EPA Region 5 Watersheds and Wetlands Branch Comments on Enbridge Proposed Water Quality Monitoring Plan for Line 5 Wisconsin Segment Relocation Project – Version 1, 09/06/2022

- **Comment 1. Native "spoil" procedures.** Page two of Enbridge's draft monitoring plan refers to excavation of streambed material to perform the open cut or dry crossing methods. It is unclear from the monitoring plan how in-stream habitat, which is a key component of the system and an indicator of the condition of the waterbody, will be evaluated to determine if it has been returned to its former condition and that the substrate/habitat condition is stable. EPA recommends using standardized measurement techniques such as Wisconsin Department of Natural Resources (WDNR) stream habitat methods (Wisconsin DNR 2002), the Qualitative Habitat Evaluation Method or quantitative particle size distribution methods (e.g., Bunte and Abt 2001; Kaufmann et al. 2008) to provide a reliable basis for making these determinations.

- **Comment 2. Dam removal.** Enbridge's draft monitoring plan should specify the proposed timeframe over which dams will be removed as this will affect the rate of sediment release and provide context for near-term impacts. (p. 2)

- **Comment 3. Temporary increases in Total Suspended Solids (TSS).** EPA agrees that TSS is expected to be one of the most affected water quality parameter from stream crossing construction activities, and based on the relevant scientific literature, TSS concentrations at the site generally return to pre-construction levels within hours (Reid et al. 2002; Lévesque & Dubé 2007). However, in some cases, sediment deposition may alter substrate composition and aquatic invertebrate communities for many years (Armitage & Gunn 1996; Lévesque & Dubé 2007) and these impacts may be more pronounced in streams or at sites with finer grain sediments and higher flow velocities (Lévesque & Dubé 2007). Enbridge's draft monitoring plan should specify how the applicant will evaluate the impacts of sediment deposition on in-stream substrate/habitat quality (see also Comment 2 above).

  Another key indicator in this regard is the benthic macroinvertebrate community. Benthic macroinvertebrates are widely used to assess the relative quality of rivers and streams, as they incorporate water quality conditions over longer time periods than reflected in grab samples for water chemistry. Benthic macroinvertebrate communities are sensitive to impacts from sedimentation (e.g., Wood and Armitage 1997). WDNR, for instance, uses data on the presence/absence and abundance of different components of the macroinvertebrate community as part of several indicators of waterbody health (WDNR 2000). WDNR has collected some macroinvertebrate data in the area of the pipeline reroute that is available on their Surface Water Data Viewer (https://dnrmaps.wi.gov/H5/?viewer=SWDV). Enbridge's draft monitoring plan should specify how it will ensure that the macroinvertebrate community at and immediately downstream of the crossing sites will not be negatively impacted or will recover to pre-construction condition after crossing activities are completed.

  EPA also notes that, due to the sediment transport functions of rivers and streams, increased sediment released to the water column at the construction site will continue to be deposited and resuspended as it moves downstream. Although short-term impacts of pipeline crossings are fairly well-documented in the literature, impacts on in-stream substrate composition/habitat and associated aquatic communities, as well as cumulative effects, are rarely studied (Courtice & Naser 2019) and more challenging to predict and monitor. In most cases, increased sediment loads from individual crossings may have minimal impacts downstream as sediment is deposited at varying sites; however, as the number of crossings increase in a watershed, depending on

timing, discharge variability, storm events, and other factors, sedimentation risks to downstream locations may increase. Enbridge should describe how potential cumulative effects from crossings in a watershed will be mitigated and consider strategic placement of continuous monitoring stations that would allow for measurements of total suspended solids (TSS) and other key parameters over the entire pre-, active, and post-construction period. Strategic placement should be considered in subwatersheds with more crossings. For example, the Lower Tyler Forks watershed (Hydrologic Unit Code 12-digit 040103020203), which has approximately 50 crossings in the watershed should be considered for strategic placement of continuous monitoring stations. Similarly, the Marengo River subwatershed (HUC 12-digit code 040103020405), which has around 30 crossings, should also be considered for continuous monitoring stations. Project-specific continuous monitoring networks have been set up pre-construction in other proposed pipeline routes, and these systems were installed and serviced by the U.S. Geological Survey which has expertise in continuous monitoring equipment and data processing (see, for example, https://www.usgs.gov/centers/virginia-and-west-virginia-water-science-center/science/monitoring-high-priority-stream#overview).

Comment 4. Pre-construction sampling locations. EPA notes that the majority of pipeline crossings of perennial streams will be monitored, or that crossing sites proposed for monitoring have other locations nearby; however, there are more than three crossings on Silver Creek and the farthest downstream crossing is currently not included in the monitored site list. Adding site "sasd1011p_x1" to the monitoring site list would allow Enbridge to evaluate effects of multiple crossings on the creek.

EPA also notes that no monitoring sites are associated with access road crossings. Since these impacts may differ from pipeline construction impacts, adding road crossing sites would allow the Enbridge and the Corps to better understand the need for post-construction actions. (p. 3)

- **Comment 5. Pre-construction monitoring period.** Enbridge proposes to collect pre-construction samples "approximately 5 days" before beginning construction activities. Enbridge should describe how it will use the pre-construction monitoring data to determine background concentrations of water quality parameters (such as TSS) and background condition of other parameters such as substrate. Enbridge should also explain how it will determine what is an acceptable exceedance from background or pre-construction conditions. (p.3-4)

- **Comment 6. Pre-construction grab sampling.** Enbridge should describe how it will how it will ensure that grab samples are representative of normal site conditions (e.g., not influenced by precipitation events or elevated flows that may not be present post-construction) and are comparable across time periods sampled (e.g., not impacted by known daily or seasonal fluctuations).

  Also consider Comment 3 above in relation to potential impacts farther downstream in the watershed.

- **Comment 7. Pre-construction water quality parameters.** EPA recommends Enbridge clarify why several other key water quality parameters were not considered for monitoring (see Comment 13 below). In addition to water quality parameters, there are some other critical parameters that are missing from the planned monitoring activities, including in-stream bed sediment/habitat, macroinvertebrate community sampling (discussed in Comment 4 above), and riparian zone measurements (see Comment 13 below). (pp. 3-4).

- **Comment 8. Active construction sampling distances.** Enbridge identifies in the "Active Construction Sampling" section that water quality samples will be collected within 100 feet upstream of the crossing and approximately 100 feet downstream of the crossing. Enbridge should explain how it determined that 100 feet upstream is appropriately outside of the influence of the zone of construction activities (including access and right-of-way construction). In addition, the Enbridge should address how it will ensure that the upstream sampling location is representative of the impact reach. (p. 4)

- **Comment 9. Active construction sampling of turbidity.** Enbridge plans to sample turbidity during active construction and evaluate sampling results against benchmarks in the Bad River Band's water quality standards (using upstream levels as background levels). Given the importance of the parameter to the Bad River Band and the potential for downstream increases over pre-, active, and post-construction periods, Enbridge should explain why turbidity will only be sampled during active construction.

- **Comment 10. Upstream/downstream sampling.** The proposed sampling plan for the active construction and post-construction phases both mention sampling of upstream and downstream locations; however, there is no mention of upstream/downstream sampling for pre-construction sampling. Enbridge should clarify. (p. 4)

- **Comment 11. Post-construction sampling.** Enbridge proposes to collect post-construction data after restoration/stabilization activities. It should clarify whether this overlaps with the statement that samples will be collected "at one-week post construction and one-month post construction" (i.e., will restoration be completed prior to one week post-construction?).

  Enbridge should address how it will determine whether post-construction site conditions are suitably similar to pre-construction conditions. If post-construction impacts are documented immediately after construction, the applicant should consider extending the monitoring period and/or describe what other actions will be taken. The applicant should describe how it will adequately evaluate the potential for alteration of substrate composition and aquatic invertebrate communities several years after construction (Armitage & Gunn 1996; Lévesque & Dubé 2007).

  Enbridge should also describe how post-construction sampling will be timed in relation to precipitation and flows to ensure that samples are comparable to pre-construction samples (see also Comment 6 above).

- **Comment 12. Impact zone.** Enbridge should provide clarification on the length of the upstream-to-downstream impact zone from the pipeline crossings and associated activity. Documents submitted as part of the permit application suggest that 95 feet of space is typically used for wetlands; however, the typical length for stream/river crossings is not clear.

- **Comment 13. Additional parameters not considered.** Enbridge should consider the following parameters for inclusion in the monitoring plan, or explain why were these parameters are not included:

  - *Nutrients and related response variables.* Increases in runoff from construction areas will inevitably deliver additional nutrients such as nitrogen and phosphorus to impacted streams/rivers. Excess nutrients can fuel algal and plant growth which can cause unnatural variation in dissolved oxygen levels and reduce habitat for aquatic organisms. Grab samples of total nitrogen and phosphorus will provide a holistic assessment of

different forms of nutrients associated with any increased inputs, but nitrate, ammonia, and phosphate can be measured continuously via probe. EPA notes that Enbridge does propose to sample one phosphorus-impaired stream for total phosphorus; however, other streams may be at risk of eutrophication impacts from increased phosphorus.

- *Fish community.* Fishes may be impacted by immediate and longer-term changes to water quality and habitat as a result of pipeline construction (Lévesque & Dubé 2007). Given that several of the streams/rivers proposed along the proposed route are coldwater systems, which may contain species more sensitive to disturbance and pollutants, pre- and post-construction fish surveys would help determine if additional restoration actions related specifically to the fish community are necessary.

- *Riparian condition.* In addition to sediment releases, crossing construction activities could cause changes to stream channel geomorphology/sinuosity via changes to riparian zone, sediment regime, and hydrology. Direct geomorphic responses can be assessed by examining reach measurements of width and slope and using before/after pictures of the site. Riparian zone width, tree density, and species composition and distribution are also important components to measure pre-construction to inform restoration needs and actions (Castro et al. 2015).

- *Discharge.* Streamflow is a fundamental driver of many components of stream and river ecosystems, and, although long-term changes to hydrology may not be expected from stream crossing activities (barring unintended changes to groundwater flow from HDD, for instance), discharge measurements would provide context for other pollutant measurements for determining impacts and calculating pollutant loading.

- *Organic matter.* Headwater streams in forested regions receive their major energy inputs from leaf litter, which drives virtually all ecosystem and community dynamics. Disruption of energy flow from litter inputs from pipeline construction activities (compounded by potential burial of litter from sediment inputs) could negatively impact these systems. Eventually, these impacts would likely become evident in the macroinvertebrate abundance or community composition in the streams; however, impacts to macroinvertebrate communities may lag the reduction in litter inputs. In-stream litter resources can be measured before and after construction using Coarse Particulate Organic Matter (CPOM) methods (Lamberti et al. 2017).

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