model boundary, there is no flow exchanged perpendicular to the direction of flow. The model grids were made sufficiently narrow that the assumption is reasonable.

The locations of the cells modeled as having surface water features are shown in Figures 17 through 19. Surface water boundaries function to either add water to or remove water from the model depending on the relative water elevation difference between the groundwater elevation in the model and the surface water elevation. Various options can be used within MODFLOW to simulate surface water features that interact with the groundwater system. One of these options is referred to as the River Package, which simulates surface water features as dependant on the surface water elevation of the and a conductance of the earth material between the surface water and the groundwater, such as the soils in the bed of a creek. The flow exchanged between the surface water features and the groundwater system is a function of the difference in water elevations (head difference) and magnitude of the conductance of the earth materials between the surface water and the groundwater system. Conductance is proportional to the size of the surface water feature, the hydraulic conductivity of the sediments and inversely proportional to the thickness of the sediments lining the feature. The significant surface water features within or adjacent to the modeled area is Pebble Creek. The width of the creek was estimated from inspection of aerial images. The elevation of the creek water surface was estimated from Waukesha County topographic data within a GIS database.

Another type of model boundary is referred to as a general head boundary, or GHBs. These boundaries are similar to river boundaries in that the magnitude of the flow between the boundary and the model block including the boundary is proportional to the difference in the water elevations and the conductance between the boundary and the model block. The conductance is also inversely proportional to the distance between the boundary feature simulated by the GHB and the location of the model block. Groundwater flow into the western end of Transects 1 and 2 was simulated with GHBs (Figures 17 and 18).

Drains were used to simulate the extraction of groundwater from the model resulting from seepage at the land surface. At drains, the groundwater flow out of the drain is proportional to the difference between the groundwater head and the elevation of the drain and the conductance of the drain. Conductance is proportional to the size of

the feature, the hydraulic conductivity of the sediments in the drain and inversely proportional to the thickness of the sediments lining the feature. Drains were included in Transects 1 and 2 to account for surface discharges and seeps (Figures 17 and 18).

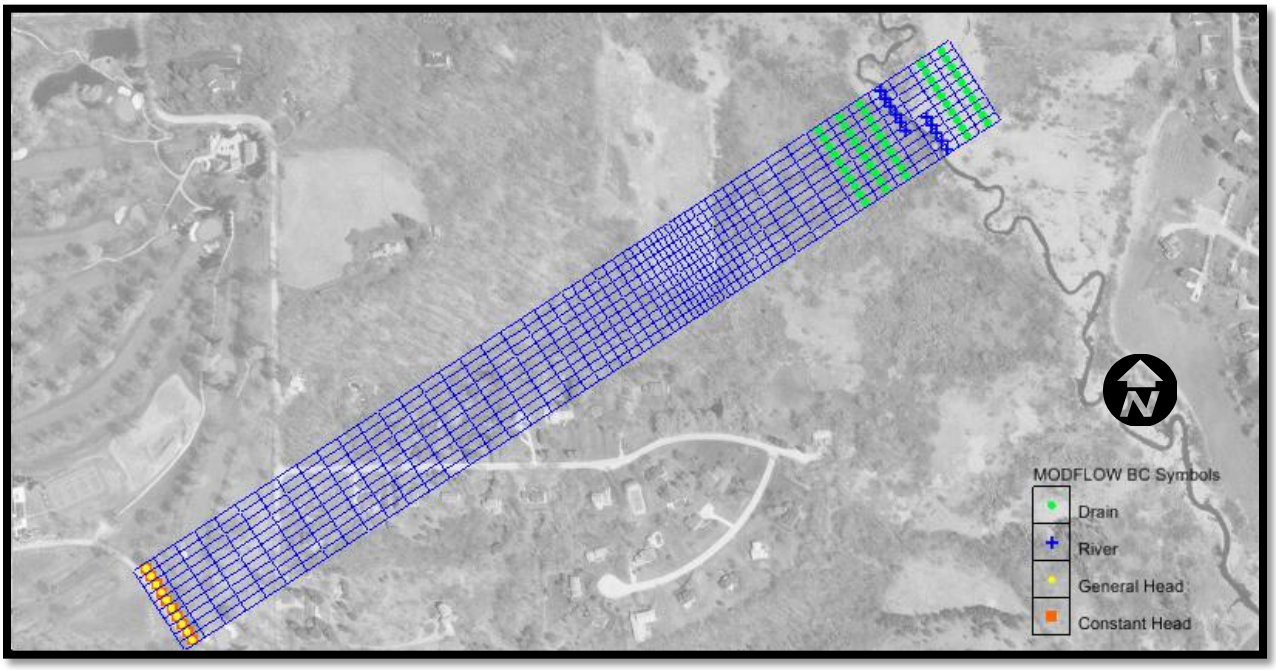

Figure 17. Transect 1 modeled boundary conditions with constant heads to simulate inflow to the bedrock from the southwest, general head nodes to simulate inflow to sands from the southwest and river nodes on the east to simulate Pebble Creek

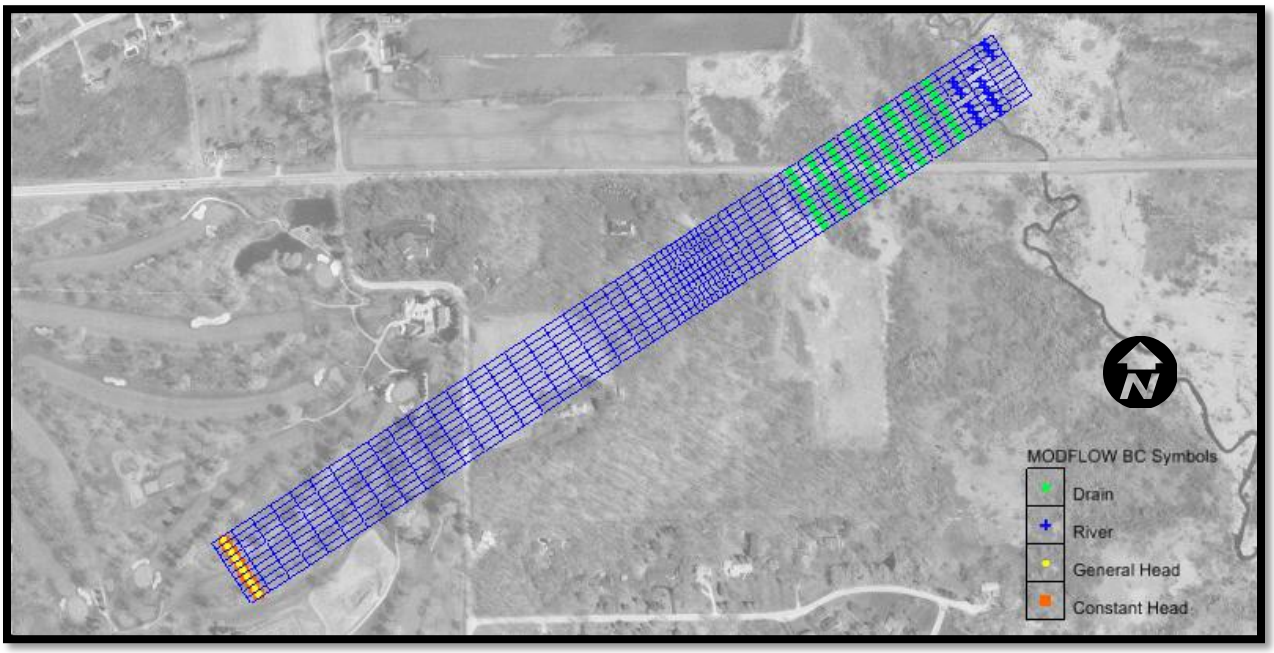

Figure 18. Transect 2 modeled boundary conditions with constant heads to simulate inflow to the bedrock from the southwest, general head nodes to simulate inflow to sands from the southwest and river nodes on the east to simulate Pebble Creek

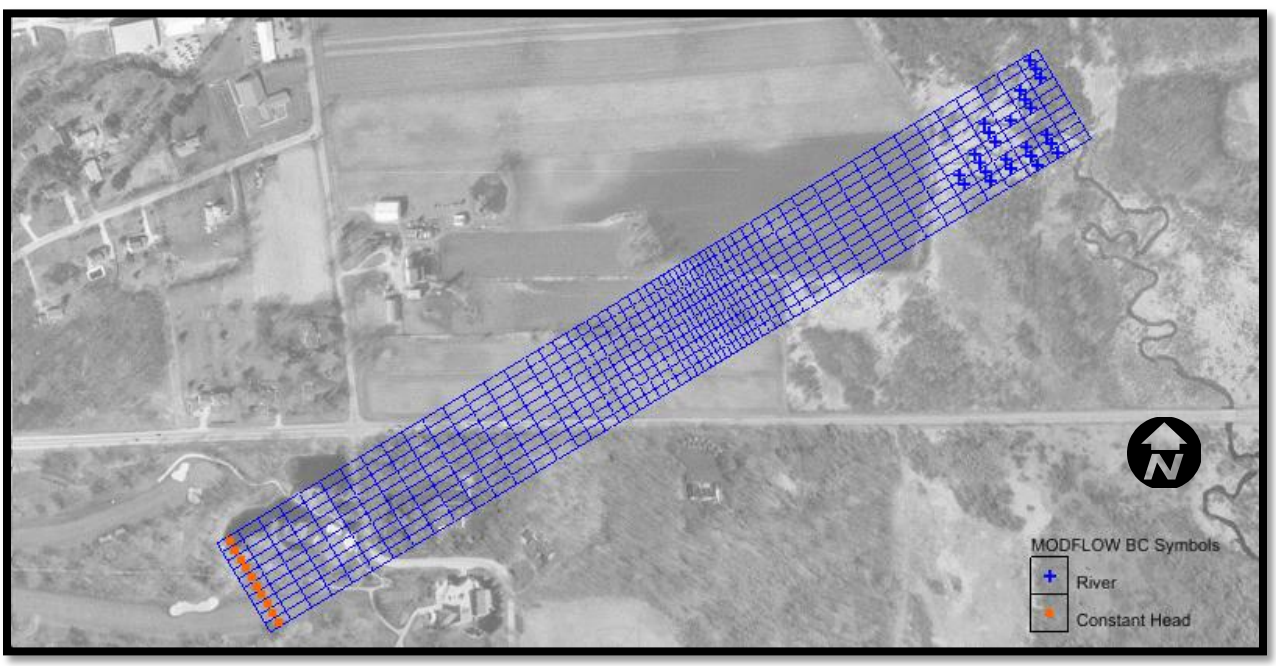

Figure 19. Transect 3 modeled boundary conditions with constant heads to simulate inflow from the southwest and golf course ponds and river nodes on the east to simulate Pebble Creek.

3. Stresses and Fluxes

The recharge rates used in the model were net recharge rates, which is infiltration minus evapotranspiration. Initial recharge rates input in the model were based on published recharge rates for Waukesha County (SEWRPC, 2008) and the recharge potential mapping presented on the Waukesha County GIS database (2013). The modeled recharge zones correspond approximately to changes in land slope and the surface deposit unit boundaries and are shown on Figures 20 through 22. A recharge of one inch per year corresponds to 0.000228 ft/day, three inches per year corresponds to 0.000685 ft/day, and five inches per year corresponds to 0.001142 ft/day. In areas were upward flow was documented recharge rates had to be adjusted downward from those mapped in the SEWRPC mappings (2008).

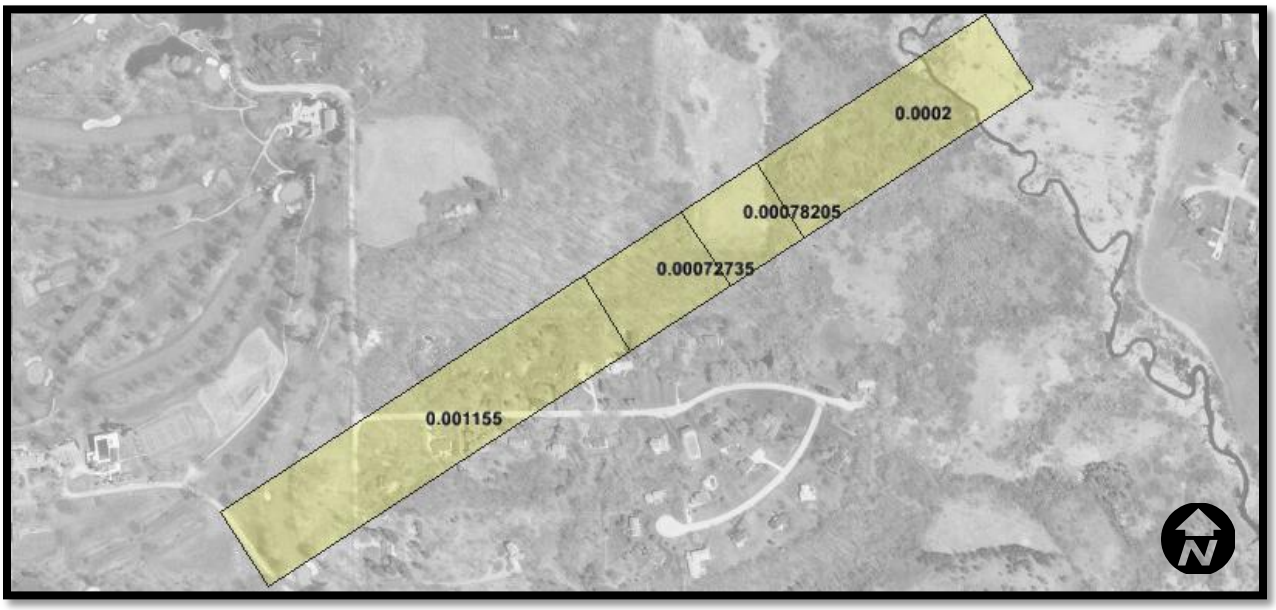

Figure 20. Transect 1 modeled recharge rates (ft/day).

The recharge rates mapped in the SEWRPC (2008) were approximately 0.000685 (three inches) to 0.001142 (five inches). In areas of groundwater discharge were also adjusted downward because these areas were considered to reduce recharge during much of the year.

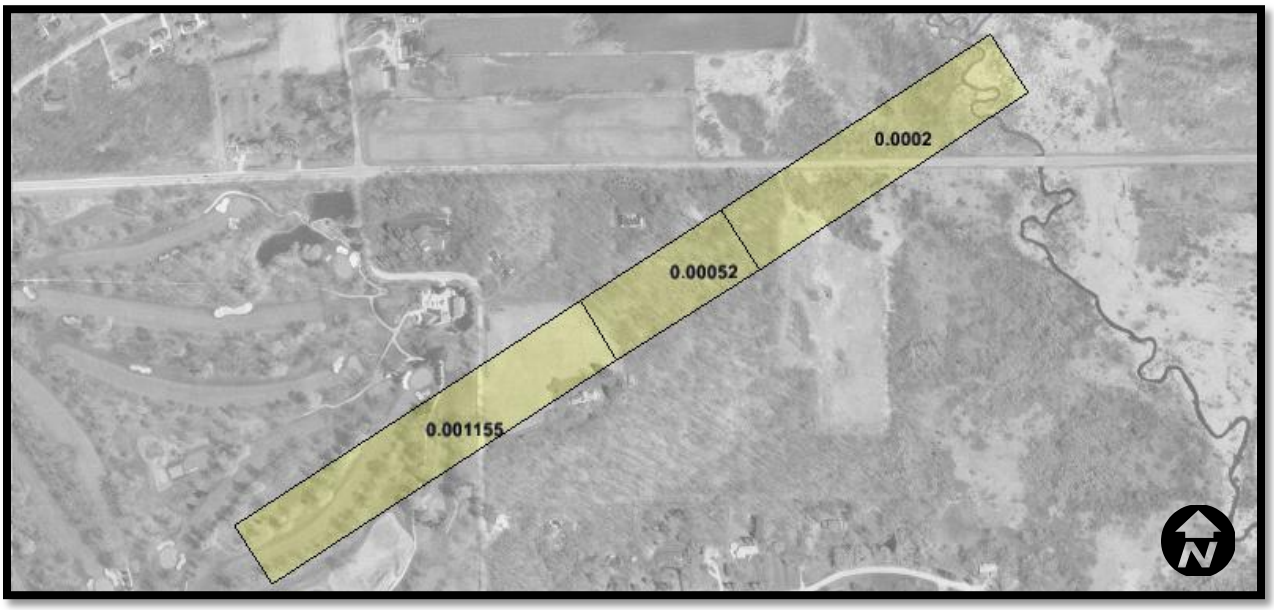

Figure 21. Transect 2 modeled recharge rates (ft/day).

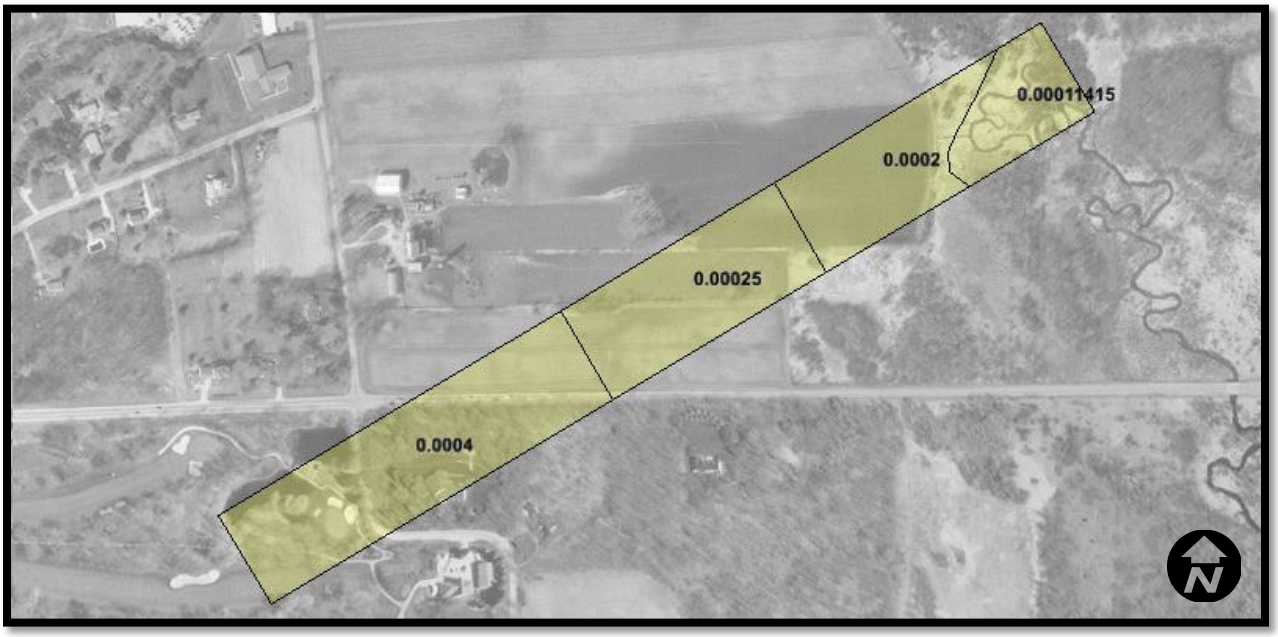

Figure 22. Transect 3 modeled recharge rates (ft/day).

4. Material Properties

The initial horizontal hydraulic conductivities of the materials were based on the results of the slug tests and general literature values (Freeze and Cherry, 1974). Vertical hydraulic conductivities were initially set to be one tenth of the horizontal hydraulic conductivities. The vertical hydraulic conductivity of the bedrock unit was set to a value derived in calibrated groundwater model of similar bedrock. The vertical hydraulic conductivity of the sands that has interbedded with thin clay layers, such as those in Transect 3, were initially set equal to the hydraulic conductivity of the clays. The ranges of the horizontal and vertical hydraulic conductivities used in the models are shown in Table 3.

Table 2

Modeled Hydraulic Conductivities

	Horizontal Hydraulic Conductivity (feet/day)	Vertical Hydraulic Conductivity (feet/day)
Clay	0.014 to 0.14 ft/day	0.0.0014 014 ft/day
Silty Clay	0.09 to 0.5 ft/day	0.01 to 0.0255 ft/day
Sandy Clay	1-3 ft/day	0.01 to 0.16 ft/day
Silt	4.5 to 7.2 ft/day	1.0 ft/day
Sand	25 to 31.5 ft/day	0.0096 to 2.8 ft/day
Dolomite	1.1 ft/day	0.0022 ft/day

Figures 23 through 25 show one row within each of the three transects. The modeled materials are color and symbol coded as shown in the accompanying legends. Clayey materials are shown in grays, silts are shown in orange, sands and gravels are shown in yellows, and bedrock is shown in blue. Storage terms were not used in the models because all three models were steady state models, and storage terms are only required for transient modeling.

The vertical scale of the sections presented in Figures 23 through 25 was exaggerated 15 times in order to show all the model layers.

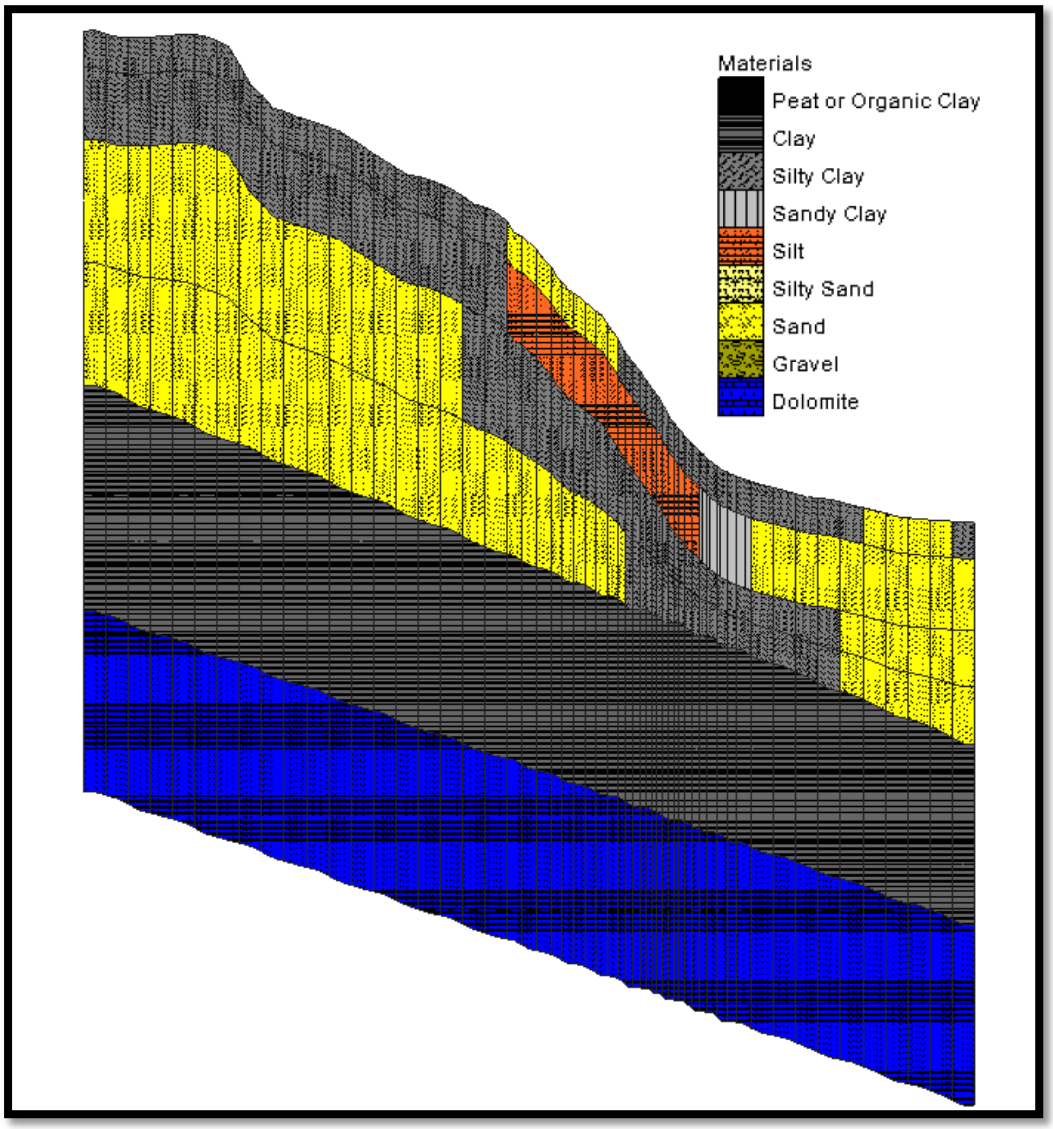

Figure 23. Modeled stratigraphy at Transect 1 The vertical scale of the model cross section is exaggerated 15 times.

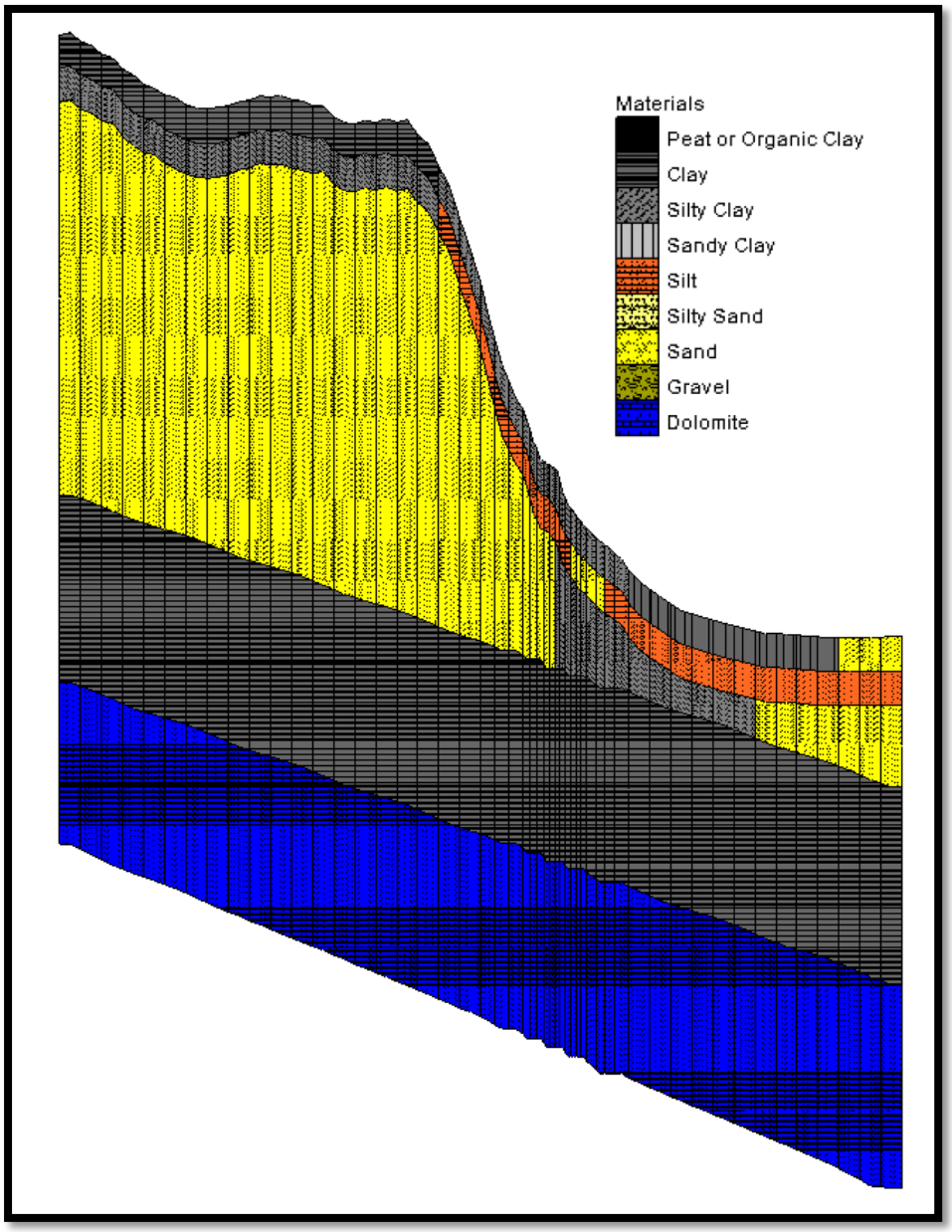

Figure 24. Modeled stratigraphy at Transect 2. The vertical scale of the model cross section is exaggerated 15 times.

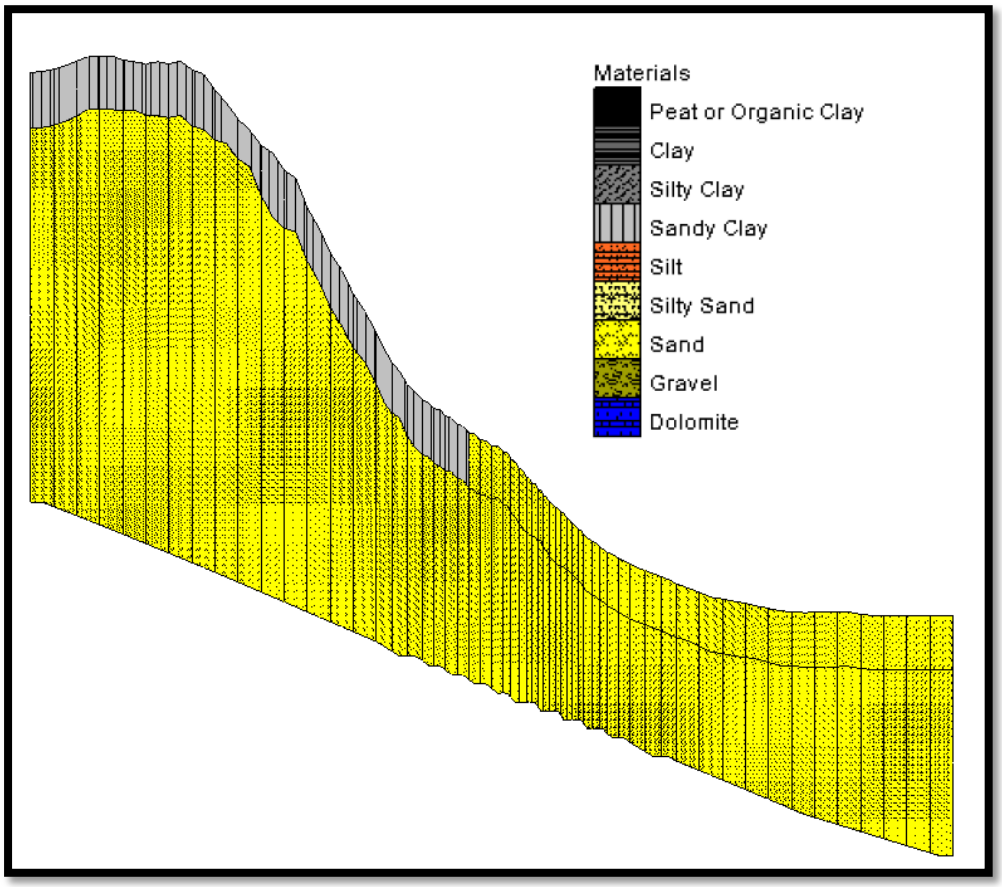

Figure 25. Modeled stratigraphy at Transect 3. The vertical scale of the model cross section is exaggerated 15 times.

5. Target Heads and Flows

As noted, six monitoring wells were installed as part of this study. Two well were located at each of three transects. The groundwater elevations measured in these wells are considered to have the most reliability and be weighted as the most significant for purposes of model calibration. The measured maximum groundwater elevations at the wells are shown in Table #.

Table 3

Groundwater Elevation Model Calibration Targets

Monitoring Well	Average Groundwater Elevation (feet msl)
MW-1	814.28
MW-2	820.91
MW-3	828.62
MW-4	837.98
MW-5	825.17
MW-6	834.22

There were no contemporary measurements of the baseline flow in Pebble Creek or of direct groundwater discharge to the creek. So groundwater discharge to the creek cannot be used as a calibration parameter.

E. Model Calibration

Model calibration is the process of adjusting model input parameters within limits appropriate for the materials modeled in order to replicate conditions measured within the model domain. Groundwater elevations measured in the modeled area are typically used as calibration targets. Groundwater flows into lakes or streams are also used for calibration targets. Static models (independent of time) are typically calibrated to average conditions and time dependant models are calibrated to time series data.

The groundwater models were calibrated as steady state condition models, which are models that is independent of change over time. The models were calibrated to the average water levels measured in the monitoring wells. The model software calculated error statistics from the difference between the measured average groundwater elevations at specified locations and depths and the modeled groundwater elevations for those locations. Three error statistics were tracked to evaluate the level of calibration relative to the monitoring well water elevation data; including the mean error, the mean absolute error and the root mean square error. A mean error close to zero is an indication that the magnitude of the positive and negative errors balance out, but not an indication of the relative size of the errors. Both the mean absolute error and the root

mean square error are measures of the magnitude of the errors regardless of the sign of the error, with the root mean square error measure being more sensitive to outliers. An error level within ten percent of the range of the water elevations within a groundwater model is generally considered a good level of model calibration. The maximum groundwater elevations in the modeled areas were the elevations measured in the upslope wells (MW-2, MW-4 and MW-6) approximately 821 to 837 feet and the minimum elevation was approximately 792 to 794 feet along Pebble Creek -a range of approximately 42 feet at Transect 1, 45 feet at Transect 2 and 27 feet at Transect 3. Ten percent of those ranges are 4.2, 4.5 and 2.7 feet. So error statistics within 2.7 to 4.5 feet were the initial target for the modeling efforts. Because of the limited distribution of calibration points, only two within each model, the ranges used to calculate the target calibration errors were revised to be limited to the ranges between the calibration points – the wells within each transect model. The resulting calibration error ranges were 0.83 feet at Transect 1, 1.02 feet at Transect 2, and 0.59 feet at Transect 3. All three models were within the 10 percent criteria for good model calibration.

As part of the calibration process, the sensitivities of the error statistics to changes in the input parameters were evaluated (Appendix F). A calibrated model should display an error minimum wherein the error statistics increase as the input parameters are either increased or decreased. The process is to systematically change parameters and track the magnitude of the error statistics. The model parameters evaluated included the horizontal conductivity, vertical hydraulic conductivity and recharge. The sensitivity the entire model to horizontal and vertical hydraulic conductivity was evaluated.

All three models showed little sensitivity to the conductance of the river nodes. This was interpreted to result from the horizontal and vertical of the calibration points from the river nodes. The sensitivity of models 1 and 2 showed a pattern of sensitivity to the conductance of the seep modes that was similar to that of the river nodes – slight sensitivity at the very low end of the scale at levels well below reasonable rates followed by almost no sensitivity to the parameter.

All three models showed sensitivity to the modeled infiltration rates, and showed calibration improvements for reduction in rates and departure from calibration with increased rates. The recharge rates in the areas of groundwater discharge and upward groundwater flow were considered to be too high and were identified as parameters for recalibration based on the sensitivity evaluation.

The sensitivities of the models to the horizontal and vertical hydraulic conductivities varied among the layers. Some of the layers appeared to be well calibrated, while others showed marked improvement following changes to the conductivities. Once

identified, the specific material within the layer that the error statistics were sensitive to was identified. Various parameters were identified for recalibration to improve the fit of the models.

Following the sensitivity evaluations the models were recalibrated to minimize the error terms. The resulting error statistics showed improvement up to an order of magnitude smaller error levels.

Table 4

Error Statistics

Pre- and Post Sensitivity Evaluation

	Transect 1		
	RMS Error	Mean Error	Absolute Mean Error
Pre-Sensitivity	2.57	-0.20	2.26
Post Sensitivity	0.07	-0.14	0.36
	Transect 2		
	RMS Error	Mean Error	Absolute Mean Error
Pre-Sensitivity	1.61	-1.79	1.79
Post Sensitivity	0.17	0.42	0.42
	Transect 3		
	RMS Error	Mean Error	Absolute Mean Error
Pre-Sensitivity	0.54	-1.00	1.00
Post Sensitivity	0.10	-0.23	0.39

The recalibrated models were used as the basis for evaluation of changes in water levels at the calibration points from implementing the bypass at the transects. The areas to be paved within the transects were based on plan and profile sheets. The plan and profile sheets geo-referenced and input into the models, and the paved areas at the three transects digitized. The levels of recharge in the paved areas were set to 0.0000 feet per day within the models. This represents the worst case wherein runoff from the pavement cannot recharge in swales adjacent to the roadways.

F. Modeling Results

Initially the models were configured to simulate grading in the areas of the transects. However, after several rounds of evaluating plan and profile sheets and cross sections, the areas of grading depths close to the water table in the area of transects were eliminated at the locations of the monitoring wells and four geotechnical borings.

The calibrated static condition models were then used to estimate the impact of paving on the groundwater elevations at the model transects. At Transect 1 the modeled groundwater level changed by 0.10 feet at MW-5 and 0.07 feet at MW-6. At Transect 2 the modeled groundwater level changed by 0.10 feet at MW-3 and 0.05 feet at MW-4. At Transect 3 the modeled groundwater level changed by 0.02 feet at MW-1 and 0.02 feet at MW-2.

As described above, the groundwater flow to the discharge areas and seeps, and the flow to Pebble Creek in the model domains were not known from field measurement and the models could not be calibrated to these flows. However, estimates in the relative modeled flows were tracked and are shown in Table 5. At Transect 1 the modeled flow to the creek decreased by 0.1 percent and the flow to discharge areas and seeps decreased by 1.4 percent. At Transect 2 the modeled flow to the creek decreased by 0.1 percent and the flow to discharge areas and seeps decreased by 0.4 percent. At Transect 3 the modeled flow to the creek decreased by 0.1 percent.

Table 5
Modeled Change at Seeps and Pebble Creek
Pre- and Post Paving without Mitigative Measures

	Existing (ft^3/day)	Pebble Creek West Alternative (ft^3/day)	Percent Difference
Transect 1			
Creek	1836	1834	0.1
Seeps	338	334	1.4
Transect 2			
Creek	440	440	0.1
Seeps	1011	1007	0.4
Transect 3			
Creek	8483	8477	0.1
Seeps			

At the request of the Army Corp of Engineers, cross sections were prepared showing the approximate areas of cut and fill at the three modeled transects. These transect sections are shown in Appendix G. The planned cuts do not intersect the water table at these transects.

VII. CONCLUSIONS

The initial conceptualization of sediment geometry in the area of investigation was that beds of granular material, such as sand, were layered between clayey sediments and that the granular beds were on the order of 5 to 10 feet thick. An alternative explanation was that the deposits of granular sediments were in the form of a blanket deposit, paralleling the land surface. The findings in these recent boreholes and wells do not fit uniformly into either of these alternative concepts.

Sediments were highly variable both horizontally and vertically based on the Investigation of the sediments at the eleven initial geotechnical borings, 29 hand auger holes from 2010 through 2011 and ten geotechnical borings in this study. The sandy sediments found on the valley slopes and within well construction records appear to be in discontinuous beds in the uplands related to multiple glacial depositional processes. Sandy sediments make up the base of the Pebble Creek valley south of Sunset Drive.

The approximate groundwater flow direction south of Sunset Drive is from southwest to northeast toward the hill slope wetlands and Pebble Creek. The direction of groundwater flow veers to the north in the northwest quadrant of the study area. Upward groundwater flows were noted at Transects 1 and 3, which is consistent with areas groundwater discharge on the valley slopes. Ground water sensitive plant communities appear to be located where layers of sandy sediments intersect the hill slopes.

Three calibrated groundwater models were prepared for transects where monitoring well water levels and aquifer properties were estimated. The modeled changes to the groundwater levels resulting from changing the amount of local recharge were on the order of 0.1 feet or less. Modeled changes in groundwater discharge were on the order of 1 percent or less, but the models were not calibrated to groundwater seepage or discharge to the creek, because these could not be measured in the previous studies.

The estimated change in flows to the groundwater discharge areas and Pebble Creek were less than the estimate inferred from 5 percent estimated change in impervious surface within the area of contribution in the initial groundwater report addendum. The difference likely results from changes in the western extent of the area of groundwater contribution necessitated by the

models compared to the initial estimate, and nonuniform recharge rates within the area of contribution.

VIII. REFERENCES

Bouwer, H. and R.C. Rice, 1976, A slug test method for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells, Water Resources Research, v. 12, no. 3, pp. 423-428.

FREEZE, R.A., and CHERRY, J., 1979, Groundwater, 604 pp: PrenticeHall, Englewood Cliffs, NJ.

Clayton, Lee, 2001, Pleistocene Geology of Waukesha County, Wisconsin, Bulletin 99, Wisconsin State Geological and Natural History Survey 33 p.

South Eastern Wisconsin Regional Planning Commission (SEWRPC), 2008, Groundwater Recharge in Southeastern Wisconsin Estimated by a GIS-Based Water Balance Model, Technical Report No. 47, 23p.

South Eastern Wisconsin Regional Planning Commission (SEWRPC), 2002, Ground Water Resources of Southern Wisconsin, Technical Report No. 37, 203 pages.

United States Geological Survey, 2013, Spreadsheets for the Analysis of Aquifer-Test and Slug-Test Data, http://pubs.usgs.gov/of/2002/ofr02197/spreadsheets.html

United States Geological Survey, 1975, Ground-Water Resources of Waukesha County, Wisconsin, Information Circular Number 29, 47 pages

Waukesha County Internet Mapping Site, 2012, http://www.waukeshacounty.gov/defaultwc.aspx?id=39458

Appendix A

SEWRPC Mapping of Groundwater Dependent Wetlands

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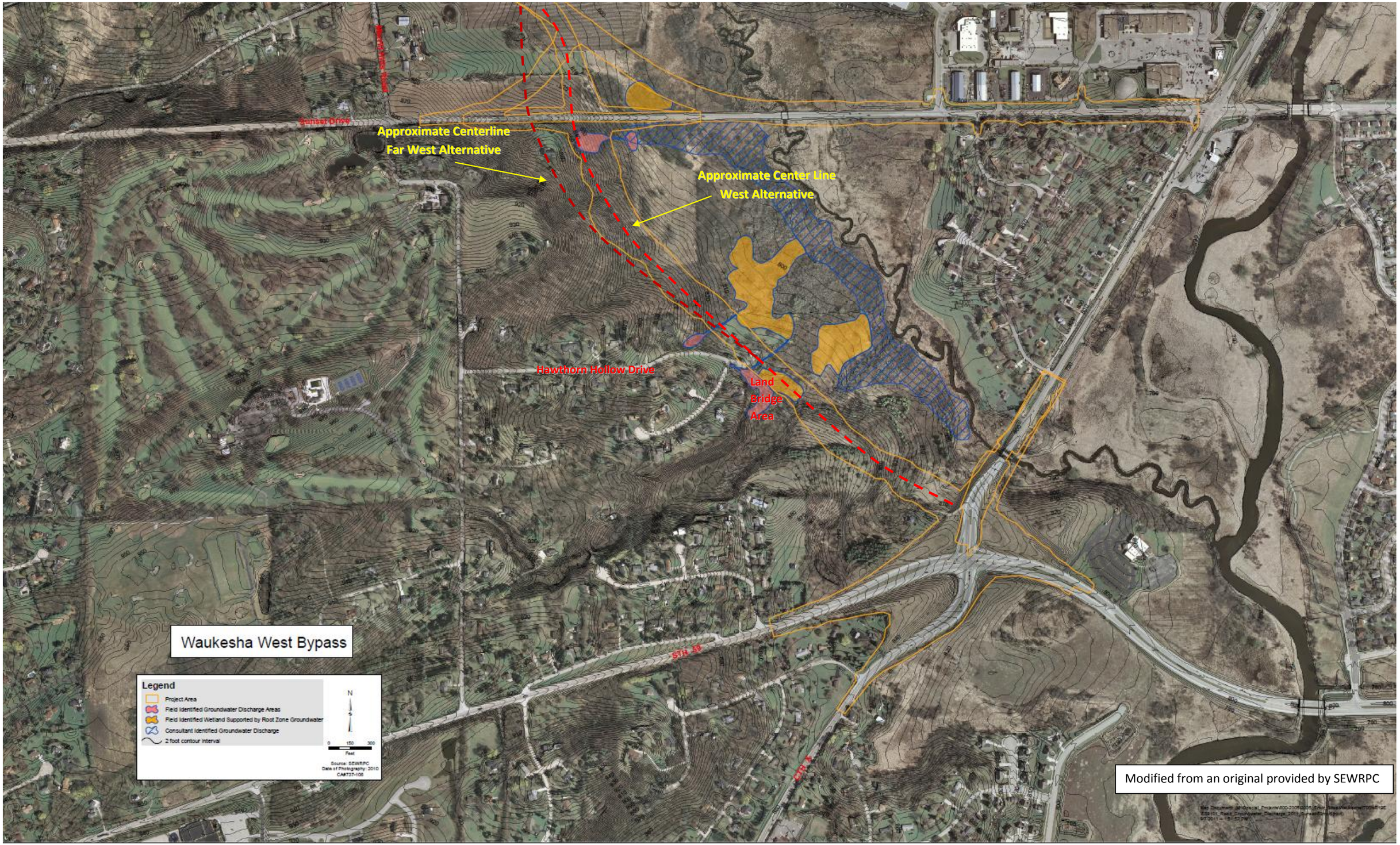
Sunset Drive
Approximate Centerline
Far West Alternative
Approximate Center Line
West Alternative
Hawthorn Hollow Drive
Land
Bridge
Area
STH 59
STH 18
Waukesha West Bypass
Legend
Project Area
Field Identified Groundwater Discharge Areas
Field Identified Wetland Supported by Root Zone Groundwater
Consultant Identified Groundwater Discharge
2 foot contour interval
N
0 150 300
Feet
Source: SEWRPC
Date of Photography: 2010
CA#737-106
Modified from an original provided by SEWRPC

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Appendix B

Geotechnical Soil Borings – 2013

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SOIL BORING LOG

Gestra Engineering Inc.
1626 W. Fond du Lac Avenue
Milwaukee, WI 53205
Phone: 414-933-7444, Fax: 414-933-7844

PROJECT NAME	Waukesha By-Pass
DATE DRILLING STARTED	3/4/2013
PROJECT LOCATION	Waukesha, WI
DATE DRILLING ENDED	3/4/2013
BORING NUMBER	SB-12
PROJECT NUMBER	10031-10
DRILLING RIG	Diedrich D50 ATV
BORING DRILLED BY	FIRM: Gestra CREW CHIEF: R. Jackson
FIELD LOG	D. Born
LAB LOG / QC	L. Gliniecki
NORTHING	
EASTING	
DRILLING METHOD	3¼" HSA
SURFACE ELEVATION	ft

Number and Type	Recovery (in)	Blow Counts	N - Value	Depth (ft)	Elevation	Soil Description and Geological Origin for Each Major Unit	USCS Classification	Graphic	Well Diagram	Unconfined Comp. Strength (Q_u or Q_p) (tsf)	Liquid Limit	Plasticity Index	Moisture Content (%)	Comments
						TOPSOIL, (4") 0.3								Frost depth 12"
SS - 1	10	3 7 8	15			LEAN CLAY WITH SAND, brown, moist, very stiff, trace gravel 2.7	cl			2.50			12	
SS - 2	18	4 4 6	10	5		SANDY LEAN CLAY, light brown, very moist, medium stiff, trace gravel, with brown sand lenses				0.50			11	
SS - 3	12	4 4 8	12				cl			0.5-0.75			12	
SS - 4	0	8 11 8	19	10		9.8							11	No recovery for sample SS-4, stone in split spoon shoe
						SILTY CLAY, gray, very moist, very soft to medium stiff, trace gravel								
SS - 5	12	3 6 8	14							<0.25			16	
							cl-ml							
SS - 6	18	2 3 3	6	15		With 1/8" thick sand seam in sample SS-6				0.5-0.75			21	
						15.5 SILTY SAND, gray, wet, medium dense								
SS - 7	16	4 4 8	12			With 4" thick clay layer at 16.5' 17.1	sm							
						LEAN CLAY, gray, moist, stiff to hard								
SS - 8	16	8 13 21	34	20			cl			4.0-4.5+			12	

WATER & CAVE-IN OBSERVATION DATA

WATER ENCOUNTERED DURING DRILLING: 17 ft.		CAVE DEPTH AT COMPLETION: N/A	WET ☐ DRY ☐
WATER LEVEL AT COMPLETION: 17 ft.		CAVE DEPTH AFTER 0 HOURS: N/A	WET ☐ DRY ☐
WATER LEVEL AFTER 0 HOURS: N/A		NE = Not Encountered; NMR = No Measurement Recorded	

NOTE: Stratification lines between soil types represent the approximate boundary; gradual transition between in-situ soil layers should be expected.

Gestra Engineering Inc.
1626 W. Fond du Lac Avenue
Milwaukee, WI 53205
Phone: 414-933-7444, Fax: 414-933-7844

SOIL BORING LOG

PROJECT NAME: Waukesha By-Pass	DATE DRILLING STARTED: 3/4/2013	BORING NUMBER: SB-12	
PROJECT LOCATION: Waukesha, WI	DATE DRILLING ENDED: 3/4/2013	PROJECT NUMBER: 10031-10	
		DRILLING RIG: Diedrich D50 ATV	
BORING DRILLED BY: FIRM: Gestra, CREW CHIEF: R. Jackson	FIELD LOG: D. Born	NORTHING	DRILLING METHOD: 3¼" HSA
	LAB LOG / QC: L. Gliniecki	EASTING	SURFACE ELEVATION: ft

Number and Type	Recovery (in)	Blow Counts	N - Value	Depth (ft)	Elevation	Soil Description and Geological Origin for Each Major Unit	USCS Classification	Graphic	Well Diagram	Unconfined Comp. Strength (Q_u or Q_p) (tsf)	Liquid Limit	Plasticity Index	Moisture Content (%)	Comments
SS - 9	15	8 12 24	36			LEAN CLAY, gray, moist, stiff to hard	cl			1.75-4.5				Clay sample was not collected for SS-9, unable to obtain moisture content. Q_p value and layer change are Driller's Observations.
						22.3								
						SILTY SAND, gray, wet, with clayey seams	sm							
						22.9								
SS - 10	18	17 22 23	45			SILTY CLAY, gray, very moist, very stiff to hard, with silt seams	cl-ml			2.5-4.5+			16	
				25		25								
						End of Boring at 25.0 ft.								
				30										
				35										
				40										

WATER & CAVE-IN OBSERVATION DATA

WATER ENCOUNTERED DURING DRILLING: 17 ft.	CAVE DEPTH AT COMPLETION: N/A	WET ☐ DRY ☐
WATER LEVEL AT COMPLETION: 17 ft.	CAVE DEPTH AFTER 0 HOURS: N/A	WET ☐ DRY ☐
WATER LEVEL AFTER 0 HOURS: N/A	NE = Not Encountered; NMR = No Measurement Recorded	

NOTE: Stratification lines between soil types represent the approximate boundary; gradual transition between in-situ soil layers should be expected.

SOIL BORING LOG

GESTRA
Gestra Engineering Inc.
1626 W. Fond du Lac Avenue
Milwaukee, WI 53205
Phone: 414-933-7444, Fax: 414-933-7844

PROJECT NAME	Waukesha By-Pass
DATE DRILLING STARTED	3/4/2013
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FIELD LOG	D. Born
LAB LOG / QC	L. Gliniecki
NORTHING	
EASTING	
DRILLING METHOD	3¼" HSA
SURFACE ELEVATION	ft

Number and Type	Recovery (in)	Blow Counts	N - Value	Depth (ft)	Elevation	Soil Description and Geological Origin for Each Major Unit	USCS Classification	Graphic	Well Diagram	Unconfined Comp. Strength (Q_u or Q_p) (tsf)	Liquid Limit	Plasticity Index	Moisture Content (%)	Comments
						TOPSOIL, (4") 0.3								Frost depth 12"
SS - 1	16	5 6 7	13			SILTY CLAY, light brown mottled gray, moist, very stiff, with silt seams 2.9	CL-ML			2.50			13	
SS - 2	15	8 8 7	15	5		SILT, light brown, moist, medium dense, trace gravel 5.4	ML							
SS - 3	12	4 3 4	7		▽	SILTY SAND, light brown, wet, loose to medium dense, trace gravel								
SS - 4	13	3 3 5	8	10			SM							
SS - 5	12	7 8 8	16			12.8								
SS - 6	11	8 8 10	18	15		SILTY SAND WITH GRAVEL, light brown, wet, medium dense to very dense	SM							
SS - 7	8	9 27 50/3"	R			17.6								
SS - 8	10	4 22 50/3"	R	20		SILTY SAND, orangeish brown, moist, dense to very dense	SM							

WATER & CAVE-IN OBSERVATION DATA

▽	WATER ENCOUNTERED DURING DRILLING: 6.5 ft.	CAVE DEPTH AT COMPLETION: N/A	WET ☐ DRY ☐
▼	WATER LEVEL AT COMPLETION: N/A	CAVE DEPTH AFTER 0 HOURS: N/A	WET ☐ DRY ☐
▼	WATER LEVEL AFTER 0 HOURS: N/A	NE = Not Encountered; NMR = No Measurement Recorded	

NOTE: Stratification lines between soil types represent the approximate boundary; gradual transition between in-situ soil layers should be expected.

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Phone: 414-933-7444, Fax: 414-933-7844

SOIL BORING LOG

PROJECT NAME: Waukesha By-Pass	DATE DRILLING STARTED: 3/4/2013	BORING NUMBER: SB-13	
PROJECT LOCATION: Waukesha, WI	DATE DRILLING ENDED: 3/4/2013	PROJECT NUMBER: 10031-10	
		DRILLING RIG: Diedrich D50 ATV	
BORING DRILLED BY: FIRM: Gestra, CREW CHIEF: R. Jackson	FIELD LOG: D. Born	NORTHING	DRILLING METHOD: 3¼" HSA
	LAB LOG / QC: L. Gliniecki	EASTING	SURFACE ELEVATION: ft

Number and Type	Recovery (in)	Blow Counts	N - Value	Depth (ft)	Elevation	Soil Description and Geological Origin for Each Major Unit	USCS Classification	Graphic	Well Diagram	Unconfined Comp. Strength (Q_u or Q_p) (tsf)	Liquid Limit	Plasticity Index	Moisture Content (%)	Comments
						SILTY SAND, orangeish brown, moist, dense to very dense	SM							
SS - 9	12	13 23 27	50											
SS - 10	12	14 24 28	52	25		25								
						End of Boring at 25.0 ft.								
				30										
				35										
				40										

WATER & CAVE-IN OBSERVATION DATA

WATER ENCOUNTERED DURING DRILLING: 6.5 ft.	CAVE DEPTH AT COMPLETION: N/A	WET ☐ DRY ☐
WATER LEVEL AT COMPLETION: N/A	CAVE DEPTH AFTER 0 HOURS: N/A	WET ☐ DRY ☐
WATER LEVEL AFTER 0 HOURS: N/A	NE = Not Encountered; NMR = No Measurement Recorded	

NOTE: Stratification lines between soil types represent the approximate boundary; gradual transition between in-situ soil layers should be expected.

SOIL BORING LOG

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1626 W. Fond du Lac Avenue
Milwaukee, WI 53205
Phone: 414-933-7444, Fax: 414-933-7844

PROJECT NAME: Waukesha By-Pass	DATE DRILLING STARTED: 3/6/2013	PAGE NUMBER: 1 of 1	BORING NUMBER: SB-14
PROJECT LOCATION: Waukesha, WI	DATE DRILLING ENDED: 3/6/2013	PROJECT NUMBER: 10031-10	DRILLING RIG: Diedrich D50 ATV
BORING DRILLED BY: FIRM: Gestra, CREW CHIEF: R. Jackson	FIELD LOG: D. Born	NORTHING	DRILLING METHOD: 3¼" HSA
	LAB LOG / QC: L. Gliniecki	EASTING	SURFACE ELEVATION: ft

Number and Type	Recovery (in)	Blow Counts	N - Value	Depth (ft)	Elevation	Soil Description and Geological Origin for Each Major Unit	USCS Classification	Graphic	Well Diagram	Unconfined Comp. Strength (Q_u or Q_p) (tsf)	Liquid Limit	Plasticity Index	Moisture Content (%)	Comments
						TOPSOIL, (5") 0.4								Frost depth 12" Boring SB-14 was converted to monitoring well MW-1 after drilling
SS - 1	17	1 2 4	6			LEAN CLAY, dark brown to gray mottled light brown, moist, medium stiff; Color change to gray mottled light brown at 2' 3	cl			0.5-0.75			25	
SS - 2	17	5 10 6	16	5	▽	SAND, brown, moist, medium dense 4.8	sp							Driller's Observation
						SANDY LEAN CLAY WITH GRAVEL, gray, moist, soft to stiff 6.5	cl			1.50			12	
SS - 3	12	5 5 5	10			GRAVEL, gray, moist (Possible Cobbles) 9.5	gp			0.25-0.5			9	Driller's Observation
SS - 4	0	2 4 5	9	10		CLAYEY SAND WITH GRAVEL, gray, wet, medium dense 12.4	sc							No recovery for sample SS-4, stone in split spoon shoe
SS - 5	3	4 8 13	21			LEAN CLAY WITH SAND, gray, moist, very stiff to hard 14.3	cl							
SS - 6	12	3 5 6	11	15		SILTY SAND, gray, wet, medium dense; With 5" thick clay layer a 16.3' (Driller's Observation) 17.5	sm			3.0-4.5				
SS - 7	18	7 12 15	27			End of Boring at 17.5 ft.								
				20										

WATER & CAVE-IN OBSERVATION DATA

▽ WATER ENCOUNTERED DURING DRILLING: 5 ft.	CAVE DEPTH AT COMPLETION: N/A	WET ☐ DRY ☐
▼ WATER LEVEL AT COMPLETION: N/A	CAVE DEPTH AFTER 0 HOURS: N/A	WET ☐ DRY ☐
▼ WATER LEVEL AFTER 0 HOURS: N/A	NE = Not Encountered; NMR = No Measurement Recorded	

NOTE: Stratification lines between soil types represent the approximate boundary; gradual transition between in-situ soil layers should be expected.

SOIL BORING LOG

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PROJECT NAME: Waukesha By-Pass	DATE DRILLING STARTED: 3/7/2013	PAGE NUMBER: 1 of 1	BORING NUMBER: SB-15
PROJECT LOCATION: Waukesha, WI	DATE DRILLING ENDED: 3/7/2013	PROJECT NUMBER: 10031-10	DRILLING RIG: Diedrich D50 ATV
BORING DRILLED BY: FIRM: Gestra, CREW CHIEF: R. Jackson	FIELD LOG: D. Born	NORTHING	DRILLING METHOD: 3¼" HSA
	LAB LOG / QC: L. Gliniecki	EASTING	SURFACE ELEVATION: ft

Number and Type	Recovery (in)	Blow Counts	N - Value	Depth (ft)	Elevation	Soil Description and Geological Origin for Each Major Unit	USCS Classification	Graphic	Well Diagram	Unconfined Comp. Strength (Q_u or Q_p) (tsf)	Liquid Limit	Plasticity Index	Moisture Content (%)	Comments
						TOPSOIL, (4") 0.3								Frost depth 2"
SS - 1	15	3 2 4	6			LEAN CLAY, brown, moist, very stiff 2.9	cl			2.50			17	Boring SB-15 was converted to monitoring well MW-2 after drilling
SS - 2	11	8 9 12	21	5		SAND WITH SILT AND GRAVEL, brown, moist to wet, medium dense								
SS - 3	6	4 6 9	15			Gravel layer at 6' (Driller's Observation)	sp-sm							Rig Chatter at 6'
SS - 4	0	5 9 10	19	10		9.5 SAND WITH SILT, brown, wet, medium dense								No recovery for sample SS-4, stone in split spoon shoe
SS - 5	15	6 5 5	10			Trace gravel in sample SS-5	sp-sm							
SS - 6	18	2 8 14	22	15		Clayey layers in saple SS-6 (Driller's Observation) 15								
						End of Boring at 15.0 ft.								
				20										

WATER & CAVE-IN OBSERVATION DATA

WATER ENCOUNTERED DURING DRILLING: 6 ft.	CAVE DEPTH AT COMPLETION: N/A	WET ☐ DRY ☐
WATER LEVEL AT COMPLETION: N/A	CAVE DEPTH AFTER 0 HOURS: N/A	WET ☐ DRY ☐
WATER LEVEL AFTER 0 HOURS: N/A	NE = Not Encountered; NMR = No Measurement Recorded	

NOTE: Stratification lines between soil types represent the approximate boundary; gradual transition between in-situ soil layers should be expected.

SOIL BORING LOG

Gestra Engineering Inc.
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PROJECT NAME: Waukesha By-Pass	DATE DRILLING STARTED: 3/4/2013	PAGE NUMBER: 1 of 1	BORING NUMBER: SB-16
PROJECT LOCATION: Waukesha, WI	DATE DRILLING ENDED: 3/4/2013	PROJECT NUMBER: 10031-10	DRILLING RIG: Diedrich D50 ATV
BORING DRILLED BY: FIRM: Gestra, CREW CHIEF: R. Jackson	FIELD LOG: D. Born	NORTHING	DRILLING METHOD: 3¼" HSA
	LAB LOG / QC: L. Gliniecki	EASTING	SURFACE ELEVATION: ft

Number and Type	Recovery (in)	Blow Counts	N - Value	Depth (ft)	Elevation	Soil Description and Geological Origin for Each Major Unit	USCS Classification	Graphic	Well Diagram	Unconfined Comp. Strength (Q_u or Q_p) (tsf)	Liquid Limit	Plasticity Index	Moisture Content (%)	Comments
						LEAN CLAY, brown, moist, very stiff								Frost depth 12" Boring SB-16 was converted to monitoring well MW-3 after drilling
SS - 1	8	3 3 7	10				cl			2.25-2.75			26	
						3.8								
SS - 2	13	8 11 8	19	5		GRAVEL WITH SAND, brown, moist 4.3	gp			0.75-2.5			12	Driller's Observation
						LEAN CLAY, light brown, moist, medium dense to hard								
SS - 3	14	4 7 11	18				cl			3.75-4.5			14	
SS - 4	16	3 7 15	22			With 1" thick sand seam at top of SS-4 (Driller's Observation) 9.6				2.5-3.0			20	
				10		SANDY LEAN CLAY WITH GRAVEL, brown, moist 10.4	cl							
						SAND WITH SILT, brown, wet, medium dense to dense, trace to with gravel								
SS - 5	15	4 4 10	14			With <1" thick clay seam in sample SS-5 (Driller's Observation)								
SS - 6	18	8 16 23	39	15		With 2" thick gravel layer at 14.8' (Driller's Observation)	sp-sm							
SS - 7	16	8 18 25	43			17.5								
						End of Boring at 17.5 ft.								
				20										

WATER & CAVE-IN OBSERVATION DATA

WATER ENCOUNTERED DURING DRILLING: 11.5 ft.		CAVE DEPTH AT COMPLETION: N/A	WET ☐ DRY ☐
WATER LEVEL AT COMPLETION: N/A		CAVE DEPTH AFTER 0 HOURS: N/A	WET ☐ DRY ☐
WATER LEVEL AFTER 0 HOURS: N/A		NE = Not Encountered; NMR = No Measurement Recorded	

NOTE: Stratification lines between soil types represent the approximate boundary; gradual transition between in-situ soil layers should be expected.

SOIL BORING LOG

GESTRA
Gestra Engineering Inc.
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Phone: 414-933-7444, Fax: 414-933-7844

PROJECT NAME	Waukesha By-Pass
DATE DRILLING STARTED	3/5/2013
PROJECT LOCATION	Waukesha, WI
DATE DRILLING ENDED	3/5/2013
BORING NUMBER	SB-17
PROJECT NUMBER	10031-10
DRILLING RIG	Diedrich D50 ATV
BORING DRILLED BY	FIRM: Gestra CREW CHIEF: A. Woerpel
FIELD LOG	D. Harris
LAB LOG / QC	L. Gliniecki
NORTHING	
EASTING	
DRILLING METHOD	3¼" HSA
SURFACE ELEVATION	ft

Number and Type	Recovery (in)	Blow Counts	N - Value	Depth (ft)	Elevation	Soil Description and Geological Origin for Each Major Unit	USCS Classification	Graphic	Well Diagram	Unconfined Comp. Strength (Q_u or Q_p) (tsf)	Liquid Limit	Plasticity Index	Moisture Content (%)	Comments
						TOPSOIL, (4") 0.3								Frost depth 6" Boring SB-17 was converted to monitoring well MW-4 after drilling
SS - 1	14	2 2 2	4			LEAN CLAY, brown, moist, medium stiff to very stiff 2.8	cl			0.75-2.25			25	
SS - 2	16	2 10 11	21	5		SANDY LEAN CLAY WITH GRAVEL, light brown, moist, very stiff	cl						10	Unable to obtain accurate Q_p value due to gravel content in sample SS-2
SS - 3	0	7 18 50/3"	R			7.3								No recovery for sample SS-3, stone in split spoon shoe
SS - 4	16	13 35 43	78	10		SAND, brown, moist, very dense, trace silt and gravel 10.4	sp							
SS - 5	4	50/5"	R			SAND WITH GRAVEL, brown, moist, very dense 12.4	sp							
SS - 6	15	18 42 50/5"	R	15		SAND WITH CLAY, brown, moist, very dense, trace gravel								
SS - 7	15	21 49 50/4"	R				sp-sc							
SS - 8	18	29 35 44	79	20		19.5	sp							

WATER & CAVE-IN OBSERVATION DATA

WATER ENCOUNTERED DURING DRILLING: 34.5 ft.		CAVE DEPTH AT COMPLETION: N/A	WET ☐ DRY ☐
WATER LEVEL AT COMPLETION: N/A		CAVE DEPTH AFTER 0 HOURS: N/A	WET ☐ DRY ☐
WATER LEVEL AFTER 0 HOURS: N/A		NE = Not Encountered; NMR = No Measurement Recorded	

NOTE: Stratification lines between soil types represent the approximate boundary; gradual transition between in-situ soil layers should be expected.

SOIL BORING LOG

Gestra Engineering Inc.
1626 W. Fond du Lac Avenue
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Phone: 414-933-7444, Fax: 414-933-7844

PROJECT NAME	Waukesha By-Pass
DATE DRILLING STARTED	3/5/2013
BORING NUMBER	SB-17
PROJECT NUMBER	10031-10
PROJECT LOCATION	Waukesha, WI
DATE DRILLING ENDED	3/5/2013
DRILLING RIG	Diedrich D50 ATV
BORING DRILLED BY	FIRM: Gestra CREW CHIEF: A. Woerpel
FIELD LOG	D. Harris
NORTHING	
DRILLING METHOD	3¼" HSA
LAB LOG / QC	L. Gliniecki
EASTING	
SURFACE ELEVATION	ft

Number and Type	Recovery (in)	Blow Counts	N - Value	Depth (ft)	Elevation	Soil Description and Geological Origin for Each Major Unit	USCS Classification	Graphic	Well Diagram	Unconfined Comp. Strength (Q_u or Q_p) (tsf)	Liquid Limit	Plasticity Index	Moisture Content (%)	Comments
						SAND WITH GRAVEL, light brown, moist, very dense, trace silt								
SS - 9	8	36 50/3"	R				sp							
SS - 10	4	50/4"	R	25		24.9								
						SAND, brown, moist, very dense, trace silt								
SS - 11	9	26 50/4"	R			27.6	sp							
						SAND WITH SILT, brown, moist, very dense, trace gravel								
SS - 12	10	27 50/4"	R	30			sp-sm							
SS - 13	11	35 50/5"	R			32.8								
						SILTY SAND, brown, wet, very dense Trace gravel in sample SS-14								
SS - 14	11	27 50/5"	R	35	▽		sm							
SS - 15	18	14 29 32	61			37.5								
						End of Boring at 37.5 ft.								
				40										

WATER & CAVE-IN OBSERVATION DATA

▽	WATER ENCOUNTERED DURING DRILLING: 34.5 ft.		CAVE DEPTH AT COMPLETION: N/A	WET ☐ DRY ☐
▼	WATER LEVEL AT COMPLETION: N/A	■	CAVE DEPTH AFTER 0 HOURS: N/A	WET ☐ DRY ☐
▼	WATER LEVEL AFTER 0 HOURS: N/A		NE = Not Encountered; NMR = No Measurement Recorded	

NOTE: Stratification lines between soil types represent the approximate boundary; gradual transition between in-situ soil layers should be expected.

SOIL BORING LOG

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PROJECT NAME	Waukesha By-Pass
DATE DRILLING STARTED	3/5/2013
PROJECT LOCATION	Waukesha, WI
DATE DRILLING ENDED	3/5/2013
BORING NUMBER	SB-18
PROJECT NUMBER	10031-10
DRILLING RIG	Diedrich D50 ATV
BORING DRILLED BY	FIRM: Gestra CREW CHIEF: A. Woerpel
FIELD LOG	D. Harris
LAB LOG / QC	L. Gliniecki
NORTHING	
EASTING	
DRILLING METHOD	3¼" HSA
SURFACE ELEVATION	ft

Number and Type	Recovery (in)	Blow Counts	N - Value	Depth (ft)	Elevation	Soil Description and Geological Origin for Each Major Unit	USCS Classification	Graphic	Well Diagram	Unconfined Comp. Strength (Q_u or Q_p) (tsf)	Liquid Limit	Plasticity Index	Moisture Content (%)	Comments
						TOPSOIL, (4") 0.3								Frost depth 3" Boring SB-18 was converted to monitoring well MW-5 after drilling LOI = 3.8%
SS - 1	14	3 7 7	14			SANDY LEAN CLAY, brown, moist, stiff to very stiff, trace gravel and organic matter 2.8	cl			1.25-3.0			30	
SS - 2	18	3 6 11	17	5		LEAN CLAY, light brown, moist, stiff to very stiff	cl			1.50			15	
SS - 3	16	4 5 12	17			7.9				3.00			18	
SS - 4	15	6 9 13	22	10		SILTY SAND, brown, wet, medium dense to very dense, trace gravel With clayey seams in sample SS-4	sm							
SS - 5	12	12 50/3"	R			12.8								
SS - 6	15	4 14 33	47	15		SILTY SAND WITH GRAVEL, whiteish gray, moist, dense 15.4	sm							
SS - 7	18	17 38 25	63			SILTY SAND, brown, moist, very dense, with clay seams 18	sm							
SS - 8	16	10 25 30	55	20		SILT WITH SAND, brown, moist, very dense, with clayey seams	ml							

WATER & CAVE-IN OBSERVATION DATA

WATER ENCOUNTERED DURING DRILLING: 6 ft.		CAVE DEPTH AT COMPLETION: N/A	WET ☐ DRY ☐
WATER LEVEL AT COMPLETION: N/A		CAVE DEPTH AFTER 0 HOURS: N/A	WET ☐ DRY ☐
WATER LEVEL AFTER 0 HOURS: N/A		NE = Not Encountered; NMR = No Measurement Recorded	

NOTE: Stratification lines between soil types represent the approximate boundary; gradual transition between in-situ soil layers should be expected.

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SOIL BORING LOG

PROJECT NAME: Waukesha By-Pass	DATE DRILLING STARTED: 3/5/2013	BORING NUMBER: SB-18	
PROJECT LOCATION: Waukesha, WI	DATE DRILLING ENDED: 3/5/2013	PROJECT NUMBER: 10031-10	
		DRILLING RIG: Diedrich D50 ATV	
BORING DRILLED BY: FIRM: Gestra, CREW CHIEF: A. Woerpel	FIELD LOG: D. Harris	NORTHING	DRILLING METHOD: 3¼" HSA
	LAB LOG / QC: L. Gliniecki	EASTING	SURFACE ELEVATION: ft

Number and Type	Recovery (in)	Blow Counts	N - Value	Depth (ft)	Elevation	Soil Description and Geological Origin for Each Major Unit	USCS Classification	Graphic	Well Diagram	Unconfined Comp. Strength (Q_u or Q_p) (tsf)	Liquid Limit	Plasticity Index	Moisture Content (%)	Comments
						SILT WITH SAND, brown, moist, very dense, with clayey seams								
SS - 9	16	13 32 33	65				ml							
SS - 10	15	16 34 50/5"	R											
				25		24.6 LEAN CLAY, brown, moist, hard	cl			4.5+			13	
						25 End of Boring at 25.0 ft.								
				30										
				35										
				40										

WATER & CAVE-IN OBSERVATION DATA

WATER ENCOUNTERED DURING DRILLING: 6 ft.	CAVE DEPTH AT COMPLETION: N/A	WET ☐ DRY ☐
WATER LEVEL AT COMPLETION: N/A	CAVE DEPTH AFTER 0 HOURS: N/A	WET ☐ DRY ☐
WATER LEVEL AFTER 0 HOURS: N/A	NE = Not Encountered; NMR = No Measurement Recorded	

NOTE: Stratification lines between soil types represent the approximate boundary; gradual transition between in-situ soil layers should be expected.

SOIL BORING LOG

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Phone: 414-933-7444, Fax: 414-933-7844

PROJECT NAME: Waukesha By-Pass	DATE DRILLING STARTED: 3/6/2013	BORING NUMBER: SB-19	
PROJECT LOCATION: Waukesha, WI	DATE DRILLING ENDED: 3/6/2013	PROJECT NUMBER: 10031-10	
		DRILLING RIG: Diedrich D50 ATV	
BORING DRILLED BY: FIRM: Gestra, CREW CHIEF: R. Jackson	FIELD LOG: D. Harris	NORTHING	DRILLING METHOD: 3¼" HSA
	LAB LOG / QC: L. Gliniecki	EASTING	SURFACE ELEVATION: ft

Number and Type	Recovery (in)	Blow Counts	N - Value	Depth (ft)	Elevation	Soil Description and Geological Origin for Each Major Unit	USCS Classification	Graphic	Well Diagram	Unconfined Comp. Strength (Q_u or Q_p) (tsf)	Liquid Limit	Plasticity Index	Moisture Content (%)	Comments
						TOPSOIL, (5") 0.4								Frost depth 4" Boring SB-19 was converted to monitoring well MW-6 after drilling
SS - 1	15	2 4 6	10			SAND WITH SILT, light brown, moist, medium dense	sp-sm							
SS - 2	16	4 5 6	11	5		5.4								
SS - 3	15	6 12 20	32			SAND WITH SILT AND GRAVEL, light brown, moist, dense to very dense	sp-sm							
SS - 4	14	8 18 27	45	10		10.3								
SS - 5	15	12 15 28	43			SILTY SAND WITH GRAVEL, brown, moist, dense; Gravel layer at 12' (Driller's Observation) 12.9	sm							
SS - 6	18	12 11 15	26	15		LEAN CLAY, grayish brown, moist, hard, with sand seams	cl			4.5+			13	
SS - 7	16	14 16 23	39							4.5+			13	
SS - 8	0	45 50/5"	R	20		19.8								No recovery for sample SS-8, stone in split spoon shoe

WATER & CAVE-IN OBSERVATION DATA

WATER ENCOUNTERED DURING DRILLING: 18.5 ft.	CAVE DEPTH AT COMPLETION: N/A	WET ☐ DRY ☐
WATER LEVEL AT COMPLETION: N/A	CAVE DEPTH AFTER 0 HOURS: N/A	WET ☐ DRY ☐
WATER LEVEL AFTER 0 HOURS: N/A	NE = Not Encountered; NMR = No Measurement Recorded	

NOTE: Stratification lines between soil types represent the approximate boundary; gradual transition between in-situ soil layers should be expected.

SOIL BORING LOG

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Phone: 414-933-7444, Fax: 414-933-7844

PROJECT NAME: Waukesha By-Pass	DATE DRILLING STARTED: 3/6/2013	BORING NUMBER: SB-19	
PROJECT LOCATION: Waukesha, WI	DATE DRILLING ENDED: 3/6/2013	PROJECT NUMBER: 10031-10	
		DRILLING RIG: Diedrich D50 ATV	
BORING DRILLED BY: FIRM: Gestra, CREW CHIEF: R. Jackson	FIELD LOG: D. Harris	NORTHING	DRILLING METHOD: 3¼" HSA
	LAB LOG / QC: L. Gliniecki	EASTING	SURFACE ELEVATION: ft

Number and Type	Recovery (in)	Blow Counts	N - Value	Depth (ft)	Elevation	Soil Description and Geological Origin for Each Major Unit	USCS Classification	Graphic	Well Diagram	Unconfined Comp. Strength (Q_u or Q_p) (tsf)	Liquid Limit	Plasticity Index	Moisture Content (%)	Comments
						SILT WITH GRAVEL, light brown, moist to wet, very dense	ml							
SS - 9	16	25 37 15	52				ml							
SS - 10	15	25 43 50/5"	R	25		25								
						End of Boring at 25.0 ft.								
				30										
				35										
				40										

WATER & CAVE-IN OBSERVATION DATA

WATER ENCOUNTERED DURING DRILLING: 18.5 ft.		CAVE DEPTH AT COMPLETION: N/A	WET ☐ DRY ☐
WATER LEVEL AT COMPLETION: N/A		CAVE DEPTH AFTER 0 HOURS: N/A	WET ☐ DRY ☐
WATER LEVEL AFTER 0 HOURS: N/A		NE = Not Encountered; NMR = No Measurement Recorded	

NOTE: Stratification lines between soil types represent the approximate boundary; gradual transition between in-situ soil layers should be expected.

SOIL BORING LOG

Gestra Engineering Inc.
1626 W. Fond du Lac Avenue
Milwaukee, WI 53205
Phone: 414-933-7444, Fax: 414-933-7844

PROJECT NAME: Waukesha By-Pass	DATE DRILLING STARTED: 3/8/2013	BORING NUMBER: SB-20	
PROJECT LOCATION: Waukesha, WI	DATE DRILLING ENDED: 3/8/2013	PROJECT NUMBER: 10031-10	
		DRILLING RIG: Diedrich D50 ATV	
BORING DRILLED BY: FIRM: Gestra, CREW CHIEF: R. Jackson	FIELD LOG: D. Born	NORTHING	DRILLING METHOD: 3¼" HSA
	LAB LOG / QC: L. Gliniecki	EASTING	SURFACE ELEVATION: ft

Number and Type	Recovery (in)	Blow Counts	N - Value	Depth (ft)	Elevation	Soil Description and Geological Origin for Each Major Unit	USCS Classification	Graphic	Well Diagram	Unconfined Comp. Strength (Q_u or Q_p) (tsf)	Liquid Limit	Plasticity Index	Moisture Content (%)	Comments
						TOPSOIL, (5") 0.4								Frost depth 12"
SS - 1	12	0 0 0	0			SILTY CLAY WITH SAND, black, very moist, very soft to medium stiff, trace organic matter	CL-ML			<0.25			21	LOI = 1.4%
SS - 2	18	0 0 3	3	5						0.25-0.5			48	LOI = 9.3%
						6.3								
SS - 3	10	0 6 10	16			SAND WITH CLAY AND GRAVEL, brown, very moist, medium dense 7.7	SP-SC							
SS - 4	9	8 8 14	22	10		GRAVEL WITH SAND, brown, wet, medium dense 10.1	GPS							Rig chatter at 8.5'
SS - 5	9	10 12 15	27			SAND WITH SILT, brown, wet, medium dense, trace gravel 12.6	SP-SM							Rig chatter at 10'
SS - 6	8	12 13 17	30	15		GRAVEL WITH SILT AND SAND, brown, wet, dense 15.1	GP-GM							
SS - 7	12	15 15 11	26			SAND WITH SILT, brown, wet, medium dense	SP-SM							
SS - 8	14	14 12 13	25	20										

WATER & CAVE-IN OBSERVATION DATA

WATER ENCOUNTERED DURING DRILLING: 8.5 ft.	CAVE DEPTH AT COMPLETION: N/A	WET ☐ DRY ☐
WATER LEVEL AT COMPLETION: 4 ft.	CAVE DEPTH AFTER 0 HOURS: N/A	WET ☐ DRY ☐
WATER LEVEL AFTER 0 HOURS: N/A	NE = Not Encountered; NMR = No Measurement Recorded	

NOTE: Stratification lines between soil types represent the approximate boundary; gradual transition between in-situ soil layers should be expected.

SOIL BORING LOG

Gestra Engineering Inc.
1626 W. Fond du Lac Avenue
Milwaukee, WI 53205
Phone: 414-933-7444, Fax: 414-933-7844

PROJECT NAME	Waukesha By-Pass
DATE DRILLING STARTED	3/8/2013
BORING NUMBER	SB-20
PROJECT NUMBER	10031-10
PROJECT LOCATION	Waukesha, WI
DATE DRILLING ENDED	3/8/2013
DRILLING RIG	Diedrich D50 ATV
BORING DRILLED BY	FIRM: Gestra CREW CHIEF: R. Jackson
FIELD LOG	D. Born
LAB LOG / QC	L. Gliniecki
NORTHING	
EASTING	
DRILLING METHOD	3¼" HSA
SURFACE ELEVATION	ft

Number and Type	Recovery (in)	Blow Counts	N - Value	Depth (ft)	Elevation	Soil Description and Geological Origin for Each Major Unit	USCS Classification	Graphic	Well Diagram	Unconfined Comp. Strength (Q_u or Q_p) (tsf)	Liquid Limit	Plasticity Index	Moisture Content (%)	Comments
						20.3	SP-SM							
						SILTY SAND WITH GRAVEL, brown, wet, medium dense to dense								
SS - 9	16	13 13 15	28				SM							
SS - 10	15	15 17 18	35	25		25								
						End of Boring at 25.0 ft.								
				30										
				35										
				40										

WATER & CAVE-IN OBSERVATION DATA

WATER ENCOUNTERED DURING DRILLING: 8.5 ft.		CAVE DEPTH AT COMPLETION: N/A	WET ☐ DRY ☐
WATER LEVEL AT COMPLETION: 4 ft.		CAVE DEPTH AFTER 0 HOURS: N/A	WET ☐ DRY ☐
WATER LEVEL AFTER 0 HOURS: N/A		NE = Not Encountered; NMR = No Measurement Recorded	

NOTE: Stratification lines between soil types represent the approximate boundary; gradual transition between in-situ soil layers should be expected.

SOIL BORING LOG

Gestra Engineering Inc.
1626 W. Fond du Lac Avenue
Milwaukee, WI 53205
Phone: 414-933-7444, Fax: 414-933-7844

PROJECT NAME	Waukesha By-Pass
DATE DRILLING STARTED	3/7/2013
BORING NUMBER	SB-21
PROJECT NUMBER	10031-10
PROJECT LOCATION	Waukesha, WI
DATE DRILLING ENDED	3/7/2013
DRILLING RIG	Diedrich D50 ATV
BORING DRILLED BY	FIRM: Gestra CREW CHIEF: R. Jackson
FIELD LOG	D. Born
LAB LOG / QC	L. Gliniecki
NORTHING	
EASTING	
DRILLING METHOD	3¼" HSA
SURFACE ELEVATION	ft

Number and Type	Recovery (in)	Blow Counts	N - Value	Depth (ft)	Elevation	Soil Description and Geological Origin for Each Major Unit	USCS Classification	Graphic	Well Diagram	Unconfined Comp. Strength (Q_u or Q_p) (tsf)	Liquid Limit	Plasticity Index	Moisture Content (%)	Comments
						TOPSOIL, (4") 0.3								No Frost
SS - 1	15	2 2 6	8			LEAN CLAY, brown, moist, stiff to very stiff, trace sand 2.9	CL			1.5-2.0			19	
SS - 2	18	3 6 7	13	5		SAND WITH CLAY AND GRAVEL, brown, moist, medium dense, trace gravel								
SS - 3	2	6 6 6	12				SP-SC							
SS - 4	14	4 7 11	18	10		10.3								
SS - 5	16	13 20 20	40			SAND WITH SILT, brown, moist to very moist, dense to very dense, trace gravel								
SS - 6	15	15 19 22	41	15			SP-SM							
SS - 7	16	16 33 49	82											
SS - 8	11	25 50/5"	R	20										

WATER & CAVE-IN OBSERVATION DATA

WATER ENCOUNTERED DURING DRILLING: 21 ft.		CAVE DEPTH AT COMPLETION: N/A	WET ☐ DRY ☐
WATER LEVEL AT COMPLETION: N/A		CAVE DEPTH AFTER 0 HOURS: N/A	WET ☐ DRY ☐
WATER LEVEL AFTER 0 HOURS: N/A		NE = Not Encountered; NMR = No Measurement Recorded	

NOTE: Stratification lines between soil types represent the approximate boundary; gradual transition between in-situ soil layers should be expected.

SOIL BORING LOG

Gestra Engineering Inc.
1626 W. Fond du Lac Avenue
Milwaukee, WI 53205
Phone: 414-933-7444, Fax: 414-933-7844

PROJECT NAME: Waukesha By-Pass	DATE DRILLING STARTED: 3/7/2013	BORING NUMBER: SB-21	
PROJECT LOCATION: Waukesha, WI	DATE DRILLING ENDED: 3/7/2013	PROJECT NUMBER: 10031-10	
		DRILLING RIG: Diedrich D50 ATV	
BORING DRILLED BY: FIRM: Gestra, CREW CHIEF: R. Jackson	FIELD LOG: D. Born	NORTHING	DRILLING METHOD: 3¼" HSA
	LAB LOG / QC: L. Gliniecki	EASTING	SURFACE ELEVATION: ft

Number and Type	Recovery (in)	Blow Counts	N - Value	Depth (ft)	Elevation	Soil Description and Geological Origin for Each Major Unit	USCS Classification	Graphic	Well Diagram	Unconfined Comp. Strength (Q_u or Q_p) (tsf)	Liquid Limit	Plasticity Index	Moisture Content (%)	Comments
						SAND WITH SILT, brown, moist to very moist, dense to very dense, trace gravel								
SS - 9	18	26 39 45	84				SP-SM							
						23								
						SILTY SAND, light brown, wet, very dense								
SS - 10	15	25 40 50/4"	R	25		25	SM							
						End of Boring at 25.0 ft.								
				30										
				35										
				40										

WATER & CAVE-IN OBSERVATION DATA

WATER ENCOUNTERED DURING DRILLING: 21 ft.	CAVE DEPTH AT COMPLETION: N/A	WET ☐ DRY ☐
WATER LEVEL AT COMPLETION: N/A	CAVE DEPTH AFTER 0 HOURS: N/A	WET ☐ DRY ☐
WATER LEVEL AFTER 0 HOURS: N/A	NE = Not Encountered; NMR = No Measurement Recorded	

NOTE: Stratification lines between soil types represent the approximate boundary; gradual transition between in-situ soil layers should be expected.

Name	Easting	Northing	Elevation	Comment
SB-12	154215.4	667851.4	814.858	BORE
SB-13	153802.6	668474.3	820.311	BORE
SB-20	150755.8	670665.4	828.975	BORE
SB-21	150490.2	671042.1	843.463	BORE
SB-14_MW-1	153153.5	669175.9	811.503	SB-14_MW-1 XYZ
	153154	669175.7	814.478	SB-14_MW-1 PVC
SB-15_MW-2	153152.5	668870.2	823.296	SB-15_MW-2 XYZ
	153152.7	668870.6	826.033	SB-15_MW-2 PVC
	153152.8	668870.4	826.373	SB-15_MW-2 TOP
SB-16_MW-3	152413.7	669380.5	836.407	SB-16_MW-3 TOP
	152413.7	669380.7	836.021	SB-16_MW-3 PVC
SB-17_MW-4	152280.6	669109.7	871.811	SB-17_MW-4 XYZ
	152280.4	669110.3	874.122	SB-17_MW-4 PVC
	152280.3	669110.4	874.291	SB-17_MW-4 TOP
SB-18_MW-5	151716	669983.7	824.781	SB-18_MW-5 XYZ
	151716.5	669983.9	826.987	SB-18_MW-5 PVC
	151716.6	669983.8	827.323	SB-18_MW-5 TOP
SB-18_MW-5	151714.7	669983.1	824.349	SB-18_MW-5 REBAR XYZ
SB-19_MW-6	151532	669729.6	850.008	SB-19_MW-6 XYZ
	151532.2	669729.9	851.029	SB-19_MW-6 PVC
	151526.4	669726.7	849.953	SB-19_MW-6 REBAR XYZ

Appendix C

Private Supply Well Construction Logs

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Wisconsin Department of Natural Resources

Wisconsin DNR Drinking Water data

Well Construction Reports

Help Reports

WI Unique Well No:	HI683	**High Capacity Well No:**	.
Hi Cap Well:	No	**Hi Cap Property:**	No
County Well Location:		**DNR Region:**	Southeast
County:	Waukesha	**Muni Type:**	T
Municipality:	WAUKESHA	**Well Address:**	S37 W26921 GENESEE RD HWY 59
Tax Parcel No:		**Owner:**	BAUER, CHARLOTTE
Owner Address:	8848 HART DR	**Owner City:**	WIND LAKE
Owner State:	WI	**Owner Zip:**	53185
Completion Date:	10/15/1993 **mm/dd/yyyy**	**DNR Received Date:**	12/01/1993
Constructor:	HERR WELL DRILLING INC	**Constructor Address:**	W295 HERR RD
Constructor City:	DOUSMAN	**Constructor State:**	WI
Constructor Zip:	53118-9407	**Fire No:**	
Subdivision:		**Lot:**	
Block:		**Government Parcel:**	
Township:	6 **N**	**Range:**	19 E
Section:	17	**Quarter Section:**	SW
Quarter-Quarter:	SW	**Status:**	Replacement
Original Year:		**Replacement Reason:**	NEEDED NEW WELL FOR SALE
Previous WI Well No:		**Replacement WI Well No:**	
Well Construction Type:	Drilled	**Other Const. Type:**	
Category:	Private, potable	**Well Depth:**	263 **ft**
# Services:	1	**Facility Type:**	
Highest Point on Property:	Yes	**In Floodplain:**	No
Rotary - Mud Circulation:		**Rotary - Air:**	Yes
Rotary - Foam:		**Reverse Rotary:**	
Cable Tool Bit:		**Cable Bit Diameter:**	**in**
Temp Outer Casing:		**Temp Casing Diameter:**	**in**

Temp Casing Removed:		**Why not removed?:**	
Other Drilling method:	Yes	**Other Drilling Description:**	@ HAMMER
Screen Diameter:	**inches**	**Screen Description:**	
Screen From:	**feet**	**Screen To:**	**feet**
Sealant Method:		**Static Water level:**	104 feet Below Ground
Pumping level:	145 **feet**	**Pumping at:**	15
Pumping units:	Minutes	**For:**	5 **Hour(s)**
Well Starting Depth:	12 inches Above Ground	**Developed:**	Yes
Disinfected:	Y	**Capped:**	Yes
Proper Seal:	No	**Seal Description:**	NOT CONTRACTED TO DO IT
Contractor Signed on:	10/28/1993	**Rig Operator Signed on:**	11/30/1993
Geologic Log Number:		**Common Well Number:**	
Calculated Specific Capacity:	.4	**DNR Facility ID:**	
Well Name:		**Water Quality Comments:**	
Water Quantity Comments:		**Drilling Difficulty:**	
Other Driller Comments:		**Exception Area Comments:**	

Distances in Feet to Nearest Objects

Type	Qualifier	Distance
Other		11
Building Overhang		14
Septic or Holding Tank		78
Sewage Absorption Unit		119

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Drillhole Dimensions

Diameter (in)	From Depth (ft.)	To Depth (ft.)
6	0	263

Download

Casing & Liner

Diameter (inches)	Description	From Depth (ft.)	To Depth (ft.)
6	18.97 LBS. PER FOOT NEW STEEL PLAIN END ASTM A53GRADE B SAWHILL TUBULAR 2660 LBS. PSI	0	193

Download

Grout or Other Sealant Materials

Kind of Sealing Material	From Depth (ft.)	To Depth (ft.)	Amount	Units
GRANULAR 8 MESH BENTONITE	0	0		

Download

Geology

Geology	Geology Description	Driller's Description	USGS Code	From Depth (feet)	To Depth (feet)
--Y-	Sand & Gravel;	SAND @ GRAVEL		0	159
--GC	Gravel/Cobbles/Boulders/Stones; Clayey;	GRAVEL @ CLAY		159	193
--L-	Limestone/Dolomite;	LIMESTONE		193	263

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Samples

Sample Date	Collected By	Description	Laboratory	Lab Sample ID
10/18/1993	RICK DEARBORN	***CHARLOTTE BAUER*8848 HART DR*WIND LAKE, WI 53185* 8957662	267	310300000

Record 1 of 1

Download

- Abandonment (0 Rows)
- Variances (0 Rows)
- Rehabilitation/Redevelopment (0 Rows)

- **Return Links**

Wisconsin Department of Natural Resources

Wisconsin DNR Drinking Water data

Well Construction Reports

Help Reports

WI Unique Well No:	CT137	**High Capacity Well No:**	.
Hi Cap Well:	No	**Hi Cap Property:**	No
County Well Location:		**DNR Region:**	Southeast
County:	Waukesha	**Muni Type:**	T
Municipality:	WAUKESHA	**Well Address:**	S36 W26608 W GENESEE RD
Tax Parcel No:		**Owner:**	HUEBNER
Owner Address:	S36 W26608 GENESEE	**Owner City:**	WAUKESHA
Owner State:	WI	**Owner Zip:**	53186
Completion Date:	07/25/1990 **mm/dd/yyyy**	**DNR Received Date:**	09/17/1992
Constructor:	RICHARD L DANECKI	**Constructor Address:**	PO BOX 94
Constructor City:	NORTH PRAIRIE	**Constructor State:**	WI
Constructor Zip:	53153-0094	**Fire No:**	
Subdivision:		**Lot:**	
Block:		**Government Parcel:**	
Township:	6 **N**	**Range:**	19 E
Section:	17	**Quarter Section:**	SW
Quarter-Quarter:	NE	**Status:**	Replacement
Original Year:		**Replacement Reason:**	HAND DUG WELL
Previous WI Well No:		**Replacement WI Well No:**	
Well Construction Type:	Drilled	**Other Const. Type:**	
Category:	Private, potable	**Well Depth:**	265 **ft**
# Services:	1	**Facility Type:**	
Highest Point on Property:	Yes	**In Floodplain:**	No
Rotary - Mud Circulation:	Yes	**Rotary - Air:**	
Rotary - Foam:		**Reverse Rotary:**	
Cable Tool Bit:		**Cable Bit Diameter:**	**in**
Temp Outer Casing:		**Temp Casing Diameter:**	**in**

Temp Casing Removed:		**Why not removed?:**	
Other Drilling method:		**Other Drilling Description:**	
Screen Diameter:	**inches**	**Screen Description:**	
Screen From:	**feet**	**Screen To:**	**feet**
Sealant Method:		**Static Water level:**	50 feet Below Ground
Pumping level:	120 **feet**	**Pumping at:**	20
Pumping units:	Minutes	**For:**	4 **Hour(s)**
Well Starting Depth:	14 inches Above Ground	**Developed:**	Yes
Disinfected:	Y	**Capped:**	Yes
Proper Seal:	Yes	**Seal Description:**	
Contractor Signed on:	07/25/1990	**Rig Operator Signed on:**	07/25/1990
Geologic Log Number:		**Common Well Number:**	
Calculated Specific Capacity:	.3	**DNR Facility ID:**	
Well Name:		**Water Quality Comments:**	
Water Quantity Comments:		**Drilling Difficulty:**	
Other Driller Comments:		**Exception Area Comments:**	

Distances in Feet to Nearest Objects

Type	Qualifier	Distance
Downspout/Yard Hydrant		14
Building Overhang		16
Septic or Holding Tank		31
Sewage Absorption Unit		65
Building Sewer		37
Clearwater Sump		28

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Drillhole Dimensions

Diameter (in)	From Depth (ft.)	To Depth (ft.)
8.75	0	200
6	200	265

Download

Casing & Liner

Diameter (inches)	Description	From Depth (ft.)	To Depth (ft.)
6	EQUIV. TO A120 HYDRO TESTED 1200 PSI 20.0 5/8 OD X.280 WALL 18.97 LB TYPE EW VSPCO	0	200

Download

Grout or Other Sealant Materials

Kind of Sealing Material	From Depth (ft.)	To Depth (ft.)	Amount	Units
BENTONITE @ CUTTINGS	0	200		

Download

Geology

Geology	Geology Description	Driller's Description	USGS Code	From Depth (feet)	To Depth (feet)
--Y-	Sand & Gravel;	SAND @ GRAVEL		0	38
--Z-	Clay & Gravel;	CLAY @ GRAVEL		38	200
--L-	Limestone/Dolomite;	LIMESTONE		200	265

Download

Samples

Sample Date	Collected By	Description	Laboratory	Lab Sample ID
07/25/1990	RICK DANECKI	***HUEBNER*S36W26608 GENESEE RD*WAUKESHA, WI 53186*	168	003163000

Record 1 of 1

Download

- Abandonment (0 Rows)
- Variances (0 Rows)
- Rehabilitation/Redevelopment (0 Rows)

- **Return Links**
  - DNR Drinking Water System

Wisconsin Department of Natural Resources

Wisconsin DNR Drinking Water data

Well Construction Reports

Help Reports

WI Unique Well No:	EQ407	**High Capacity Well No:**	.
Hi Cap Well:	No	**Hi Cap Property:**	No
County Well Location:		**DNR Region:**	Southeast
County:	Waukesha	**Muni Type:**	T
Municipality:	WAUKESHA	**Well Address:**	W267 S3742 VELMA CT
Tax Parcel No:		**Owner:**	JAMES DOWNING
Owner Address:	W267 S3742 VELMA CT	**Owner City:**	WAUKESHA
Owner State:	WI	**Owner Zip:**	53188
Completion Date:	04/10/1992 **mm/dd/yyyy**	**DNR Received Date:**	04/24/1992
Constructor:	HERR WELL DRILLING INC	**Constructor Address:**	W295 HERR RD
Constructor City:	DOUSMAN	**Constructor State:**	WI
Constructor Zip:	53118-9407	**Fire No:**	
Subdivision:	LAWRENCE WOODS SUBD.	**Lot:**	00001
Block:	1	**Government Parcel:**	
Township:	6 **N**	**Range:**	19 E
Section:	17	**Quarter Section:**	SW
Quarter-Quarter:	SE	**Status:**	New Well
Original Year:		**Replacement Reason:**	WATER SUPPLY FOR NEW HOME
Previous WI Well No:		**Replacement WI Well No:**	
Well Construction Type:	Drilled	**Other Const. Type:**	
Category:	Private, potable	**Well Depth:**	224 **ft**
# Services:	1	**Facility Type:**	
Highest Point on Property:	Yes	**In Floodplain:**	No
Rotary - Mud Circulation:		**Rotary - Air:**	
Rotary - Foam:		**Reverse Rotary:**	
Cable Tool Bit:		**Cable Bit Diameter:**	**in**

Temp Outer Casing:		**Temp Casing Diameter:**	**in**
Temp Casing Removed:		**Why not removed?:**	
Other Drilling method:		**Other Drilling Description:**	
Screen Diameter:	**inches**	**Screen Description:**	
Screen From:	**feet**	**Screen To:**	**feet**
Sealant Method:		**Static Water level:**	64 feet Below Ground
Pumping level:	100 **feet**	**Pumping at:**	20
Pumping units:		**For:**	5 **Hour(s)**
Well Starting Depth:	12 inches Above Ground	**Developed:**	Yes
Disinfected:	Y	**Capped:**	Yes
Proper Seal:		**Seal Description:**	NONE
Contractor Signed on:	04/16/1992	**Rig Operator Signed on:**	04/16/1992
Geologic Log Number:		**Common Well Number:**	
Calculated Specific Capacity:	.6	**DNR Facility ID:**	
Well Name:		**Water Quality Comments:**	
Water Quantity Comments:		**Drilling Difficulty:**	
Other Driller Comments:		**Exception Area Comments:**	

Distances in Feet to Nearest Objects

Type	Qualifier	Distance
Building Overhang		14

Download

Drillhole Dimensions

Diameter (in)	From Depth (ft.)	To Depth (ft.)
8.75	0	219
6	219	224

Download

Casing & Liner

Diameter (inches)	Description	From Depth (ft.)	To Depth (ft.)
6	18.97 LBS. PER FT NEW STEEL PLAIN END ASTM A53GRADE B SAWHILL TUBULAR 2660 LBS. PSI	0	219

Download

Grout or Other Sealant Materials

Kind of Sealing Material	From Depth (ft.)	To Depth (ft.)	Amount	Units
CLAY SLURRY @ DRILLING MUD	0	219		

Download

Geology

Geology	Geology Description	Driller's Description	USGS Code	From Depth (feet)	To Depth (feet)
--Y-	Sand & Gravel;	SAND @ GRAVEL		0	69
--GC	Gravel/Cobbles/Boulders/Stones; Clayey;	GRAVEL @ CLAY		69	137
--C-	Clay;	CLAY		137	219
--LH	Limestone/Dolomite; Shaley;	LIMESTONE @ SHALE		219	224

Download

Samples

Sample Date	Collected By	Description	Laboratory	Lab Sample ID
04/13/1992	DEARBORN	*** JAMES DOWNING*W267 S3742 VELMA CRT*WAUKESHA WI *4145240373	113133790	BC086642

Record 1 of 1

Download

- Abandonment (0 Rows)
- Variances (0 Rows)

Wisconsin Department of Natural Resources

Wisconsin DNR Drinking Water data

Well Construction Reports

Help Reports

WI Unique Well No:	MY500	**High Capacity Well No:**	.
Hi Cap Well:	No	**Hi Cap Property:**	No
County Well Location:		**DNR Region:**	Southeast
County:	Waukesha	**Muni Type:**	T
Municipality:	WAUKESHA	**Well Address:**	S32 W26320 BOB BELL CT
Tax Parcel No:		**Owner:**	CAMPBELL, JAY
Owner Address:	W735 MIRAMIR RD	**Owner City:**	MUKWONAGO
Owner State:	WI	**Owner Zip:**	53149
Completion Date:	07/21/1999 **mm/dd/yyyy**	**DNR Received Date:**	09/24/1999
Constructor:	MICHAEL HARTMAN	**Constructor Address:**	PO BOX 218
Constructor City:	NORTH LAKE	**Constructor State:**	WI
Constructor Zip:	53064-0218	**Fire No:**	
Subdivision:		**Lot:**	1
Block:		**Government Parcel:**	
Township:	6 **N**	**Range:**	19 E
Section:	17	**Quarter Section:**	NE
Quarter-Quarter:	SW	**Status:**	New Well
Original Year:		**Replacement Reason:**	NEW HOME
Previous WI Well No:		**Replacement WI Well No:**	
Well Construction Type:	Drilled	**Other Const. Type:**	
Category:	Private, potable	**Well Depth:**	205 **ft**
# Services:	1	**Facility Type:**	HOME
Highest Point on Property:	Yes	**In Floodplain:**	No
Rotary - Mud Circulation:		**Rotary - Air:**	
Rotary - Foam:		**Reverse Rotary:**	
Cable Tool Bit:		**Cable Bit Diameter:**	**in**
Temp Outer Casing:		**Temp Casing Diameter:**	**in**

Temp Casing Removed:		**Why not removed?:**	
Other Drilling method:		**Other Drilling Description:**	
Screen Diameter:	**inches**	**Screen Description:**	
Screen From:	**feet**	**Screen To:**	**feet**
Sealant Method:	MOUNDED	**Static Water level:**	20 feet Below Ground
Pumping level:	60 **feet**	**Pumping at:**	25
Pumping units:	Minutes	**For:**	4 **Hour(s)**
Well Starting Depth:	18 inches Above Ground	**Developed:**	Yes
Disinfected:	Y	**Capped:**	Yes
Proper Seal:	No	**Seal Description:**	NO WELL
Contractor Signed on:	07/27/1999	**Rig Operator Signed on:**	
Geologic Log Number:		**Common Well Number:**	
Calculated Specific Capacity:	.6	**DNR Facility ID:**	
Well Name:		**Water Quality Comments:**	
Water Quantity Comments:		**Drilling Difficulty:**	
Other Driller Comments:		**Exception Area Comments:**	

Distances in Feet to Nearest Objects

Type	Qualifier	Distance
Foundation Drain to Clearwater		20
Building Overhang		19
Septic or Holding Tank		45
Sewage Absorption Unit		60
Building Sewer		40
Clearwater Sump		25

Download

Drillhole Dimensions

Diameter (in)	From Depth (ft.)	To Depth (ft.)
6	0	205

Download

Casing & Liner

Diameter (inches)	Description	From Depth (ft.)	To Depth (ft.)
6	0.280 A53GRB SAWHILL STEEL WELDED	0	130

Download

Grout or Other Sealant Materials

Kind of Sealing Material	From Depth (ft.)	To Depth (ft.)	Amount	Units
CRUMBLES	0			

Download

Geology

Geology	Geology Description	Driller's Description	USGS Code	From Depth (feet)	To Depth (feet)
--P-	Hardpan;	HARDPAN		0	36
--Y-	Sand & Gravel;	SAND, GRAVEL		36	48
--P-	Hardpan;	HARDPAN		48	130
--L-	Limestone/Dolomite;	LIMSTONE		130	205

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Samples

Sample Date	Collected By	Description	Laboratory	Lab Sample ID
07/21/1999	M HARTMAN	***JAY CAMPBELL*W735 MIRAMIR RD*MUKWONAGO, WI 53149*4143638229	290	722258

Record 1 of 1

Download

- Abandonment (0 Rows)
- Variances (0 Rows)
- Rehabilitation/Redevelopment (0 Rows)

- **Return Links**

Wisconsin Department of Natural Resources

Wisconsin DNR Drinking Water data

Well Construction Reports

Help Reports

WI Unique Well No:	NA898	**High Capacity Well No:**	.
Hi Cap Well:	No	**Hi Cap Property:**	No
County Well Location:		**DNR Region:**	Southeast
County:	Waukesha	**Muni Type:**	T
Municipality:	WAUKESHA	**Well Address:**	S32 W26334 BOB BELL CT
Tax Parcel No:		**Owner:**	TRITZ, RON
Owner Address:	S32 W26334 BOB BELL	**Owner City:**	WAUKESHA
Owner State:	WI	**Owner Zip:**	53189
Completion Date:	03/04/2001 **mm/dd/yyyy**	**DNR Received Date:**	09/27/2002
Constructor:	EMANUEL BURGARINO	**Constructor Address:**	HYDRO WELL DRILLING
Constructor City:	HALES CORNERS	**Constructor State:**	WI
Constructor Zip:	53130-2618	**Fire No:**	
Subdivision:		**Lot:**	
Block:		**Government Parcel:**	
Township:	6 **N**	**Range:**	19 E
Section:	17	**Quarter Section:**	NE
Quarter-Quarter:	NE	**Status:**	New Well
Original Year:		**Replacement Reason:**	NEW HOME
Previous WI Well No:		**Replacement WI Well No:**	
Well Construction Type:	Drilled	**Other Const. Type:**	
Category:	Private, potable	**Well Depth:**	173 **ft**
# Services:	1	**Facility Type:**	
Highest Point on Property:	Yes	**In Floodplain:**	No
Rotary - Mud Circulation:	Yes	**Rotary - Air:**	
Rotary - Foam:		**Reverse Rotary:**	
Cable Tool Bit:		**Cable Bit Diameter:**	**in**
Temp Outer Casing:		**Temp Casing Diameter:**	**in**

Temp Casing Removed:		**Why not removed?:**	
Other Drilling method:		**Other Drilling Description:**	
Screen Diameter:	**inches**	**Screen Description:**	
Screen From:	**feet**	**Screen To:**	**feet**
Sealant Method:		**Static Water level:**	4 feet Below Ground
Pumping level:	120 **feet**	**Pumping at:**	14
Pumping units:	Minutes	**For:**	4 **Hour(s)**
Well Starting Depth:	12 inches Above Ground	**Developed:**	Yes
Disinfected:	Y	**Capped:**	Yes
Proper Seal:		**Seal Description:**	
Contractor Signed on:	03/26/2001	**Rig Operator Signed on:**	03/26/2001
Geologic Log Number:		**Common Well Number:**	
Calculated Specific Capacity:	.1	**DNR Facility ID:**	
Well Name:		**Water Quality Comments:**	
Water Quantity Comments:		**Drilling Difficulty:**	
Other Driller Comments:		**Exception Area Comments:**	

Distances in Feet to Nearest Objects

Type	Qualifier	Distance
Building Overhang		16
Septic or Holding Tank		61
Sewage Absorption Unit		85

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Drillhole Dimensions

Diameter (in)	From Depth (ft.)	To Depth (ft.)
8.75	0	135
6	135	173

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Casing & Liner

Diameter (inches)	Description	From Depth (ft.)	To Depth (ft.)
6	PE NEW STL 18.97# ASTMA53B SAWHILL TUB	0	135

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Grout or Other Sealant Materials

Kind of Sealing Material	From Depth (ft.)	To Depth (ft.)	Amount	Units
DRILLING MUD	0	135		

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Geology

Geology	Geology Description	Driller's Description	USGS Code	From Depth (feet)	To Depth (feet)
--C-	Clay;	CLAY		0	41
--Y-	Sand & Gravel;	SAND/GRAVEL		41	75
--C-	Clay;	CLAY		75	135
--L-	Limestone/Dolomite;	LIMESTONE		135	173

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Samples

No Records returned

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- Abandonment (0 Rows)
- Variances (0 Rows)
- Rehabilitation/Redevelopment (0 Rows)

- **Return Links**
  - DNR Drinking Water System

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Wisconsin Department of Natural Resources

Wisconsin DNR Drinking Water data

Well Construction Reports

Help Reports

WI Unique Well No:	MY452	**High Capacity Well No:**	.
Hi Cap Well:	No	**Hi Cap Property:**	No
County Well Location:		**DNR Region:**	Southeast
County:	Waukesha	**Muni Type:**	T
Municipality:	WAUKESHA	**Well Address:**	S32 W26325 BOB BELL CT
Tax Parcel No:		**Owner:**	HANDCRAFTED HOMES
Owner Address:	909 BLACKSTONE AVE	**Owner City:**	WAUKESHA
Owner State:	WI	**Owner Zip:**	53186
Completion Date:	01/25/1999 **mm/dd/yyyy**	**DNR Received Date:**	04/16/1999
Constructor:	MICHAEL HARTMAN	**Constructor Address:**	PO BOX 218
Constructor City:	NORTH LAKE	**Constructor State:**	WI
Constructor Zip:	53064-0218	**Fire No:**	
Subdivision:		**Lot:**	4
Block:		**Government Parcel:**	
Township:	6 **N**	**Range:**	19 E
Section:	17	**Quarter Section:**	NE
Quarter-Quarter:	SW	**Status:**	New Well
Original Year:		**Replacement Reason:**	NEW HOME
Previous WI Well No:		**Replacement WI Well No:**	
Well Construction Type:	Drilled	**Other Const. Type:**	
Category:	Private, potable	**Well Depth:**	165 **ft**
# Services:	1	**Facility Type:**	HOME
Highest Point on Property:	Yes	**In Floodplain:**	No
Rotary - Mud Circulation:		**Rotary - Air:**	
Rotary - Foam:		**Reverse Rotary:**	
Cable Tool Bit:		**Cable Bit Diameter:**	**in**

Temp Outer Casing:		**Temp Casing Diameter:**	**in**
Temp Casing Removed:		**Why not removed?:**	
Other Drilling method:		**Other Drilling Description:**	
Screen Diameter:	**inches**	**Screen Description:**	
Screen From:	**feet**	**Screen To:**	**feet**
Sealant Method:	MOUNDED	**Static Water level:**	10 feet Below Ground
Pumping level:	60 **feet**	**Pumping at:**	40
Pumping units:	Minutes	**For:**	4 **Hour(s)**
Well Starting Depth:	18 inches Above Ground	**Developed:**	Yes
Disinfected:	Y	**Capped:**	Yes
Proper Seal:	No	**Seal Description:**	NO WELL
Contractor Signed on:	01/26/1999	**Rig Operator Signed on:**	
Geologic Log Number:		**Common Well Number:**	
Calculated Specific Capacity:	.8	**DNR Facility ID:**	
Well Name:		**Water Quality Comments:**	
Water Quantity Comments:		**Drilling Difficulty:**	
Other Driller Comments:		**Exception Area Comments:**	

Distances in Feet to Nearest Objects

Type	Qualifier	Distance
Foundation Drain to Clearwater		16
Building Overhang		15
Septic or Holding Tank		120
Sewage Absorption Unit		160
Building Sewer		35
Clearwater Sump		50

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Drillhole Dimensions

Diameter (in)	From Depth (ft.)	To Depth (ft.)

6	0	165

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Casing & Liner

Diameter (inches)	Description	From Depth (ft.)	To Depth (ft.)
6	0.280 A 53 GRB SAWHILL STEEL WELDED	0	141

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Grout or Other Sealant Materials

Kind of Sealing Material	From Depth (ft.)	To Depth (ft.)	Amount	Units
CRUMBLES	0			

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Geology

Geology	Geology Description	Driller's Description	USGS Code	From Depth (feet)	To Depth (feet)
--P-	Hardpan;	HARDPAN		0	9
--G-	Gravel/Cobbles/Boulders/Stones;	GRAVEL		9	24
--P-	Hardpan;	HARDPAN		24	134
--C-	Clay;	CLAY		134	140
--P-	Hardpan;	HARDPAN		140	141
--L-	Limestone/Dolomite;	LIMESTONE		141	165

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Samples

Sample Date	Collected By	Description	Laboratory	Lab Sample ID
01/25/1999	M HARTMAN	***HANDCRAFTED HOMES*2142 W GREENFIELD AV*NEW BERLIN, WI 53146*4145749094	290	662606

Record 1 of 1

Wisconsin Department of Natural Resources

Wisconsin DNR Drinking Water data

Well Construction Reports

Help Reports

WI Unique Well No:	CX628	**High Capacity Well No:**	.
Hi Cap Well:	No	**Hi Cap Property:**	No
County Well Location:		**DNR Region:**	Southeast
County:	Waukesha	**Muni Type:**	T
Municipality:	WAUKESHA	**Well Address:**	S33 W26765 HAWTHORNE HOLLOW DR
Tax Parcel No:		**Owner:**	THE FLANAGAN COMPANY
Owner Address:	S33 W26921 HAWTHORNE	**Owner City:**	WAUKESHA
Owner State:	WI	**Owner Zip:**	53188
Completion Date:	12/11/1991 **mm/dd/yyyy**	**DNR Received Date:**	02/19/1992
Constructor:	HERR WELL DRILLING INC	**Constructor Address:**	W295 HERR RD
Constructor City:	DOUSMAN	**Constructor State:**	WI
Constructor Zip:	53118-9407	**Fire No:**	
Subdivision:	HAWTHORNE HOLLOW WEST	**Lot:**	00006
Block:		**Government Parcel:**	
Township:	6 **N**	**Range:**	19 E
Section:	17	**Quarter Section:**	NW
Quarter-Quarter:	SW	**Status:**	New Well
Original Year:		**Replacement Reason:**	WATER SUPPLY FOR A NEW HO
Previous WI Well No:		**Replacement WI Well No:**	
Well Construction Type:	Drilled	**Other Const. Type:**	
Category:	Private, potable	**Well Depth:**	205 **ft**
# Services:	1	**Facility Type:**	
Highest Point on Property:	Yes	**In Floodplain:**	No

Rotary - Mud Circulation:	Yes	**Rotary - Air:**	
Rotary - Foam:		**Reverse Rotary:**	
Cable Tool Bit:		**Cable Bit Diameter:**	**in**
Temp Outer Casing:		**Temp Casing Diameter:**	**in**
Temp Casing Removed:		**Why not removed?:**	
Other Drilling method:		**Other Drilling Description:**	
Screen Diameter:	**inches**	**Screen Description:**	
Screen From:	**feet**	**Screen To:**	**feet**
Sealant Method:		**Static Water level:**	96 feet Below Ground
Pumping level:	125 **feet**	**Pumping at:**	15
Pumping units:		**For:**	5 **Hour(s)**
Well Starting Depth:	12 inches Above Ground	**Developed:**	Yes
Disinfected:	Y	**Capped:**	Yes
Proper Seal:		**Seal Description:**	
Contractor Signed on:	01/06/1992	**Rig Operator Signed on:**	02/17/1992
Geologic Log Number:		**Common Well Number:**	
Calculated Specific Capacity:	.5	**DNR Facility ID:**	
Well Name:		**Water Quality Comments:**	
Water Quantity Comments:		**Drilling Difficulty:**	
Other Driller Comments:		**Exception Area Comments:**	

Distances in Feet to Nearest Objects

Type	Qualifier	Distance
Building Overhang		15
Septic or Holding Tank		82
Sewage Absorption Unit		119

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Drillhole Dimensions

Diameter (in)	From Depth (ft.)	To Depth (ft.)
8.75	0	127
6	127	205

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Casing & Liner

Diameter (inches)	Description	From Depth (ft.)	To Depth (ft.)
6	18.97 LBS. PER FOOT NEW STEEL PLAIN END ASTM A53GRADE B SAWHILL TUBULAR 2660 LBS. PSI	0	127

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Grout or Other Sealant Materials

Kind of Sealing Material	From Depth (ft.)	To Depth (ft.)	Amount	Units
CLAY SLURRY @ DRILLING MUD	0	127		

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Geology

Geology	Geology Description	Driller's Description	USGS Code	From Depth (feet)	To Depth (feet)
--C-	Clay;	CLAY		0	49
--Y-	Sand & Gravel;	SAND @ GRAVEL		49	86
--C-	Clay;	CLAY		86	127
--L-	Limestone/Dolomite;	LIMESTONE		127	205

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Samples

Sample Date	Collected By	Description	Laboratory	Lab Sample ID
12/12/1991	DEARBORN	*** THE FLANAGAN CO *S33 W2691 HAWTHORNE*WAUKESHA WI *4145475199	113133790	BC056981

Record 1 of 1

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Wisconsin DNR Drinking Water data

Well Construction Reports

Help Reports

WI Unique Well No:	MB247	**High Capacity Well No:**	.
Hi Cap Well:	No	**Hi Cap Property:**	No
County Well Location:		**DNR Region:**	Southeast
County:	Waukesha	**Muni Type:**	T
Municipality:	WAUKESHA	**Well Address:**	W269 S3600 MERRILL HILLS RD
Tax Parcel No:		**Owner:**	TALLINGER, ROB
Owner Address:	24661 SUNSET DR	**Owner City:**	WAUKESHA
Owner State:	WI	**Owner Zip:**	53186
Completion Date:	09/03/1997 **mm/dd/yyyy**	**DNR Received Date:**	10/10/1997
Constructor:	HERR WELL DRILLING INC	**Constructor Address:**	W295 HERR RD
Constructor City:	DOUSMAN	**Constructor State:**	WI
Constructor Zip:	53118-9407	**Fire No:**	
Subdivision:		**Lot:**	
Block:		**Government Parcel:**	
Township:	6 **N**	**Range:**	19 E
Section:	17	**Quarter Section:**	SW
Quarter-Quarter:	NW	**Status:**	New Well
Original Year:		**Replacement Reason:**	WATER SUPPLY FOR NEW HOME
Previous WI Well No:		**Replacement WI Well No:**	
Well Construction Type:	Drilled	**Other Const. Type:**	
Category:	Private, potable	**Well Depth:**	222 **ft**
# Services:	1	**Facility Type:**	
Highest Point on Property:	Yes	**In Floodplain:**	No
Rotary - Mud Circulation:		**Rotary - Air:**	
Rotary - Foam:		**Reverse Rotary:**	
Cable Tool Bit:		**Cable Bit Diameter:**	**in**
Temp Outer Casing:		**Temp Casing Diameter:**	**in**

Temp Casing Removed:		**Why not removed?:**	
Other Drilling method:		**Other Drilling Description:**	
Screen Diameter:	**inches**	**Screen Description:**	
Screen From:	**feet**	**Screen To:**	**feet**
Sealant Method:		**Static Water level:**	116 feet Below Ground
Pumping level:	145 **feet**	**Pumping at:**	20
Pumping units:	Minutes	**For:**	3 **Hour(s)**
Well Starting Depth:	12 inches Above Ground	**Developed:**	Yes
Disinfected:	Y	**Capped:**	Yes
Proper Seal:		**Seal Description:**	NONE
Contractor Signed on:	09/12/1997	**Rig Operator Signed on:**	10/03/1997
Geologic Log Number:		**Common Well Number:**	
Calculated Specific Capacity:	.7	**DNR Facility ID:**	
Well Name:		**Water Quality Comments:**	
Water Quantity Comments:		**Drilling Difficulty:**	
Other Driller Comments:		**Exception Area Comments:**	

Distances in Feet to Nearest Objects

Type	Qualifier	Distance
Building Overhang		13
Septic or Holding Tank		74
Sewage Absorption Unit		92

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Drillhole Dimensions

Diameter (in)	From Depth (ft.)	To Depth (ft.)
6	0	222

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Casing & Liner

Diameter (inches)	Description	From Depth (ft.)	To Depth (ft.)
6	1897 LBS PER FOOT NEW STEEL PLAIN END ASTM A53GRADE B IPSCO TUBULAR 2660 LBS PSI	0	170

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Grout or Other Sealant Materials

Kind of Sealing Material	From Depth (ft.)	To Depth (ft.)	Amount	Units
GRANULAR 8 MESH BENTONITE	0	0		

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Geology

Geology	Geology Description	Driller's Description	USGS Code	From Depth (feet)	To Depth (feet)
--Z-	Clay & Gravel;	GRAVEL @ CLAY		0	6
--Y-	Sand & Gravel;	SAND @ GRAVEL		6	51
--Z-	Clay & Gravel;	GRAVEL @ CLAY		51	170
--L-	Limestone/Dolomite;	LIMESTONE		170	222

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Samples

Sample Date	Collected By	Description	Laboratory	Lab Sample ID
09/03/1997	RICK DEARBORN	***ROB TALLINGER*24661 SUNSET DR*WAUKESHA, WI 53186*4145446161	331	073939000

Record 1 of 1

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- Abandonment (0 Rows)
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- **Return Links**
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Wisconsin Department of Natural Resources

Wisconsin DNR Drinking Water data

Well Construction Reports

Help Reports

WI Unique Well No:	OV245	**High Capacity Well No:**	
Hi Cap Well:	No	**Hi Cap Property:**	No
County Well Location:		**DNR Region:**	Southeast
County:	Waukesha	**Muni Type:**	T
Municipality:	WAUKESHA	**Well Address:**	W269 S3448 MERRILL HILLS RD
Tax Parcel No:		**Owner:**	BERANEK, RONALD
Owner Address:	W269 S3450 MERRILL H	**Owner City:**	WAUKESHA
Owner State:	WI	**Owner Zip:**	53189
Completion Date:	09/11/2001 **mm/dd/yyyy**	**DNR Received Date:**	10/12/2001
Constructor:	ROSCHI BROS WELL DRLG & PUMP INC	**Constructor Address:**	N10W28210 NORTHVIEW RD
Constructor City:	WAUKESHA	**Constructor State:**	WI
Constructor Zip:	53188-9401	**Fire No:**	
Subdivision:		**Lot:**	
Block:		**Government Parcel:**	
Township:	6 **N**	**Range:**	19 E
Section:	17	**Quarter Section:**	NW
Quarter-Quarter:	SW	**Status:**	New Well
Original Year:		**Replacement Reason:**	NEW CONSTRUCTION
Previous WI Well No:		**Replacement WI Well No:**	
Well Construction Type:	Drilled	**Other Const. Type:**	
Category:	Private, potable	**Well Depth:**	220 **ft**
# Services:	1	**Facility Type:**	
Highest Point on Property:	Yes	**In Floodplain:**	No
Rotary - Mud Circulation:		**Rotary - Air:**	Yes
Rotary - Foam:		**Reverse Rotary:**	
Cable Tool Bit:		**Cable Bit Diameter:**	**in**

Temp Outer Casing:		**Temp Casing Diameter:**	**in**
Temp Casing Removed:		**Why not removed?:**	
Other Drilling method:		**Other Drilling Description:**	
Screen Diameter:	**inches**	**Screen Description:**	
Screen From:	**feet**	**Screen To:**	**feet**
Sealant Method:		**Static Water level:**	88 feet Below Ground
Pumping level:	120 **feet**	**Pumping at:**	10
Pumping units:	Minutes	**For:**	2 **Hour(s)**
Well Starting Depth:	12 inches Above Ground	**Developed:**	Yes
Disinfected:	Y	**Capped:**	Yes
Proper Seal:		**Seal Description:**	
Contractor Signed on:	09/11/2001	**Rig Operator Signed on:**	09/11/2001
Geologic Log Number:		**Common Well Number:**	
Calculated Specific Capacity:	.3	**DNR Facility ID:**	
Well Name:		**Water Quality Comments:**	
Water Quantity Comments:		**Drilling Difficulty:**	
Other Driller Comments:		**Exception Area Comments:**	

Distances in Feet to Nearest Objects

Type	Qualifier	Distance
Foundation Drain to Clearwater		9
Building Overhang		9

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Drillhole Dimensions

Diameter (in)	From Depth (ft.)	To Depth (ft.)
6	0	220

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Casing & Liner

Diameter (inches)	Description	From Depth (ft.)	To Depth (ft.)
6	BLACK STEEL PIPE, WELDED JOINTS, 18.97# ASTM A53 1780 PSI SAWHILL	0	161

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Grout or Other Sealant Materials

Kind of Sealing Material	From Depth (ft.)	To Depth (ft.)	Amount	Units
BENTONITE CRUMBLES	0	15		

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Geology

Geology	Geology Description	Driller's Description	USGS Code	From Depth (feet)	To Depth (feet)
--CG	Clay; w/Gravel/Cobbles/Boulders/Stones;	STONEY CLAY		0	17
--Y-	Sand & Gravel;	SAND-GRAVEL		17	85
--CG	Clay; w/Gravel/Cobbles/Boulders/Stones;	STONEY CLAY		85	136
--P-	Hardpan;	HARDPAN		136	161
--L-	Limestone/Dolomite;	LIMESTONE		161	220

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Samples

Sample Date	Collected By	Description	Laboratory	Lab Sample ID
09/20/2001	R ROSCHI	***RONALD BERANEK*W269 S3450 MERRILL HILLS RD*WAUKESHA, WI 53189*	290	982104

Record 1 of 1

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Wisconsin Department of Natural Resources

Wisconsin DNR Drinking Water data

Well Construction Reports

Help Reports

WI Unique Well No:	AE309	**High Capacity Well No:**	.
Hi Cap Well:	No	**Hi Cap Property:**	No
County Well Location:		**DNR Region:**	Southeast
County:	Waukesha	**Muni Type:**	T
Municipality:	WAUKESHA	**Well Address:**	W269 S3450 MERRILL HILLS ROAD
Tax Parcel No:		**Owner:**	RON BERANEK
Owner Address:	W269 S3450 MERRILL H	**Owner City:**	WAUKESHA
Owner State:	WI	**Owner Zip:**	53188
Completion Date:	01/14/1988 **mm/dd/yyyy**	**DNR Received Date:**	02/01/1988
Constructor:	WILLIAMS RANDY E	**Constructor Address:**	1844 WATERVIEW LANE
Constructor City:	WAUKESHA	**Constructor State:**	WI
Constructor Zip:	53186	**Fire No:**	
Subdivision:		**Lot:**	
Block:		**Government Parcel:**	
Township:	6 **N**	**Range:**	19 E
Section:	17	**Quarter Section:**	NW
Quarter-Quarter:	SW	**Status:**	New Well
Original Year:		**Replacement Reason:**	NEW HOME
Previous WI Well No:		**Replacement WI Well No:**	
Well Construction Type:	Drilled	**Other Const. Type:**	
Category:	Private, potable	**Well Depth:**	210 **ft**
# Services:	1	**Facility Type:**	
Highest Point on Property:	Yes	**In Floodplain:**	No
Rotary - Mud Circulation:		**Rotary - Air:**	
Rotary - Foam:		**Reverse Rotary:**	
Cable Tool Bit:	Yes	**Cable Bit Diameter:**	10 **in**

Temp Outer Casing:	Yes	**Temp Casing Diameter:**	10 **in**
Temp Casing Removed:	Yes	**Why not removed?:**	
Other Drilling method:		**Other Drilling Description:**	
Screen Diameter:	**inches**	**Screen Description:**	
Screen From:	**feet**	**Screen To:**	**feet**
Sealant Method:	GRAVITY	**Static Water level:**	88 feet Below Ground
Pumping level:	94 **feet**	**Pumping at:**	12
Pumping units:		**For:**	3 **Hour(s)**
Well Starting Depth:	14 inches Above Ground	**Developed:**	Yes
Disinfected:	Y	**Capped:**	Yes
Proper Seal:	Yes	**Seal Description:**	
Contractor Signed on:	01/26/1988	**Rig Operator Signed on:**	
Geologic Log Number:	682	**Common Well Number:**	
Calculated Specific Capacity:	2	**DNR Facility ID:**	
Well Name:		**Water Quality Comments:**	
Water Quantity Comments:		**Drilling Difficulty:**	
Other Driller Comments:		**Exception Area Comments:**	

Distances in Feet to Nearest Objects

Type	Qualifier	Distance
Downspout/Yard Hydrant		20
Foundation Drain to Clearwater		17
Building Overhang		16
Septic or Holding Tank		168
Sewage Absorption Unit		188
Building Sewer		90

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Drillhole Dimensions

Diameter (in)	From Depth (ft.)	To Depth (ft.)

10	0	20
6	20	210

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Casing & Liner

Diameter (inches)	Description	From Depth (ft.)	To Depth (ft.)
6	NEW STEEL P/E WELDED 18.97#/FT ASTM A-53 SUMITOMOMETAL	0	167

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Grout or Other Sealant Materials

Kind of Sealing Material	From Depth (ft.)	To Depth (ft.)	Amount	Units
PUDDLED CLAY	0	20		

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Geology

Geology	Geology Description	Driller's Description	USGS Code	From Depth (feet)	To Depth (feet)
-VP-	Non-Caving; Hardpan;	HARDPAN-YELLOW-NON CAVE		0	24
Y-S-	Yellow; Sand;	SAND-DARK YELLOW		24	107
-VC-	Non-Caving; Clay;	CLAY-GREY-NON CAVE		107	121
-VCS	Non-Caving; Clay; Sandy;	SANDY CLAY-GREY-NEW CAVE		121	127
Y-P-	Yellow; Hardpan;	HARDPAN-YELLOW-NON CAVE		127	141
-QY-	Caving; Sand & Gravel;	SAND @ GRAVEL-CAVING		141	150
T-P-	Tan/Brown; Hardpan;	HARDPAN BROWN		150	156
--S-	Sand;	SAND		156	167
I-L-	White; Limestone/Dolomite;	LIMESTONE WHITE MEDIUM HARDNESS		167	210

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Samples

Sample Date	Collected By	Description	Laboratory	Lab Sample ID
01/26/1988	R WILLIAMS WELL DRILLER	***RON BERANEK*W269 S3450 MERRILL H*WAUKESHA, WI 53188*4145427247	999	057442000

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- Abandonment (0 Rows)
- Variances (0 Rows)
- Rehabilitation/Redevelopment (0 Rows)

- **Return Links**
  - DNR Drinking Water System

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Wisconsin Department of Natural Resources

Wisconsin DNR Drinking Water data

Well Construction Reports

Help Reports

WI Unique Well No:	NZ364	**High Capacity Well No:**	.
Hi Cap Well:	No	**Hi Cap Property:**	No
County Well Location:		**DNR Region:**	Southeast
County:	Waukesha	**Muni Type:**	T
Municipality:	WAUKESHA	**Well Address:**	S25 W26919 WINNEBAGO WAY
Tax Parcel No:		**Owner:**	DOWNING BROTHERS BLDRS
Owner Address:	W267 S3742 VELMA CT	**Owner City:**	WAUKESHA
Owner State:	WI	**Owner Zip:**	53188
Completion Date:	04/11/2000 **mm/dd/yyyy**	**DNR Received Date:**	04/19/2000
Constructor:	HERR WELL DRILLING INC	**Constructor Address:**	W295 HERR RD
Constructor City:	DOUSMAN	**Constructor State:**	WI
Constructor Zip:	53118-9407	**Fire No:**	
Subdivision:	WESTERN HLS	**Lot:**	3
Block:	1	**Government Parcel:**	
Township:	6 **N**	**Range:**	19 E
Section:	8	**Quarter Section:**	NW
Quarter-Quarter:	SW	**Status:**	New Well
Original Year:		**Replacement Reason:**	WATER SUPPLY FOR A NEW HO
Previous WI Well No:		**Replacement WI Well No:**	
Well Construction Type:		**Other Const. Type:**	
Category:	Private, potable	**Well Depth:**	122 **ft**
# Services:	1	**Facility Type:**	
Highest Point on Property:	Yes	**In Floodplain:**	No
Rotary - Mud Circulation:		**Rotary - Air:**	
Rotary - Foam:		**Reverse Rotary:**	
Cable Tool Bit:		**Cable Bit Diameter:**	**in**

Temp Outer Casing:		**Temp Casing Diameter:**	**in**
Temp Casing Removed:		**Why not removed?:**	
Other Drilling method:		**Other Drilling Description:**	
Screen Diameter:	**inches**	**Screen Description:**	
Screen From:	**feet**	**Screen To:**	**feet**
Sealant Method:		**Static Water level:**	69 feet Below Ground
Pumping level:	90 **feet**	**Pumping at:**	20
Pumping units:	Minutes	**For:**	2 **Hour(s)**
Well Starting Depth:	12 inches Above Ground	**Developed:**	Yes
Disinfected:	Y	**Capped:**	Yes
Proper Seal:	No	**Seal Description:**	NONE
Contractor Signed on:	04/17/2000	**Rig Operator Signed on:**	04/17/2000
Geologic Log Number:		**Common Well Number:**	
Calculated Specific Capacity:	1	**DNR Facility ID:**	
Well Name:		**Water Quality Comments:**	
Water Quantity Comments:		**Drilling Difficulty:**	
Other Driller Comments:		**Exception Area Comments:**	

Distances in Feet to Nearest Objects

Type	Qualifier	Distance
Building Overhang		12
Septic or Holding Tank		80
Sewage Absorption Unit		121

Download

Drillhole Dimensions

Diameter (in)	From Depth (ft.)	To Depth (ft.)
6	0	122

Download

Casing & Liner

Diameter (inches)	Description	From Depth (ft.)	To Depth (ft.)
6	18.97 LBS. PERE FOOT NEW STEEL PLAIN END ASTM A53 GRADE B SAWHILL TUBULAR 2660 LBS. PSI	0	97

Download

Grout or Other Sealant Materials

Kind of Sealing Material	From Depth (ft.)	To Depth (ft.)	Amount	Units
GRANULAR 8 MESH BENTONITE	0			

Download

Geology

Geology	Geology Description	Driller's Description	USGS Code	From Depth (feet)	To Depth (feet)
--YC	Sand & Gravel; Clayey;	SAND, GRAVEL & CLAY		0	9
--Y-	Sand & Gravel;	SAND & GRAVEL		9	43
--C-	Clay;	CLAY		43	83
--YC	Sand & Gravel; Clayey;	SAND, GRAVEL & CLAY		83	97
--L-	Limestone/Dolomite;	LIMESTONE		97	122

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Samples

Sample Date	Collected By	Description	Laboratory	Lab Sample ID
04/11/2000	SCOTT BIEGEMANN	***DOWNING BROTHERS BLDRS*W267S3742 VELMA CT*WAUKESHA, WI 53188*2625240373	331	001212

Record 1 of 1

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Wisconsin Department of Natural Resources

Wisconsin DNR Drinking Water data

Well Construction Reports

Help Reports

WI Unique Well No:	AK478	**High Capacity Well No:**	.
Hi Cap Well:	No	**Hi Cap Property:**	No
County Well Location:		**DNR Region:**	Southeast
County:	Waukesha	**Muni Type:**	T
Municipality:	WAUKESHA	**Well Address:**	S34W27733 PHEASANT RUN
Tax Parcel No:		**Owner:**	SWENTON BLDR
Owner Address:	2204 WOODFIELD CIR	**Owner City:**	WAUKESHA
Owner State:	WI	**Owner Zip:**	53186
Completion Date:	01/30/1989 **mm/dd/yyyy**	**DNR Received Date:**	02/09/1989
Constructor:	HERR WELL DRILLING INC	**Constructor Address:**	W295 HERR RD
Constructor City:	DOUSMAN	**Constructor State:**	WI
Constructor Zip:	53118	**Fire No:**	
Subdivision:	MERRILL HILLS ESTATES	**Lot:**	00002
Block:	5	**Government Parcel:**	
Township:	6 **N**	**Range:**	19 E
Section:	18	**Quarter Section:**	NW
Quarter-Quarter:		**Status:**	New Well
Original Year:		**Replacement Reason:**	WATER SUPPLY FOR A NEW HO
Previous WI Well No:		**Replacement WI Well No:**	
Well Construction Type:	Drilled	**Other Const. Type:**	
Category:	Private, potable	**Well Depth:**	245 **ft**
# Services:	1	**Facility Type:**	
Highest Point on Property:	Yes	**In Floodplain:**	No
Rotary - Mud Circulation:	Yes	**Rotary - Air:**	
Rotary - Foam:		**Reverse Rotary:**	
Cable Tool Bit:		**Cable Bit Diameter:**	**in**

Temp Outer Casing:		**Temp Casing Diameter:**	**in**
Temp Casing Removed:		**Why not removed?:**	
Other Drilling method:		**Other Drilling Description:**	
Screen Diameter:	**inches**	**Screen Description:**	
Screen From:	**feet**	**Screen To:**	**feet**
Sealant Method:		**Static Water level:**	101 feet Below Ground
Pumping level:	145 **feet**	**Pumping at:**	17
Pumping units:		**For:**	5 **Hour(s)**
Well Starting Depth:	12 inches Above Ground	**Developed:**	Yes
Disinfected:	Y	**Capped:**	Yes
Proper Seal:		**Seal Description:**	NONE
Contractor Signed on:	02/08/1989	**Rig Operator Signed on:**	02/08/1989
Geologic Log Number:		**Common Well Number:**	
Calculated Specific Capacity:	.4	**DNR Facility ID:**	
Well Name:		**Water Quality Comments:**	
Water Quantity Comments:		**Drilling Difficulty:**	
Other Driller Comments:		**Exception Area Comments:**	

Distances in Feet to Nearest Objects

Type	Qualifier	Distance
Building Overhang		12
Septic or Holding Tank		82
Sewage Absorption Unit		196

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Drillhole Dimensions

Diameter (in)	From Depth (ft.)	To Depth (ft.)
8.75	0	102
6	102	245

Download

Casing & Liner

Diameter (inches)	Description	From Depth (ft.)	To Depth (ft.)
6	18.97 LBS. PER FOOT NEW STEEL PLAIN END A53 GRADEB VALLEY STEEL PRODUCTS	0	102

Download

Grout or Other Sealant Materials

Kind of Sealing Material	From Depth (ft.)	To Depth (ft.)	Amount	Units
CLAY SLURRY DRILLING MUD	0	102		

Download

Geology

Geology	Geology Description	Driller's Description	USGS Code	From Depth (feet)	To Depth (feet)
--C-	Clay;	CLAY		0	4
--SG	Sand; w/Gravel/Cobbles/Boulders/Stones;	SAND GRAVEL		4	58
--GC	Gravel/Cobbles/Boulders/Stones; Clayey;	GRAVEL CLAY		58	102
--L-	Limestone/Dolomite;	LIMESTONE		102	245

Download

Samples

Sample Date	Collected By	Description	Laboratory	Lab Sample ID
01/31/1989	RICK DEARBORN	***SWENTON*2204 WOODFIELD CIR*WAUKESHA, WI 53186*4145441481	999	059318000
02/14/1989	JOHN HERR	***SWENTON BLDR: GERBENSKY CONSTR*2204 WOODFIELD CIR*WAUKESHA, WI 53186*414	999	062338000

Records 1 to 2 of 2

Download

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Appendix D

Aquifer Test Results

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WELL ID: MW-1

Local ID: MW-1
Date: 4/2/2013
Time: 5:29

INPUT

Construction:

Casing dia. (d_c)	2.38	Inch
Annulus dia. (d_w)	5.24	Inch
Screen Length (L)	5	Feet

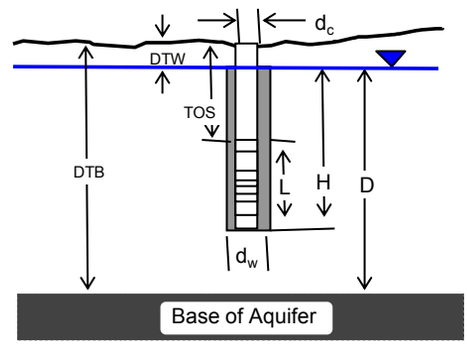
Depths to:

water level (DTW)	1.65	Feet
top of screen (TOS)	15	Feet
Base of Aquifer (DTB)	20	Feet

Annular Fill:

across screen -- Coarse Sand
above screen -- Bentonite

Aquifer Material -- Clay soils (surface)



COMPUTED

L_{wetted}	5	Feet
D =	18.35	Feet
H =	18.35	Feet
L/r_w =	22.90	
$y_{0\text{-DISPLACEMENT}}$ =	1.31	Feet
$y_{0\text{-SLUG}}$ =	1.14	Feet

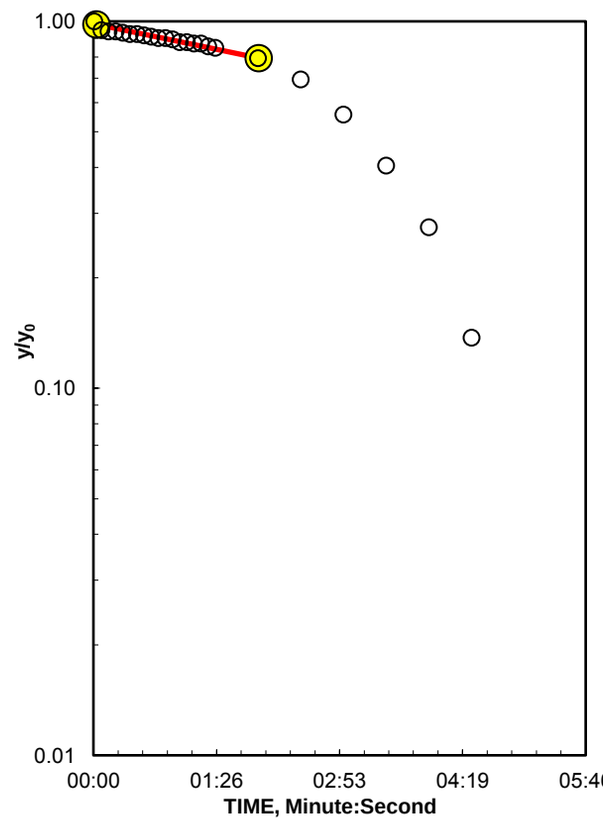
From look-up table using L/r_w

Fully penetrate C =	1.838	
ln(Re/rw) =	3.044	
Re =	4.58	Feet
Slope =	0.000806	$\log_{10}$/sec
$t_{90\%}$ recovery =	1241	sec

Input is consistent.

K =	0.48	Feet/Day

Adjust slope of line to estimate K



REMARKS: Bouwer and Rice analysis of slug test, WRR 1976

Slug-In K Test of MW-1

WELL ID: MW-1

Local ID: MW-1
Date: 4/2/2013
Time: 6:16

INPUT

Construction:

Casing dia. (d_c)	2.38	Inch
Annulus dia. (d_w)	5.24	Inch
Screen Length (L)	5	Feet

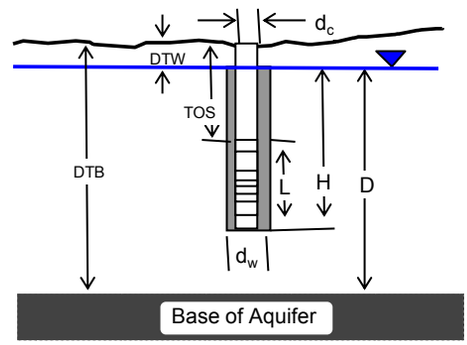
Depths to:

water level (DTW)	1.65	Feet
top of screen (TOS)	15	Feet
Base of Aquifer (DTB)	20	Feet

Annular Fill:

across screen -- Coarse Sand
above screen -- Bentonite

Aquifer Material -- Clay soils (surface)



COMPUTED

L_{wetted}	5	Feet
D =	18.35	Feet
H =	18.35	Feet
L/r_w =	22.90	
$y_{0\text{-DISPLACEMENT}}$ =	2.09	Feet
$y_{0\text{-SLUG}}$ =	1.72	Feet

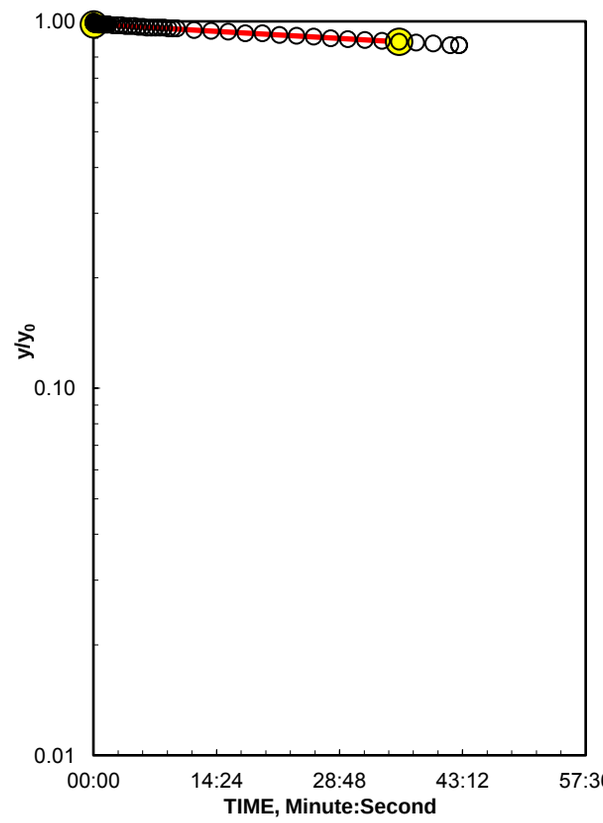
From look-up table using L/r_w

Fully penetrate C =	1.838	
ln(Re/rw) =	3.044	
Re =	4.58	Feet
Slope =	2.2E-05	$\log_{10}$/sec
$t_{90\%}$ recovery =	45437	sec

Input is consistent.

K = 0.013 Feet/Day

Adjust slope of line to estimate K



REMARKS:

Bouwer and Rice analysis of slug test, WRR 1976

Slug-Out K Test of MW-1

WELL ID: MW-2

Local ID: MW-4
Date: 4/2/2013
Time: 3:50

INPUT

Construction:

Casing dia. (d_c)	2.38	Inch
Annulus dia. (d_w)	5.24	Inch
Screen Length (L)	5	Feet

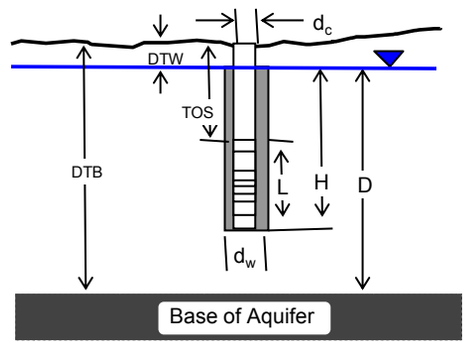
Depths to:

water level (DTW)	7.08	Feet
top of screen (TOS)	5	Feet
Base of Aquifer (DTB)	10	Feet

Annular Fill:

across screen -- Coarse Sand
above screen -- Bentonite

Aquifer Material -- Medium Sand



COMPUTED

L_{wetted}	2.92	Feet
D =	2.92	Feet
H =	2.92	Feet
L/r_w =	13.37	
$y_{0\text{-DISPLACEMENT}}$ =	1.67	Feet
$y_{0\text{-SLUG}}$ =	1.99	Feet

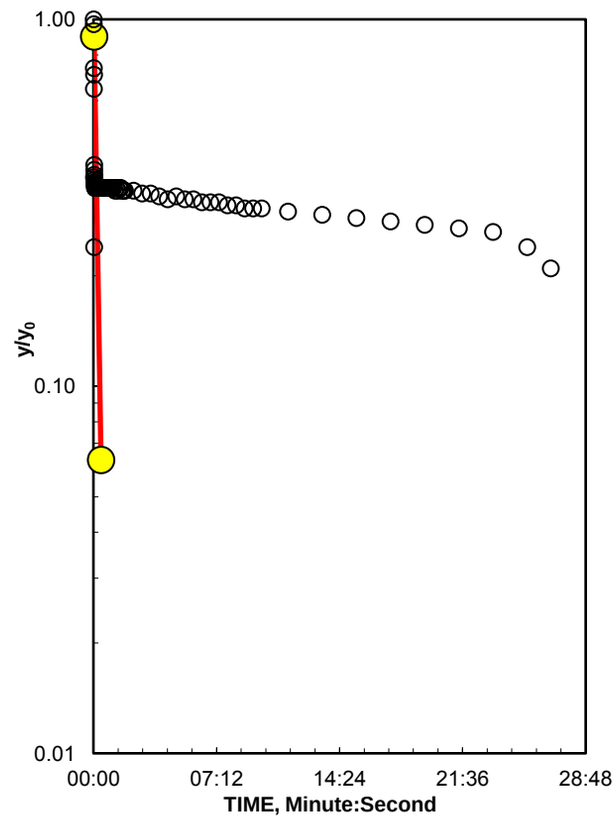
From look-up table using L/r_w

Fully penetrate C =	1.425	
ln(Re/rw) =	1.884	
Re =	1.44	Feet
Slope =	0.047099	$\log_{10}$/sec
$t_{90\%}$ recovery =	21	sec

Input is consistent.

K =	30	Feet/Day

Adjust slope of line to estimate K



REMARKS:

Bouwer and Rice analysis of slug test, WRR 1976

Slug-In K Test of MW-2

WELL ID: MW-2

Local ID: MW-4
Date: 4/2/2013
Time: 3:50

INPUT

Construction:

Casing dia. (d_c)	2.38	Inch
Annulus dia. (d_w)	5.24	Inch
Screen Length (L)	5	Feet

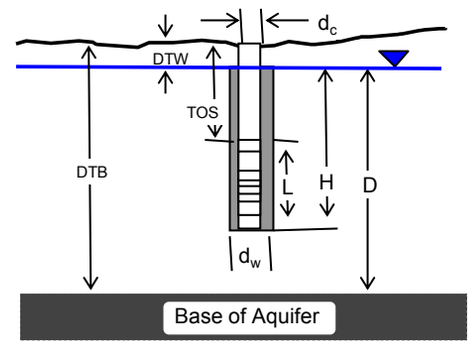
Depths to:

water level (DTW)	7.08	Feet
top of screen (TOS)	5	Feet
Base of Aquifer (DTB)	10	Feet

Annular Fill:

across screen -- Coarse Sand
above screen -- Bentonite

Aquifer Material -- Clay soils (surface)



COMPUTED

L_{wetted}	2.92	Feet
D =	2.92	Feet
H =	2.92	Feet
L/r_w =	13.37	
$y_{0\text{-DISPLACEMENT}}$ =	1.67	Feet
$y_{0\text{-SLUG}}$ =	1.99	Feet

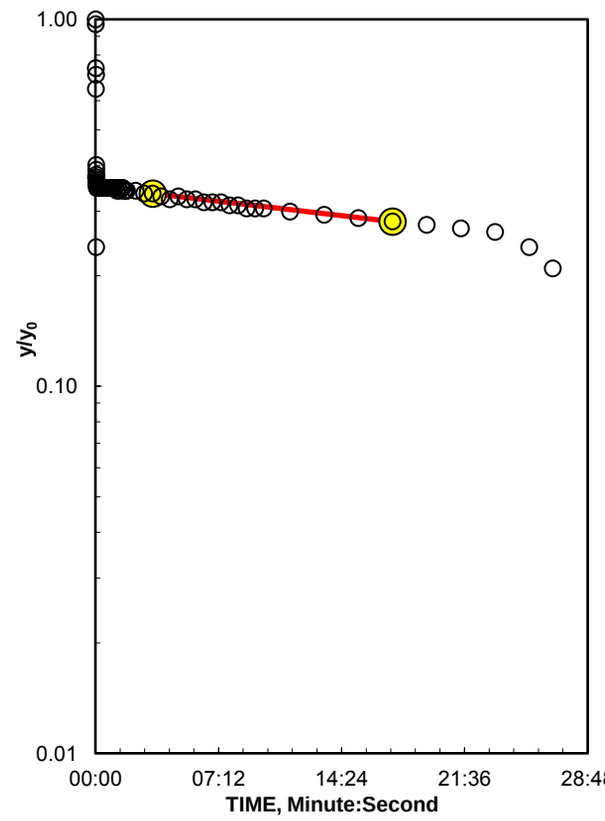
From look-up table using L/r_w

Fully penetrate C =	1.425	
ln(Re/rw) =	1.884	
Re =	1.44	Feet
Slope =	9.07E-05	$\log_{10}$/sec
$t_{90\%}$ recovery =	11030	sec

Input is consistent.

K =	0.057	Feet/Day

Adjust slope of line to estimate K



REMARKS:

Bouwer and Rice analysis of slug test, WRR 1976

Slug-In K Test - Late Data from MW-2

WELL ID: MW-2

Local ID: MW-2
Date: 4/2/2013
Time: 4:19

INPUT

Construction:

Casing dia. (d_c)	2.38	Inch
Annulus dia. (d_w)	5.24	Inch
Screen Length (L)	5	Feet

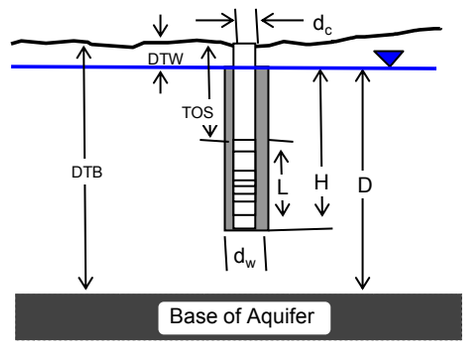
Depths to:

water level (DTW)	7.08	Feet
top of screen (TOS)	5	Feet
Base of Aquifer (DTB)	10	Feet

Annular Fill:

across screen -- Coarse Sand
above screen -- Bentonite

Aquifer Material -- Clay soils (surface)



COMPUTED

L_{wetted}	2.92	Feet
D =	2.92	Feet
H =	2.92	Feet
L/r_w =	13.37	
$y_{0\text{-DISPLACEMENT}}$ =	2.08	Feet
$y_{0\text{-SLUG}}$ =	1.99	Feet

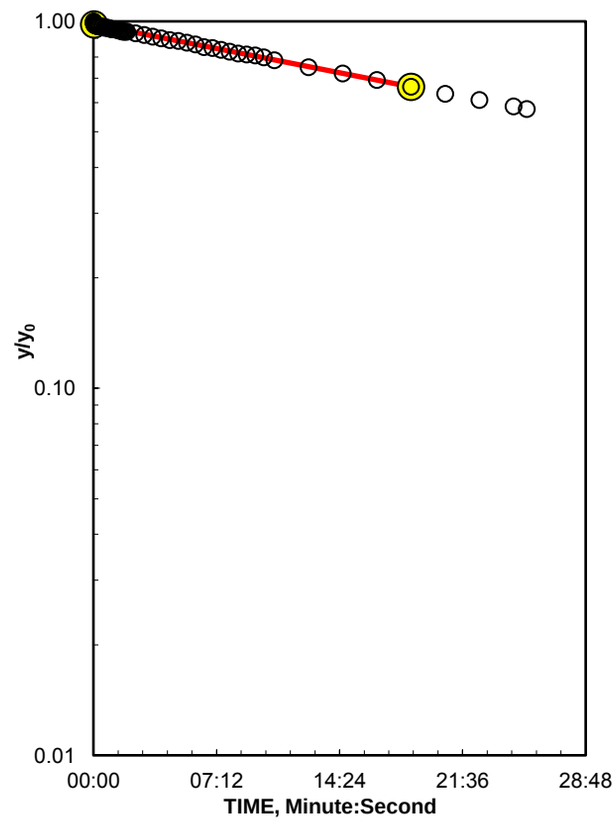
From look-up table using L/r_w

Fully penetrate C =	1.425	
ln(Re/rw) =	1.884	
Re =	1.44	Feet
Slope =	0.000153	$\log_{10}$/sec
$t_{90\%}$ recovery =	6541	sec

Input is consistent.

K = 0.096 Feet/Day

Adjust slope of line to estimate K



REMARKS:

Bouwer and Rice analysis of slug test, WRR 1976

Slug-Out K Test of MW-2

WELL ID: MW-3

Local ID: MW-3
Date: 4/2/2013
Time: 2:46

INPUT

Construction:

Casing dia. (d_c)	2.38	Inch
Annulus dia. (d_w)	5.24	Inch
Screen Length (L)	5	Feet

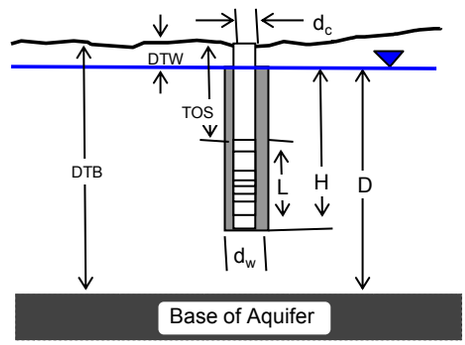
Depths to:

water level (DTW)	9.14	Feet
top of screen (TOS)	15	Feet
Base of Aquifer (DTB)	20	Feet

Annular Fill:

across screen -- Coarse Sand
above screen -- Bentonite

Aquifer Material -- Medium Sand



COMPUTED

L_{wetted}	5	Feet
D =	10.86	Feet
H =	10.86	Feet
L/r_w =	22.90	
$y_{0\text{-DISPLACEMENT}}$ =	3.10	Feet
$y_{0\text{-SLUG}}$ =	2.86	Feet

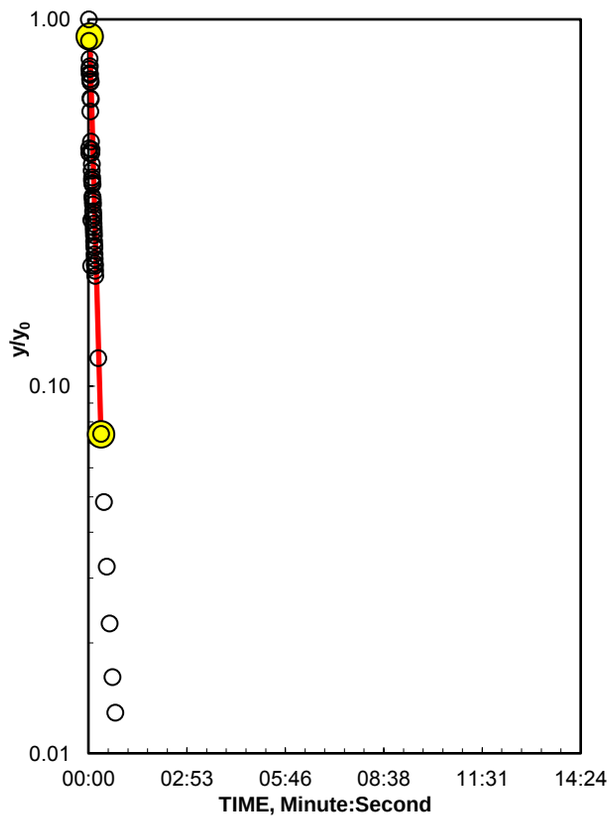
From look-up table using L/r_w

Fully penetrate C =	1.838	
ln(Re/rw) =	2.764	
Re =	3.46	Feet
Slope =	0.054202	$\log_{10}$/sec
$t_{90\%}$ recovery =	18	sec

Input is consistent.

K =	29	Feet/Day

Adjust slope of line to estimate K



REMARKS:

Bouwer and Rice analysis of slug test, WRR 1976

Slug-In K Test of MW-3

WELL ID: MW-3

Local ID: MW-3
Date: 4/2/2013
Time: 2:59

INPUT

Construction:

Casing dia. (d_c)	2.38	Inch
Annulus dia. (d_w)	5.24	Inch
Screen Length (L)	5	Feet

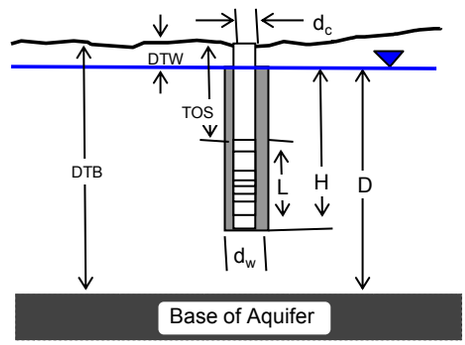
Depths to:

water level (DTW)	9.14	Feet
top of screen (TOS)	15	Feet
Base of Aquifer (DTB)	20	Feet

Annular Fill:

across screen -- Coarse Sand
above screen -- Bentonite

Aquifer Material -- Medium Sand



COMPUTED

L_{wetted}	5	Feet
D =	10.86	Feet
H =	10.86	Feet
L/r_w =	22.90	
$y_{0\text{-DISPLACEMENT}}$ =	2.23	Feet
$y_{0\text{-SLUG}}$ =	2.55	Feet

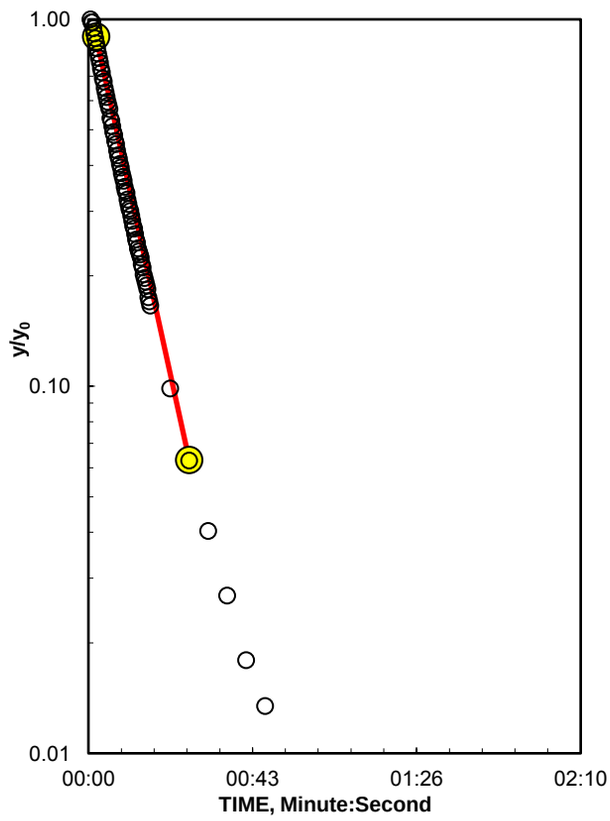
From look-up table using L/r_w

Fully penetrate C =	1.838	
ln(Re/rw) =	2.764	
Re =	3.46	Feet
Slope =	0.047099	$\log_{10}$/sec
$t_{90\%}$ recovery =	21	sec

Input is consistent.

K =	25	Feet/Day

Adjust slope of line to estimate K



REMARKS:

Bouwer and Rice analysis of slug test, WRR 1976

Slug-Out K Test of MW-3

WELL ID: MW-4

Local ID: MW-4
Date: 4/2/2013
Time: 1:56

INPUT

Construction:

Casing dia. (d_c)	2.38	Inch
Annulus dia. (d_w)	5.24	Inch
Screen Length (L)	5	Feet

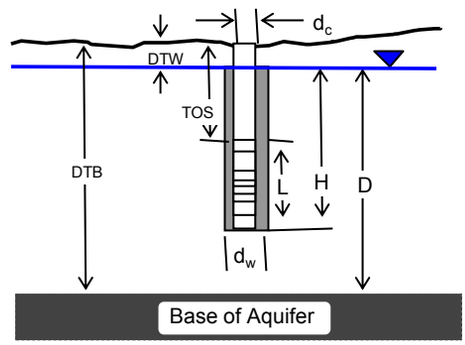
Depths to:

water level (DTW)	37.56	Feet
top of screen (TOS)	35	Feet
Base of Aquifer (DTB)	40	Feet

Annular Fill:

across screen -- Coarse Sand
above screen -- Bentonite

Aquifer Material -- Medium Sand



COMPUTED

L_{wetted}	2.44	Feet
D =	2.44	Feet
H =	2.44	Feet
L/r_w =	11.18	
$y_{0\text{-DISPLACEMENT}}$ =	0.88	Feet
$y_{0\text{-SLUG}}$ =	1.03	Feet

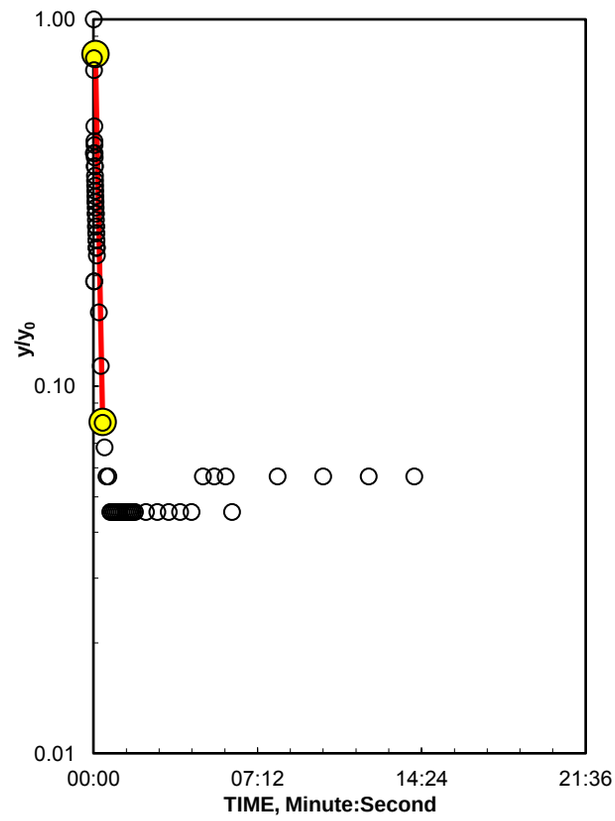
From look-up table using L/r_w

Fully penetrate C =	1.293	
ln(Re/rw) =	1.750	
Re =	1.26	Feet
Slope =	0.052774	$\log_{10}$/sec
$t_{90\%}$ recovery =	19	sec

Input is consistent.

K =	37	Feet/Day

Adjust slope of line to estimate K



REMARKS:

Bouwer and Rice analysis of slug test, WRR 1976

Slug-In K Test of MW-4

WELL ID: MW-4

Local ID: MW-4
Date: 4/2/2013
Time: 2:13

INPUT

Construction:

Casing dia. (d_c)	2.38	Inch
Annulus dia. (d_w)	5.24	Inch
Screen Length (L)	5	Feet

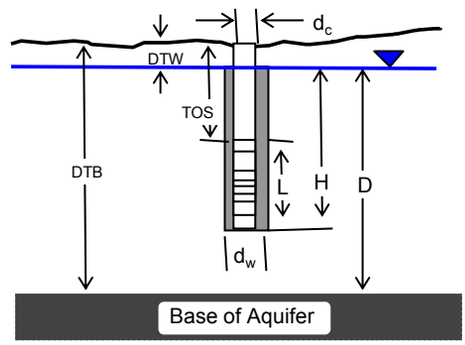
Depths to:

water level (DTW)	37.56	Feet
top of screen (TOS)	35	Feet
Base of Aquifer (DTB)	40	Feet

Annular Fill:

across screen -- Coarse Sand
above screen -- Bentonite

Aquifer Material -- Medium Sand



COMPUTED

L_{wetted}	2.44	Feet
D =	2.44	Feet
H =	2.44	Feet
L/r_w =	11.18	
$y_{0\text{-DISPLACEMENT}}$ =	1.27	Feet
$y_{0\text{-SLUG}}$ =	1.14	Feet

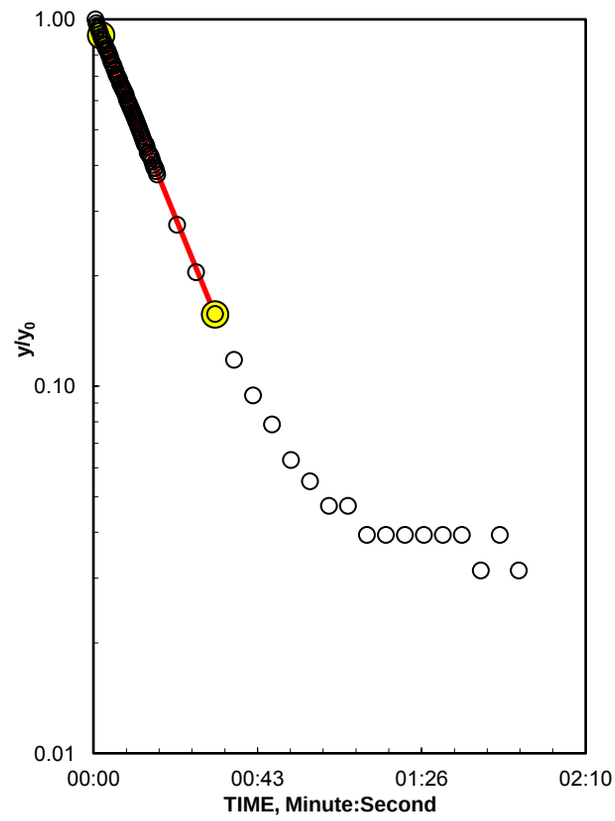
From look-up table using L/r_w

Fully penetrate C =	1.293	
ln(Re/rw) =	1.750	
Re =	1.26	Feet
Slope =	0.025358	$\log_{10}$/sec
$t_{90\%}$ recovery =	39	sec

Input is consistent.

K =	18	Feet/Day

Adjust slope of line to estimate K



K= 18 is less than likely minimum of 20 for Medium Sand

REMARKS: Bouwer and Rice analysis of slug test, WRR 1976

Slug-Out K Test of MW-4

WELL ID: MW-5

Local ID: MW-5
Date: 4/2/2013
Time: 0:58

INPUT

Construction:

Casing dia. (d_c)	2.38	Inch
Annulus dia. (d_w)	5.24	Inch
Screen Length (L)	5	Feet

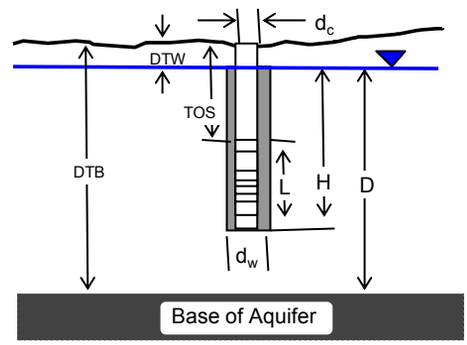
Depths to:

water level (DTW)	3.47	Feet
top of screen (TOS)	10	Feet
Base of Aquifer (DTB)	15	Feet

Annular Fill:

across screen -- Coarse Sand
above screen -- Bentonite

Aquifer Material -- Fine Sand



COMPUTED

L_{wetted}	5	Feet
D =	11.53	Feet
H =	11.53	Feet
L/r_w =	22.90	
$y_{0\text{-DISPLACEMENT}}$ =	3.21	Feet
$y_{0\text{-SLUG}}$ =	2.82	Feet

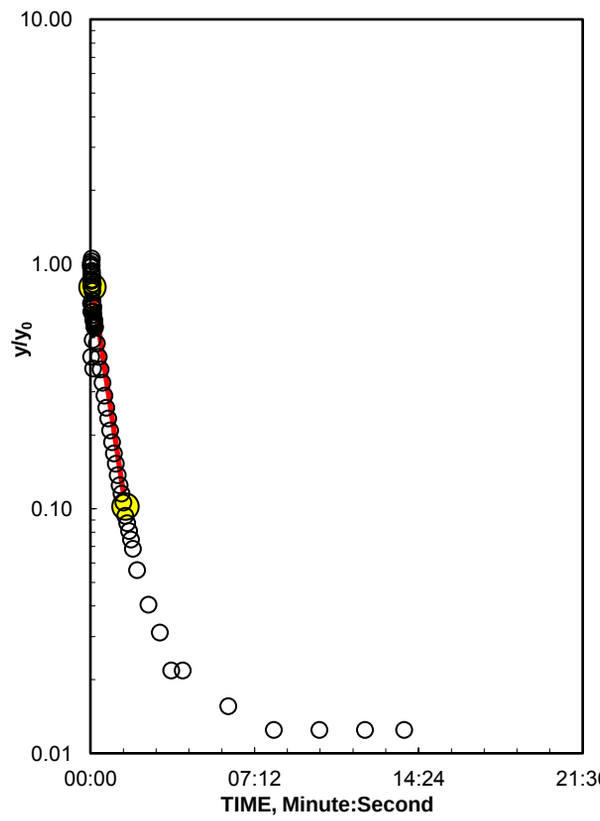
From look-up table using L/r_w

Fully penetrate C =	1.838	
ln(Re/rw) =	2.797	
Re =	3.58	Feet
Slope =	0.010313	$\log_{10}$/sec
$t_{90\%}$ recovery =	97	sec

Input is consistent.

K =	5.6	Feet/Day

Adjust slope of line to estimate K



REMARKS:

Bouwer and Rice analysis of slug test, WRR 1976

Slug-In K Test of MW-5

WELL ID: MW-5

Local ID: MW-5
Date: 4/2/2013
Time: 1:13

INPUT

Construction:

Casing dia. (d_c)	2.38	Inch
Annulus dia. (d_w)	5.24	Inch
Screen Length (L)	5	Feet

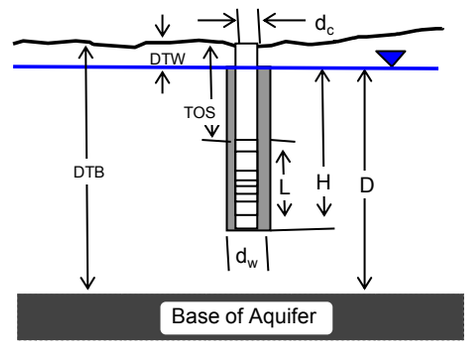
Depths to:

water level (DTW)	3.47	Feet
top of screen (TOS)	10	Feet
Base of Aquifer (DTB)	15	Feet

Annular Fill:

across screen -- Coarse Sand
above screen -- Bentonite

Aquifer Material -- Fine Sand



COMPUTED

L_{wetted}	5	Feet
D =	11.53	Feet
H =	11.53	Feet
L/r_w =	22.90	
$y_{0\text{-DISPLACEMENT}}$ =	2.66	Feet
$y_{0\text{-SLUG}}$ =	2.82	Feet

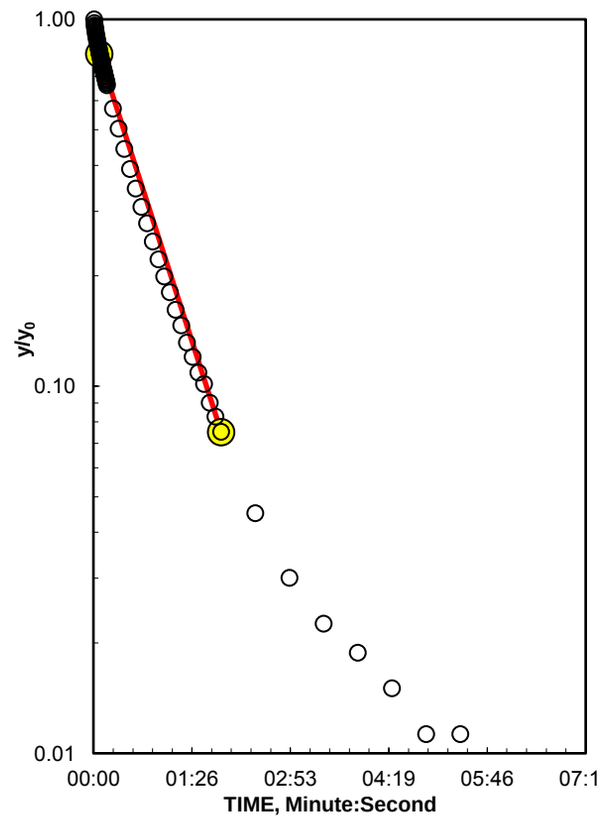
From look-up table using L/r_w

Fully penetrate C =	1.838	
ln(Re/rw) =	2.797	
Re =	3.58	Feet
Slope =	0.009633	$\log_{10}$/sec
$t_{90\%}$ recovery =	104	sec

Input is consistent.

K =	5.3	Feet/Day

Adjust slope of line to estimate K



REMARKS:

Bouwer and Rice analysis of slug test, WRR 1976

Slug-Out K Test of MW-5

WELL ID: MW-6

Local ID: MW-6
Date: 4/2/2013
Time: 0:06

INPUT

Construction:

Casing dia. (d_c)	2.38	Inch
Annulus dia. (d_w)	5.24	Inch
Screen Length (L)	5	Feet

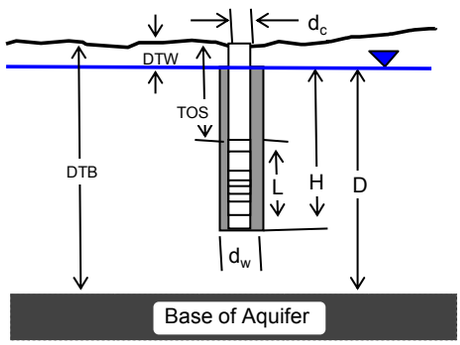
Depths to:

water level (DTW)	18.8	Feet
top of screen (TOS)	20	Feet
Base of Aquifer (DTB)	25	Feet

Annular Fill:

across screen -- Coarse Sand
above screen -- Bentonite

Aquifer Material -- Fine Sand



COMPUTED

L_{wetted}	5	Feet
D =	6.2	Feet
H =	6.2	Feet
L/r_w =	22.90	
$y_{0\text{-DISPLACEMENT}}$ =	2.69	Feet
$y_{0\text{-SLUG}}$ =	2.29	Feet

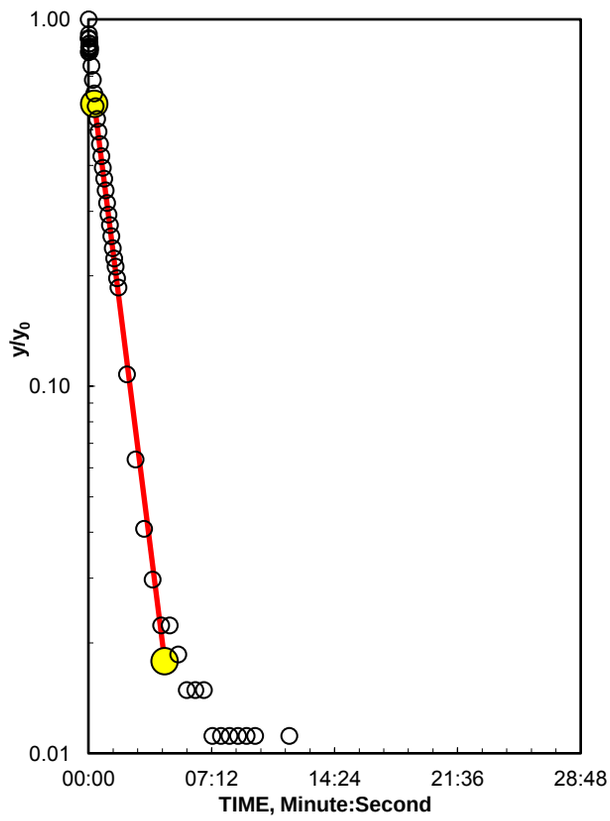
From look-up table using L/r_w

Fully penetrate C =	1.838	
ln(Re/rw) =	2.445	
Re =	2.52	Feet
Slope =	0.006147	$\log_{10}$/sec
$t_{90\%}$ recovery =	163	sec

Input is consistent.

K = 2.9 Feet/Day

Adjust slope of line to estimate K



K= 2.9 is less than likely minimum of 3 for Fine Sand

REMARKS: Bouwer and Rice analysis of slug test, WRR 1976

Slug-In K Test of MW-6

WELL ID: MW-6

Local ID: MW-6
Date: 4/2/2013
Time: 0:30

INPUT

Construction:

Casing dia. (d_c)	2.38	Inch
Annulus dia. (d_w)	5.24	Inch
Screen Length (L)	5	Feet

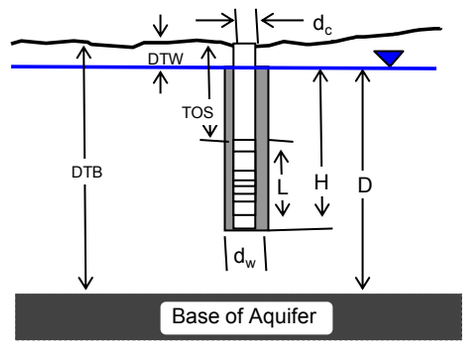
Depths to:

water level (DTW)	18.8	Feet
top of screen (TOS)	20	Feet
Base of Aquifer (DTB)	25	Feet

Annular Fill:

across screen -- Coarse Sand
above screen -- Bentonite

Aquifer Material -- Fine Sand



COMPUTED

L_{wetted}	5	Feet
D =	6.2	Feet
H =	6.2	Feet
L/r_w =	22.90	
$y_{0\text{-DISPLACEMENT}}$ =	2.46	Feet
$y_{0\text{-SLUG}}$ =	2.29	Feet

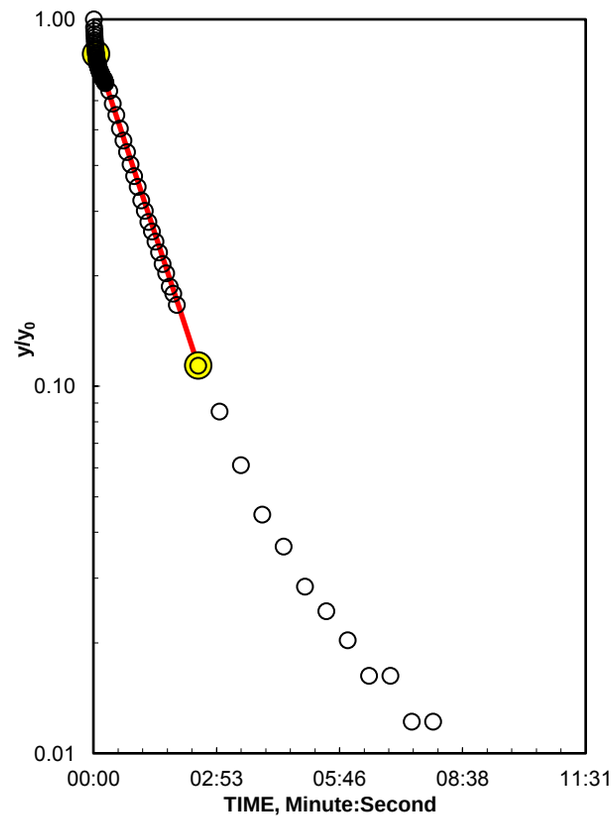
From look-up table using L/r_w

Fully penetrate C =	1.838	
ln(Re/rw) =	2.445	
Re =	2.52	Feet
Slope =	0.005916	$\log_{10}$/sec
$t_{90\%}$ recovery =	169	sec

Input is consistent.

K = 2.8 Feet/Day

Adjust slope of line to estimate K



K= 2.8 is less than likely minimum of 3 for Fine Sand

REMARKS: Bouwer and Rice analysis of slug test, WRR 1976

Slug-Out K Test of MW-6

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Appendix E

Conceptual Model Memo

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The initial conceptualization of sediment geometry in the area of investigation was that beds of granular material, such as sand, were layered between clayey sediments and that the granular beds were on the order of 5 to 10 feet thick. An alternative explanation was that the deposits of granular sediments were in the form of a blanket deposit, paralleling the land surface. Ten borings were drilled to evaluate alternative concepts, and monitoring six wells were installed to measure groundwater elevations in deeper intervals than were previously measured by the data logging well points during the initial investigation. The findings in these recent boreholes and wells do not fit uniformly into either of these alternative concepts. The locations of the borings and wells are shown on the following figure.

Three transects of two wells each were constructed (T1, T2 and T3). The well transect on the parcel immediately north of Sunset Drive, T1, encountered sandy sediments beneath topsoil. Thin clay layers were interspersed with the sands. The sands in these boreholes were fine grained to the point that they flowed into the drilling tools under hydrostatic pressure, which may impact on construction practice. The monitoring well located farther to the east, MW-1, had sufficient head pressure to raise the water level approximately two feet above ground level, to approximately 814 ft (as noted on 3-27-2013). At MW-2 the ground elevation was approximately 826 feet and the water table elevation was

approximately 819 feet. At boring SB-13 the ground elevation was approximately 820 feet and the estimated water table elevation was 815 feet. Based on this data and the county-wide water table data, the groundwater elevation contours in this area are likely to curve back to the west, approximately paralleling the creek. There is a subtle ridge in the topographic in the area east of the location of SB-13. Predicting the water table in this area is complicated by ridge and the change in direction of the local ground water contours.

The proposed cuts in this area begin northwest of station 161 and switch to fills southeast of station 165. A preliminary evaluation of the grading in this area cannot evaluate the impact of the ditches constructed into these soils because of the uncertainty in the groundwater elevations. Filling and construction of impervious surfaces have the potential to affect recharge to groundwater.

In transect T2 the eastern well, MW-3, encountered 11 feet of clayey sediments over six feet of sandy sediments. The initial groundwater level at that location was approximately eight feet below grade (water elevation of 825 ft). MW-4 in transect T2 intersected a thick sand unit extending from 867 feet (4 feet below grade) to the bottom of the borehole at 833 feet (38 feet below grade). The initial groundwater elevation at that location was approximately 836 feet, approximately 36 feet below grade. Grading in this area of the slope will not likely encounter saturated soils based on the approximate location of the water table between these two wells. Filling and construction of impervious surfaces have the potential to affect recharge to groundwater.

At transect T3 the boring for MW-5 encountered clay over sand over clay. At MW-6 the boring encountered sands over clays over sands. The water table at MW-5 was measured at 823.52 feet, 1.3 feet below grade. At MW-6 the water table was measured at 832.23 feet, 17.8 feet below grade. At Station 139+00 the proposed ditch at elevation 822 feet on the southbound lane is likely to intersect the water table, which projects to approximately 825 feet. Similar conditions could occur at Stations 137+00 through 139+50. Between Stations 137 and 140 the southbound ditch could extend 3 to 5 feet below the water table. In the area of station 137+00 the groundwater elevation is estimated at 822 feet, and the southbound ditch is proposed to extend to a depth of 818.59 feet, 3.4 feet lower than the water table. Sediments in this area could be either sandy or clayey, based on the borings for wells MW-5 and MW-6, but are more likely to be sandy based on the hand auger results obtained in the previous investigations. Filling and construction of impervious surfaces have the potential to affect recharge to groundwater.

In the southeast end of the proposed alternative northwest of Highway 59 the two borings, SB-20 and SB-21, encountered 3 to 6 feet of clayey sediments over sandy sediments. In the area of SB-20 there is no cutting. Filling and construction of impervious surfaces have the potential to affect recharge to groundwater. In the area of boring SB-21 at Station 123+00 the proposed grading cuts extend to approximately 829 feet. In this area sandy soils are likely to be encountered, and the water table, as measured in the boring, was estimated at 822 feet. It is not likely that grading in this area will encounter saturated soils, based on the logged boring. Filling and construction of impervious surfaces have the potential to affect recharge to groundwater.

Appendix F

Sensitivity Test Results

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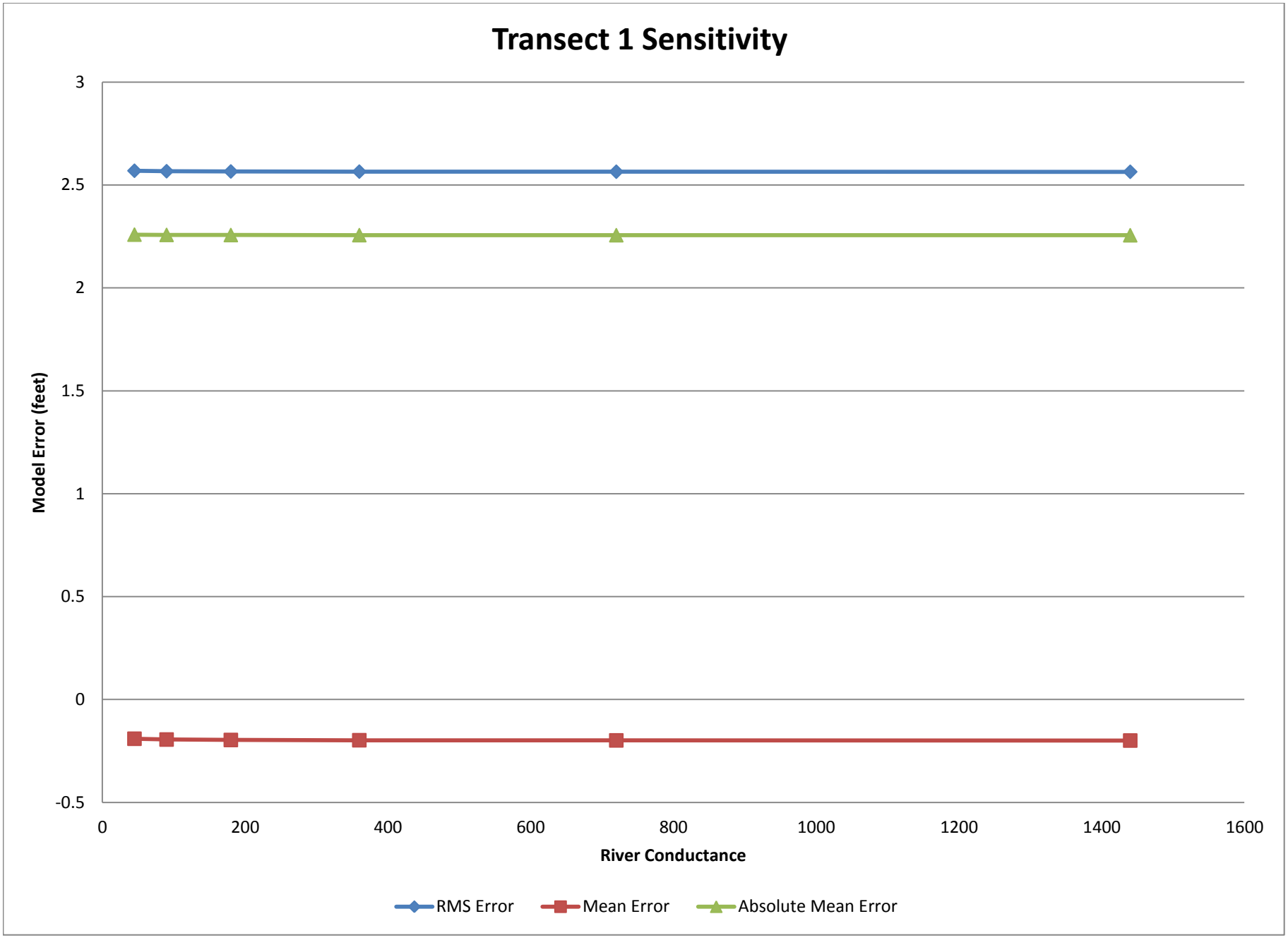
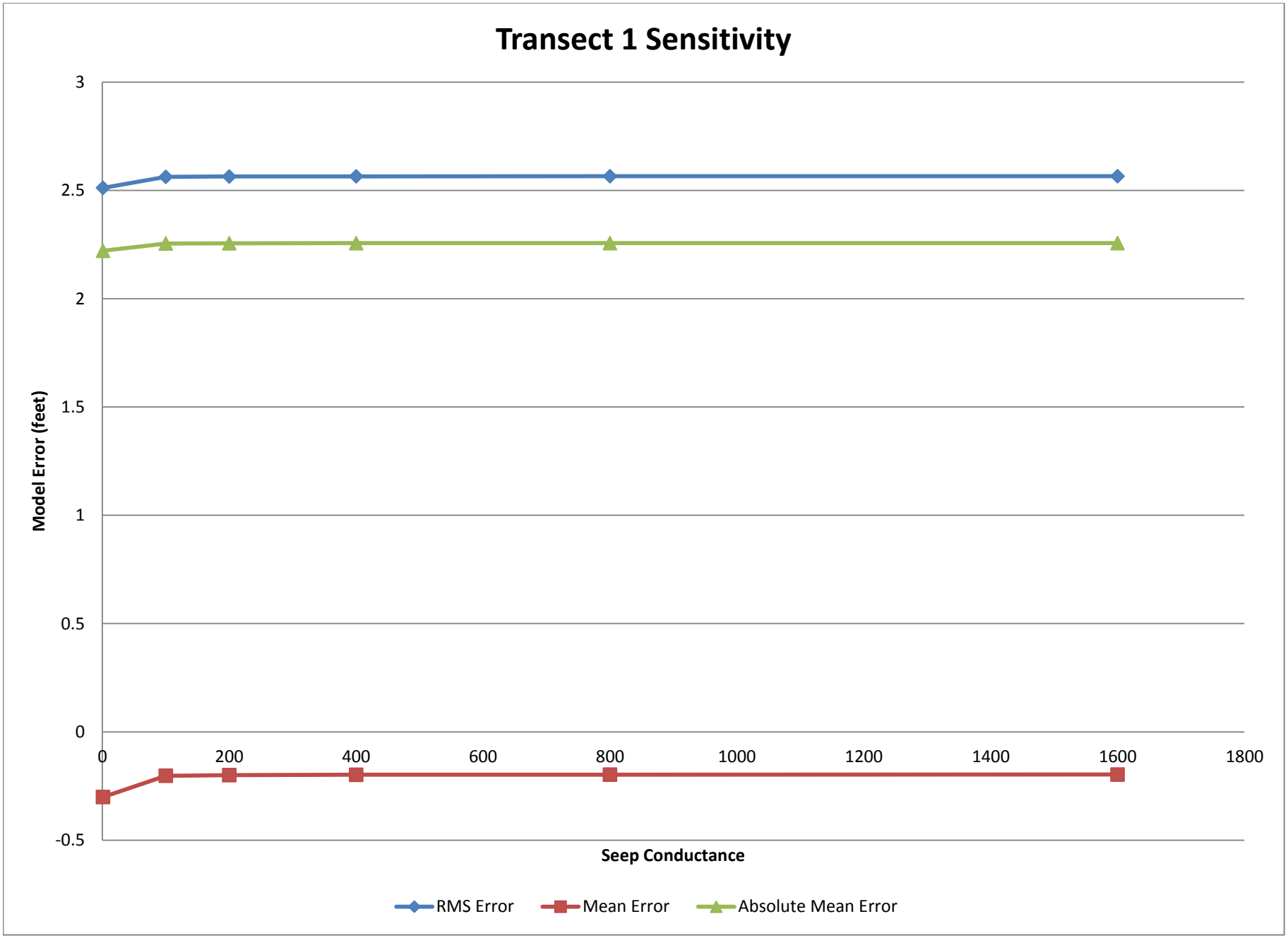
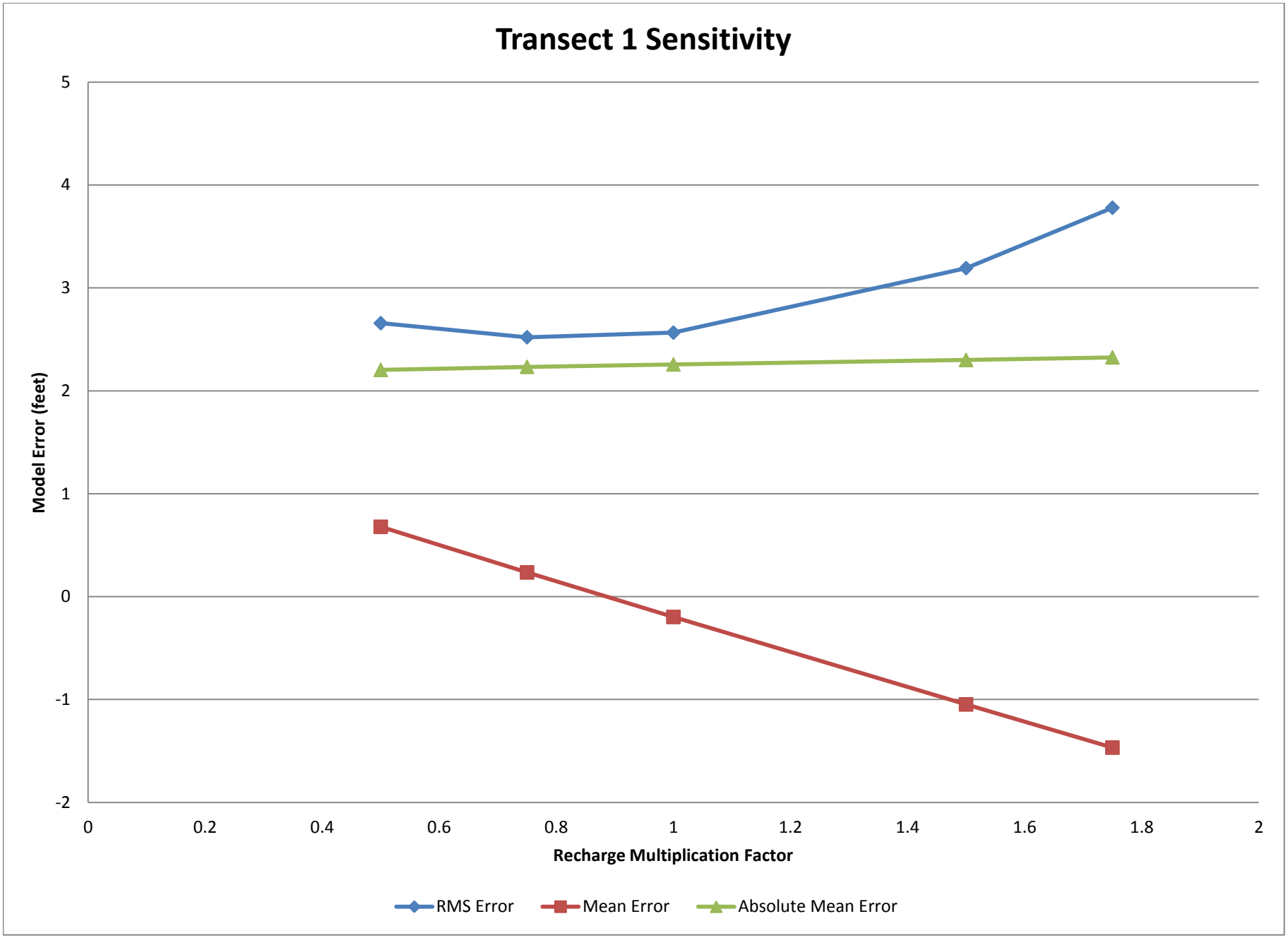
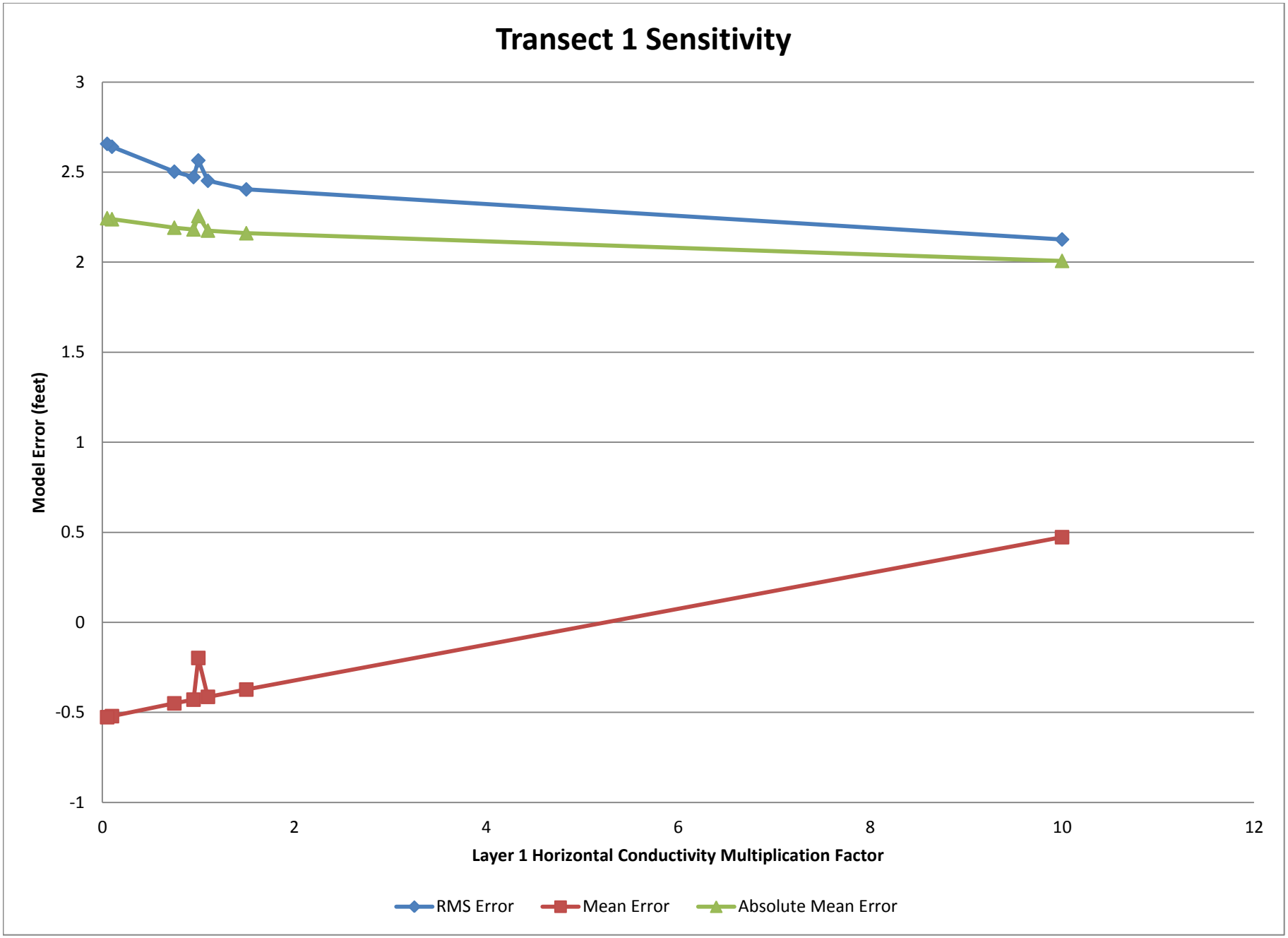
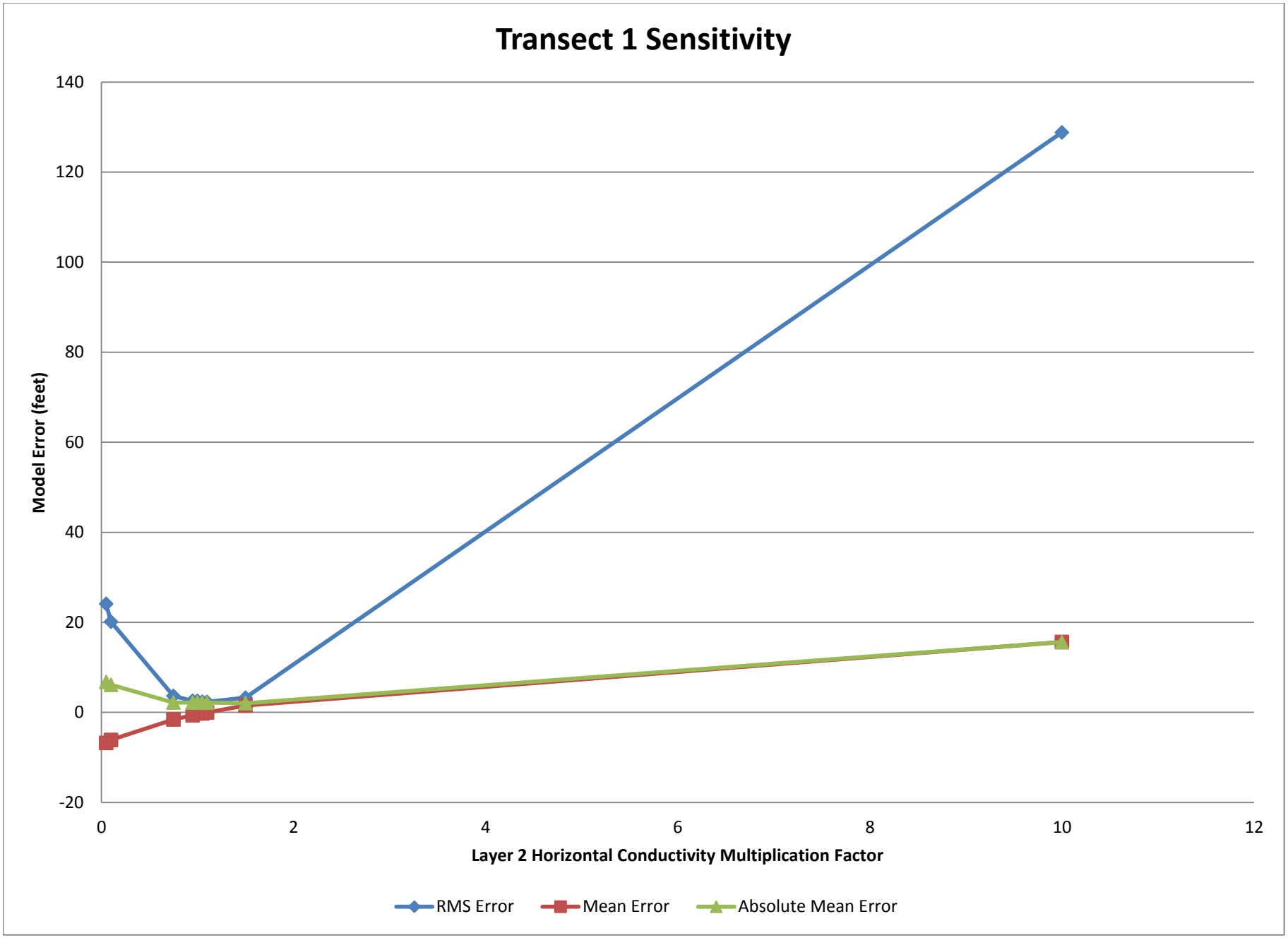
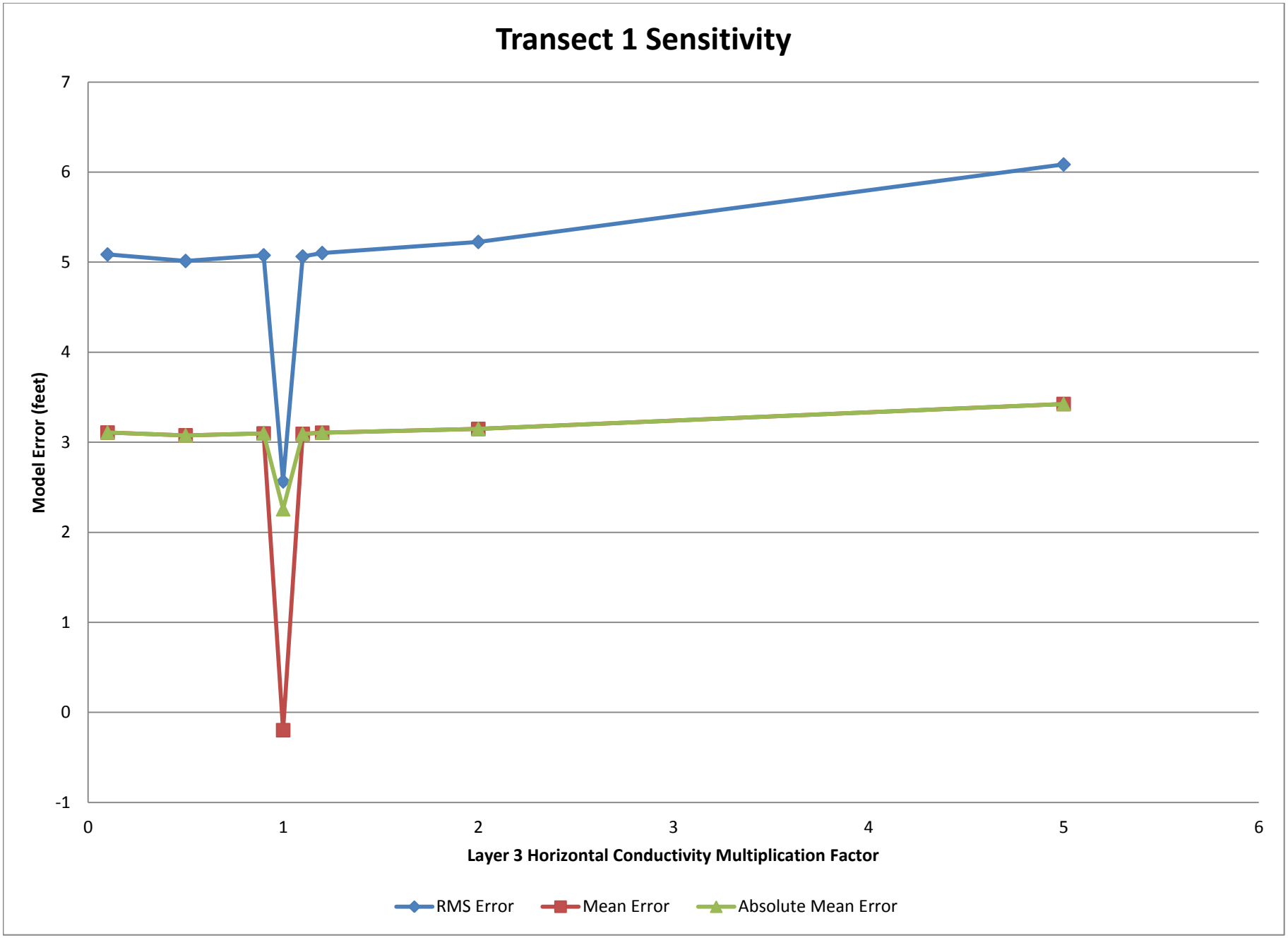

Transect 1 Sensitivity
Model Error (feet)
3
2.5
2
1.5
1
0.5
0
-0.5
0
200
400
600
800
1000
1200
1400
1600
River Conductance
RMS Error
Mean Error
Absolute Mean Error

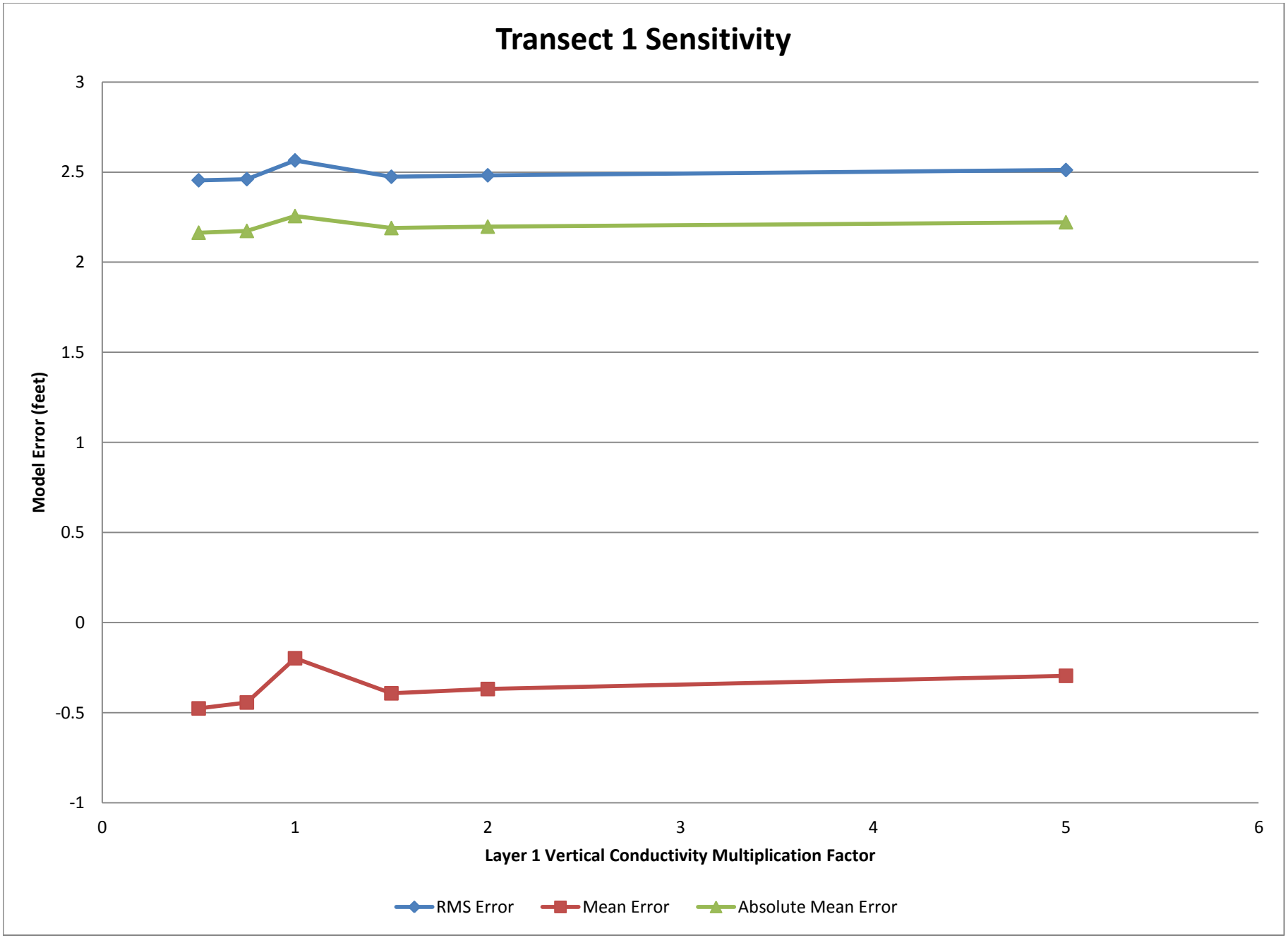

Transect 1 Sensitivity
Model Error (feet)
3
2.5
2
1.5
1
0.5
0
-0.5
0
200
400
600
800
1000
1200
1400
1600
1800
Seep Conductance
RMS Error
Mean Error
Absolute Mean Error

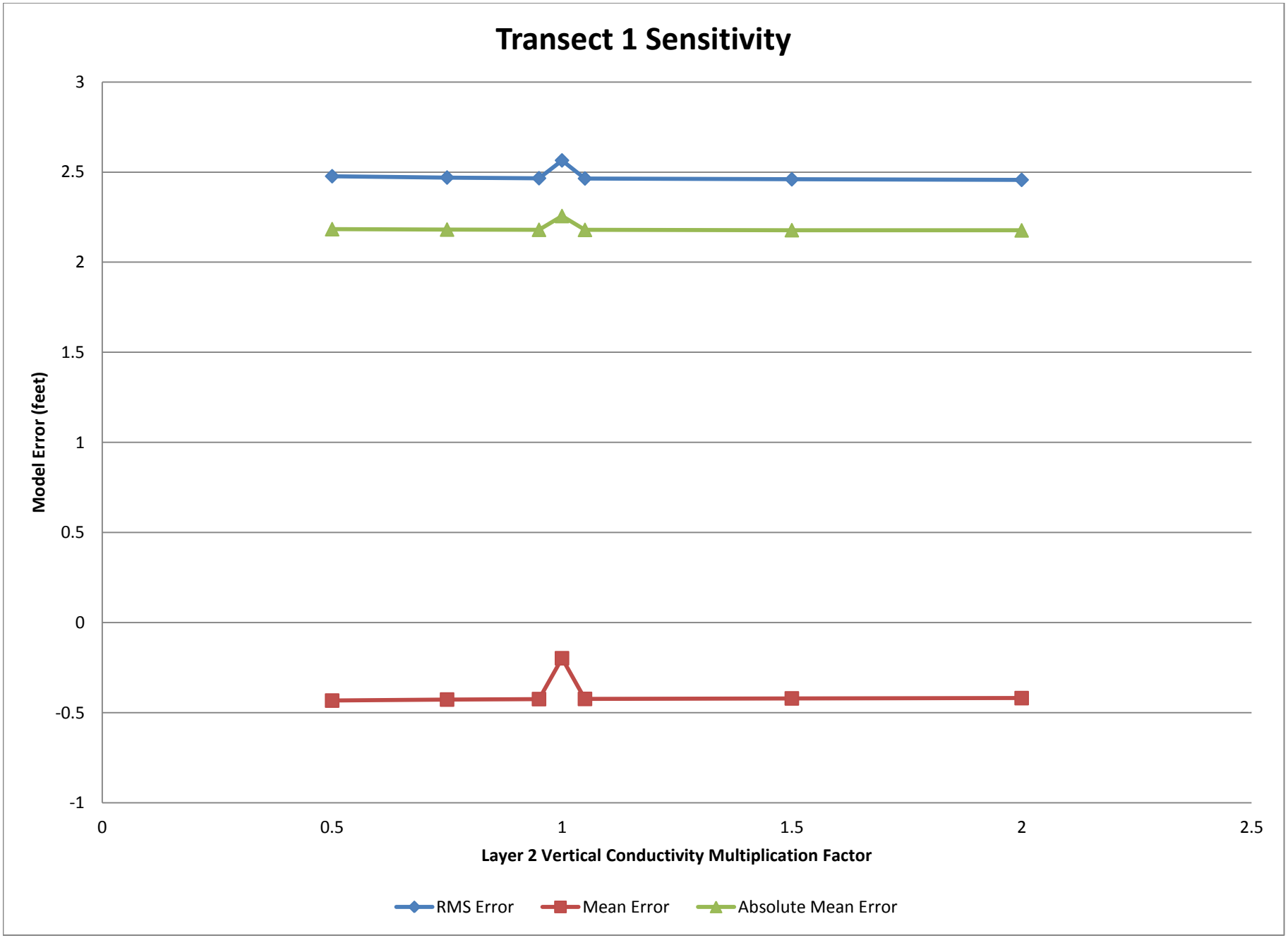

Transect 1 Sensitivity
Model Error (feet)
5
4
3
2
1
0
-1
-2
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
Recharge Multiplication Factor
RMS Error
Mean Error
Absolute Mean Error

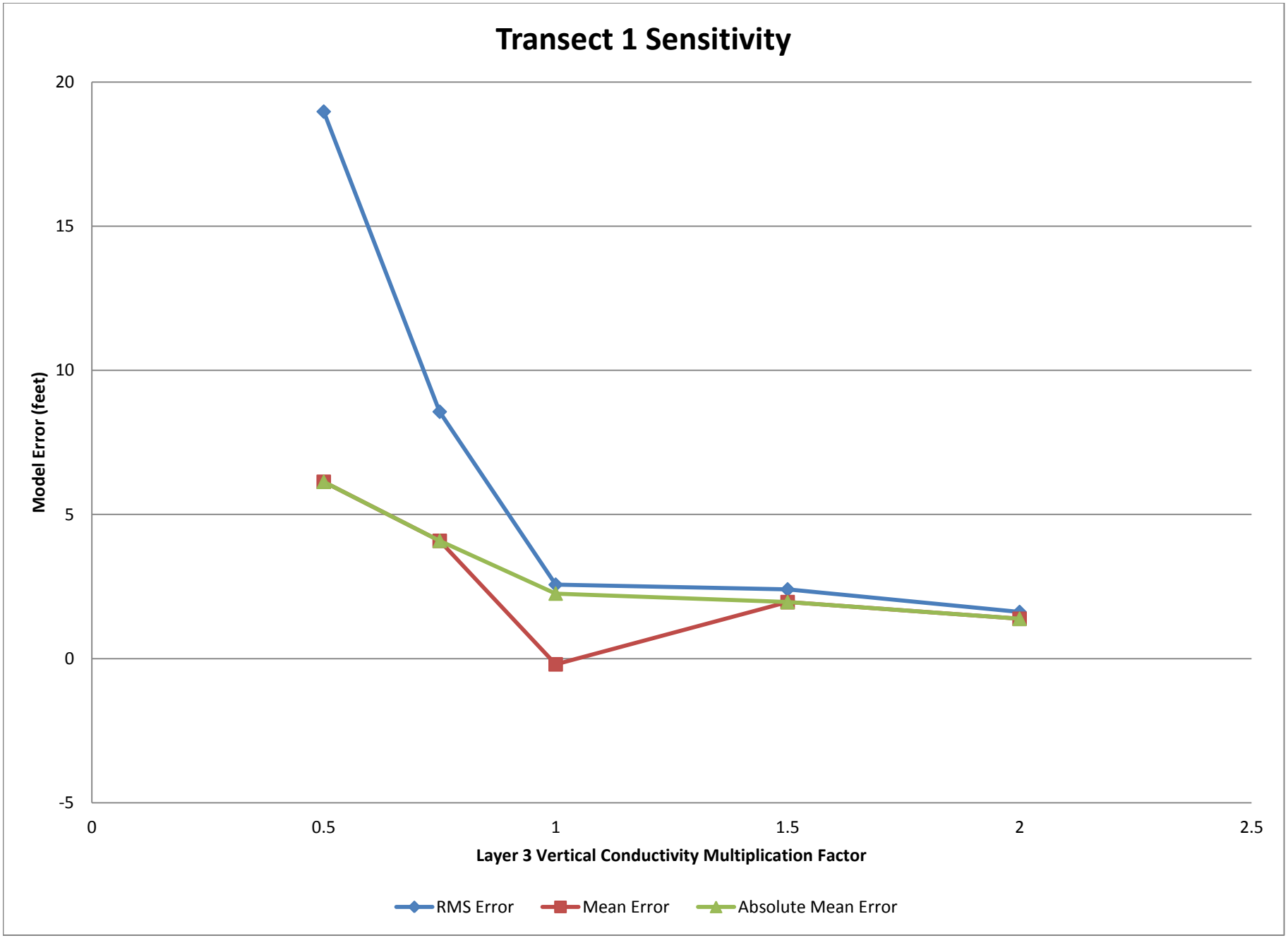

Transect 1 Sensitivity
Model Error (feet)
3
2.5
2
1.5
1
0.5
0
-0.5
-1
0
2
4
6
8
10
12
Layer 1 Horizontal Conductivity Multiplication Factor
RMS Error
Mean Error
Absolute Mean Error

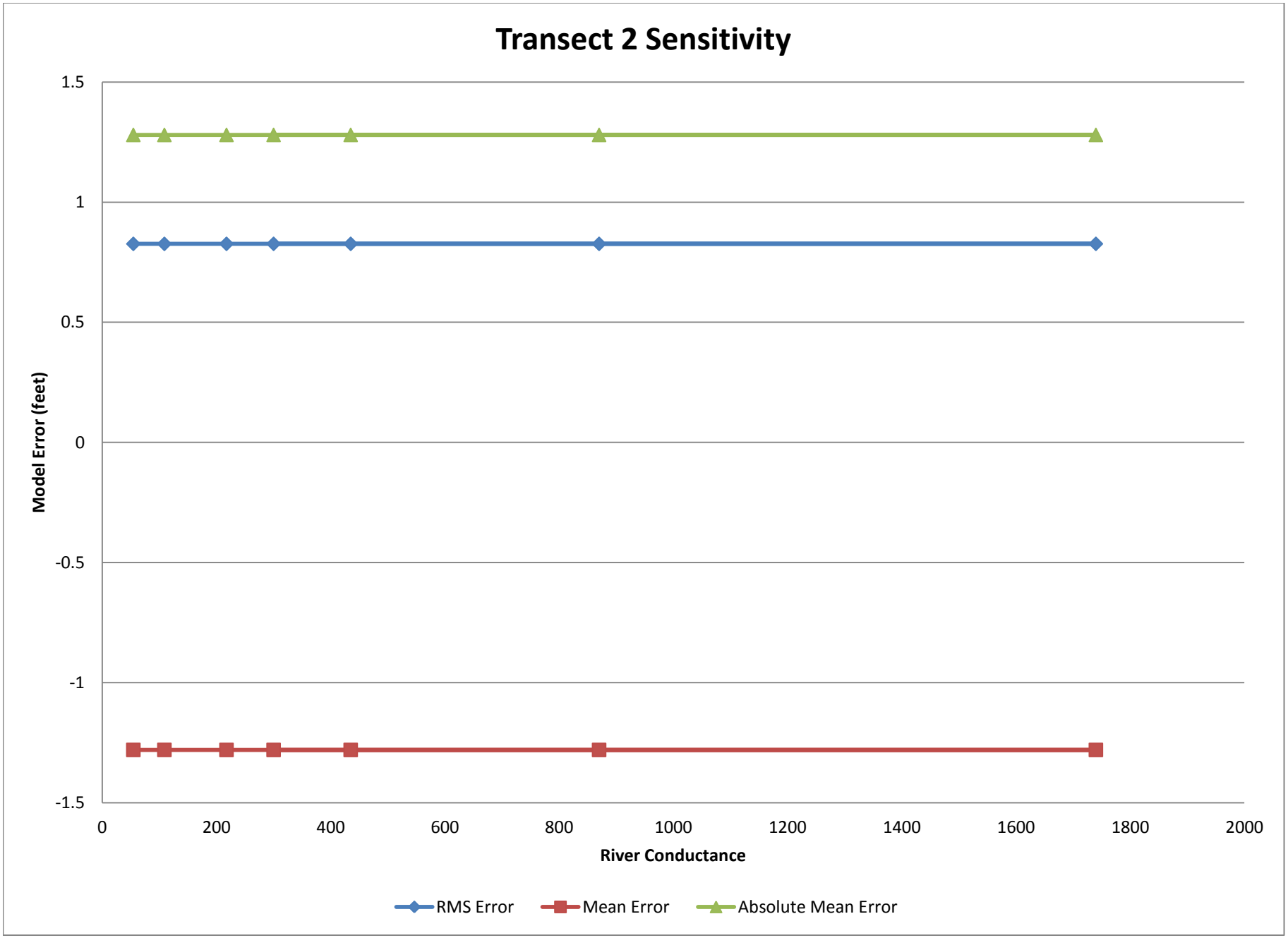

Transect 1 Sensitivity
140
120
100
80
60
40
20
0
-20
Model Error (feet)
0
2
4
6
8
10
12
Layer 2 Horizontal Conductivity Multiplication Factor
RMS Error
Mean Error
Absolute Mean Error

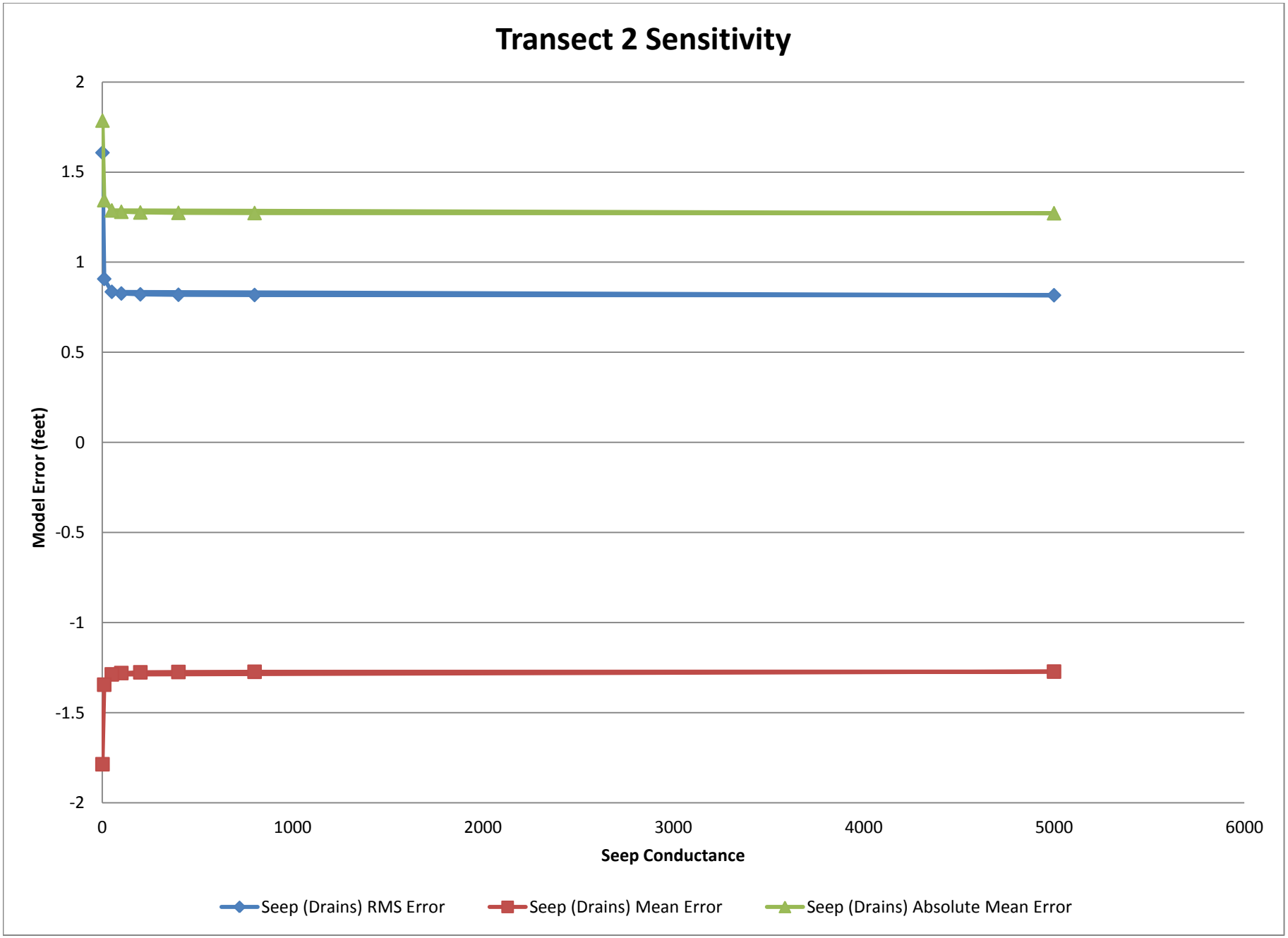

Transect 1 Sensitivity
Model Error (feet)
7
6
5
4
3
2
1
0
-1
0
1
2
3
4
5
6
Layer 3 Horizontal Conductivity Multiplication Factor
RMS Error
Mean Error
Absolute Mean Error

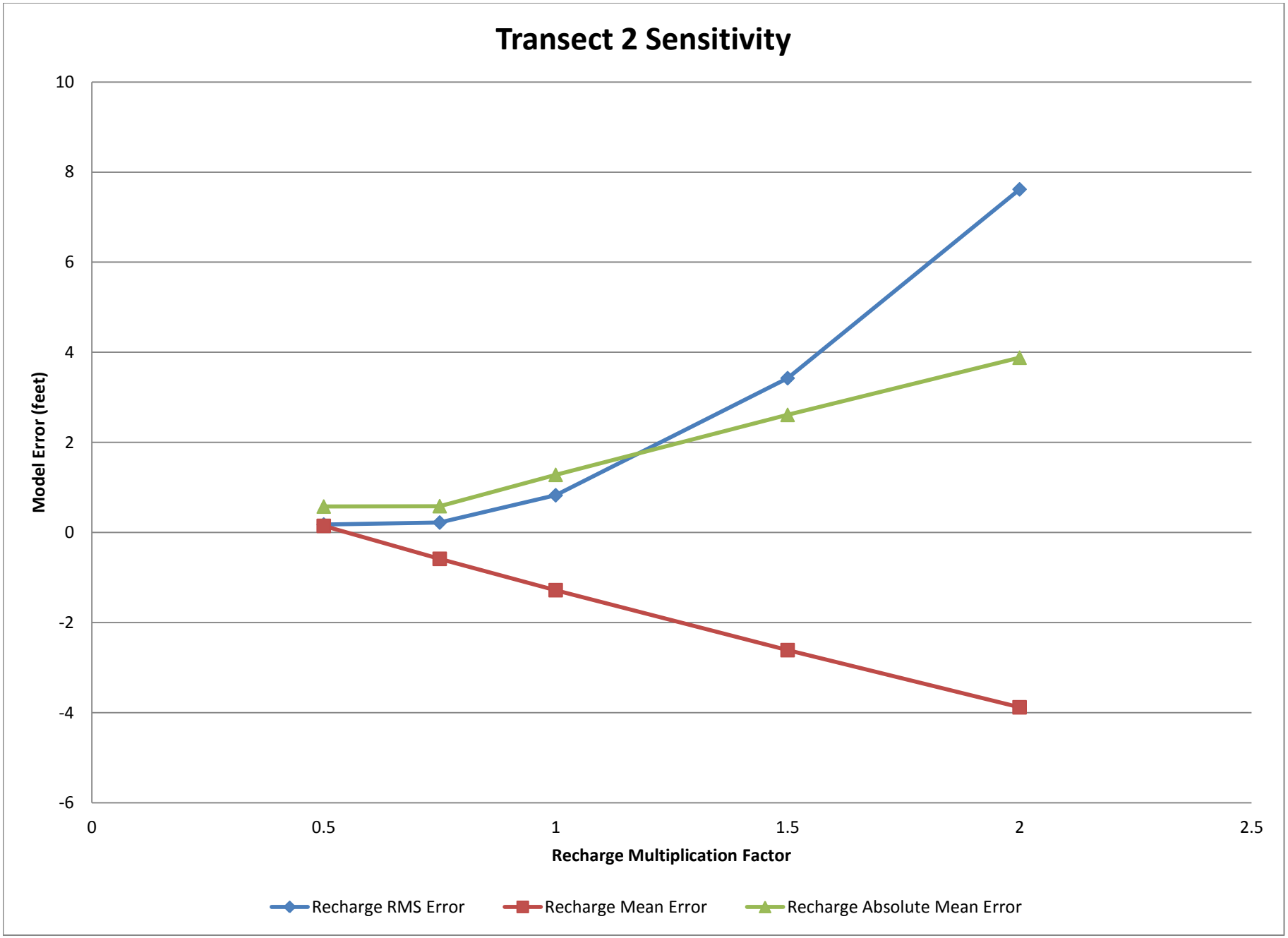

Transect 1 Sensitivity
Model Error (feet)
3
2.5
2
1.5
1
0.5
0
-0.5
-1
0
1
2
3
4
5
6
Layer 1 Vertical Conductivity Multiplication Factor
RMS Error
Mean Error
Absolute Mean Error

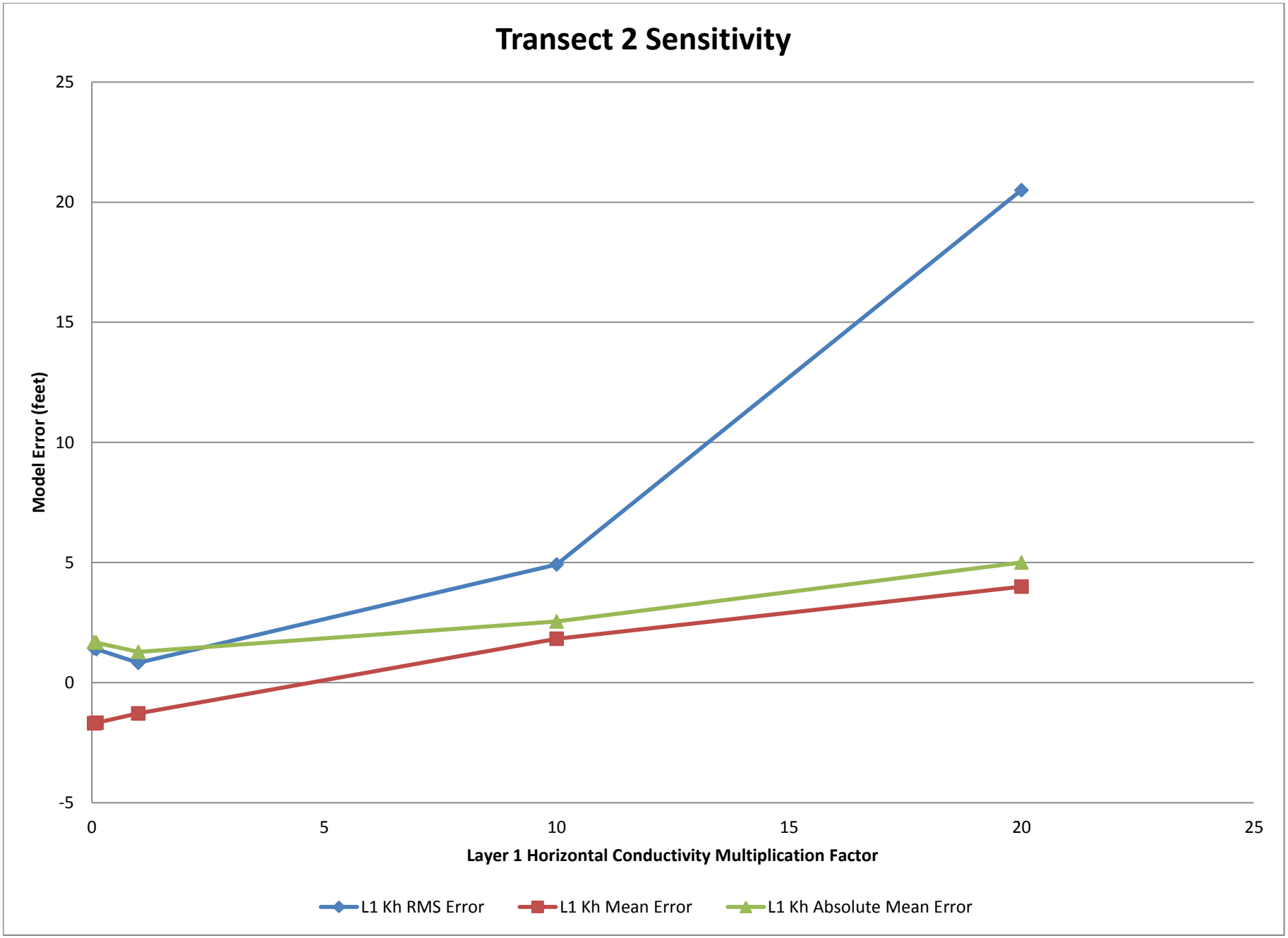

Transect 1 Sensitivity
Model Error (feet)
3
2.5
2
1.5
1
0.5
0
-0.5
-1
0
0.5
1
1.5
2
2.5
Layer 2 Vertical Conductivity Multiplication Factor
RMS Error
Mean Error
Absolute Mean Error

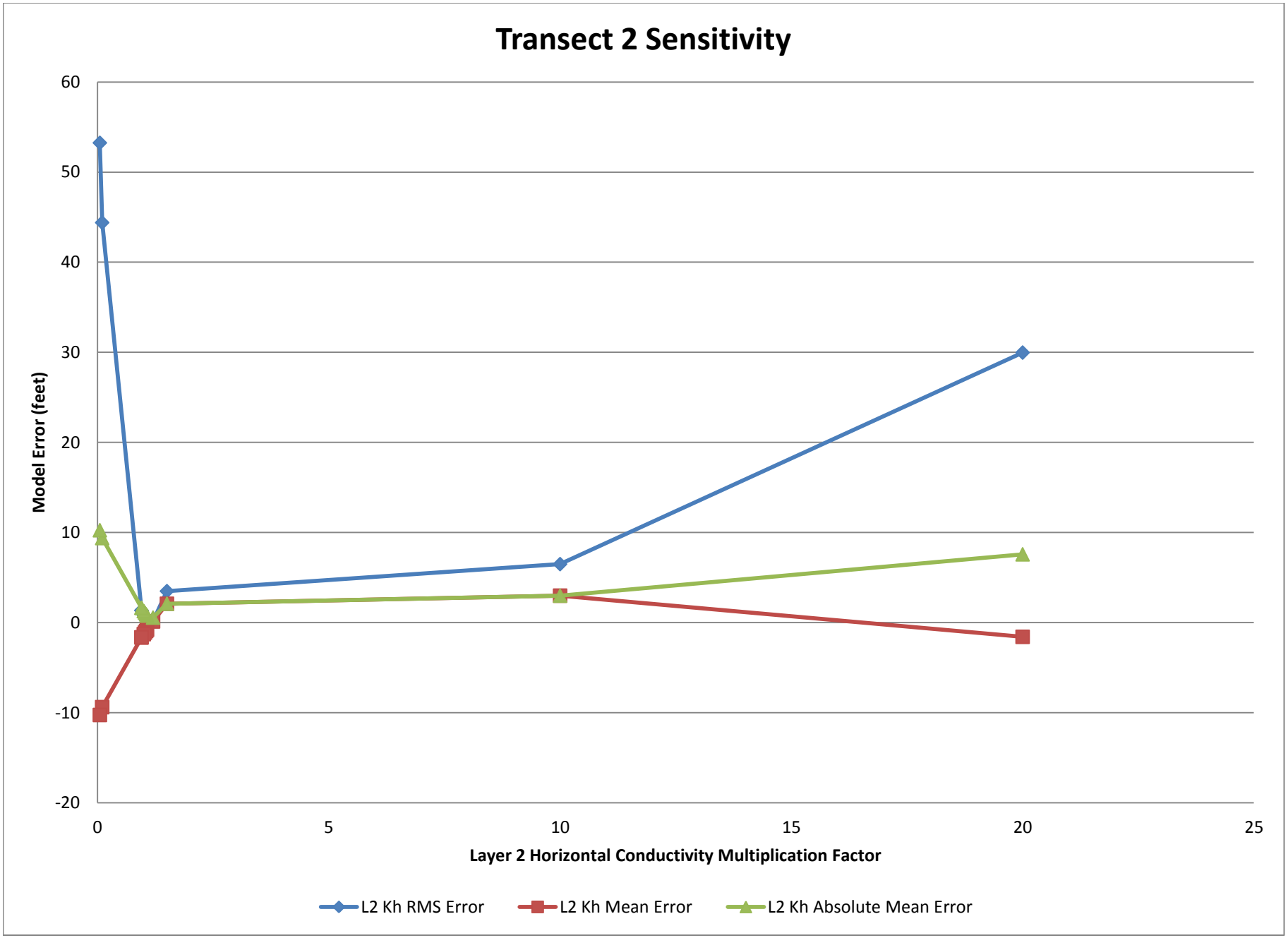

Transect 1 Sensitivity
20
15
10
5
0
-5
Model Error (feet)
0
0.5
1
1.5
2
2.5
Layer 3 Vertical Conductivity Multiplication Factor
RMS Error
Mean Error
Absolute Mean Error

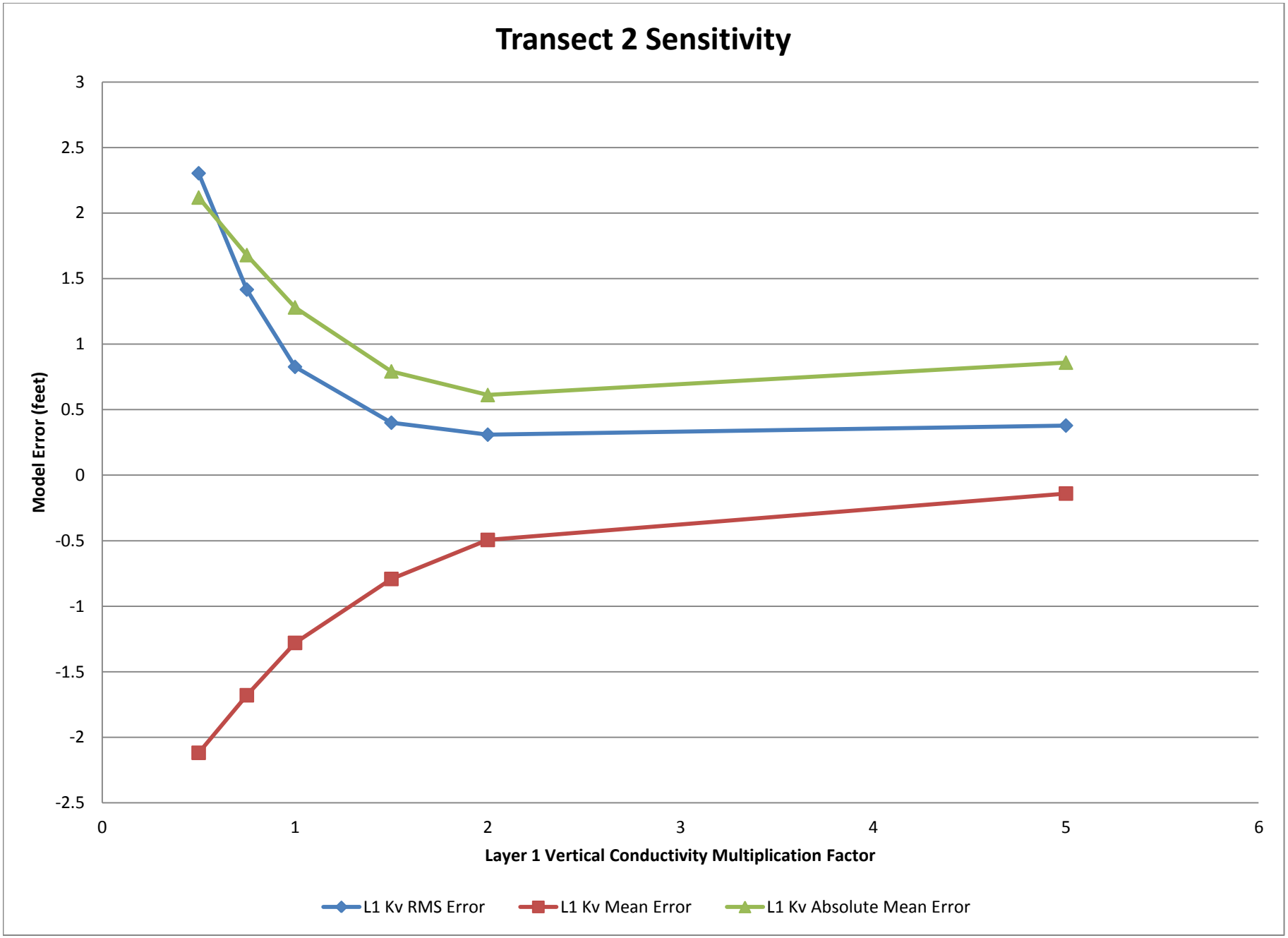

Transect 2 Sensitivity
1.5
1
0.5
0
-0.5
-1
-1.5
Model Error (feet)
0
200
400
600
800
1000
1200
1400
1600
1800
2000
River Conductance
RMS Error
Mean Error
Absolute Mean Error

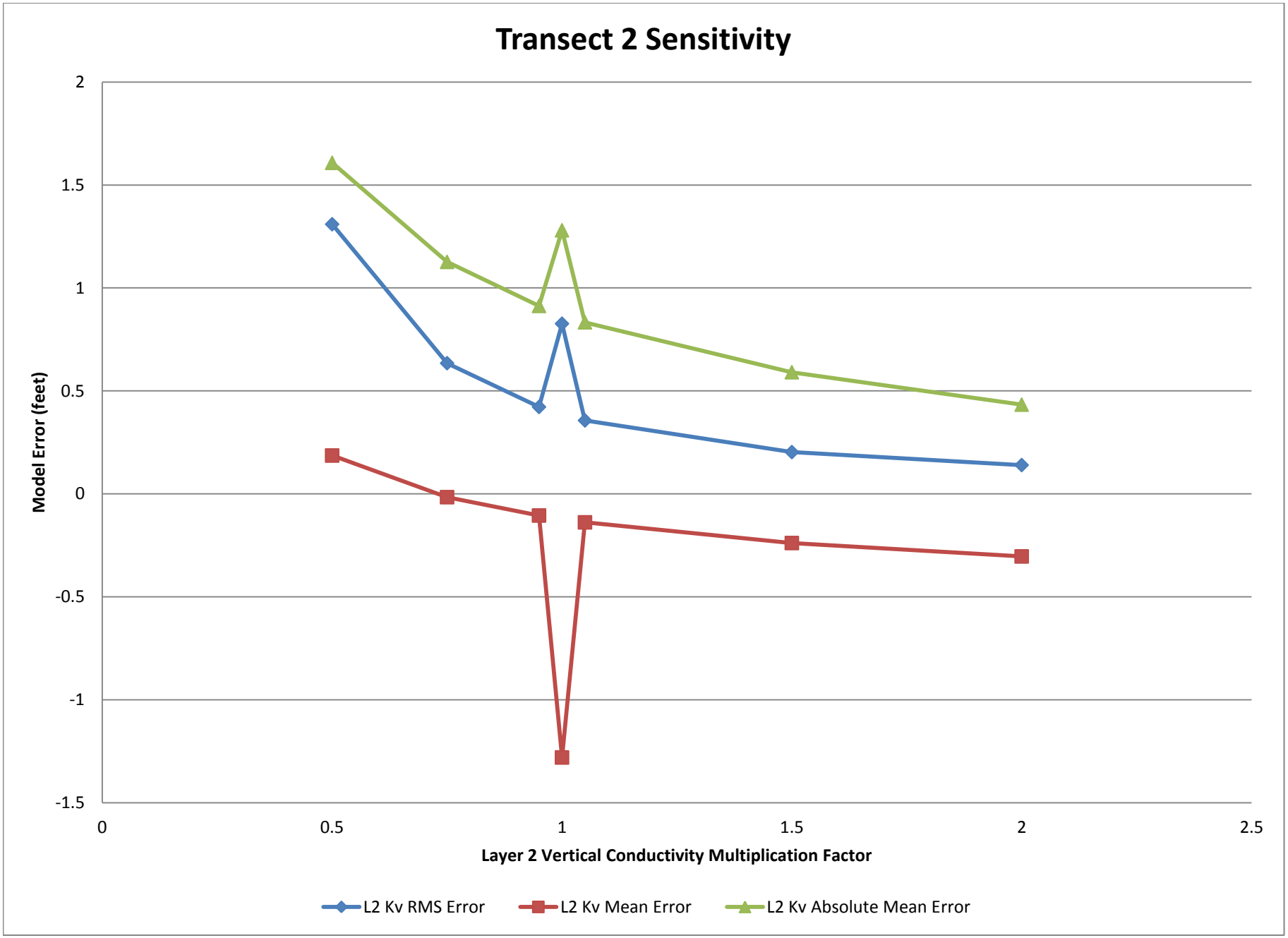

Transect 2 Sensitivity
Model Error (feet)
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
0
1000
2000
3000
4000
5000
6000
Seep Conductance
Seep (Drains) RMS Error
Seep (Drains) Mean Error
Seep (Drains) Absolute Mean Error

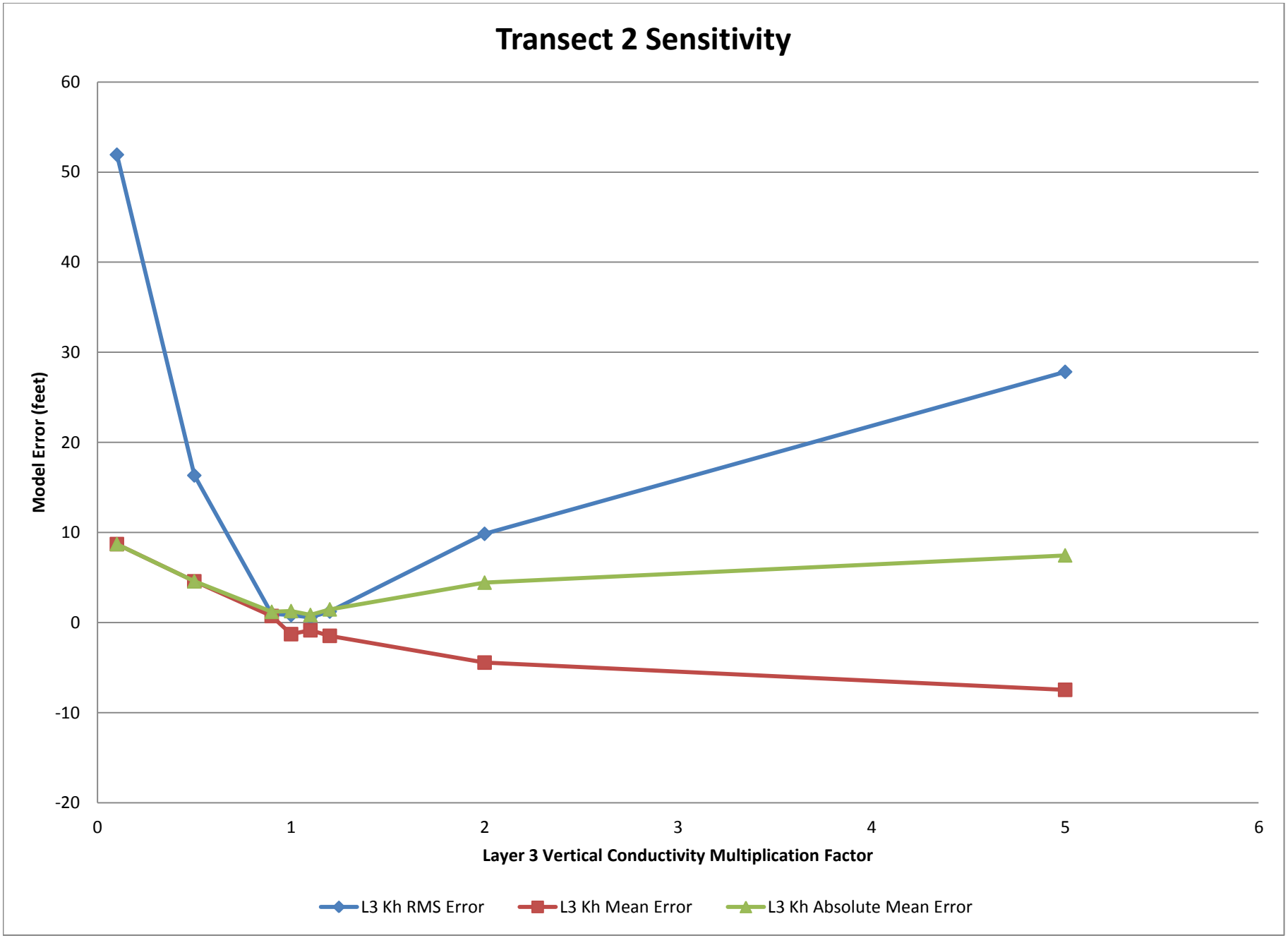

Transect 2 Sensitivity
10
8
6
4
2
0
-2
-4
-6
Model Error (feet)
0
0.5
1
1.5
2
2.5
Recharge Multiplication Factor
Recharge RMS Error
Recharge Mean Error
Recharge Absolute Mean Error


Transect 2 Sensitivity
Model Error (feet)
25
20
15
10
5
0
-5
0
5
10
15
20
25
Layer 1 Horizontal Conductivity Multiplication Factor
L1 Kh RMS Error
L1 Kh Mean Error
L1 Kh Absolute Mean Error


Transect 2 Sensitivity
Model Error (feet)
60
50
40
30
20
10
0
-10
-20
0
5
10
15
20
25
Layer 2 Horizontal Conductivity Multiplication Factor
L2 Kh RMS Error
L2 Kh Mean Error
L2 Kh Absolute Mean Error


Transect 2 Sensitivity
Model Error (feet)
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
0
1
2
3
4
5
6
Layer 1 Vertical Conductivity Multiplication Factor
L1 Kv RMS Error
L1 Kv Mean Error
L1 Kv Absolute Mean Error


Transect 2 Sensitivity
Model Error (feet)
2
1.5
1
0.5
0
-0.5
-1
-1.5
0
0.5
1
1.5
2
2.5
Layer 2 Vertical Conductivity Multiplication Factor
L2 Kv RMS Error
L2 Kv Mean Error
L2 Kv Absolute Mean Error


Transect 2 Sensitivity
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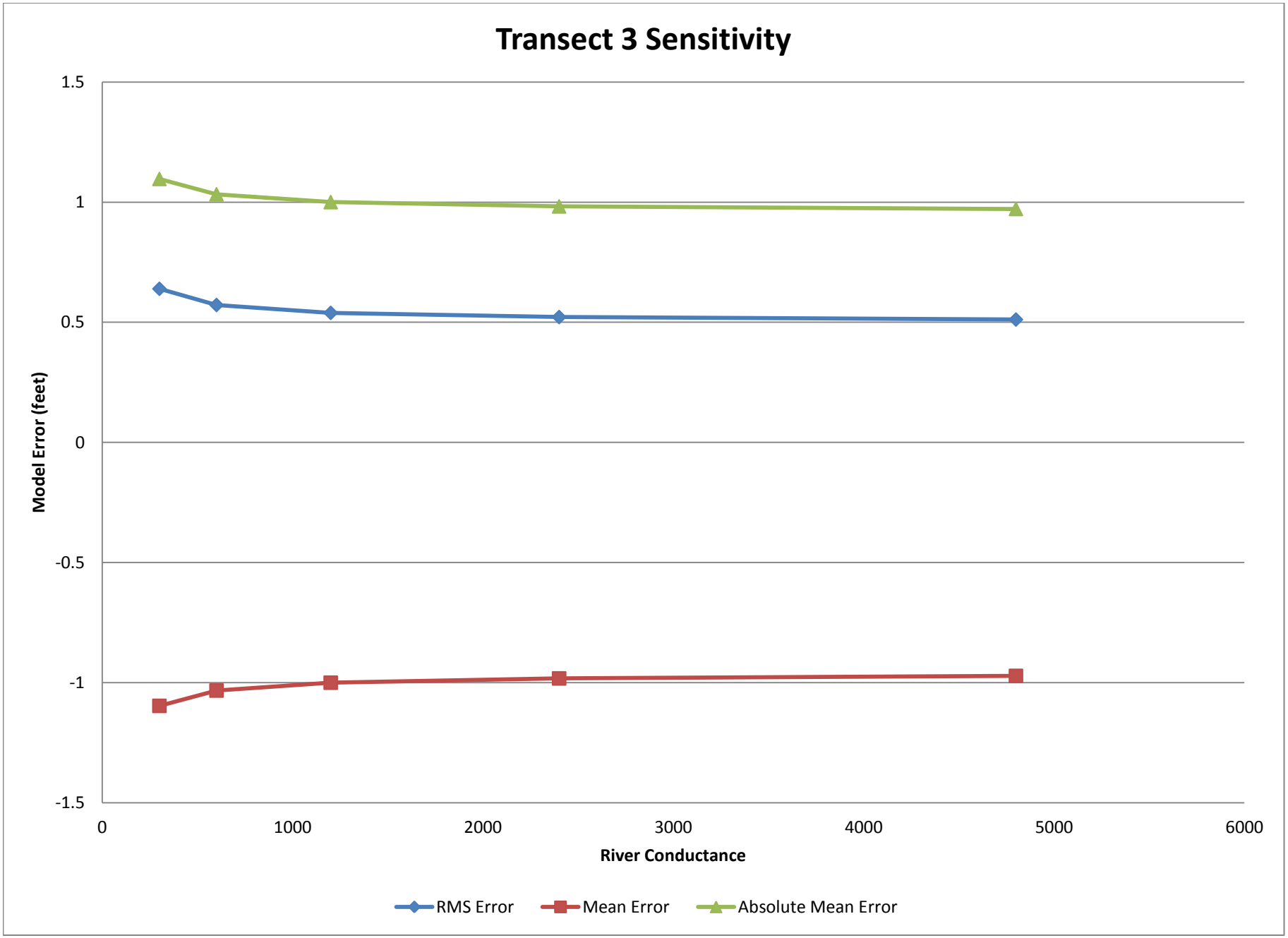
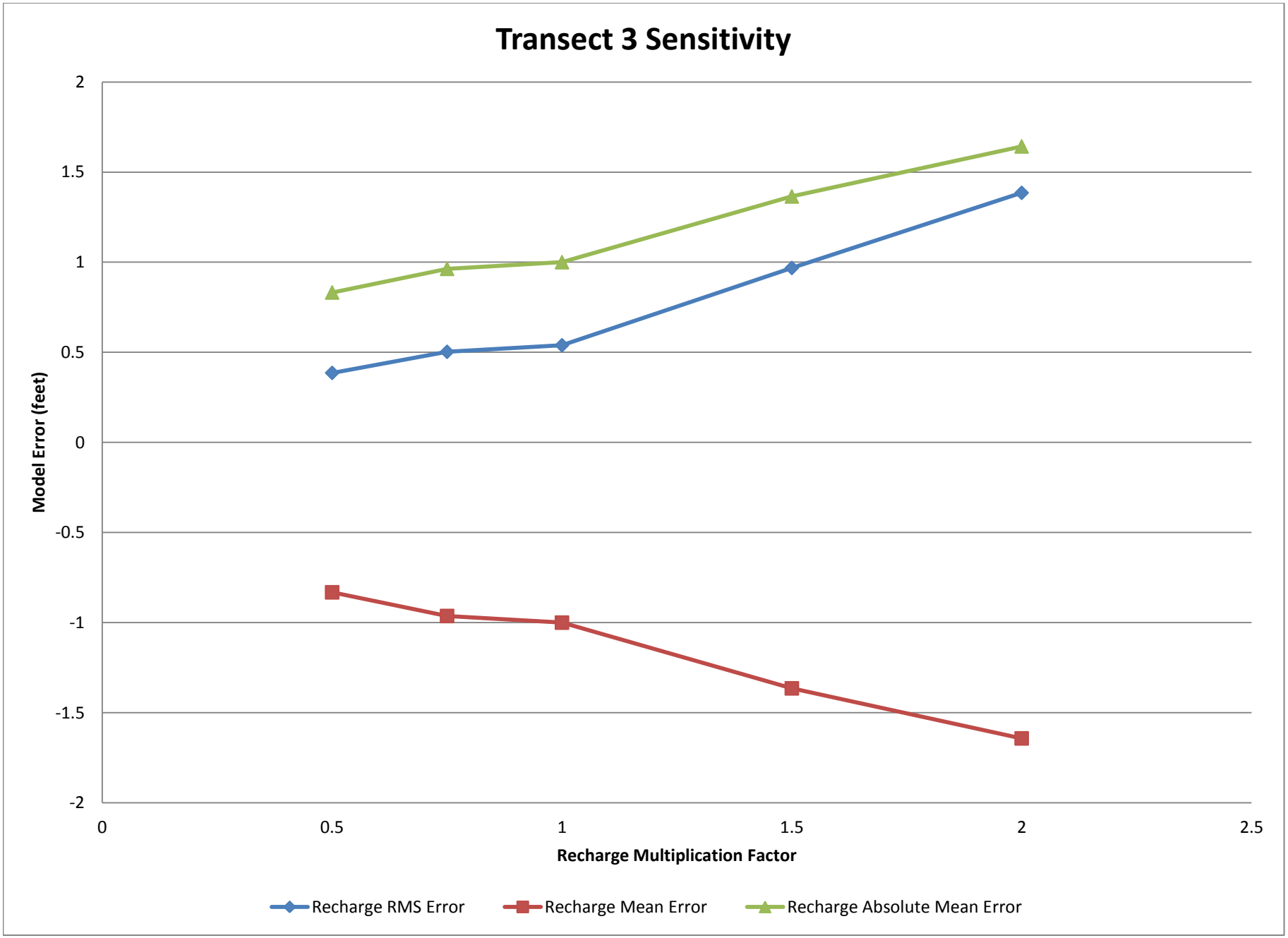
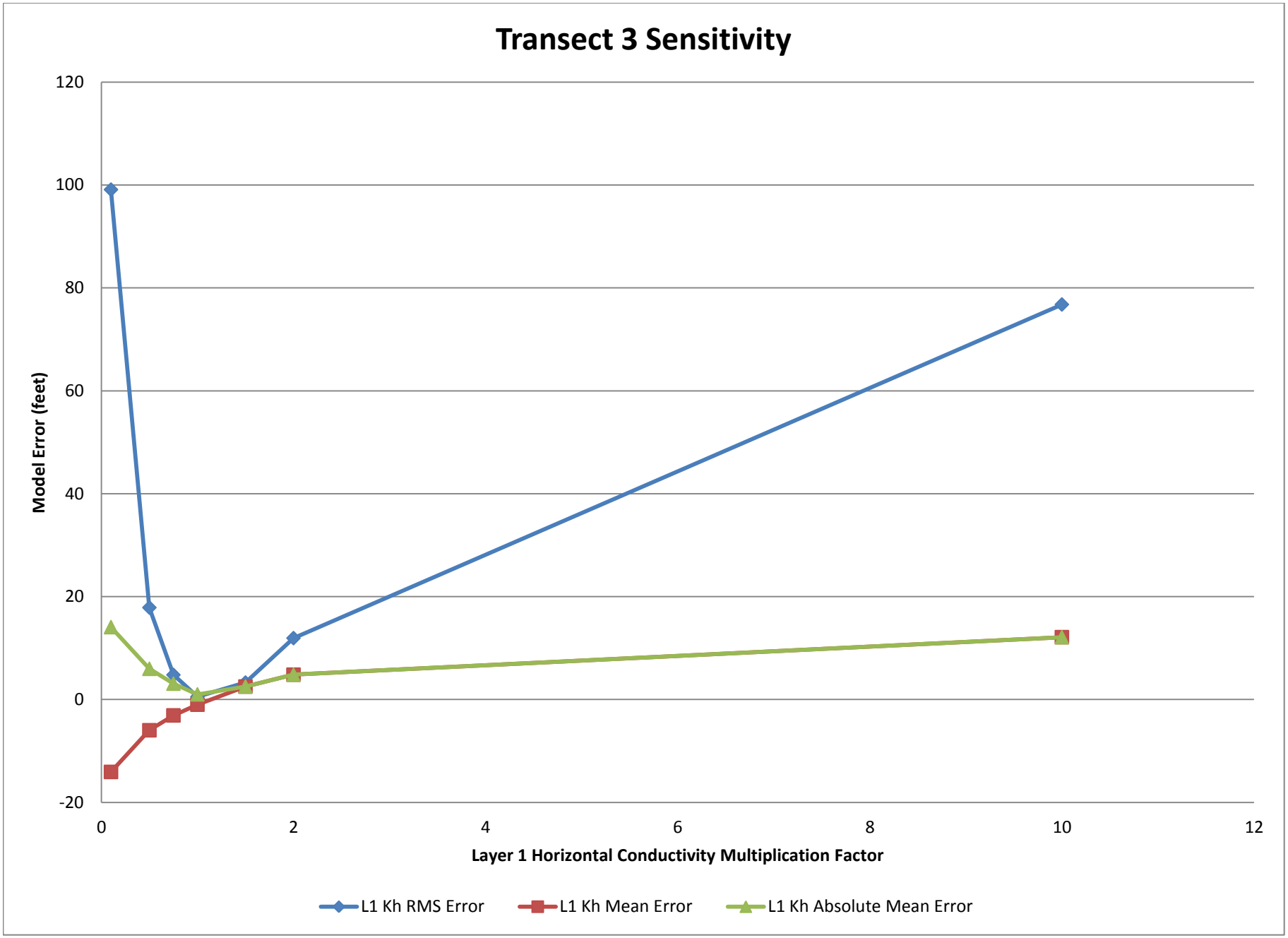
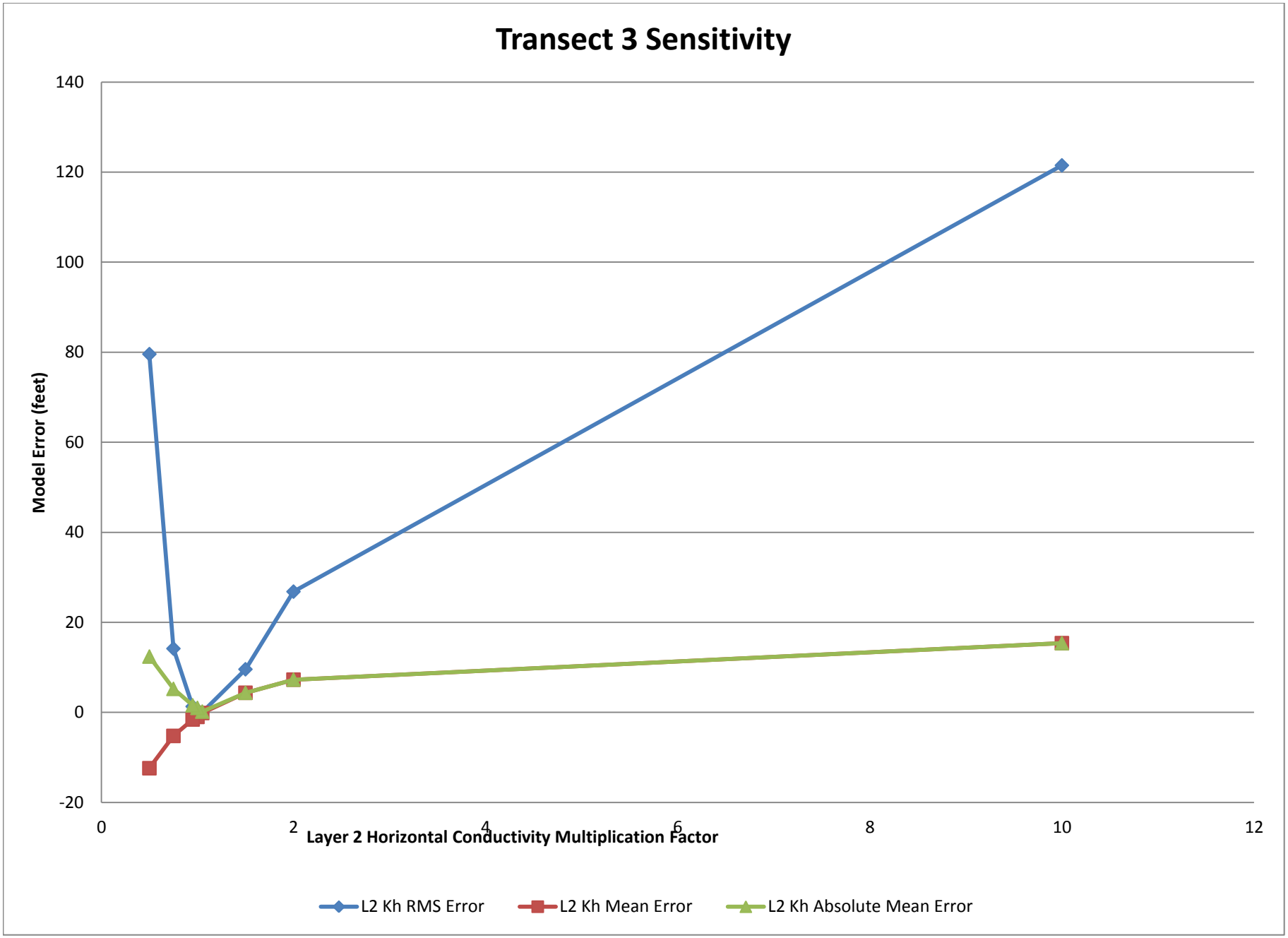
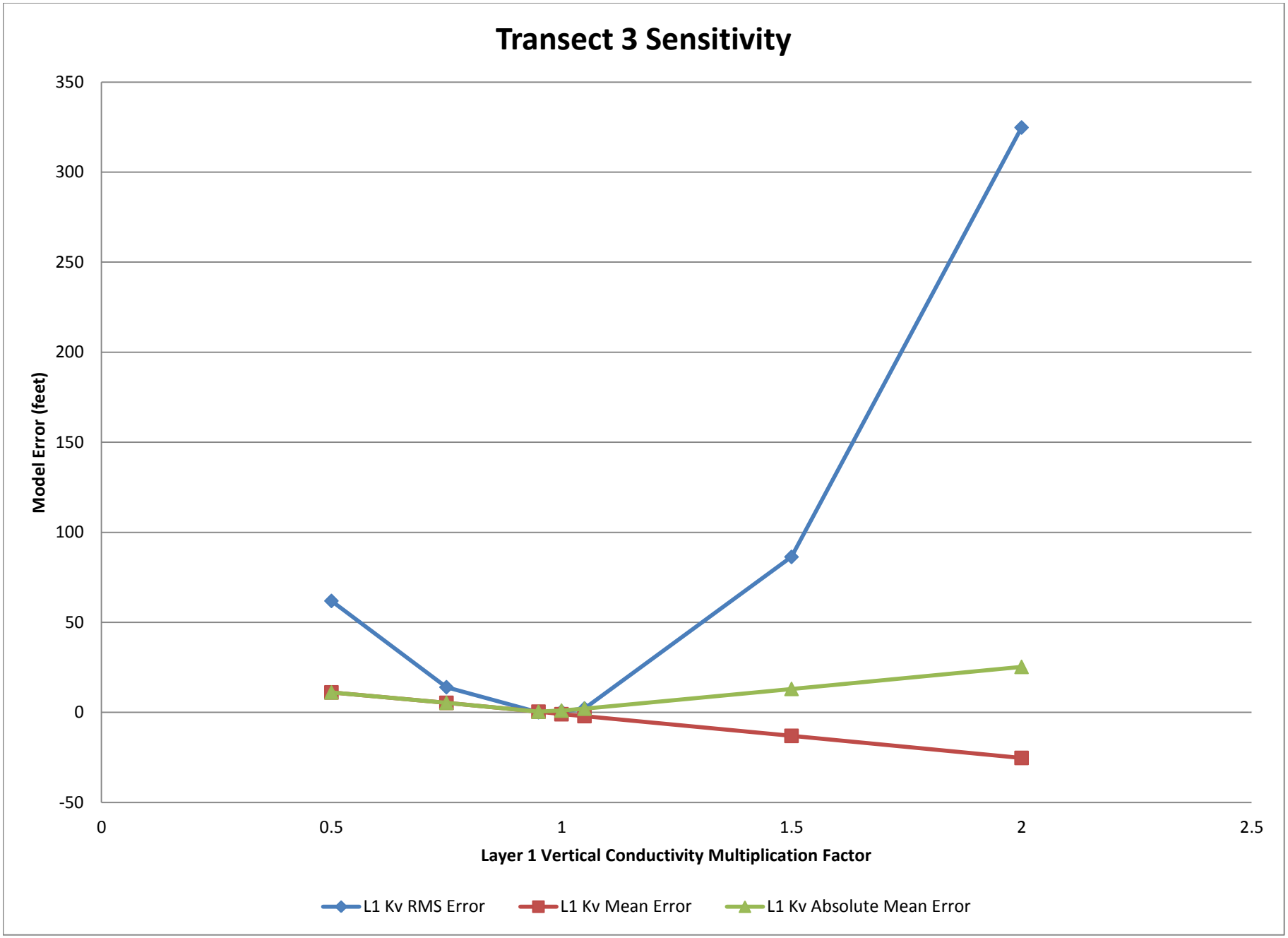
50
40
30
20
10
0
-10
-20
Model Error (feet)
0
1
2
3
4
5
6
Layer 3 Vertical Conductivity Multiplication Factor
L3 Kh RMS Error
L3 Kh Mean Error
L3 Kh Absolute Mean Error


Transect 3 Sensitivity
1.5
1
0.5
0
-0.5
-1
-1.5
Model Error (feet)
0
1000
2000
3000
4000
5000
6000
River Conductance
RMS Error
Mean Error
Absolute Mean Error

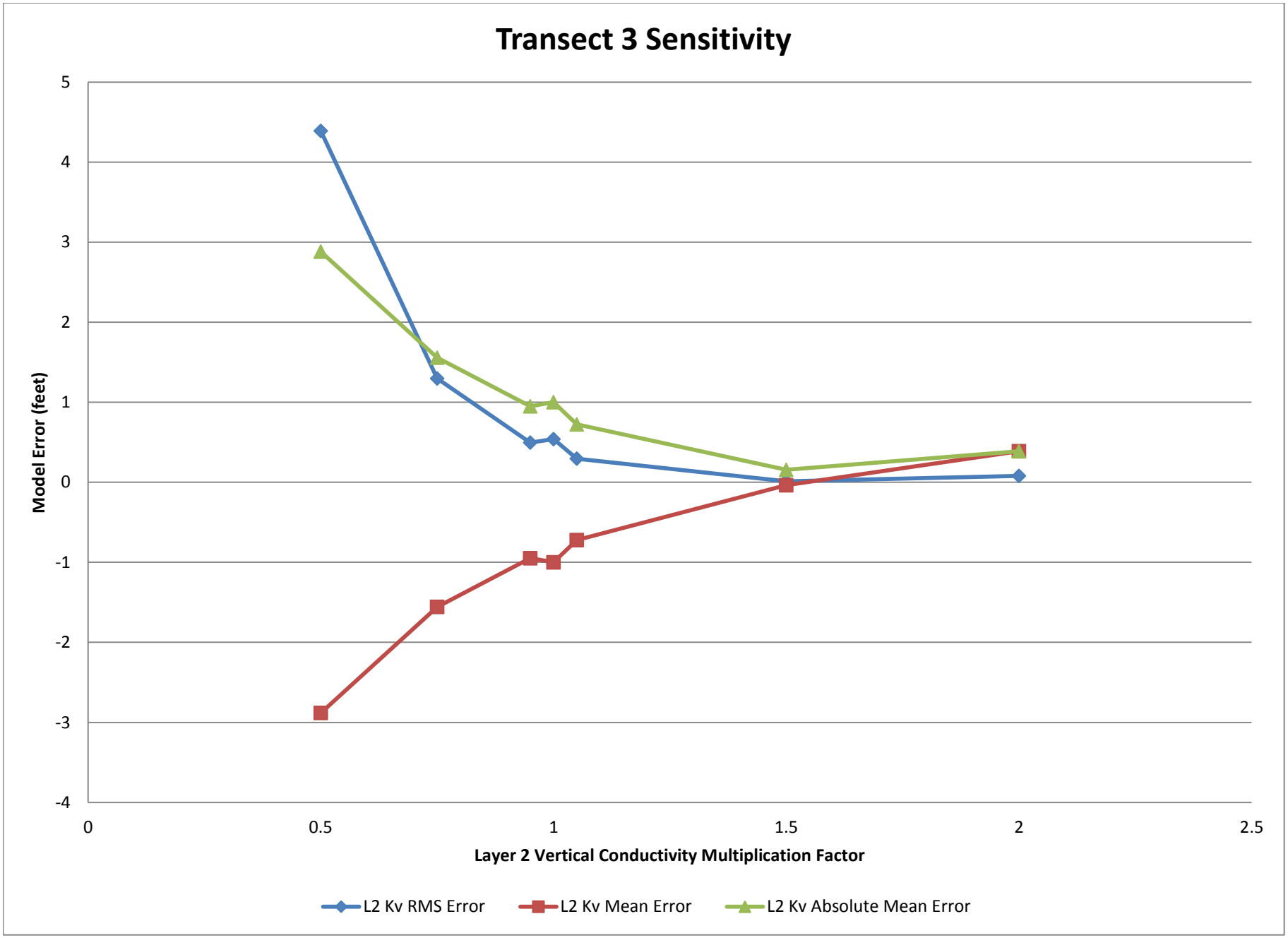

Transect 3 Sensitivity
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
Model Error (feet)
0
0.5
1
1.5
2
2.5
Recharge Multiplication Factor
Recharge RMS Error
Recharge Mean Error
Recharge Absolute Mean Error


Transect 3 Sensitivity
120
100
80
60
40
20
0
-20
Model Error (feet)
0
2
4
6
8
10
12
Layer 1 Horizontal Conductivity Multiplication Factor
L1 Kh RMS Error
L1 Kh Mean Error
L1 Kh Absolute Mean Error


Transect 3 Sensitivity
140
120
100
80
60
40
20
0
-20
Model Error (feet)
0
2
4
6
8
10
12
Layer 2 Horizontal Conductivity Multiplication Factor
L2 Kh RMS Error
L2 Kh Mean Error
L2 Kh Absolute Mean Error


Transect 3 Sensitivity
350
300
250
200
150
100
50
0
-50
Model Error (feet)
0
0.5
1
1.5
2
2.5
Layer 1 Vertical Conductivity Multiplication Factor
L1 Kv RMS Error
L1 Kv Mean Error
L1 Kv Absolute Mean Error

D200


Transect 3 Sensitivity
Model Error (feet)
5
4
3
2
1
0
-1
-2
-3
-4
0
0.5
1
1.5
2
2.5
Layer 2 Vertical Conductivity Multiplication Factor
L2 Kv RMS Error
L2 Kv Mean Error
L2 Kv Absolute Mean Error

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Appendix G

Cuts and Fills

At Transects

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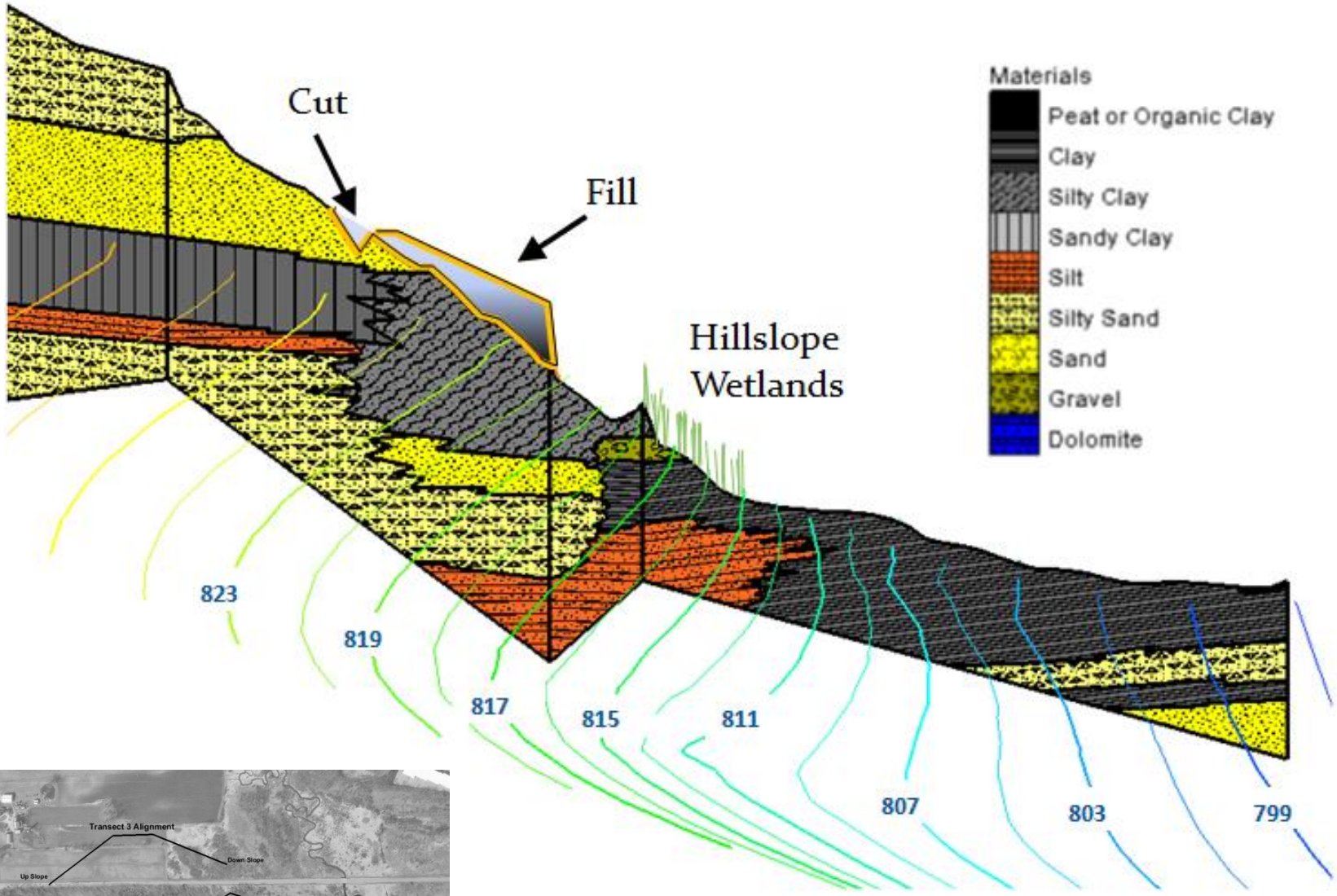
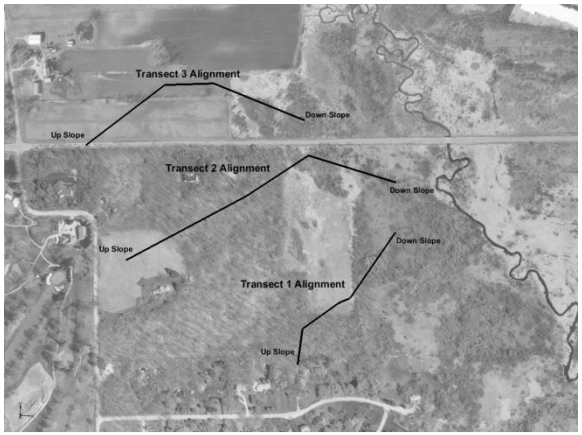
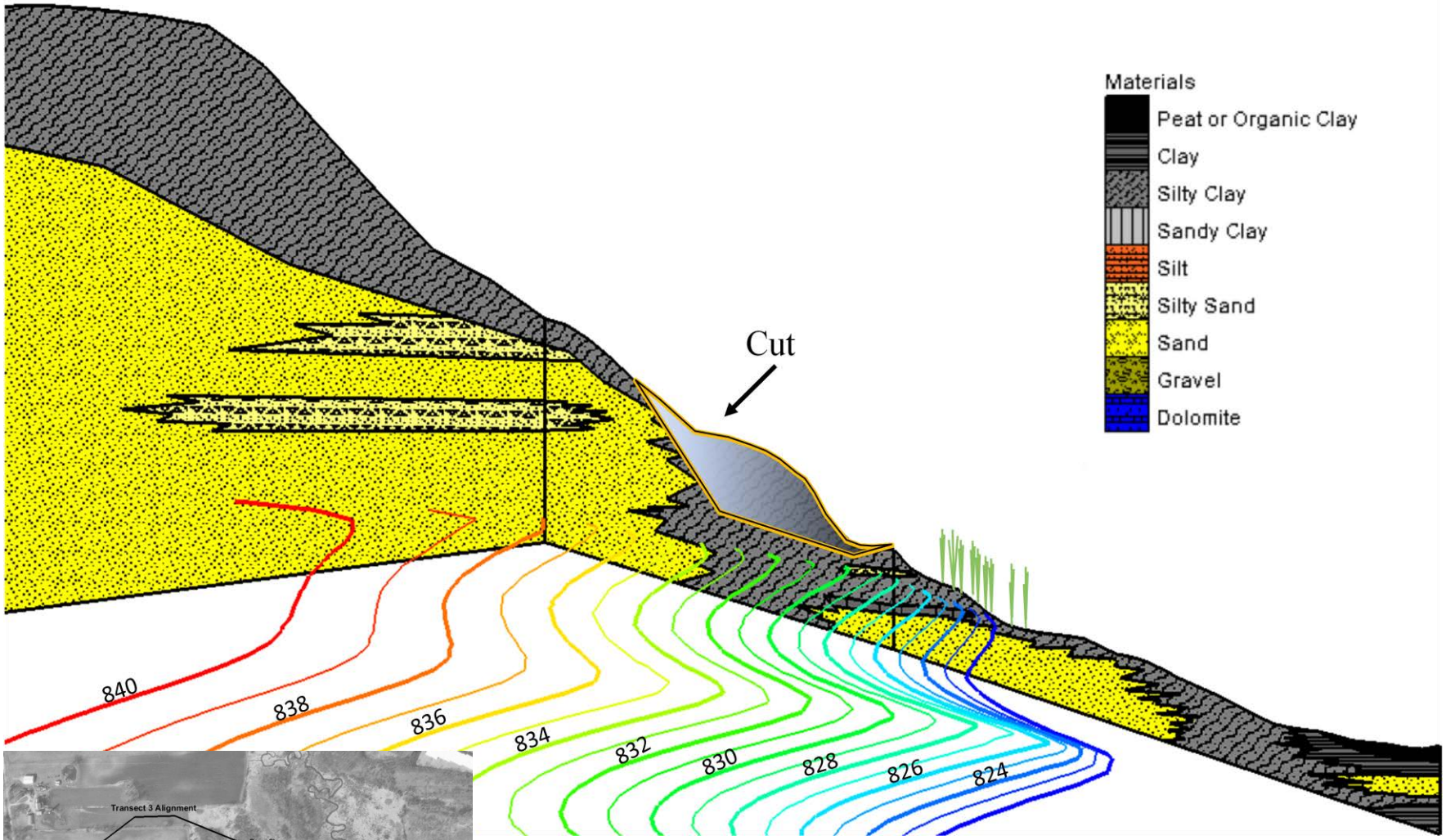
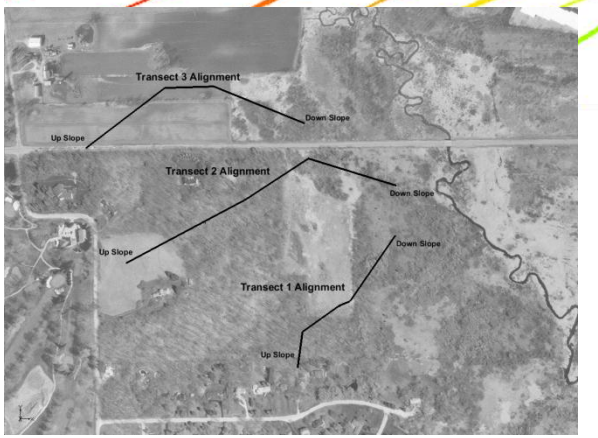
Transect 1 from southwest to north east. Contour interval of one foot. Not to scale.



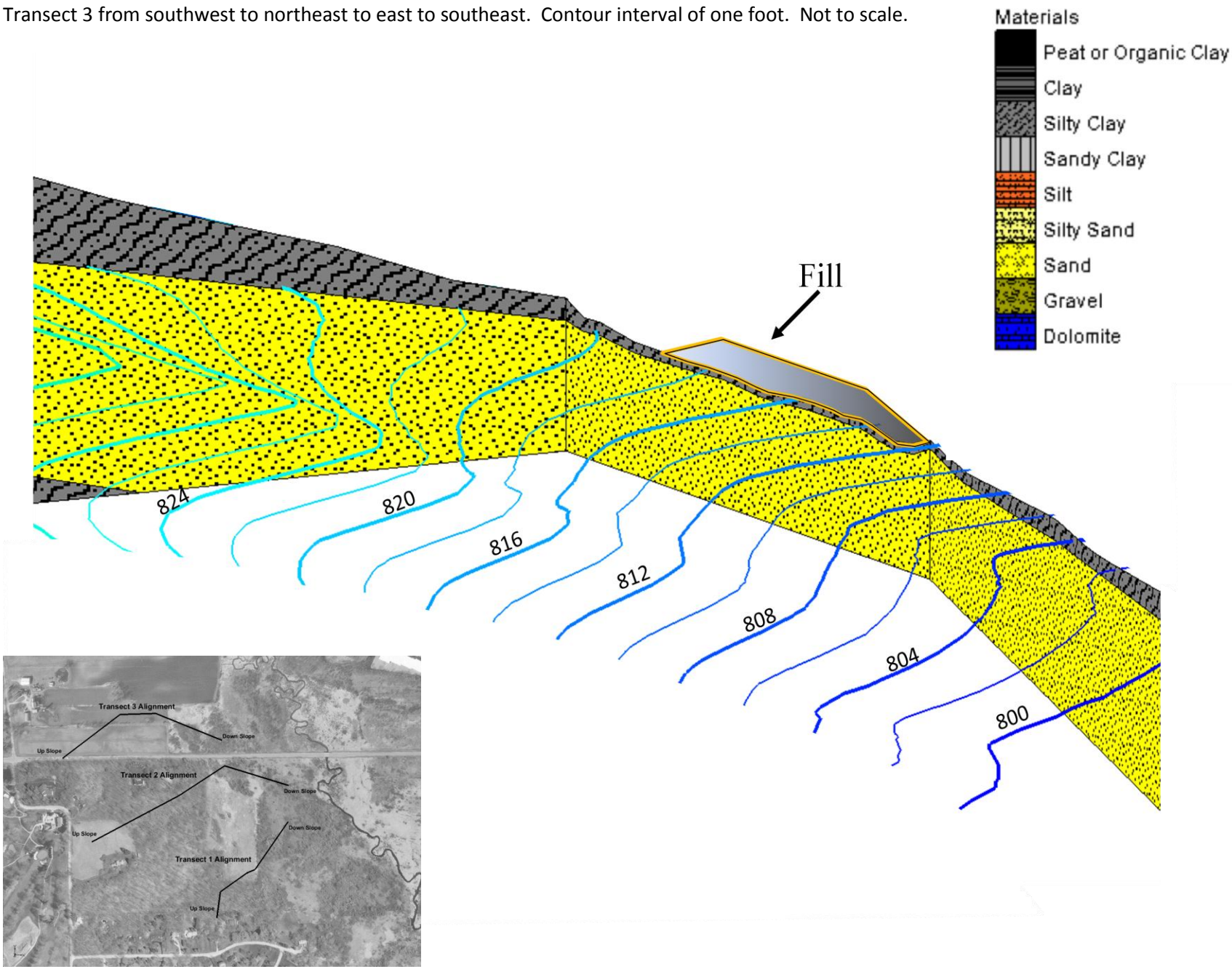


Transect 2 from southwest to northeast to east. Contour interval of one foot. Not to scale.





Transect 3 from southwest to northeast to east to southeast. Contour interval of one foot. Not to scale.



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Appendix E
Aerial Photo Exhibit

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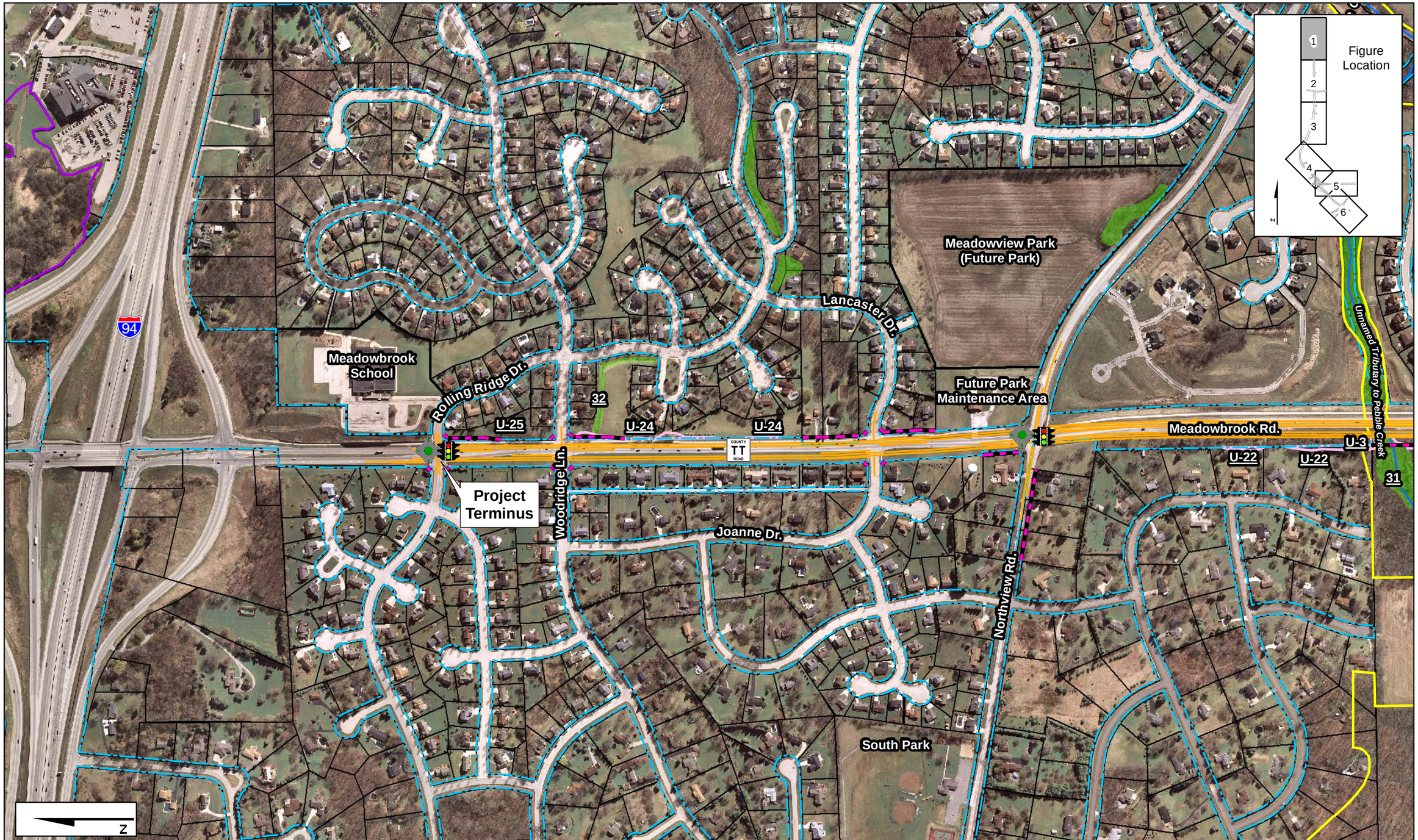

Legend

- Edge of Pavement
- Proposed Right-of-Way
- Existing Roadway Right-of-Way
- Railroad
- Wetlands
- FEMA Floodplain
- Parcel
- Upland Areas
- Isolated Natural Resource Area
- Primary Environmental Corridor
- Secondary Environmental Corridor
- River/Stream

Relocations

- Outbuilding
- Residential
- Roadway Removal
- Reconstructed and Widened Area
- Historic Building
- Roundabout
- Traffic Signal

Notes:

- 1 SWRPC Wetland Identifier
- U-10 Upland Identifier
- 2010 Aerial Photography

0 450 900
Feet

West Waukesha Bypass Study Potential Impacts
Sheet 1

\\HERCULES\PROJ\WISDOT\144825 - WISDOT BD\COUNTIES\WAUKESHA COUNTY BD\WAUKESHA CO BYPASS\GIS\MAPFILES\2014\MAPGRIDS\WAUKESHABYPASS_GRIDS_SHEETS_ONLY.MXD JHANSEN1 7/30/2014 1:33:03 PM

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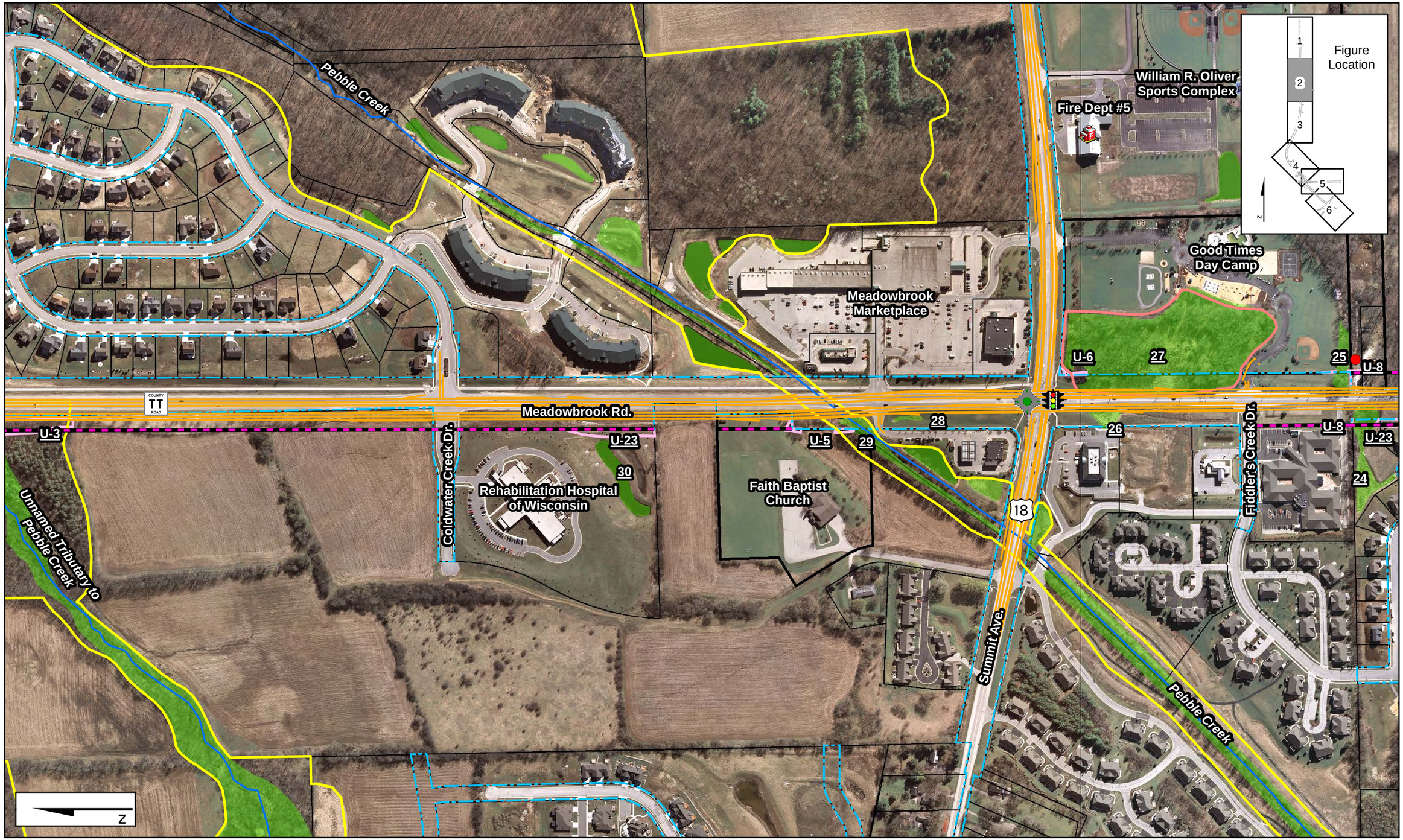

Legend

- Edge of Pavement
- Proposed Right-of-Way
- Existing Roadway Right-of-Way
- Railroad
- Wetlands
- FEMA Floodplain
- Parcel
- Upland Areas
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- Primary Environmental Corridor
- Secondary Environmental Corridor
- River/Stream

Relocations

- Outbuilding
- Residential
- Roadway Removal
- Reconstructed and Widened Area
- Historic Building
- Roundabout
- Traffic Signal

Notes:

- SWRPC Wetland Identifier
- U-10 Upland Identifier
- 2010 Aerial Photography

0 350 700
Feet

West Waukesha Bypass Study Potential Impacts
Sheet 2

\\HERCULES\PROJ\WISDOT\144825 - WISDOT BD\COUNTIES\WAUKESHA COUNTY BD\WAUKESHA CO BYPASS\GIS\MAPFILES\2014\MAPGRIDS\WAUKESHABYPASS_GRIDS_051214 HANSEN1 5/21/2014 10:06:29 AM

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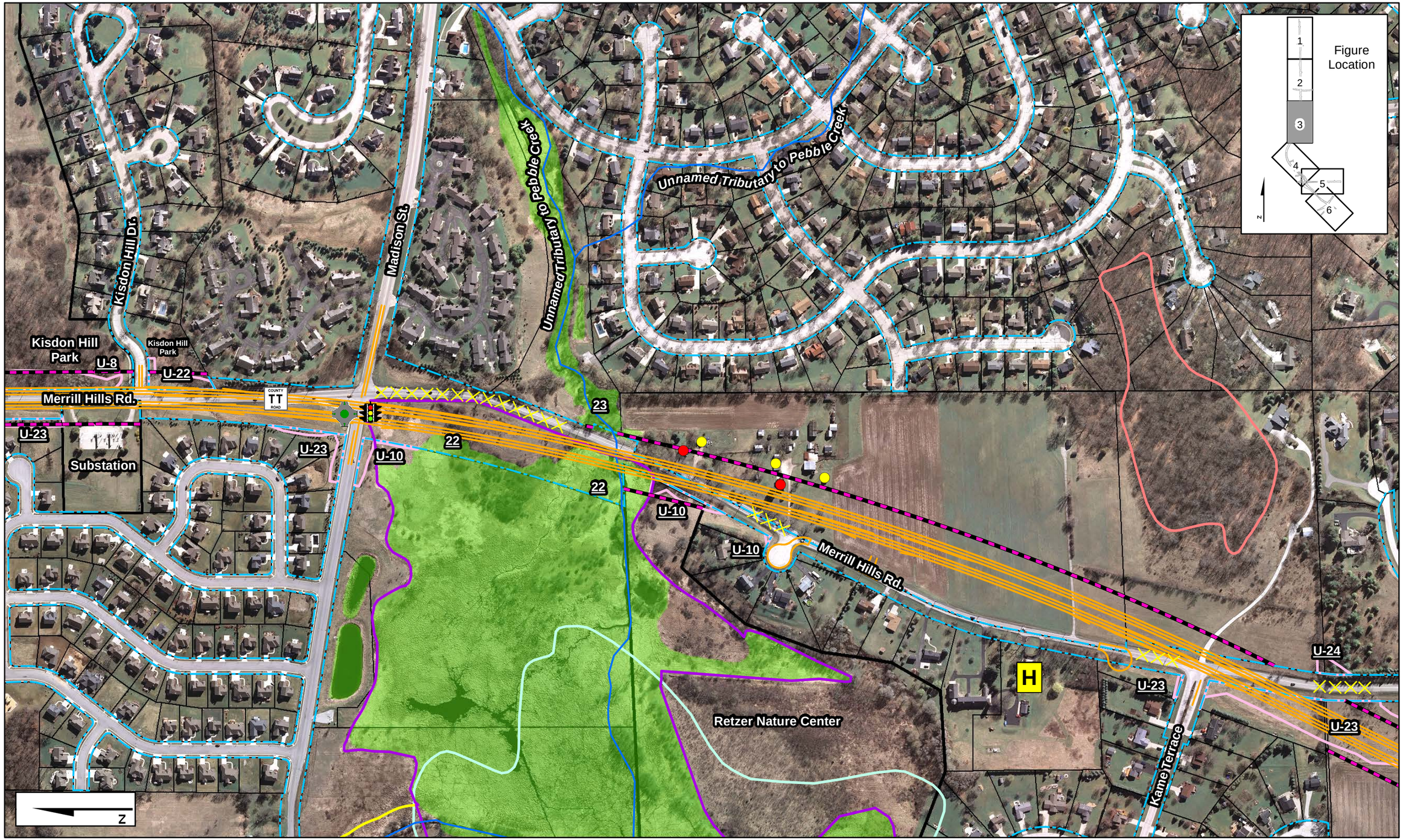

Legend

- Edge of Pavement
- Proposed Right-of-Way
- Existing Roadway Right-of-Way
- Railroad
- Wetlands
- FEMA Floodplain
- Parcel
- Upland Areas
- Isolated Natural Resource Area
- Primary Environmental Corridor
- Secondary Environmental Corridor
- River/Stream

Relocations

- Outbuilding
- Residential
- Roadway Removal
- Reconstructed and Widened Area
- Historic Building
- Roundabout
- Traffic Signal

Notes:

- SWRPC Wetland Identifier
- U-10 Upland Identifier
- 2010 Aerial Photography

0 350 700
Feet

West Waukesha Bypass Study Potential Impacts
Sheet 3

\\HERCULES\PROJ\WISDOT\144825 - WISDOT BD\COUNTIES\WAUKESHA COUNTY BD\WAUKESHA CO BYPASS\GIS\MAPFILES\2014\MAPGRIDS\WAUKESHABYPASS_GRIDS_051214 HANSEN1 5/21/2014 10:06:29 AM

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0 350 700
Feet

Legend

- Edge of Pavement
- Proposed Right-of-Way
- Existing Roadway Right-of-Way
- Railroad
- Wetlands
- FEMA Floodplain
- Parcel
- Upland Areas
- Isolated Natural Resource Area
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- Secondary Environmental Corridor
- River/Stream

Relocations

- Outbuilding
- Residential
- Roadway Removal
- Reconstructed and Widened Area
- Historic Building
- Roundabout
- Traffic Signal

Notes:

- SWRPC Wetland Identifier
- U-10 Upland Identifier
- 2010 Aerial Photography

West Waukesha Bypass Study Potential Impacts
Sheet 4

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Legend

- Edge of Pavement
- Proposed Right-of-Way
- Existing Roadway Right-of-Way
- Railroad
- Wetlands
- FEMA Floodplain
- Parcel
- Upland Areas
- Isolated Natural Resource Area
- Primary Environmental Corridor
- Secondary Environmental Corridor
- River/Stream

Relocations

- Outbuilding
- Residential
- Roadway Removal
- Reconstructed and Widened Area
- Historic Building
- Roundabout
- Traffic Signal

Notes:

- SWRPC Wetland Identifier
- U-10 Upland Identifier
- 2010 Aerial Photography

0 350 700
Feet

West Waukesha Bypass Study Potential Impacts
Sheet 5

\\HERCULES\PROJ\WISDOT\144825 - WISDOT BD\COUNTIES\WAUKESHA COUNTY BD\WAUKESHA CO BYPASS\GIS\MAPFILES\2014\MAPGRIDS\WAUKESHABYPASS_GRIDS_051214\HANSEN1 5/21/2014 10:06:29 AM

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0 350 700
Feet

Legend

- Edge of Pavement
- Proposed Right-of-Way
- Existing Roadway Right-of-Way
- Railroad
- Wetlands
- FEMA Floodplain
- Parcel
- Upland Areas
- Isolated Natural Resource Area
- Primary Environmental Corridor
- Secondary Environmental Corridor
- River/Stream

Relocations

- Outbuilding
- Residential
- Roadway Removal
- Reconstructed and Widened Area
- Historic Building
- Roundabout
- Traffic Signal

Notes:

- 1 SWRPC Wetland Identifier
- U-10 Upland Identifier
- 2010 Aerial Photography

West Waukesha Bypass Study Potential Impacts
Sheet 6

\\HERCULES\PROJ\WISDOT\144825 - WISDOT BD\COUNTIES\WAUKESHA COUNTY BD\WAUKESHA CO BYPASS\GIS\MAPFILES\2014\MAPGRIDS\WAUKESHABYPASS_GRIDS_05121 HANSEN1 5/21/2014 10:06:29 AM

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