Section 7
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7.1 Long-Term versus Short-Term Effects

Long-term and short-term effects have been considered in the evaluation criteria used in Table 5-63 of this document to determine significant impacts. The Lake Michigan water supply alternative from either the City of Milwaukee or the City of Oak Creek with Underwood Creek return flow has a minor adverse impact. The Lake Michigan water supply alternative from the City of Racine with Underwood Creek return flow has a moderate adverse impact.

7.2 Effects on Geographically Scarce Resources

Relative effects on geographically scarce resources for each of the alternatives are summarized in Table 5-63 in Section 5 of this document. There are also additional details in corresponding sub-sections in Section 5.

7.3 Reversibility of Effects

The impacts identified for the Lake Michigan water supply and return flow are either minor adverse impact or moderate adverse impacts. The minor adverse impacts for Lake Michigan water supply are for aquatic habitat change in the Fox River, which is estimated to cause less than 2 inches of water depth change (see Section 5.1.2.2); minor changes in Underwood Creek, Menomonee River, and Lake Michigan water quality which modeling has shown 3 out of 4 water quality parameters will improve with return flow (see Section 5.1.2.3); and temporary wetland construction impacts the majority of which will be eliminated after construction of the pipeline as wetlands affected by the pipeline construction are restored (see Section 5.1.3). The only moderate adverse impact was for the City of Racine Lake Michigan water supply which had additional wetland impacts due to the longer pipeline length.

7.4 Cumulative Effects

The Compact and state statutes require that the proposed project have no significant adverse impacts to the Great Lakes basin. Specifically, they require that:

> *A diversion must be implemented so as to ensure that it will result in no significant adverse individual impacts or cumulative impacts to the quantity or quality of the waters and water dependent natural resources of the basin, including cumulative impacts that might result due to any precedent-setting aspects of the proposal, based upon a determination that the proposal will not have any significant adverse impacts on the sustainable management of the waters of the Great Lakes basin. Reference: Compact Article 4, Section 4.9.4.d.; Wis. Stat. §§ 281.346(4)(f)5.*

The Compact and state statues also define cumulative impacts as:

> *the impacts on the Great Lakes basin ecosystem that result from incremental effects of all aspects of a withdrawal, diversion, or consumptive use in addition to other past, present, and reasonably foreseeable future withdrawals, diversions, and consumptive uses regardless of who undertakes the other withdrawals, diversions, and consumptive uses, including individually minor but collectively significant withdrawals, diversions, and consumptive uses taking place over a period of time. Wis. Stat. § 281.346(1)(g); See also Compact, Article 1.*

The proposed project will have no significant adverse individual or cumulative impacts on the quantity or quality of the waters and water dependent natural resources of the Basin. To the contrary, the proposed project is anticipated to have a net positive impact on the waters and water dependent natural resources to the groundwater and inland waterways.

As a result of switching to a Lake Michigan source of water, the City of Waukesha would discontinue its use of groundwater from the deep and shallow aquifers. Pumping the deep aquifer pulls down water from the overlaying shallow aquifer to the deep aquifer. If pumping of the deep aquifer is replaced with a Lake Michigan supply, Waukesha will no longer pull water from the shallow aquifer to the deep aquifer. Discontinuing the use of groundwater would stop the cumulative adverse impacts to the groundwater and connected surface water resources (e.g. streams and wetlands) identified in the Water Supply Service Area Plan (Appendix B of the Application) and in Section 5.1.2.2 of this document. This will improve critical baseflows to surface water resources, including wetlands, streams and lakes.

Switching to a Lake Michigan water supply and discontinuing the withdrawal of groundwater from the deep aquifer would also benefit the waters of the Lake Michigan basin. Historically, water from the deep aquifer flowed towards Lake Michigan. As pumping increased, the flow of groundwater was actually reversed and water that otherwise would have fed Lake Michigan was drawn to the groundwater wells. Now, waters of the Great Lakes Basin are flowing into the deep aquifer rather than recharging Lake Michigan. See ER Section 5.1.4 and the Water Supply Service Area Plan (Appendix B of the Application). Switching from the groundwater supply to a Lake Michigan surface water supply would contribute to aquifer recovery and would eliminate the diversion of water from the Lake Michigan groundwatershed to the Mississippi River watershed.

As discussed under the proposed project in Section 3 of this document, and under Return Flow Management Plan in Section 5 of the Application, the City has a goal to exceed the Compact requirements with the return volume equal to the withdrawn volume. By providing 100 percent return volume, there will be no volume change to the Great Lakes basin and therefore no significant cumulative impact to the water dependent industries (e.g. shipping and hydropower generation) in the Great Lakes basin.

The withdrawal of water from Lake Michigan will also not endanger the integrity of the Lake Michigan ecosystem. This is because the return flow water quality will meet all WDNR requirements and the City has a goal to return 100 percent of the withdrawn volume. The return flow will also improve or maintain the physical and biological resources, and improve or have a minor change to the chemical resources of the tributary stream and Lake Michigan (see Section 5.1.2 Inland Waterways in this document).

7.5 Risk (Including Unknowns and Problems Due to Installation and Operation)

Risk to public health is minimized with the Lake Michigan water supply alternative compared to the Deep and Shallow Aquifer as well as the Shallow Aquifer and Fox River Alluvium alternatives. This comparison of public health risk is documented in The Water Supply Service Area Plan (Appendix B of the Application).

7.6 Precedence

The City of Waukesha's proposed project for Lake Michigan water is supported by detailed alternatives evaluations and modeling from numerous experts, including the WDNR, USGS, WGNHS, academia and SEWRPC. The City has demonstrated that its use of Lake Michigan water will not result in significant adverse impacts to the Great Lakes basin. The application demonstrates that the Great Lakes basin will be benefited if the City completes the proposed project.

Because the return flow management plan meets all the requirements without exception and exceeds some requirements, it would create a high standard if it were to be used as a precedent in the future. By proposing to exceed the Compact and Wisconsin requirements, the City of Waukesha has set a precedent beyond that which is required.

See Sections 5 and 6 of the Application for additional information about precedence.

7.7 Public Controversy

The proposed project is the first straddling county diversion application under the Compact and Wisconsin Act 227. Consequently, the project is expected to be closely followed by interested stakeholders throughout the Great Lakes basin. The Compact was developed to allow straddling counties to obtain Great Lakes water, and it was approved by eight states and the U.S. Congress with a parallel approval process in Canada. Consequently, public interest is expected to be high, but many stakeholders across the Great Lakes basin have already developed the process whereby such an application can be proposed and approved.

In Wisconsin, the City of Waukesha has been evaluating water supply alternatives for radium compliance for over 20 years. In recent years, the City of Waukesha has publicly communicated efforts to evaluate Lake Michigan as a water supply source and has communicated with potential Lake Michigan water suppliers and communities that may be affected with a return flow. The City has continued their public education program that has allowed the public to obtain detailed information about the future water supply alternatives, to ask questions, and to provide comments. The City of Waukesha's future water supply will be the single largest capital project ever completed by the City and will subsequently have high public interest. The Compact and state statute provides the process for a straddling county diversion evaluation and there are established means for working with neighboring municipalities, obtaining public input, and resolving disputes.

The preparation of this document is in response to the public interest over this project to provide a method to evaluate impacts to environmental resources comprehensively. This process provides a means for the public to have input, review, and comment on the proposed project.