**WDNR Data Request Question #1:**

*Expand the Wetland Waterbody Crossing Table provided on July 10, 2023 to include columns for groundwater-fed wetlands (known, likely, possible) and indicators (plant species such as Symplocarpus foetidus (Skunk Cabbage) and Caltha palustris (Marsh Marigold) and any other relevant conditions observed during delineation surveys or other site visits).*

**Enbridge Response to WDNR Data Request Question #1**

Enbridge has reviewed the wetland delineation data sheets compiled from the 2019 and 2020 field seasons and has incorporated additional information regarding potential groundwater discharges to wetlands crossed by the Project into the Wetland and Waterbody Crossing Table (Attachment 1).

**WDNR Data Request Question #2:**

*WDNR Comment #2: Provide a table listing all soil borings taken, including columns for latitude, longitude, elevation, boring depth, depth to bedrock, bedrock type, fractured bedrock (low, moderate, high), groundwater encountered (flag for yes), depth to groundwater, and explanatory notes (e.g., how depth to groundwater was measured or estimated).*

**Enbridge Response to WDNR Data Request Question #2**

A table listing all soil boring taken, including columns for latitude, longitude, elevation, boring depth, depth to bedrock, bedrock type, fractured bedrock (low, moderate, high), groundwater encountered (flag for yes), depth to groundwater, and explanatory notes is attached (Attachment 2).

Since 2019, Enbridge has commissioned multiple studies to evaluate and document subsurface conditions along the proposed right-of-way ("ROW”):

1. **2019-2023 Foreign Utility Line Locations** – Existing buried utility line locate probing to identify foreign utilities. Locations of foreign utilities study are not included in the attached table of soil borings as they only focus on locating depth of foreign utilities, such as pipelines.

2. **2020 Primary Full Geotechnical Investigation Boring Program** – This program occurred in 2020 and focused on obtaining geotechnical soil boring information for the following types of locations:
    a. Horizontal Directional Drills (HDD) - Proposed HDD/Direct Pipe Installations (DPI) locations
    b. Valves - Proposed Valve Site locations
    c. Roads - Proposed Road Bore locations
    d. Railroads - Proposed Railroad Crossing locations
    e. Open-Cut Waterbodies - Select proposed open-cut waterbody crossings
    f. Rock Investigation – Bores to aid in understanding where rock may be encountered

3. **2021 – Silver Creek HDD Additional Bores –** Enbridge's HDD/DPI Design consultant (JD Hair & Associates, Inc.) requested additional information for select bores completed as part of the 2020 Primary Full Geotechnical Investigation Boring Program for Silver Creek.

4. **2019/2020 – Rock Depth Identification** – Enbridge conducted additional investigations to further quantify where shallow bedrock would be encountered during excavation. As part of this additional analysis, Enbridge commissioned the following activities:
   a. Enbridge conducted hydrovac investigations at various locations to determine the depth slightly deeper than the nominal trench depth to identify if bedrock exists within the trench line.
   b. Enbridge conducted additional probing at various locations to the depth slightly deeper than the nominal trench depth to identify if bedrock exists within the trench line.
   c. Enbridge conducted geotechnical borings to aid in understanding where rock may be encountered.
   d. Enbridge also conducted other testing to identify potential shallow bedrock areas that did not involve ground disturbance.

5. **Fall 2022 Probing and Augering**
   a. Enbridge conducted a probing analysis using hand push style probes to identify areas that may require sheetpile installation for trench excavation stabilization.
   b. Enbridge completed additional hand augering to further identify areas that may require sheetpile installation and to assess water table depth where possible.

**WDNR Data Request Question #3:**

*WDNR Comment #3: Describe the criteria Enbridge used for selecting the proposed method for crossing wetlands and streams; preferably, in the form of a decision-tree.*

**Enbridge Response to WDNR Data Request Question #3**

Enbridge has provided substantial information in the Project's application materials, supplements, and agency information requests regarding the criteria used to select waterbody crossing methods. This document provides further information on how the waterbody crossing methodologies were selected and how the selected method minimizes impacts to wetlands and streams.

One of the best ways to reduce both primary as well as secondary impacts is to complete construction in an expedited fashion to minimize the duration of temporary impacts associated with disturbance. The quickest way to cross a waterbody and limit the duration of secondary impacts is to complete an open-cut crossing. Open-cut crossings minimize the duration of in-stream construction and allow restoration of the ROW to occur relatively quickly. Open-cut crossings do result in temporary impacts to the waterbody. However, completion of work on the ROW and subsequent restoration of the ROW can occur more expediently which can minimize the secondary impacts which results in a net benefit to the Project. Depending upon the flow and morphology of the stream crossed, total temporary direct impacts to a waterbody crossing can be greatly reduced by completing an open-cut dry crossing versus trenchless methods, which will be discussed in future detail later in this response.

Trenchless crossing methods can reduce the temporary waterbody impacts, but they have limitations and can result in additional direct impacts and increased secondary impacts as a result of those limitations.

The limitations of the HDD trenchless crossing method include:

- In most instances, HDDs take longer to complete than a trench method, increasing the duration of disturbance to the surrounding areas.
- May result in different direct and secondary impacts as compared to a trenched method, such as inadvertent returns ("IRs").
- HDDs require sufficient straight ROW length to accommodate the actual HDD path as well as an equal length of ORW for the pullback string to be pulled in as one pipeline segment, resulting in the need for more workspace at each end of the HDD as well as restrictions on use of HDD where sufficient straight ROW is not present. The need for additional workspace can result in additional impacts.
- HDDs generally have a long profile. This length is the result of a few major design inputs including pipe diameter, pipe wall thickness, pipe grade, angle of entry and exit of the HDD, entry elevation, exit elevation, depth of primary obstacle, depth of non-primary included obstacles, desired burial depth, hydrofracture factor of safety, soil types, hydrotechnical scour susceptibility, channel width, and others. All of these factors may affect the length of the HDD and pullback string length. Based on the diameter of the proposed pipe and pipe wall thickness, the minimum HDD radius from entry to exit is approximately 1,280 feet under optimal conditions. For reference the shortest HDD on this Project is 1,774 feet.
- When coupled with the pullback length, and working room, the desired total for a fairly straight segment of ROW is approximately 3,600 feet.
- If routing of the pipeline cannot accommodate this full length of straight ROW, such as where the mainline ROW curves at the exit end of an HDD, an additional segment of ROW must be acquired and cleared to accommodate the length of the pullback string. The false ROW required increases impacts both direct and secondary.
- The HDD equipment and process requires larger workspace which can increase impacts.
- HDD construction is slower than trenching. When one looks at a minimum 1,280-foot HDD requiring 3,000 feet of disturbance, the installation of these 1,280 feet takes a minimum of approximately 8 weeks. The same 3,000 feet of pipeline installation by open cut construction would take 2 to 3 weeks to complete and restore. When the HDD is being completed over the 8 weeks period the ROW cannot be restored on each side of the HDD because construction crews need to maintain access to each side of the HDD until the HDD is complete. The result is the direct construction impacts remain in place longer on each side of the HDD, which can increase secondary impacts.
- There are only a limited number of HDD rigs available to the Project to complete the construction which further lengthens the time to complete the Project and increases secondary impacts. The Project has been able to contract for 12 HDDs and 1 DPI unit. The

number of trenchless crossings being completed is already high and will lengthen the time of open ROW for the Project.

- These considerations also apply to other trenchless technologies, like boring small waterbodies in a "road-bore" type fashion, with the exception that road bore type crossings would not require the same extent of additional straight ROW, but would instead require significant additional disturbance including deep excavation near the stream banks to establish the Project's depth of cover requirements. This method would further require increased dewatering and increased workspace at the waterbody, and the crossing method would be less safe to install.

Based on the factors above when selecting the waterbody crossing method, the best approach is to evaluate if an open cut crossing method is feasible. Open cut crossings are feasible in most cases; however, where there are high flows, deep streams, wider stream widths, boat traffic, and other factors present, the open cut can become challenging and require more work and time in the waterbody. Open cut crossings of large width waterbodies would require equipment traffic to a large extent on the bed of the waterbody and side casting excavated material in the waterbody, which if a dry crossing was not completed would result in increased sedimentation. Dry crossings could be completed but it would require dam and pumping or dam and flumes to be in place for a longer time, more equipment driving on the waterbody bed, and sidecasting excavated spoil material below the ordinary high-water mark ("OHWM") would still occur within the dams on the waterbody bed which could increase sedimentation once the dams are removed. High flows of a large width waterbody require more extensive dams and pumps or flumes to maintain water flow. Increased depths make dry crossings more challenging for similar reasons. A sauerman dragline could be used to cross wide, high flow, and/or deep waterbodies, but this construction method results in higher sedimentation during construction and is not favorable. For streams or rivers with active boat traffic, navigation present in the waterbody makes a dry crossing not practicable unless the crossing was completed in two halves to maintain navigability. The presence of a sauerman dragline operation would also impact navigation by boat traffic. The more time construction crews spend in an area almost always results in increased direct and secondary impacts as previously stated. Attachment 3 shows the crossing method decision flow chart. The flow chart starts out with assessing if the waterbody crossing is feasible as an open cut crossing. The gray box to the right of the first box shows the considerations for feasibility of an open cut crossing. Based on these considerations the next decision box factors in these considerations to determine if there would be challenges or secondary impacts such as time or increased sedimentation to an unacceptable level.

The decision box here sends the flow chart down the trenchless method flow path. More definition of this decision box is provided as follows:

Primary Driver for Trenchless method:

- Large streams or rivers with high flows or deep depths which are challenging and require more time to cross, pose a risk for more sedimentation, and would have impacts to navigation are the primary drivers for a trenchless crossing method.

Secondary Drivers for the Trenchless method:

- Streams or rivers with steep banks or bank materials which will be difficult to restore.

- Elevated topography at the crossing in combination with flow and depth is also a consideration.

The next box on the Trenchless Method flow path looks at the ability to have a straight ROW to accommodate a Trenchless method. The decision box considers HDD, as this is the most available and widely used trenchless method in the industry. As discussed above, the minimum drill length for a 30-inch diameter pipe of the required pipe wall thickness is approximately 1,300 feet. The minimum drill length increases with topography, minimum depth required under the waterbody to have an acceptable safety factor in the hydrofracture analysis to not have IRs, and entry and exit angle limitations. If this minimum drill length is not available, then there are three options. One is shown on the flow chart, specifically consideration of rerouting the pipeline. The two not shown because a flow chart needs to have yes, or no decision boxes is to assess suitability for direct pipe or to reconsider the feasibility of open cutting.

The next decision box on the Trenchless flow path pertains to availability of and potential impacts to workspace. As discussed above, trenchless methods require more workspace for the HDD drilling or direct pipe installation equipment and process, as well as for pipe assembly. The pipe string and assembly workspace must be relatively flat because the drill string cannot have bends that would impact the ability to install the pipe in the drill hole. Limited topography changes can be accommodated by the height of pipe cribbing and the flexibility of the pipe string, but there are limitations to these options that limit the feasibility of the HDD trenchless method. When this method is not available, reroutes are considered as before, with the minimum radius requirement. Again, at this box two options are not shown because of the reason previously stated and they are direct pipe or relooking at open cutting. The additional workspace must also be reviewed for the additional impacts. Wetlands, waterbodies, forested areas, and secondary impacts of the increased time to complete the HDD as previously described. Depending on topography, the additional impacts may make an HDD not appropriate and again may result in a reroute decision or looking at direct pipe and/or open cut.

The last decision box in the Trenchless method flow path looks at the geotechnical results for feasibility of an HDD. The HDD technology has developed extensively since it was first conducted in the industry. HDD's can be completed in most soil and bedrock geologies. There are some geologies however that are less conducive to drilling such as substrates with large boulders and cobbles present or other conditions which result in collapse of the borehole which does not allow the pipe to be pulled through the pilot and reamed hole.

When the geology is problematic for an HDD, a DPI is considered. The DPI uses a mechanical auger process versus a fluid drilling process. The mechanical auger process also advances the pipe as the auger progresses. The mechanical auger process can address the geology limitations of an HDD by advancing the pipe as the auger progresses since the pipe advancing with the auger thereby keeping the hole open throughout the crossing process. Similar to HDD, the DPI method requires significant workspace to accommodate the equipment necessary to install the pipeline and has greater limitations on the installation angles. DPI is less commonly used and there are not as many mechanical auger rigs available for these types of crossings, so they are only used when needed.

The crossing method flow chart has a second flow path, which is the more commonly used path because most waterbodies crossed by the Project are relatively small, shallow, and have limited flows. Waterbodies of this nature can be crossed by a dry crossing method which limits the potential for sedimentation. Excavation equipment can operate in uplands from the banks of the river, excavated material can be stored in piles outside the waterbody in the temporary workspace, and the crossings can be completed in a short period. The dry open cut crossing process was modeled by RPS for sediment transport which showed limited temporary impacts to water quality from suspended solids and no permanent adverse impacts to sediment loads.

The open cut flow path starts with the open cut method and then looks at the considerations as before. When the stream is not wide, does not have high flows, is not deep, and does not have navigation, the open cut crossing has limited temporary impacts, the workspaces are smaller, and secondary impacts are reduced because of the expediate nature of completing the crossing and the Project as a whole.

The second decision box in the open cut flow path considered if the stream has a special designation or an endangered species. Streams that have a special designation and have medium flows, larger widths and depth, and other factors may be moved to the Trenchless flow path. The Project does not have any waterbodies of this nature which are not being crossed via HDD. The majority of waterbodies with special designations are being crossed by HDDs on the Project.

Stream banks considerations are the next decision box in the open cut crossing flow path. Most stream bank materials can be restored. Billy Creek on the Line 5 relocation Project was changed to an HDD from an open cut because of the soils and the slopes at the creek.

The sediment discharge decision box asks the question whether potential sediment discharge can be controlled. There are many Best Management Practices (“BMPs”) available to control sediment discharge. The Project Environmental Protection Plan (“EPP”) and Erosion and Sediment Control Plans (“ESCP”) document the BMPs to be used. As a result, sediment discharge can be controlled, but there are limited cases where this could be a factor and thus a box to direct back towards the trenchless flow path.

The final decision box in the open cut crossing flow path considers if there is water flowing at the time of crossing. The vast majority of waterbodies on the Project are very small intermittent or ephemeral streams. Enbridge has committed to using the dry crossing method where flowing water is present to minimize the direct impacts from construction as well as the secondary impacts. When water is not present, or the water is stagnant and fewer than 6 inches deep, the crossing would be crossed by the wet trench method, meaning dam and pumps or flumes will not be used.

**Wetlands:**

A flow chart for the wetland crossing method was not developed for this Project. The reason being the wetlands on the Project are stable soil wetlands which can be crossed by open cut methods. Again, looking at the aspect of least amount of time in an area provides the least impact. There are situations where saturated (e.g., standing water) wetlands with unconsolidated substrates, boggy wetlands, and deep peat wetlands, as examples, may be more suitable to an HDD crossing or push-pull type installation across the wetland, but these features have not been identified on the Project that are not already proposed as HDDs.

Similarly, the wetlands adjacent to streams are limited and generally not saturated, lending themselves to being crossed by open cut crossing techniques and restored using BMPs. Past project experience shows that wetlands readily re-establish themselves and post construction monitoring plan has been developed to monitor the wetlands and document their re-establishment.

**Routing and Selection Nuances:**

The flow chart discussions above do not capture some of the nuances in the pipeline routing and waterbody crossing reasons. There are times when features exist where multiple features, such as a highway or a railroad and a waterbody are located close together with limited space between each feature. When this occurs, an HDD is often proposed versus completing each crossing as separate items. An example like this is at the Highway 13 crossing, where there is a highway, a railroad, and a stream in-between. Each by themselves, could be crossed using standard pipeline installation techniques, but when stacked together the routing and crossing method selection decisions are made by looking at the collective features.

**HDD**

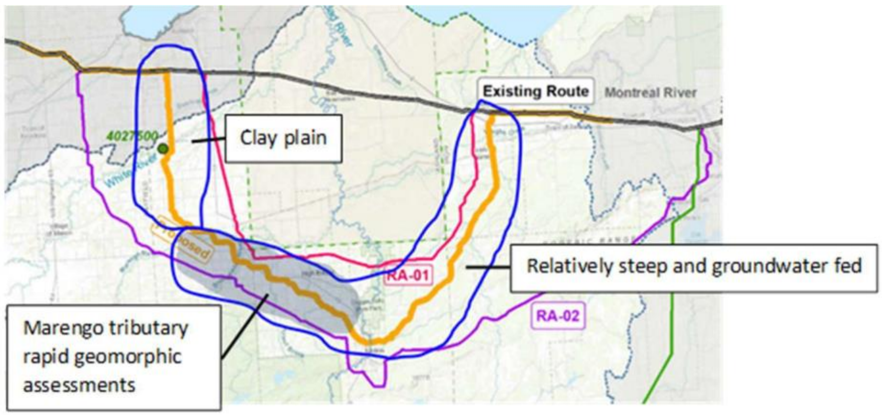
As discussed in previous Enbridge filings as well as above, Enbridge has internal construction standards that are used in conjunction with experience from specialized HDD design firms to develop site-specific plans for each HDD. Enbridge's designs incorporate and consider geotechnical information documenting subsurface geology, topography between the entry and exit locations as well as workspace for pipe fabrication, required depth below river bottom, pipe diameter and associated installation radius and drilling mud hydraulics. For this Project, Enbridge conducted preconstruction geotechnical investigations to design and confirm the suitability of the subsurface material for HDD. In concert with those carefully developed designs, Enbridge will use a highly experienced HDD company with years of experience successfully completing drills to help plan, design and execute each drill. These plans will include the requirements set forth in Wisconsin Technical Standard 1072 for Horizontal Directional Drilling. Enbridge further evaluated the designs and events of the recent Line 3 Replacement Project in Minnesota with its HDD design engineering firm to assess modifications to the Project designs to further reduce the likelihood of an IR. Enbridge made modifications to the Project HDD designs as appropriate. However, to be successful, an HDD operation requires large additional temporary workspaces at the drill entry and exit locations for staging and equipment. It also requires suitable subsurface geology conductive to drilling; relatively flat topography for pipe fabrication; and a relatively straight cleared area of ROW on the drill exit side to fabricate the pipe segments to be pulled back under the river.

An HDD crossing of this length or greater for narrow waterways is not warranted and may not be feasible without additional ROW area, and suitable topography and subsurface geology. Moreover, as described above, use of the HDD method could result in additional wetland and waterbody impacts due to the additional workspace required for drilling and pipe string fabrication. For small waterbodies, the additional impacts associated with an HDD could offset any environmental advantages in the utilization of HDD. Additionally, further use of the HDD method would result in extension of the Project construction schedule to accommodate the additional time required to complete an HDD, resulting in longer disturbance to resources near the HDD locations that would remain disturbed until the HDDs could be completed.

**WDNR Data Request Question #4:**

*WDNR Comment #4: Provide an explanation of whether and how the following characteristics were included in the decision criteria for selecting what crossing method to use, plus any other criteria that were included when proposing a method:*

*a. Environmental quality of the wetland or stream to be crossed (e.g., trout stream, high-quality wetland, outstanding/exceptional resource water)*
*b. Stream/river width (e.g., streams/rivers greater than 10 ft. wide)*
*c. Streams with or without adjacent wetlands*
*d. Potential geohazards in or near the wetland or stream to be crossed (refer to the geohazard table provided by Enbridge in November 2021, which is posted at: https://widnr.widen.net/s/nhtvvbwmzp/4_l5wsr_potentialgeohazards_fromenbridge_combined_2021.11.03.)*
*e. Steep slopes in or near the area to be crossed, including bluffs and adjacent uplands that would be drilled/bored under*
*f. Soil conditions (e.g., peat, very soft clay) of the area to be crossed, including adjacent uplands that would be drilled/bored under*
*g. Geologic conditions (e.g., moderately or highly fractured rock) of the area to be crossed, including adjacent uplands that would be drilled/bored under*
*h. The need for blasting and associated impacts to the potential migration of water*
*i. The results of hydro fracture analyses (graphs submitted on July 12, 2023)*
*j. The potential for an aquifer breach and any best management practices that could be used to help prevent such a breach*
*k. Groundwater depth as indicated by Geotech bores, nearby well logs, or other information sources*
*l. Artesian conditions encountered or indicated by Geotech bores, nearby well logs, or other information sources*
*m. Regional differences in geomorphology, erosion hazard, and groundwater contribution between the Clay Plain, (2) Clay-to-Sand/Gravel Transition Zone (i.e., Upper Marengo watershed), and Penokee Hills/Copper Falls Formation (i.e., area east/northeast of the proposed Bad River crossing). (See map below.)*
*n. Fluvial Erosion Hazard Rapid Geomorphic Assessment Data for the Marengo Watershed developed by U.S. Geological Survey and others (Fitzpatrick et al. 2022, available at: https://www.sciencebase.gov/catalog/item/6230edbad34ec9f19eeaf615)*

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**Enbridge Response to WDNR Data Request Question #4**

4.a Enbridge reviewed publicly available data (e.g., WDNR Surface Water Data Viewer and Wisconsin Administrative Code) to identify waterbodies within the Project area that have special designations such as Exceptional Resource Waters ("ERW"), Outstanding Resource Waters ("ORW"), including trout streams. These special designations were factored into the proposed construction method for crossing each stream along with many other factors. Please refer to Enbridge's Decision Matrix Table included in Response #3 above regarding how this factor was incorporated.

The primary control used to minimize impacts to wetlands has been through routing to avoid and/or minimize impacts to the extent practicable and by reducing the width of the Project workspace within wetlands where impacts could not be avoided. Wherever practical, wetlands were avoided first prioritizing forested wetlands, then scrub/shrub and emergent wetlands. If avoidance was not practicable and no other significant construction obstacle existed, Enbridge proceeded with designing construction using wetland construction techniques.

4.b Stream width was considered as a factor for selecting a crossing method, however, it was assessed along with other factors. Along with width, Enbridge also assessed stream depth and flow. Stream width, depth, flow, and adjacent terrain characteristics are evaluated together to determine if the waterbody could be crossed using a dry crossing technique. Stream width in and of itself is not a standalone decision factor in determining a crossing method as wide, shallow streams, especially streams with limited or intermittent flow, may still be crossable by open/dry cut methods.

4.c The size and type of wetland adjacent to a stream were analyzed as part of the stream crossing technique only in determining general characteristics of both soil conditions and groundwater levels. Saturated and/or standing water wetlands with poorly defined stream banks are difficult to cross using dry crossing techniques as the stream channel cannot be effectively isolated from the surrounding wetland. Similarly, waterbody crossings within large riparian wetlands with near-surface water and deep unconsolidated soils can make construction of stream crossings more challenging. However, the presence of an adjacent riparian wetland alone was not a primary driver for selecting a waterbody crossing method. Additionally, the wetlands adjacent to waterbodies on the Project do not have the problematic conditions that would require a dry crossing technique as described above.

4.d Potential geohazards along the Project's route can be geotechnical or hydrotechnical in nature. Geohazards include slope instability, hazardous soils, and subsidence. As part of the overall pipeline routing process, Enbridge identified and evaluated each geohazard and how that hazard could affect pipeline construction, pipeline operation, and the potential to impact environmental resources such as wetlands or waterbodies. Enbridge's route was selected to minimize geohazards to the extent practicable. Where a geohazard could not be avoided, Enbridge evaluated mitigation approaches. As discussed in Enbridge's response to WDNR's September 1, 2021 Data Request (Questions #7 and #8 Response submitted on September 16, 2021) and Enbridge's supplemental response filed on October 4, 2021, Enbridge analyzed the pipeline route and designed the pipeline to mitigate the potential risk of erosion that could lead to future pipeline exposure. As part of Enbridge's design process, Enbridge completed an assessment that included:

- visual observations of the channel crossing;
- topographic measurement and physical sampling of the channel;
- comparison of present and historic aerial imagery;
- analysis of the channel crossing watershed;
- determination of recurrence interval peak flood flows;
- determination of threshold channels;
- determination of channel properties related to geometry-flow dynamics specific to various recurrence intervals; and
- determination of scour depths and estimation of the likelihood of meandering based on various recurrence intervals and historic aerial imagery.

Each channel crossing was assessed for the likelihood that various geohazards may present themselves over the course of the pipeline's lifetime including vertical channel movement, horizontal channel movement, and channel relocation. Each of these hydrotechnical geohazard was rated as either unlikely, possible, or likely to occur at each channel crossing over the course of the pipeline's lifetime.

Enbridge assessed the integrity of the channel boundary and potential for hydrotechnical geohazards for channel crossings associated with the Project. Enbridge then used this information on the potential for scouring and/or exposure of the pipe to design the minimum depth of pipeline at and on the approaches to each crossing.

Mitigation measures to prevent erosion and a pipe exposure from a 100-year storm event have been incorporated in the waterbody crossings designs which includes: scour depth, rip-rap, channel bottom and bank armoring, bank restorations (i.e., root wads, soil wraps, willow stakes, brush layering, coir matting, biologs), backfill and compaction requirements, usage of bed material, and soil amendments. Note that 13 streams have been designed with HDD and DPI to reduce the risk of geohazard and minimize the impact of an open cut in the watercourses and steep banks.

Avoidance of geohazards was a key design element when laying out the route, many were avoided by moving the route to its current alignment. A further review then identified remaining geohazards. Each remaining geohazard was assessed and a mitigation was designed for each.

These geohazards included slope instability, flowable soils, and areas where subsidence and other hydrotechnical geohazards were identified.

The process for identifying such locations was as follows:

- Complete a desktop investigation to characterize geohazard areas using existing and public databases and information (Project data, topographical investigation, geological investigation, hydrotechnical investigation, localized investigation);

- Complete a field investigation to further characterize and evaluate the areas identified during the desktop investigation to collect additional information and to confirm potential geohazards identified and generate a risk ranked profile for each location including in some cases extending beyond areas surveyed or observed. Information collected includes:
    - Site description;
    - Geotagged photographs;
    - Geohazard characteristics;
    - Slope instability features (i.e., angles, materials, soil properties, cracks or depressions, etc.);
    - Subsidence features (i.e., soil layering, new growth patterns, etc.);
    - Soil characteristics and sampling;
    - Shallow or exposed bedrock outcrops;
    - Vegetation;
    - Springs, water seepage, ponding, or high-water table; and
    - Stream characteristics (channel movement, undercut banks, etc.).

- Mitigation of the geohazard was based on field investigation and other analyses to achieve the best design for each location. Examples of mitigation designs that were used include:
    - Pipeline Reroutes;
    - HDDs;
    - Increased Pipe Depth;
    - Slope stabilization Plans;
    - Drainage Schemes; and
    - Erosion and Sediment Controls.

After a geohazard has been identified and mapped, a preliminary qualitative geohazard threat level was assigned (Low to High). The threat level was assigned based upon best professional judgment taking into account potential magnitude, location, likelihood, and severity of the geohazards' impact to the Project.

Site-specific mitigation measures were developed during the Project and were designed to address each geohazard. These include:
- Avoidance of side slopes to cross contour lines perpendicular with the pipeline;
- Avoidance of paralleling meandering watercourses;
- Drainage;
    - Trench Plugs, Rip-Rap Ditches, Pipe Trench Drains, Longitudinal Drains, Transverse Drains;
- Surface water controls;

  - o Waterbars, Diversion Ditches;
- Depth of cover;
- Backfill and Compaction Requirements;
- Soil Amendments;
- Mechanically Stabilized Slope Options; and
- Slope Facings.

During the construction phase, if additional geohazards or potential geohazards are identified, Enbridge would evaluate the identified area and develop corrective actions, based on the site-specific conditions.

Enbridge may also elect to install monitoring equipment in areas identified as a geohazard location or potential future geohazard location. This equipment may include strain gages, inclinometers, GPS pins, or similar devices.

4.e Steep slopes can be a factor in choosing crossing type. Please see Enbridge's response to WDNR Data Request Question 4.d. above regarding geohazards, which include steep slopes.

4.f Please see Enbridge's response to WDNR Data Request #3 above regarding use of the HDD method.

4.g Please see Enbridge's response to WDNR Data Request #3 above regarding use of the HDD method.

4.h Enbridge assessed areas that may require blasting as part of its constructability review. Enbridge developed a blasting plan that includes the use of trench breakers to minimize the potential for subsurface water movement following blasting. Additional information is also provided in Enbridge's response to USACE December 9, 2022, Data Request responses (filed with the USACE on June 9, 2023).

4.i Enbridge used the hydrofracture analysis results to develop a design profile that meets or exceeds a safety factor of two. This safety factor was used along the HDD path to evaluate the HDD drilling pressure in regard to the soil capacity to confine the drilling pressure and avoid potential IRs of drill fluid to the surface. The soil characteristics were taken from the geotechnical bore logs provided by Braun Intertec after the 2020-2021 geotechnical survey program (see Enbridge's response to WDNR Data Request Question 2 above). The depth of the HDDs were adjusted to ensure that each segment of the HDDs passes through geology at a depth which results in a confining capacity that reduces the risk of an IR. During the drilling operation, the contractor will continuously measure the drilling fluid pressure at the front head of the drill bit, the fluid returns, as well as assessing the cuttings coming back to the drill rig. These readings allow the operator to: control the rate of penetration; monitor the pressure in the hole; and see the material that the drill bit is going through. These three readings, combined with close monitoring of the geodesic coordinates, will confirm that the design profile is met within acceptable tolerances and will confirm that the geotechnical strata is aligned with the geotechnical data found during the borehole program. The annular pressure is controlled at the drilling rig to not exceed the hydrofracture curve calculated. Based on the ongoing assessment of the drilling conditions, the HDD operator can increase the number of reaming passes/cleaning passes, reduce the rate of penetration (depending on the soil found) or increase the rate of return of cuttings to reduce the resistance in the hole seen by the drilling bits and thereby reduce the risk of an IR. Finally, WDNR-approved additives may be added to the bentonite to help sealing the wall inside the hole that would also contribute to reduce the risk of IR.

In the case of the Marengo River, the soils did not appear to meet the design specifications to support successful completion of an HDD; therefore, Enbridge has proposed the crossing as a DPI. As discussed above, the DPI method installs the carrier pipe through the soil with an auger removing the material as the pipeline installation progresses, thereby supporting the "excavated" hole throughout pipe installation.

4.j Enbridge has conducted multiple investigations to identify the potential for encountering shallow confined aquifers along the Project route. Enbridge provided information regarding potential aquifer breaches in its response to USACE December 9, 2022, Data Request responses (filed with the USACE on June 9, 2023) and Enbridge's response to WDNR Data Request Question 2 above.

4.k Groundwater depth as indicated by nearby well logs or geotechnical bores would provide some indication of difficulty of open cutting a crossing as it pertains to dewatering of the ditch line; however, applicability of such logs and bores decays quickly with distance from the crossing as well as when the bore/well is at a different ground elevation than the crossing due to water tables following topography. Weighting of water table characteristics might be given to bores/logs located within +/- 50 feet of the water crossing.

4.l Enbridge has conducted multiple investigations to identify the potential for encountering shallow confined aquifers that could result in artesian conditions along the Project route. Enbridge provided information regarding potential aquifer breaches in its response to USACE December 9, 2022, Data Request responses (filed with the USACE on June 9, 2023) as Enbridge's response to WDNR Data Request Question 2 above.

4.m Enbridge evaluated the information obtained through geotechnical surveys specific to the Project corridor rather than more generalized information.

4.n The referenced document Fluvial Erosion Hazard Rapid Geomorphic Assessment Data for the Marengo Watershed developed by U.S. Geological Survey and others (Fitzpatrick et al. 2022, available at: https://www.sciencebase.gov/catalog/item/6230edbad34ec9f19eeaf615) was not part of the review process. The Project crossing methods were determined and applications submitted and had substantial review process completed well before the reference document was developed in 2022. Additionally, as in 4.m above, Enbridge evaluated the information obtained through geotechnical surveys specific to the Project corridor rather than more generalized information.

**<u>WDNR Data Request Question #5:</u>**

*Provide site-specific reasoning for selecting trenching versus HDD for the following Proposed Crossings:*

- *5.a: MP 14.7 (sasc1006p) Unnamed Tributary to Brunsweiler River*
- *5b: MP 15.8 (sasc1003p_x1) Unnamed tributary to Trout Brook*
- *5c: MP 19.8 (sasd1015p) Unnamed tributary to Silver Creek*
- *5d (MP 28.7 (sasw011) Unnamed tributary to Gehrman Creek*

- *5e (MP 35.9 (sira001i, wira008s, wira008e, wira008f) headwaters to Coil Creek*

**Enbridge Response to WDNR Data Request Question #5**

As discussed above, open cut dry trench methods such as dam and pump or dam and flume, offer advantages in many situations. Some of those advantages may include faster installation, ability to limit move-arounds, shallower disturbance levels, no risk of IRs, more predictable construction timing, less specialized equipment, less specialized engineering, and less overall resources necessary to complete the crossing. As a result, dry trench methods are generally the preferred method until the crossing difficulty or specific environmental condition warrants increasing complexity of the crossing method to something like an HDD or DPI. Please refer to Enbridge's response to WDNR Data Request Question #3 above, which details the crossing selection process.

**5.a: MP 14.7 (sasc1006p) Unnamed Tributary to Brunsweiler River**

Waterbody sasc1006p is a perennial stream bordered by a floodplain wetland complex. The identified OHWM is approximately 8 feet wide with water's edge to water's edge distance at the time of survey being approximately 4 feet and water's depth of approximately 0.5 feet.

The adjacent wetland (wasc1033) includes both emergent as well as shrub-carr habitat. Construction will temporarily disturb approximately 0.17 acre of wetland (approximately 0.05 acre of emergent wetland and approximately 0.12 acre of shrub-carr wetland. Approximately 0.07 acre of shrub-carr wetland will be converted to emergent wetland following restoration.

The unnamed Tributary to the Brunsweiler River as described above is not a wide, or deep, fast flowing waterbody. Based on these factors, the open cut flow path would be followed on the decision flow chart. Since the waterbody is classified as a perennial tributary to a trout stream, Enbridge selected a dry crossing method to reduce the potential for downstream sediment transport during active construction.

Although the waterbody is located in a valley with slopes greater than 20 percent on both the east and west approaches, these slopes can be reconstructed using BMPs and restoration techniques, such as installation of erosion control blankets, trench breakers, slope breakers, and reseeding. Enbridge is developing a site-specific slope restoration plan for this location incorporating these BMPs. Enbridge will submit this plan to the WDNR upon completion of the drawing.

Although technically feasible based on desktop analysis, an HDD of sasc1006p using a general minimum HDD drill radius of approximately 1,300 feet would require additional workspace that would likely increase the impact on some neighboring wetlands, require additional tree clearing, place the pullback section of pipe within 200 feet of a residence, and would increase the activity level and duration of construction. The proposed crossing method will minimize in-stream sedimentation. Based on a literature review and modelling results, the proposed crossing method will have only a minor, localized, and temporary effect and will not impact stream-wide water quality, while avoiding these secondary impacts.

**5b: MP 15.8 (sasc1003p_x1) Unnamed tributary to Trout Brook**

Waterbody sasc1003p_x1 is a perennial stream bordered by a floodplain wetland complex. The identified OHWM is approximately 8 feet wide with water’s edge to water’s edge distance at the time of survey being approximately 6 feet and water’s depth of approximately 1.0 foot.

The adjacent wetland (wasc1014f) includes both emergent as well as shrub-carr habitat. Construction will temporarily disturb approximately 0.21 acre of wetland. Approximately 0.12 acre of forested wetland will be converted to emergent wetland following restoration.

This unnamed tributary to Trout Brook as described above is not a wide, or deep, fast flowing waterbody. Based on these factors, the open cut flow path would be followed on the decision flow chart. Since the waterbody is classified as a perennial tributary to a trout stream, Enbridge selected a dry crossing method to reduce the potential for downstream sediment transport during active construction.

Although the waterbody is located in a valley with slopes greater than 20 percent on both the east and west approaches, the slopes are limited in length. These slopes can be reconstructed using BMPs and restoration techniques, such as installation of erosion control blankets, trench breakers, slope breakers, and reseeding. Enbridge is developing a site-specific slope restoration plan for this location. Enbridge will submit this plan to the WDNR upon completion of the drawing.

Although technically feasible based on desktop analysis, an HDD of sasc1003p_x1 using a minimum radius drill of approximately 1,300 feet (minimum distance under optimal drilling conditions) would require additional workspace that would increase the impact on wetlands, require additional tree clearing, and would increase the activity level and duration of construction. The proposed crossing method will minimize in-stream sedimentation. Based on literature review and modelling results, the proposed crossing method will have only a minor and localized effect and will not impact stream-wide water quality. Based on literature review and modelling results, the proposed crossing method will have only a minor, localized, and temporary effect and will not impact stream-wide water quality.

**5c: MP 19.8 (sasd1015p) Unnamed Tributary to Silver Creek**

Waterbody sasd1015p is a perennial stream bordered by a floodplain wetland complex. The identified OHWM is approximately 8 feet wide with water's edge to water's edge distance at the time of survey being approximately 6 feet and water's depth of approximately 0.75 foot.

The adjacent wetland (wasd1033) includes both forested as well as shrub-carr habitat. Construction will temporarily disturb approximately 0.10 acre of wetland. Approximately 0.06 acre of forested/scrub-shrub wetland will be converted to emergent wetland following restoration.

The unnamed Tributary to Silver Creek as described above is not a wide, deep, fast flowing waterbody. Based on these factors, the open cut flow path would be followed on the decision flow chart. Since the waterbody is classified as a perennial tributary to a trout stream, Enbridge selected a dry crossing method to reduce the potential for downstream sediment transport during active construction.

The waterbody is located in a valley with slopes greater than 20 percent on both the east and west approaches. Enbridge has assessed these slopes and is designing a site-specific slope restoration plan for this area. Enbridge will submit this plan to the WDNR upon completion of the drawing.

Due to the topography at this crossing, with the current alignment, a minimum radius HDD would not be feasible. The additional workspace required for an HDD would increase the impact on wetlands (including forested wetlands) and the pipe fabrication area would increase the activity level and duration of construction in wetlands. Additionally, the construction workspace for the HDD pullback section would extend across Silver Creek outside of the Project's current workspace configuration. The proposed crossing method (using a dry crossing method) will minimize in-stream sedimentation. Based on literature review and modelling results, the proposed crossing method will have only a minor, localized, and temporary effect and will not impact stream-wide water quality.

**5d: MP 28.7 (sasw011) Unnamed Tributary to Gehrman Creek**

Waterbody sasw011p is an intermittent stream bordered by a floodplain wetland complex. The identified OHWM is approximately 6 feet wide with water's edge to water's edge distance at the time of survey being approximately 4.5 feet and water's depth of approximately 0.50 foot.

The adjacent wetland (wasw023s) is shrub-carr habitat. Construction will temporarily disturb approximately 0.30 acre of wetland. Approximately 0.16 acre of scrub-shrub wetland will be converted to emergent wetland following restoration.

The unnamed tributary to Gehrman Creek as described above is not a wide, deep, fast flowing waterbody. It is not classified as a trout stream or perennial tributary to a trout stream. Nor does it have any other special designation. Based on these factors, the open cut flow path would be followed on the decision flow chart. As previously stated, all flowing waterbodies will be crossed by the dry crossing method to reduce sediment and other impacts. The waterbody is located in an area with minimal topographic relief. The banks can be restored by implementing standard BMPs.

Based on a desktop review, an HDD may be technically feasible at this location; however, an HDD would result in an increased disturbance to wetland wasw024f, wasa031f, and sasa004p to accommodate workspace expansion for the HDD and assembly of the pullback. The workspace required for an HDD would increase the impact on wetlands (including forested wetlands) and the pipe fabrication area would increase the activity level and duration of construction in wetlands.

**5e: MP 35.9 (sira001i, wira008s, wira008e, wira008f) Headwaters to Coil Creek**

Waterbody sira001i is an intermittent stream bordered by a floodplain wetland complex. The identified OHWM is approximately 6 feet wide with water's edge to water's edge distance at the time of survey being approximately 4 feet and water's depth of approximately 2 feet.

The adjacent wetland (wira008) includes shrub-carr, forested, and emergent wetland habitats. Construction will temporarily disturb approximately 1.02 acre of wetland. Approximately 0.37 acre of scrub-shrub/forested wetland will be converted to emergent wetland following restoration. Field notes from the delineation indicate that the surrounding area has been heavily logged and documented beaver activity.

The WDNR Surface Water Data Viewer identifies this waterbody as an unnamed intermittent stream (WBIC 3000151). The stream is not a wide, deep, fast flowing waterbody or is described as having any special designations. Based on these factors, the open cut flow path would be followed on the decision flow chart. As previously stated, all flowing waterbodies will be crossed by the dry crossing method to reduce sediment and other impacts. The waterbody is located in an area with minimal topographic relief. The banks will be restored by standard BMPs.

Based on a desktop review, an HDD may be technically feasible at this location; however, an HDD would result in increased disturbance to wetland wira008f, wira008f, wasa031f, and sasa004p to accommodate workspace expansion for the HDD and assembly of the pullback pipeline segment. The workspace required for an HDD would increase the impact on wetlands (including forested wetlands) and the pipe fabrication area would increase the activities in and duration of construction in wetlands.

**DOCUMENT: EROSION CONTROL MAP**

**WDNR data Request Question ECM-1:**

*The erosion control and stormwater management plans submitted to date do not appear to reflect 100% design.*

**Enbridge Response to WDNR Data Request Question ECM-1**

Enbridge's Erosion Control and Stormwater Management Plan is developed to show the base conditions anticipated to be encountered during construction and restoration of the Project. The plan is intended to be adaptive based on actual field conditions at the time of construction. Enbridge is incorporating revisions to the Erosion Control and Stormwater Management Plan, including revisions to the site-specific mainline valve plans. These revised plans will be submitted to the WDNR upon completion.

**WDNR data Request Question ECM-2:**

*How will dirt access roads be maintained so as to not rut or have sediment wash away during rain events?*

**Enbridge Response to WDNR Data Request Question ECM-2**

Enbridge will maintain temporary access roads throughout construction to minimize resource disturbance associated with Project activities, such as rutting and/or sediment runoff. The level of effort needed to maintain the temporary access roads during active construction will be based on field conditions encountered throughout construction. Where access roads cross a wetland, Enbridge will install matting through the wetland to minimize the potential for rutting and soil mixing due to construction traffic. If rutting develops along temporary access roads in upland areas, Enbridge will either add matting, install gravel/soil, grade the area, or restrict use of the access road until field conditions improve. Enbridge's erosion controls plans show locations where installation of erosion control devices are proposed along access roads based on presence of adjacent sensitive resource areas such as wetlands/waterbodies or steep slopes. Enbridge's Environmental Inspectors ("EIs") will be observing field conditions throughout construction. Should wet weather create field conditions that result in sediment transport, Enbridge's EIs will work with the Project's contractor to adaptively manage changing field conditions through installation of additional site-specific erosion controls based on changing conditions at the time of construction. These site-specific erosion controls will include silt fence, bio-logs, straw bales, or equivalent erosion and sediment control devices based on the changing site conditions. Where additional BMPs are necessary, Enbridge's EI and the Project's contractor will determine the appropriate BMPs based on field conditions (such as slope, length of slope, presence of sensitive features, or presence of concentrated flow) per the EPP and the applicable Technical Standards.

**WDNR Data Request Question ECM-3:**

*Will a cover crop be established prior to construction activities in row crop fields used for work area or laydown area where needed to limit bare soil exposure per s. NR 151.11 (8) (d), Wis. Adm. Code?*

**Enbridge Response to WDNR Data Request Question ECM-3**

Enbridge does not propose to establish a cover crop prior to construction activities in row crop fields. If row crops are planted prior to construction Enbridge will mow the row crops as part of clearing. Enbridge intends to segregate the top 12 inches of topsoil from the Project workspace in actively cultivated areas (or to actual depth of topsoil if less than 12 inches is present unless otherwise specified/requested by other plans, permit conditions, or the landowner) to protect the topsoil from potential Project-related impacts such as compaction and/or mixing of A and B horizon material. Enbridge's proposed methods are described in Section 9.0 of Enbridge's EPP and depicted on Figures 1-3 within the EPP. As described in EPP Section 9.0, upland areas where topsoil will be stripped include croplands, hay fields, pasture, residential areas, and other areas as requested by the landowner or as specified in the Project plans, commitments, and/or permits. Topsoil will not be used to construct berms, trench breakers, temporary slope breakers, improving or maintaining roads, or to pad the pipe. Gaps will be left where stockpiled topsoil and spoil piles intersect with water conveyances (i.e., ditches, swales, and waterways) to maintain natural drainage and install erosion control devices ("ECDs").

The following topsoil segregation methods will be employed during construction:

- Full Construction ROW (refer to EPP Figure 1)
- Trench-Line-Only (refer to EPP Figure 2)
- Modified Ditch-Plus-Spoil Side (refer to EPP Figure 3)

The Full Construction ROW topsoil segregation technique is typical in active cropland, hayfields, pasture, and residential areas which will consist of stripping topsoil from the spoil storage area, trench line, and the travel lane to the topsoil storage area. Enbridge utilizes the Trench-Line-Only topsoil segregation method where the width of the construction ROW is insufficient for other methods. Enbridge will utilize the Trench-Line-Only topsoil segregation method in wetlands without standing water. Enbridge does not typically segregate in standing water wetlands unless specifically requested by the landowner and/or managing land agency in accordance with applicable permit conditions.

Enbridge may use alternative topsoil segregation methods, such as Ditch-Plus-Spoil or Modified Ditch-Plus-Spoil Side, in non-agricultural or forested uplands or as requested by the landowner.

Once segregated, topsoil piles will be protected from erosion by either seeding, hydroseeding, applying an agency-approved tackifier, and/or mulching, depending on the length of time that the topsoil will remain segregated. In accordance with NR 151.11 (8)(d), Enbridge will temporarily stabilize spoil piles (including topsoil piles) in areas where construction activities have temporarily ceased and will not resume for a period exceeding 14 calendar days, as described in Enbridge's EPP, Section 8.4.

In row crop areas, Enbridge will return the land to tillable/planting condition (i.e., ready for planting). Enbridge will offer to seed row crop areas with an annual cover crop as part of final restoration; however, this will be dependent on landowner preference.

**<u>WDNR Data Request Question ECM-4:</u>**

*For additional temporary workspace that exceeds 1 acre that will not be stabilized during construction, provision of sediment traps and basins may be needed.*

**<u>Enbridge Response to WDNR Data Request Question ECM-4:</u>**

Enbridge has identified those areas where additional temporary workspace ("ATWS") exceeds one acre. Enbridge will maintain vegetation root structure in those areas where practicable and where full topsoil segregation is not required/anticipated. Where topsoil will be segregated, Enbridge will protect the associated topsoil piles as described in Enbridge's response to WDNR Data Request Question ECM-3 above. Enbridge is evaluating the potential need for, and will install sediment traps/sediment basins, in accordance with Wisconsin Technical Standards 1063 and 1064 (respectively).

**<u>WDNR Data Request Question ECM-5:</u>**

*The note 'trenchless construction mitigates ground disturbing activities along HDD drill path' is not recommended as that implies that no other erosion and sediment control may be needed. It would be better to have a note that communicates that ground disturbance is expected to be limited to clearing (but not grubbing) and vehicle access. If a localized area of ground disturbance occurs…insert description of measures that will be taken.*

**<u>Enbridge Response to WDNR Data Request Question ECM-5:</u>**

Enbridge is proposing to flush-cut vegetation along the HDD paths between the entry and exit workspaces. During installation of the HDD, Enbridge anticipates only foot traffic between the entry and exit workspaces to monitor for IRs during the drilling process. Enbridge does not intend to establish vehicle access related to HDD installation unless an IR develops that requires tracked or rubber-tired equipment access to the IR site. If clearing operations or IR response activities result in exposed soils, Enbridge will stabilize the exposed soil areas by applying seed and mulch (or equivalent). Enbridge will also evaluate the need for and install additional erosion controls (e.g., bio-logs or silt fence) at disturbed areas based on the extent of disturbance, slope, and potential for sediment transport. Enbridge does not anticipate the need to install additional erosion controls along the HDD paths unless ground disturbance is incurred.

**<u>WDNR Data Request Question ECM-6:</u>**

*How will perimeter controls be installed in frozen ground/snow covered conditions?*

**<u>Enbridge Response to WDNR Data Request Question ECM-6:</u>**

During frozen conditions, installation of certain temporary erosion and sediment control devices (e.g., silt fence and staked straw bales) may not be practicable or provide adequate resource protection due to installation challenges. In this case, alternative BMPs (such as compost filter socks, erosion control blankets, straw wattles, and/or mulch) will be installed on bare frozen ground or snow (less than 2 inches deep) to mitigate erosion and sediment migration during thawing events.

All erosion and sediment control devices will be subject to inspection and repair requirements as outlined in Section 8.2 of the EPP and/or applicable permits. When thawing conditions begin, BMPs will be monitored and upgraded as needed to prevent sediment deposition into resources or off site. BMPs will be installed as needed to provide a conduit for the concentrated flow of melt water to ensure that snow melt will not cause erosion and sediment loss.

Additionally, Enbridge will stabilize exposed ground surfaces using straw mulch (except for actively cultivated land and most wetlands). Mulch can be applied regardless of snow cover to cover at least 90 percent of the ground surface; sunlight will melt the straw into the snow and onto bare soil in the spring. Mulch will not be applied in wetlands or conveyance systems.

**WDNR Data Request Question ECM-7:**

*Provide detail on winter/fall stabilization techniques*

**Enbridge Response to WDNR Data Request Question ECM-7:**

Winter construction standards are included in Section 27 of the EPP. Stabilization methods during the winter and fall months will include seeding with a dormant seed mix, mulching, and the placement of erosion mats, as discussed in Enbridge's response to WDNR Data Request Question ECM-6 above. All mulch placed for winter stabilization will be anchored. Erosion mats will not be placed over snow cover that prevents the erosion mat from being properly anchored to the soil (2 inches of snow cover or more). Hydro-mulch and liquid tackifiers may also be used in accordance with the EPP and Technical Standard 1050.

**WDNR Data Request Question ECM-8:**

*Identify slopes 15-20% slope and >20% that are not adjacent to waterbodies. Summarize in a table by milepost or access road. Incorporate additional site-specific BMPs into the plans for these areas.*

**Enbridge Response to WDNR Data Request Question ECM-8:**

A table listing slopes 15 percent or greater is included as Attachment 4. Enbridge's Project-specific ESCP has been modified to incorporate additional BMPs in these areas, as applicable base on the slope angle and length.

**WDNR Data Request Question ECM-9:**

*Provide location of cuttings deposition for each HDD site.*

**Enbridge Response to WDNR Data Request Question ECM-9:**

Per Enbridge's EPP (Section 23.3.4), after the pipe is in place, excess drilling mud will be hauled to an Enbridge-approved disposal location or licensed disposal facility. Enbridge and its contractor(s) have identified 10 gravel pits near the Project. Enbridge is in the process of contacting the owners of these facilities to establish agreements with these landowners for delivery of the drill cuttings and excess drilling fluid. Based on landowner interest, Enbridge will conduct a site review of each location to verify that no wetlands/waterbodies are present that may be affected by drilling mud. Enbridge will only use sites where impacts to sensitive resources (e.g., wetlands) will be avoided. Enbridge will construct a bermed holding area at the off-site sand/gravel pit disposal location(s) to contain the drilling mud mixture and prevent migration of the material offsite. The water component of the drilling mud will then be allowed to evaporate. Enbridge will provide location information for the final selected drilling mud disposal locations prior to construction.

**WDNR Data Request Question ECM-10:**

*Please provide a map that shows proposed site restoration measures, including site-specific measures as agreed to in landowner agreements or with other stakeholders. If needed, this can be updated prior to permitting, where restoration measures are still being discussed.*

**Enbridge Response to WDNR Data Request Question ECM-10:**

Site-specific restoration measures have not been developed at this time. Enbridge will present the seed mixes included in the EPP for each landowner to select a seed mix(es) depending on how the landowner intends to manage the land following final Project restoration. Additional landowner requests (e.g., retaining cut timber or disposal of excess rock) will be evaluated by Enbridge on a case-by-case basis and verified that the request is allowable based on Project permits (e.g., no filling of wetlands or establishment of permanent road upgrades not consistent with State stormwater requirements). Enbridge will provide a map with site-specific restoration measures once developed.

**WDNR Data Request Question ECM-11:**

*Redundant perimeter control is needed on HDD sites along wetlands.*

**Enbridge Response to WDNR Data Request Question ECM-11:**

Enbridge has added redundant perimeter controls along the HDD workspaces where there are adjacent wetlands. Wetlands within the HDD workspace will be matted during active construction. Perimeter controls around the wetlands within the construction work area will be added following completion of the HDD as part of site clean-up/restoration. During restoration, Enbridge anticipated using singular ECDs around wetlands within the construction workspace unless site-specific conditions require installation of redundant controls.

**WDNR Data Request Question ECM-12:**

*First Bullet under General ESCP & EPP Notes – should clarify that modifications must be at least as protective of the environment as the BMP measure being adjusted or modified.*

**<u>Enbridge Response to WDNR Data Request Question ECM-12:</u>**

Additional language has been added to the first bullet to clarify that modifications must be at least as protective of the environment as the BMP measure being adjusted or modified.

**<u>WDNR Data Request Question ECM-13:</u>**

*Second bullet under 'Wetlands' – maximum depth of debris should be per permitting requirements, not environmental inspector. Typical allowable depth is 2 inches.*

**<u>Enbridge Response to WDNR Data Request Question ECM-13:</u>**

Additional language has been added to clarify the second bullet under the *Wetlands* section.

EPP Section 7.1 states that "Vegetation and trees within wetlands will be cut off at ground level, leaving existing root systems intact; clearing debris will be removed from the wetland for disposal. Hydro-axe debris, or similar can be left in the wetland if spread evenly in the construction ROW to a depth which will allow for normal revegetation, as specified in applicable permit conditions and to not exceed 2 inches."

**<u>WDNR Data Request Question ECM-14:</u>**

*Third bullet under 'Wetlands' – Please clarify if 'ditch line' is used to mean 'trench line' or use trench line consistently.*

**<u>Enbridge Response to WDNR Data Request Question ECM-14:</u>**

In the pipeline industry 'ditch line' and 'trench line' are synonymous terms and can be used interchangeably.

**<u>WDNR Data Request Question ECM-15:</u>**

*Fourth bullet under 'Wetlands' – modify this bullet to conform with Chapter 30 permit requirements.*

**<u>Enbridge Response to WDNR Data Request Question ECM-15:</u>**

Project-specific Chapter 30 permit conditions have not yet been established by the WDNR. Enbridge will work with the WDNR to incorporate appropriate language regarding wetland topsoil segregation following availability of the Chapter 30 permit conditions.

**<u>WDNR Data Request Question ECM-16:</u>**

*Sixth bullet under 'Wetlands' – modify this bullet to conform with Chapter 30 permit requirements.*

**<u>Enbridge Response to WDNR Data Request Question ECM-16:</u>**

As discussed in Enbridge's response to WDNR Data Request Question EMC-15 above, Project-specific Chapter 30 permit conditions have not yet been established by the WDNR. Enbridge will work with the WDNR to incorporate appropriate language regarding wetland backfilling following availability of the Chapter 30 permit conditions.

**<u>WDNR Data Request Question ECM-17:</u>**

*Last bullet under 'Wetlands' – Clarify which conditions matting will be used or not used. There needs to be a clear commitment to use matting over delineated wetlands within the right-of-way except directly over the trench during pipe installation. A short list of conditions where matting may be omitted may be included if allowed by the wetland permit. Consideration should be given to any forecasted rain or thaw events during the duration of the anticipated access that may impact decisions on mat installation. Please remove the phrase 'if necessary' from references to matting.*

**<u>Enbridge Response to WDNR Data Request Question ECM-17:</u>**

Per section 24.1 (Right-of-Way Stabilization) of Enbridge's EPP, low ground pressure equipment will be used in wetlands, limiting disturbance to the wetland. Where low ground pressure equipment is not used, construction equipment will operate from timber construction mats or equivalent means (refer to Figure 18 of the EPP). Matting will be used on the travel lane side of the ROW to support equipment travel through wetlands unless the wetland is dry or frozen and can support construction traffic without rutting. If conditions change during construction (i.e., rain events or thawing), mats will be installed to prevent rutting. Enbridge does not typically install mats on the spoil storage side of the construction workspace unless equipment access is required. Enbridge has not modified the phrase "if necessary" within the associated document.

**<u>WDNR Data Request Question ECM-18:</u>**

*Second bullet under 'Seeding and mulching'-Tackifiers should be applied per Technical standard 1050.*

**<u>Enbridge Response to WDNR Data Request Question ECM-18:</u>**

Additional language regarding the use of tackifiers in accordance with Technical Standard 1050 has been added.

**<u>WDNR Data Request Question ECM-19:</u>**

*Fourth bullet under 'Seeding and mulching'-Mulching is not recommended in concentrated flow areas unless water is diverted until seed is established per Technical Standard 1058.*

**<u>Enbridge Response to WDNR Data Request Question ECM-19:</u>**

Clarifying language has been added specifying that mulch should not be used in concentrated flow areas unless water is diverted until seed is established, per Technical Standard 1058.

**<u>WDNR Data Request Question ECM-20:</u>**

*Under Seeding and mulching, consider including provisions for watering to support vegetation establishment if a prolonged period without precipitation fails to support vegetation growth.*

**<u>Enbridge Response to WDNR Data Request Question ECM-20:</u>**

As part of Project clean-up and final restoration, Enbridge will remove temporary construction entrances, temporary bridges, and temporary matting through wetlands. Once this step is complete, equipment access down the ROW is no longer allowed without reinstallation of these protective measures. This prevents Enbridge's ability to water the ROW as part of restoration without resulting in additional temporary disturbance. As a result, provisions for watering cannot be provided once the above items are removed.

**<u>WDNR Data Request Question ECM-21:</u>**

*In the 'General Sequence of Construction', the following clarifications should be made:*

1. *Grubbing activities should not occur prior to sediment control device installation except as needed to install sediment control devices*
2. *Land disturbance must be staged to limit the duration of bare soils*

**<u>Enbridge Response to WDNR Data Request Question ECM-21:</u>**

Clarifying language has been added specifying that grubbing activities should not occur prior to sediment control device installation except as needed to install sediment control devices.

Construction involves a series of discrete activities typically conducted in a linear sequence. These activities include survey and staking; clearing and grading; pipe stringing, bending, and welding; trenching; lowering-in and backfilling; hydrostatic testing; final tie-in; commissioning; and ROW cleanup and restoration. In addition to the linear sequence activities, site-specific construction activities will occur by specialized crews at select areas such as at waterbody crossings, HDD sites, and road crossings. The process will be coordinated to minimize the total time an individual tract of land is disturbed as well as the duration of bare exposed soil.

**WDNR Data Request Question ECM-22:**

*Under ESC Plan Sheet Notes-Note 1, please note that manufactured trackout control devices are also an option.*

**Enbridge Response to WDNR Data Request Question ECM-22:**

Enbridge has modified the language in ESC Plan Sheet Notes – Note 1 to include manufactured trackout control devices as an option.

**WDNR Data Request Question ECM-23:**

*Under ESC Plan Sheet Notes-Note 2, Instead of 'adjust according to site conditions', suggest 'Adjust placement to conform to Technical standard 1056, providing ditch check silt fence relief at concentrated flow points and low points.' This allows adjustment to more detailed topography that what is on the erosion control plans but does not leave the action too open-ended.*

**Enbridge Response to WDNR Data Request Question ECM-23:**

Enbridge has modified the language in ESC Plan Sheet Notes – Note 2 to include the recommended language.

**WDNR Data Request Question ECM-24:**

*Under ESC Plan Sheet Notes-Note 3, there are 5 potential BMPs listed for steep slope areas. Please clarify which of these practices would be implemented on all sites and which practices may be used to supplement based on site-specific or timing-specific situations. A clear commitment to a specific set of minimum BMPs is necessary in these high-erosion risk areas. If there are specific conditions that would dictate use of certain BMPs, please include this detail. A potential example of this would be: 'If a slope greater than 20% is less than 50 feet long, anchored erosion control mat will be used.'*

**Enbridge Response to WDNR Data Request Question ECM-24:**

Perimeter controls and slope interrupters, such as silt fence, will be the standard BMP for areas of non-concentrated flow. Sizing and spacing will be determined based upon site conditions in accordance with the WNDR Technical Standard 1056 and the Project-specific EPP. On exposed slopes greater than 30 percent, erosion control blankets will be used to stabilize the slope as part of site restoration. Mulching will be used for temporary stabilization in dry, sandy areas where wind or water erosion concerns are present, but slopes are less than 30 percent. Cat tracking will be used on steep slopes during active grading and for short periods of time. Cat tracking will be used in conjunction with other BMPs. Berms and slope breakers will be implemented to reduce slope length and divert run off. Enbridge is in the process of updating the Project's ESCP drawings and Stormwater Pollution Prevention Plan to incorporate additional BMPs. Enbridge will submit the revised plans upon completion.

**WDNR Data Request Question ECM-25:**

*Under ESC Plan Sheet Notes-Note 5, please exclude the crossing method in Figure 14 if there is water present. DNR will require the use of a flow bypass system to isolate the in-water work zone in all waterways proposed to be trenched, unless the waterway is completely dry for the entire duration of the activity below the OHWM.*

**Enbridge Response to WDNR Data Request Question ECM-25:**

As described in Enbridge's application materials and subsequent filings, Enbridge proposes to cross waterbodies that are dry or have no flow at the time of crossing using an open cut crossing technique. These include ephemeral and intermittent waterbodies with isolated pockets of standing water. If a waterbody has flow, including ephemeral and intermittent waterbodies, Enbridge will use a dry crossing (i.e., dam and pump or flume) method or trenchless (i.e., HDD or DPI) method. If an intermittent or ephemeral stream has more than 6 inches of stagnant water across the width of the ROW, Enbridge will install upstream and downstream dams to isolate the construction workspace. Pumping will not occur unless flow conditions change during the crossing. As discussed in Enbridge's response to WDNR Data Request Questions ECM-15 and ECM-16 Project-specific Chapter 30 permit conditions have not yet been established by the WDNR. Enbridge will work with the WDNR to incorporate appropriate language regarding use of the open cut wet trench waterbody crossing method following availability of the Chapter 30 permit conditions. Should the waterbody begin to flow during active instream work, Enbridge will switch to a dry crossing method.

**WDNR Data Request Question ECM-26:**

*In the table, please note that Technical Standard 1071 has been combined with Technical standard 1056, so Biolog should reference 1056.*

**Enbridge Response to WDNR Data Request Question ECM-26:**

Enbridge has modified the table language to include the recommended language.

**WDNR Data Request Question ECM-27:**

*Figure 6-spacing should reference or be consistent with Technical Standard 1056.*

**Enbridge Response to WDNR Data Request Question ECM-27:**

Enbridge has modified the language on Figure 6 to be consistent with WDNR Technical Standard 1056.

**WDNR Data Request Question ECM-28:**

*Figure 9, Note 1-Suggest modifying note to: Sediment control device may be removed when vegetation upslope of the device has reached 70% density of permanent vegetation.*

**Enbridge Response to WDNR Data Request Question ECM-28:**

Enbridge has modified the language on Figure 9, Note 1 to include the recommended language.

**WDNR Data Request Question ECM-29:**

*Figure 9, Note 2- Suggest modifying note to: Lowest berm may be omitted if spacing from next to lowest berm to down slope sediment control device meets the spacing requirements in Technical Standard 1056.*

**Enbridge Response to WDNR Data Request Question ECM-29:**

Enbridge has modified the language on Figure 9, Note 2 to include the recommended language.

**WDNR Data Request Question ECM-30:**

*Figure 9, Note 3- Suggest modifying note to: Extend berms so discharge is to a well vegetated area or an area protected by anchored erosion control mat. J-hooks or ditch checks may be used to dissipate energy and reduce erosion at the discharge end.*

**Enbridge Response to WDNR Data Request Question ECM-30:**

Enbridge has modified the language on Figure 9, Note 3 to include the recommended language.

**WDNR Data Request Question ECM-31:**

*Figure 9, Note 4- Suggest modifying note to: If silt fence or staked straw bales are used, criteria in Technical Standard 1056, Perimeter sediment control and slope interruption should be followed.*

**Enbridge Response to WDNR Data Request Question ECM-31:**

Enbridge has modified the language on Figure 9, Note 4 to include the recommended language.

**WDNR Data Request Question ECM-32:**

*Figure 9, Note 6- Suggest modifying note to: If width of berm exceeds 100 feet, consider providing multiple discharge points. All discharge points must be to a well vegetated area or stabilized with anchored erosion control mat.*

**Enbridge Response to WDNR Data Request Question ECM-32:**

Enbridge has modified the language on Figure 9, Note 6 to include the recommended language.

**WDNR Data Request Question ECM-33:**

*Figure 9, Note 7-If the length of the slope is less than the distance of required berm spacing, use slope interruption devices or anchored erosion control mat to limit erosion on slopes with 5% slope or greater.*

**Enbridge Response to WDNR Data Request Question ECM-33:**

Enbridge has modified the language on Figure 9, Note 7 to include the recommended language.

**WDNR Data Request Question ECM-34:**

*Figure 10, Note 1-Suggest limiting outslope of berm to 2% to reduce erosion potential*

**Enbridge Response to WDNR Data Request Question ECM-34:**

Based on Enbridge's experience construction of berms with a 2 to 4 percent outslope is appropriate for providing positive drainage without increasing the risk of erosion or creating a condition where the berm holds water without effective drainage

**WDNR Data Request Question ECM-35:**

*Figure 10, Note 3-Berms shall be spaced…Need to specify spacing here as construction specifications were not submitted with the erosion control plan.*

**Enbridge Response to WDNR Data Request Question ECM-35:**

Enbridge has revised the language on Figure 10, Note 3 to reference Figures 9 and 11 for berm spacing guidance.

**WDNR Data Request Question ECM-36:**

*Figure 10, Note 5-Suggest changing note to: minimum dimensions are shown-spacing may be decreased if field conditions dictate.*

**Enbridge Response to WDNR Data Request Question ECM-36:**

Enbridge has modified the language on Figure 10, Note 5 to clarify that the spacing is the maximum spacing distance and that the spacing may be decreased based on site-specific conditions.

**<u>WDNR Data Request Question ECM-37:</u>**

*On the contours and the aerial photos, there appears to be concentrated flow paths from substantial uphill areas flowing through the work area. How will those flows be managed during use of the temporary work area? Will the flows be temporarily diverted around the work area?*

**<u>Enbridge Response to WDNR Data Request Question ECM-37:</u>**

This location is an active agricultural area where Enbridge intends to strip topsoil. As described in Enbridge's response to WDNR Data Request Question ECM-3 above, Enbridge intends to segregate the top 12 inches of topsoil from the Project workspace in actively cultivated areas (or to actual depth of topsoil if less than 12 inches is present unless otherwise specified/requested by other plans, permit conditions, or the landowner) to protect the topsoil from potential Project related impacts such as compaction and/or mixing. Gaps will be left where stockpiled topsoil and spoil piles intersect with water conveyances (i.e., ditches, swales, and waterways) to maintain natural drainage. Where Enbridge observes surface runoff pooling at the edge of the workspace, Enbridge will actively pump the water around the construction workspace and discharge at the downslope extent of the convenance adjacent to the Project workspace to maintain downslope progression of water flow. Where surface water has entered the construction workspace, Enbridge will install BMPs (i.e., biologs or equivalent) within the drainage flowpath to filter sediment from stormwater runoff. Enbridge will also install BMPs at the downslope discharge point of the swale to provide additional filtration.

**<u>WDNR Data Request Question ECM-38:</u>**

*Describe work taking place at north and south sides of the White River Reservoir. Specifically, please indicate why the work area includes areas along the bank on both sides of the bridge.*

**<u>Enbridge Response to WDNR Data Request Question ECM-38:</u>**

Enbridge has proposed to appropriate water from the White River Reservoir for hydrostatic testing the pipeline. The locations shown on the north and south sides of the White River Reservoir are options for setting up equipment depending on time of year that hydrostatic testing will be completed (schedule is dependent on timing of permit issuance and completion of pipeline assembly). A water line will be laid on the surface along Highway 112 to Enbridge's workspace south of the reservoir. No ground disturbance is anticipated at either location or along Highway 12. Enbridge has submitted an application to the WDNR for hydrostatic testing activities.

**<u>WDNR Data Request Question ECM-39:</u>**

*Describe/include in plan set how water will be handled on either side of this segment of ROW. Stream flow is nearly parallel with ROW, will water not want to flow along berms?*

**<u>Enbridge Response to WDNR Data Request Question ECM-39:</u>**

Please see Enbridge's response to WDNR Data Request Question ECM-37 above. The upper portion of this drainage/conveyance has been determined by WDNR staff to be non-navigable.

**<u>WDNR Data Request Question ECM-40:</u>**

*Describe/include in plan set scope of work along pipe laydown area. Are impacts to steep slopes/ wetlands needed?*

**<u>Enbridge Response to WDNR Data Request Question ECM-40:</u>**

The workspace extending to the west from Van De Bruggen Road is needed for assembly of the Brunsweiller River HDD pipe section. Vegetation will be cleared from the workspace to allow for assembly of the HDD segment. Enbridge will install mats in wetland areas to limit rutting and/or soil mixing. Grading will be necessary in the upland, open field areas to segregate topsoil from the workspace. Additionally, Enbridge will establish a travel path down the slopes associated with waterbodies sase1023e and sasd1022p to allow equipment to travel down the slope to assemble the pipeline segment and assist in maneuvering the assembled pipeline segment during the pullback/installation of the pipeline into the HDD hole. Enbridge has minimized the area of disturbance to the extent safe and practicable based on the length of the HDD pipeline and angle of entry into the HDD hole. Enbridge will install BMPs along the disturbed slope areas to minimize the potential for erosion and sediment transport. Following construction, disturbed areas will be recontoured to match pre-construction conditions, stabilized with erosion controls, and revegetated.

**<u>WDNR Data Request Question ECM-41:</u>**

*Near MP 13.8, it appears that perimeter control is crossing a concentrated flow channel. Silt fence should only be used in areas of sheet flow.*

**Enbridge Response to WDNR Data Request Question ECM-41:**

Enbridge has revised the drawing to show installation of a biolog across the wetland (concentrated flow channel).

**<u>WDNR Data Request Question ECM-42:</u>**

*Will matting be placed where HDD path crosses wetlands?*

**Enbridge Response to WDNR Data Request Question ECM-42:**

Enbridge intends to minimize activities between the HDD entrance workspace and exit workspace to the extent practicable. Matting may be required during clearing activities along the HDD path to support clearing equipment and/or vegetation removal to prevent rutting; however, Enbridge expects only foot access will be needed along the HDD path during active drilling and pipeline installation to monitor for potential IRs. Enbridge does not propose to install matting or maintain matting installed for clearing along the HDD path unless equipment access is needed to respond to an IR of drilling fluid, at which time matting will be installed.

**WDNR Data Request Question ECM-43:**

*Can the LOD and silt fence be pulled back to the top of the steep slope area on the west end of the work area near MP 15?*

**Enbridge Response to WDNR Data Request Question ECM-43:**

Enbridge will work with its contractor to evaluate opportunities to reduce steep slope disturbance, where feasible, based on site-specific conditions at the time of construction and safety considerations.

**WDNR Data Request Question ECM-44:**

*Based on the contours and labeling of a stream, it appears that there may be a concentrated flow path across AR 028.1. Will this be addressed via a low water crossing detail or a temporary cross culvert? Is there potential to shift the access road to get it out of what appears to be a concentrated flow path?*

**Enbridge Response to WDNR Data Request Question ECM-44:**

Enbridge will work with its contractor and the landowner to evaluate opportunities to shift temporary access road AR 028.1 away from the headwater region of ephemeral waterbody sasa1027e and the potential concentrated flow path. If shifting is not possible, Enbridge will install BMPs to minimize the potential for sediment transport and will install matting in a way to allow for flow, should a runoff event occur.

**WDNR Data Request Question ECM-45:**

*There appears to be a substantial area uphill draining to the large work area at MP 15. How is this water being diverted or managed as it flows through the site? Will there be a temporary culvert or matting placed over the concentrated flow path through the work area? It appears that there needs to be additional sediment control on the north side of the work area due to the proximity of the gully/stream. On the east side of the work area, there may be a concentrated flow path passing through the HDD entry point. Can that be adjusted to move away from that path?*

**Enbridge Response to WDNR Data Request Question ECM-45:**

Please see Enbridge's response to WDNR Data Request Question ECM-37 above regarding the potential concentrated flow path through the work area. The workspace size and location has been determined to be necessary to complete the HDD beneath Highway 13 and, therefore, cannot be adjusted away from the potential concentrated flow path.

**<u>WDNR Data Request Question ECM-46:</u>**

*At MP 14.7-14.9 there is a crossing of a tributary to a tribal ORW. This is not an HDD crossing, but labeling is not clear on which crossing detail will be used. It is mapped as an intermittent stream.*

**<u>Enbridge Response to WDNR Data Request Question ECM-46:</u>**

A description of Enbridge's proposed crossing methods is included in Enbridge's application materials for a Chapter 30 permit and associated supplemental information. The crossing method for this tributary will be based on flow conditions at the time of construction. Enbridge proposes to cross dry and/or non-flowing waterbodies (water may be present such as in isolated pools but not flowing) using the Open Cut – Wet Trench method (see Typical Drawing 14). If this waterbody is flowing at the time of construction, Enbridge will cross the feature using a dry crossing technique. Enbridge has added clarification to the mapping designating the proposed crossing method. Updated mapping will be filed upon completion of all revisions.

**<u>WDNR Data Request Question ECM-47:</u>**

*'Block Road' is labeled 'Hanninen Road' on the surface water data viewer (SWDV). Suggest noting both names for the purpose of emergency response.*

**<u>Enbridge Response to WDNR Data Request Question ECM-47:</u>**

*The label "Hanninen Road" has been added to the map page.*

**<u>WDNR Data Request Question ECM-48:</u>**

*Suggest placing perimeter control between begin of HDD and the unnamed tributary to a tribal ORW since the risk of IR is higher near the start and end of an HDD*

**Enbridge Response to WDNR Data Request Question ECM-48:**

Enbridge will install perimeter controls around the eastern-most extent of the HDD workspace, as well as in other locations around the HDD workspace. Enbridge notes that Highway 13 and a private driveway separate the HDD workspace from the unnamed tributary. Updated erosion and sediment controls are shown on the Project's ESCP sheets that will be filed upon completion of all revisions.

**<u>WDNR Data Request Question ECM-49:</u>**

*Describe/include in plan set scope of work along pipe laydown area. Are impacts to steep slopes/ wetlands needed?*

**Enbridge Response to WDNR Data Request Question ECM-49:**

As described in Enbridge's response to WDNR Data Request Question ECM-40 above, the workspace is needed for assembly of the Billy Creek (sasc022p) HDD pipe section. Vegetation will be cleared from the workspace to allow for assembly of the HDD segment. Enbridge will install mats in wetland areas to limit potential rutting and/or soil mixing in the wetlands. Grading is necessary in the upland, open field areas to segregate topsoil from the workspace. Additionally, grading a travel path down the slopes associated with waterbody sasc1014p_x2 may be needed to allow equipment safe access down the slope to assemble the pipeline segment and assist in maneuvering the assembled pipeline segment during the pullback/installation of the pipeline segment into the HDD hole. Enbridge has minimized the area of disturbance to the extent safe and practicable based on the length of the HDD and angle of entry into the HDD hole.

**WDNR Data Request Question ECM-50:**

*Please provide more info on access/use of HDD path ROW—is this mostly foot and ATV access, or would larger vehicles use it?*

**Enbridge Response to WDNR Data Request Question ECM-50:**

As described in Enbridge's response to WDNR Data Request Question ECM-42 above, Enbridge intends to minimize activities between the HDD entrance workspace and exit workspace to the extent practicable. Enbridge expects only foot access will be needed along the HDD path during drilling and pipeline installation. Enbridge does not propose to install matting along the HDD path unless needed for initial clearing activities or unless equipment access is needed to respond to an IR of drilling fluid.

**WDNR Data Request Question ECM-51:**

*Perimeter control is shown across both intermittent unnamed tribs of Billy Creek. Perimeter control is not designed for use in concentrated flow areas and should not be placed in streams but is used around them. Describe work and erosion control measures taken at steep slopes south of ROW. Can impacts be minimized since no trenching is occurring there?*

**Enbridge Response to WDNR Data Request Question ECM-51:**

Enbridge has revised the drawing to remove perimeter controls from across both intermittent unnamed tributaries to Billy Creek. These drawings will be provided upon completion.

As described in Enbridge's response to WDNR Data Request Questions ECM-40 and ECM-49 above, the workspace is needed for assembly of the Trout Brook (sasc022p) HDD pipe section. Vegetation will be cleared from the workspace to allow for assembly of the HDD segment. Enbridge will install mats in wetland areas to limit potential rutting and/or soil mixing in the wetlands. Grading will be necessary in the upland, open field areas to segregate topsoil from the workspace. Additionally, grading of a travel path down the slopes associated with waterbodies sasb1002i, sasc025i_x, and sasb1004e may be needed to allow equipment safe access down the slope to assemble the pipeline segment and assist in maneuvering the assembled pipeline segment during the pullback/installation of the pipeline segment into the HDD hole. Enbridge has minimized the area of disturbance to the extent safe and practicable based on the length of the HDD and angle of entry into the HDD hole.

**WDNR Data Request Question ECM-52:**

*There appears to be a concentrated flow path through the middle of the workspace near the HDD entrance. How will this flow be addressed during construction?*

**Enbridge Response to WDNR Data Request Question ECM-52:**

Please see Enbridge's response to WDNR Data Request Questions ECM-3 and ECM-37 above.

**WDNR Data Request Question ECM-53:**

*There is a slope greater than 1:3 and more than 250 feet long between the HDD entry point and Silver Creek. There are also no clear span bridges across the portions of the oxbow crossed by the HDD. How will access for IR monitoring be provided?*

**Enbridge Response to WDNR Data Request Question ECM-53:**

Enbridge's Chapter 30 application includes a request to allow bridging of Silver Creek from the west for access to remove timber that will be hand-cleared along the 30-foot maintained corridor between the HDD entry and exit. Hand-felled timber will be cut into smaller size logs and cleared from the center of the 30-foot corridor to allow access in the event of an IR. IR response materials will be hand carried into the area and staged near the river. Boats will be used, as necessary, to transport materials and personnel across the river to monitor for IRs.

**WDNR Data Request Question ECM-54:**

*There is a groundwater fed wetland at MP 19.5. What additional precautions will be taken to avoid impacting the aquifer in this location, and other locations where wetlands are known or likely to be groundwater fed?*

**Enbridge Response to WDNR Data Request Question ECM-54:**

The wetland at this location was sampled by Enbridge and determined to be a perched wetland. Enbridge completed a hand auger analysis of this wetland to a depth of 12.2 feet. The sampled soils were found wet at a depth of 4.3 feet and water was encountered at a depth of 5.8 feet. Soils were described as:

- 0 -2.9 feet peat/muck;
- 2.9 - 4.3 feet gray silt;
- 4.3 – 10 feet medium sand poorly graded; and
- 10.0 – 12.2 feet wet red clay.

Based on the auger results, this wetland is likely a surface water (runoff) fed wetland with a confining layer, not a groundwater fed wetland; especially when considered its location in the overall landscape. Lidar contours indicate that surface drainage of the adjacent upland area contributes to the wetland. The elevation of the wetland is at approximately 1092 feet, approximately 30 feet above the disturbance level of the adjacent gravel pit and approximately 60 feet above UNT to Silver Creek, located south of the wetland. Based on these adjacent elevation changes and the intervening topography, groundwater would drain towards these lower elevation areas, rather than to the wetland.

**WDNR Data Request Question ECM-55:**

*AR 039 should have perimeter control between it and the wetland immediately downhill west of the wetland crossing west of Silver Creek.*

**Enbridge Response to WDNR Data Request Question ECM-55:**

Enbridge has extended the proposed erosion controls along access road AR-039 to further protect wetlands wase1034f and wase1033f.

**WDNR Data Request Question ECM-56:**

*Describe scope of work in pipe laydown area. How will grading be done / impact minimized on steep slopes and wetlands? Will additional fill be needed?*

**Enbridge Response to WDNR Data Request Question ECM-56:**

As described in Enbridge's response to WDNR Data Request Questions ECM-40, ECM-49, and ECM-51 the workspace is needed for assembly of the Silver Creek (sasd1011p) HDD pipe section. Vegetation will be cleared from the workspace to allow for assembly of the HDD segment. Enbridge will install mats in wetland areas to limit potential rutting and/or soil mixing in the wetlands. Grading will be necessary in the upland, open field areas to segregate topsoil from the workspace. Additionally, grading of a travel path down the slopes associated with waterbodies sasd1017p and sasa071p may be needed to allow equipment safe access down the slope to assemble the pipeline segment and assist in maneuvering the assembled pipeline segment during the pullback/installation of the pipeline segment into the HDD hole. Enbridge has minimized the area of disturbance to the extent safe and practicable based on the length of the HDD and angle of entry into the HDD hole. No additional earthen fill will be needed; however, wooden cribbing will be used to temporarily support the pipe during assembly and pullback.

**WDNR Data Request Question ECM-57:**

Is there an existing culvert where AR045 crosses UNT of Silver Creek?

**Enbridge Response to WDNR Data Request Question ECM-57:**

Yes, there is an approximately 16-inch diameter culvert at this location.

**WDNR Data Request Question ECM-58:**

*Sheet 58-need more perimeter control due to location of steep slope and ORW near HDD staging.*

**Enbridge Response to WDNR Data Request Question ECM-58:**

Enbridge has extended the proposed erosion controls around the perimeter of the HDD workspace.

**WDNR Data Request Question ECM-59:**

*Please provide additional information about proposed grading and the extent of gravel placement. If the gravel placement will be permanent, then post-construction storm water requirements are likely to apply. Perimeter control alone is not adequate during land disturbing activities.*

**Enbridge Response to WDNR Data Request Question ECM-59:**

The proposed Peterson Pipe Yard is an existing commercial use facility that has been previously disturbed, including disposal of large bedrock blast material, possibly from the Highway 13 work just outside the City of Mellen. Although within the facility boundary, Enbridge does not propose to disturb the steep slopes at this location. Grading, if needed, will be limited to previously disturbed upland areas and will avoid steep slope areas. Enbridge does not anticipate the need for additional gravel at this location. If gravel is required, it will be temporary and removed as part of final site restoration.

**WDNR Data Request Question ECM-60:**

*What are the black squares over waterways? Are they supposed to be yellow to represent a bridge?*

**Enbridge Response to WDNR Data Request Question ECM-60:**

Correct. The symbology on the maps has been adjusted.

**WDNR Data Request Question ECM-61:**

*Please clarify if any grading will take place in the work areas with slopes steeper than 1:3*

**Enbridge Response to WDNR Data Request Question ECM-61:**

Yes, grading and blasting will be necessary at this location. The pipeline route crosses through a bedrock outcropping at this location where blasting will be necessary to create the trench through the bedrock materials. Enbridge will also establish a safe travel and equipment operating workspace along the proposed trench through this area.

**WDNR Data Request Question ECM-62:**

*Additional perimeter control is needed between MP 29.6 and 29.7 near stream*

**Enbridge Response to WDNR Data Request Question ECM-62:**

Enbridge has extended the proposed erosion controls along the perimeter of the workspace between MP 29.6 and MP 29.7.

**WDNR Data Request Question ECM-63:**

*Sediment control is needed on downslope side of access road near waterway*

**Enbridge Response to WDNR Data Request Question ECM-63:**

Enbridge has added erosion controls along the edge of access road AR-092, between the access road and pond (oirv001).

**WDNR Data Request Question ECM-64:**

*A bridge needed to cross unnamed tributary of Vaughn Creek unless determined non-navigable by WNDR.*

**Enbridge Response to WDNR Data Request Question ECM-64:**

The WDNR visited this location on August 27, 2021 and made a navigability determination of not navigable.

**WDNR Data Request Question ECM-65:**

*A bridge needed to cross unnamed tributary of Vaughn Creek unless determined non-navigable by WNDR.*

**Enbridge Response to WDNR Data Request Question ECM-65:**

The WDNR visited this location on August 27, 2021 and made a navigability determination of not navigable.

**WDNR Data Request Question ECM-66:**

*The site-specific Aerial Plan Sheets still use the numerical references to standard details. Please provide actual site-specific erosion control plans, including the following information:*

1. *Site-specific measures to reduce erosion on the steep slopes. Notes on the plans should clarify the specific measures proposed such as requirements for timely stabilization, use of erosion*

*control or turf reinforcement mats, temporary diversion of runoff around bare slopes, and slope interruption devices.*

2. *Proposed location of cofferdams and dewatering measures*
3. *Proposed begin and end of the temporary stream crossing*
4. *Temporary sediment traps or basins*
5. *Additional perimeter control between disturbed area and top of slope*
6. *Proposed ditch check locations*
7. *Proposed methods to maintain existing drainage patterns along ditches crossed by the pipeline or access roads during and after construction*
8. *Proposed locations of soil stockpiles with associated erosion and sediment control*
9. *Minimum extent of proposed construction matting*

*An example of the level of detail expected can be found in the following projects: FIN 88984 ePermitting - DocSetViewDet (wi.gov) in the erosion control map*

**Enbridge Response to WDNR Data Request Question ECM-66:**

Enbridge is in the process of updating the Project's ESCP drawings and Stormwater Pollution Prevention Plan to incorporate additional BMPs. Enbridge will submit the revised plans upon completion.

**WDNR Data Request Question ECM-67:**

*Can the work area be adjusted to avoid Steep slopes along NE side?*

**Enbridge Response to WDNR Data Request Question ECM-67:**

Enbridge will work with its contractor to evaluate opportunities to reduce steep slope disturbance, where feasible based on site-specific conditions at the time of construction and safety considerations.

**WDNR Data Request Question ECM-68:**

*Can the work area be adjusted to avoid steep slopes (specifically SE side, but also N)?*

**Enbridge Response to WDNR Data Request Question ECM-68:**

Enbridge will work with its contractor to evaluate opportunities to reduce steep slope disturbance, where feasible based on site-specific conditions at the time of construction and safety considerations.

**WDNR Data Request Question ECM-69:**

*Is it feasible to adjust the west limits of the additional work area to minimize disturbances of slopes greater than 20%?*

**Enbridge Response to WDNR Data Request Question ECM-69:**

Enbridge will work with its contractor to evaluate opportunities to reduce steep slope disturbance, where feasible based on site-specific conditions at the time of construction and safety considerations.

**WDNR Data Request Question ECM-70:**

*The department may have additional comments on new information submitted in response to these comments.*

**Enbridge Response to WDNR Data Request Question ECM-70:**

Enbridge will continue to work with the WDNR to address future comments.

## *DOCUMENTS: HDD PROFILES AND HYDROFRACTURE ANALYSIS AND SITE-SPECIFIC IR PLANS*

### WDNR Data Request Question HP-1:

*In the June 5, 2023 response to an information request regarding chapter 30 permitting (IP-NO-2020-2-N00471), there is a statement that "Enbridge has determined that its plans meet WDNR Technical Standard 1072 requirements." Since this is the case, please provide an HDD Summary as described in the technical standard.*

### Enbridge Response to WDNR Data Request Question HP-1:

Enbridge has provided a table comparing the WDNR Technical Standard 1072 requirements to those items that have been reviewed, developed, or are planned prior to construction (see Attachment 5).

### WDNR Data Request Question HP-2:

*Please also provide a table summarizing the HDD crossings similar to that provided in the Antidegradation report for Line 3 in Minnesota. Please identify all areas where the soil confining pressure is less than 2.0 times the expected fluid pressure as elevated risk areas.*

### Enbridge Response to WDNR Data Request Question HP-2:

**Line 5 Wisconsin Segment Relocation Project**

**Summary of Hydrofracture Analysis Reports for Proposed HDD Crossings**

| Waterbody Feature (MP) | Total Horizontal Length of HDD Crossing (ft) | Total Length of Wetlands Crossed (ft)[a] | Estimated Duration of HDD (days)[b] | Risk of Inadvertent Return[c] | Section With Elevated Risk[d] | Distance from Waterbody to HDD Entry Point (ft) | Distance from Waterbody to HDD Exit Point (ft) |
|---|---|---|---|---|---|---|---|
| White River (MP 3.6) | 4,439 | 1,165 | 65 | Low | None (Intersecting Drill) | 2,124 | 2,315 |
| Deer Creek (MP 6.17) | 1,777 | 128 | 21 | Low | Last 150 Feet of Crossing | 813 | 964 |
| Marengo River - Direct Pipe (MP 11.12) | 2,007 | 364 | 45 | NA -DPI | NA | 574 | 1,433 |
| Brunsweiler River (MP 13.88) | 2,790 | 587 | 45 | Low | Last 200 Feet of Crossing | 1,616 | 1,174 |
| HWY13/CN Railroad (MP 15.08) | 1,998 | 140 | 20 | Low | Last 150 Feet of Crossing | 1,027 | 971 |
| Trout Brook (MP 16.43) | 2,337 | 665 | 25 | Low | Last 50 Feet of Crossing | 818 | 1,519 |
| Billy Creek (MP 17.11) | 1,775 | 0 | 41 | Low | Last 200 Feet of Crossing | 1,030 | 745 |
| Silver Creek (MP 18.78) | 3,635 | 1,015 | 73 | Low | Last 180 Feet of Crossing | 1,887 | 1,748 |
| Krause Creek (MP 22.15) | 2,076 | 198 | 92 | Low | Last 300 Feet of Crossing | 689 | 1,387 |
| Bad River (MP 24.43) | 1,777 | 987 | 22 | Low | Last 150 Feet of Crossing | 476 | 1,301 |
| Tyler Forks (MP 33.85) | 1,841 | 286 | 47 | Low | Last 200 Feet of Crossing | 782 | 1,059 |
| Potato River (MP 37.38) | 3,472 | 1,704 | 98 | Low | First 180 Feet of Crossing | 2,549 | 923 |
| Vaughn Creek (MP 39.39) | 2,055 | 386 | 22 | Low | Last 220 Feet of Crossing | 952 | 1,103 |

a Does not include waterbody crossing length b Assumed single 12-hour working shift

c Based on the Delft Method

d Elevated risk of a hydrofracture occurs when the soils confining capacity (pounds per square inch) is less than 2 times the estimated annular pressure exerted by the drill.

**WDNR Data Request Question HP-3:**

*Please clarify the conditions under which matting will be used outside of wetlands and the conditions under which matting would be considered not necessary in wetlands*

**Enbridge Response to WDNR Data Request Question HP-3:**

Matting may be placed in non-wetland delineated areas that are saturated or show signs of deep rutting. Matting may not be necessary in wetlands during unusually dry periods or if the ground is frozen if rutting or compaction are not likely. Please also see Enbridge's responses to WDNR Data Request Questions ECM-2, 4, 17, 20, 40, 42, 49, 50, 51, and 56 above for additional discussion regarding mat placement.

**WDNR Data Request Question HP-4:**

*The IR response plans do not provide sufficient detail on monitoring the drill path for IRs. The following information should be added:*

1. *Indicate how each drill path will be observed for monitoring-can the path be walked, driven, or flown? How is that different where slopes exceed 20%?*
2. *How will off right-of-way IRs be detected in areas heavily wooded on either side of the right-of-way.*
3. *Is a boat going to be available onsite for larger waterway crossings or ones with steep banks?*
4. *What is the minimum frequency of drill path observation during drilling operations?*
5. *Will there be night-time operations? If so, how will observation be conducted between sunset and sunrise?*

**Enbridge Response to WDNR Data Request Question HP-4:**

HP-4.1: The drill path will be walked for monitoring. The frequency of monitoring will be every 300 feet of drill length completed or every 2 hours, whichever is less. Slopes exceeding 20% will not result in a different monitoring plan or schedule.

HP-4.2: Monitoring will be completed by walking at the schedule described above. During monitoring the monitor will observe for potential IRs both within the Project workspace as well as in adjacent off ROW areas. The monitors will use a meandering pattern down the ROW to observe conditions on both sides of the cleared drill path. If the monitoring of pump rates, re-circulation rates, and/or fluid returns indicates that a potential IR may have occurred, the width of the meandering traverse will be widened to determine if and where an IR occurred. The shortest path to ground is along the drill path, which would generally have the lowest soil confining capacity as a result. The further distance to each side of the drill path traveled the longer the distance to the ground surface and the higher the soil confining capacity. As a result, should an IR occur it is typically along the drill path.

HP-4.3: Yes, a boat will be available for larger waterway crossings (e.g., White River). Steep banks will not require a boat for monitoring as the banks and waterway would still be visible from the bank.

HP-4.4: Monitoring of the drill path will be conducted by observing land surfaces and the watercourse (if applicable) for surface migration during drilling, reaming, and pipe installation procedures. As described in Enbridge response to WDNR Data Request Question HP-4.1 above, the frequency of monitoring will be every 300 feet of drill length completed or every 2 hours, whichever is less.

HP-4.5: Yes, there will be a potential for 24-hour operations at each crossing location. The path will be monitored per response to WDNR Data Request Questions HP-4.1 and HP-4.4 above. Monitoring during night operations will be completed with handheld lights and/or head lamps.

**WDNR Data Request Question HP-5:**

*The IR response procedures are different for 'inaccessible locations'. What constitutes an 'inaccessible' location? Please define in the report*

**Enbridge Response to WDNR Data Request Question HP-5:**

Inaccessible locations would include sloped areas too steep to safely allow personnel access to the site as well as locations within a waterbody that are too deep and/or flowing too rapidly to allow personnel access to the site.

**WDNR Data Request Question HP-6:**

*For all crossings, there appears to be a higher risk of IRs near the exit end. The documents provided do not provide any discussion on measures to reduce this risk or potential impacts from it (i.e. additional visual monitoring, adjustments to mud mix, reduced fluid pressure, etc.).*

**Enbridge Response to WDNR Data Request Question HP-6:**

During the HDD installation, the contractor will continuously monitor the drilling pressure of the front head of the drill bit as well as the fluid returns and assess the cuttings coming back to the drill rig. These readings will allow the operator to control the rate of penetration, to monitor the pressure in the hole, and see the material that the drill bit is going through. This combined with the geodesic coordinates will confirm that the design profile is met within acceptable tolerances and will confirm that the geotechnical strata is aligned with the geotechnical data found during the borehole program. The annular pressure is controlled at the drilling rig to not exceed the hydrofracture curve calculated. To meet these conditions, the HDD operator can increase the number of ream and cleaning passes, reduce the rate of penetration (depending on the soil found) or increase the rate of return of cuttings to reduce the resistance in the hole seen by the drilling bits and thereby reduce the risk of an IR. Lastly, WDNR-approved additives can be added to the bentonite to help seal the wall inside the hole that would also contribute to reduce the risk of an IR.

Incorporation of these measures reduce the overall risk of an IR; however, IRs can occur as the drilling head progresses to the surface at the exit location. IRs that occur near the exit point as the bit approaches the surface are rarely problematic as they usually occur within the temporary workspace limits and can easily be contained. To prevent drilling fluid flowing outside of the workspace boundary near the exit point, the driller will typically reduce pump pressure as the bit approaches the ground surface. Crew members in radio communication with the driller will be stationed on the exit side during punch out of the drill bit along with drilling fluid containment materials.

**WDNR Data Request Question HP-7:**

*The documents do not provide any discussion of site-specific risk factors and measures that will be taken to reduce the risk and potential impacts of an IR due to these factors. Subsequent comments identify some site- specific risks identified to date, but other known risks should also be addressed in the documentation.*

**Enbridge Response to WDNR Data Request Question HP-7:**

See Enbridge's response to WDNR Data Request Questions 4i and HP-6 above which addresses how site-specific risk factors are addressed during design and HDD execution.

**WDNR Data Request Question HP-8:**

*How will the followings site-specific IR risks be addressed at the White River HDD Crossing:*

1. *Very soft clay soils*
2. *Rock fragments and/or cobbles.*

**Enbridge Response to WDNR Data Request Question HP-8:**

1. Approximately 80 feet of 48-inch conductor casing is planned to be installed on the entry side of the crossing to seal off the bore from the soft clay soils near the surface.
2. Rock fragments and/or cobbles are not a factor that increases the risk of IRs of drilling fluid. Additionally, Enbridge's response to WDNR Data Request Questions 4i and HP-6 above describe how the risks were addressed during design and HDD execution.

**WDNR Data Request Question HP-9:**

*How will the following IR risks be addressed at the Marengo River Direct Pipe Crossing:*

1. *Wetlands downhill of exit end with calculated confining soil pressure less than anticipated fluid pressure in the last 200 feet of the drill path*
2. *Very soft soils*
3. *Cobbles and boulders found in soil borings*

**Enbridge Response to WDNR Data Request Question HP-9:**

1. Since DPI typically involves exiting within an excavation, as opposed to existing at the ground surface, it is likely that a shallow excavation will be placed east of station 19+50, which will essentially capture the DP-MTBM before the risk of hydrofracture is greatest.
2. The DPI method was selected for this crossing location due to the presence of very low blow count clay soils over the entire crossing length.
3. The DPI is a mechanical process where the fluids are only used to bring back returns. Since the process does not use fluids for the drilling process, drilling pressures do not exist to cause IRs.

**WDNR Data Request Question HP 10:**

*How will the followings site-specific IR risks be addressed at the Brunsweiler River HDD Crossing:*

1. *Highly variable soil textures and strengths*
2. *Shallow groundwater*
3. *Highly fractured rock*

**Enbridge Response to WDNR Data Request Question HP-10:**

1. The drill path will pass through multiple differing soil strata with varying strength characteristics and gravel percentages. While the soil variation itself does not increase the risk of IRs, encountering a zone of low blow count soil can result in fluid loss to the formation, and in some cases the drilling fluid will make its way to the surface if the annular pressure exceeds the decreased soil confining capacity. Boring 22-C shows a large zone of fat clay with very low blow counts above the conglomerate bedrock on the west bank of the Brunsweiler River. The drill path is well below this clay zone and into the conglomerate bedrock in this area and it is not anticipated that the soft clay will be encountered. If soft soils are encountered and the rig operator identifies a sustained loss in drilling fluid pressure or a loss of circulation, the steps outlined in the "Prevention" section of the Inadvertent Return Plan will be followed.
2. To be able to quantify the risk of an IR of drilling fluid due to hydrofracture, the soil confining capacity and required annular pressure were calculated. The soil confining capacity was calculated using the "Delft Method", which is described in Appendix B of an U.S. Army Corps of Engineers publication titled *Recommended Guidelines for Installation of Pipelines beneath Levees using Horizontal Directional Drilling*. Within these calculations, saturated soils have relatively

higher strength characteristics than unsaturated soils. Shallow groundwater is a benefit as it will provide higher strength of soils near surface where confining capacity is usually the lowest.

3. The drill path will pass through highly to moderately fractured conglomerate over a majority of the crossing length. There is potential for drilling fluid in the annulus to find an alternate flow path through the rock fractures and into the overburden soil. It is unlikely that the drilling fluid will be pressured high enough to then fracture the surrounding soil and flow to the surface. If the rig operator identifies a sustained loss in drilling fluid pressure or a loss of circulation, the steps outlined in the "Prevention" section of the Inadvertent Return Plan will be followed.

Enbridge's response to WDNR Data Request Questions 4i and HP-6 above describe how the risks were addressed during design and HDD execution.

**WDNR Data Request Question HP 11:**

*How will the followings site-specific IR risks be addressed at the Highway 13 HDD Crossing:*

1. *Highly variable soil textures and strengths*
2. *Entry and exit are near small streams*

**Enbridge Response to WDNR Data Request Question HP-11:**

1. See Enbridge's response to WDNR Data Request Question HP-10-1 above.
2. The first obstacle along the HDD alignment is a small stream on the west side of Highway 13. The drill path was designed to achieve 50 feet of cover below the small stream. Based on hydrofracture calculations, the stiff soil 50 feet below the stream has a soil confining capacity greater than the anticipated annular pressure with a safety factor of 2. The HDD profiles and hydrofracture analysis provided show the waterbody locations and the corresponding soil confining capacity in relation to the drill pressure.

Enbridge's response to WDNR Data Request Questions 4i and HP-6 describe how the risks were addressed during design and HDD execution.

**WDNR Data Request Question HP 12:**

*How will the followings site-specific IR risks be addressed at the Trout Brook HDD Crossing:*

1. *Highly variable soil textures and strengths*
2. *Entry near delineated wetlands and exit near both a stream and wetlands*
3. *Cobbles*

**Enbridge Response to WDNR Data Request Question HP-12:**

1. See Enbridge's response to WDNR Data Request Question HP-10-1 above.
2. Wetlands located within the entry side workspace boundary will be covered or bridged with construction matting. The hydrofracture analysis indicates that the soil confining capacity will

increase quickly with depth. Estimated annular pressures are not anticipated to exceed the soil confining capacity near the entry point where depth of cover is shallow. IRs that occur near the exit point as the bit approaches the surface can happen but are rarely problematic as they usually occur within the temporary workspace limits and can easily be contained. To prevent drilling fluid flowing outside of the workspace boundary near the exit point, the driller will typically reduce pump pressure as the bit approaches the ground surface. Crew members in radio communication with the driller will be stationed on the exit side with drilling fluid containment materials during punch out of the drill bit.

The HDD profile provided for the Trout Brook HDD shows the locations of the wetland and stream in relation to the HDD profile. The hydrofracture analysis provided shows the soil confining capacity is well above the estimated annular drilling pressure at the stream and waterbody locations

3. See Enbridge's response to WDNR Data Request Question HP-8-2 above. Additionally, Enbridge's response to WDNR Data Request Questions 4i and HP-6 above describe how the risks were addressed during design and HDD execution.

**<u>WDNR Data Request Question HP 13:</u>**

*How will the followings site-specific IR risks be addressed at the Billy Creek HDD Crossing:*

1. *Highly variable soil textures and strengths*
2. *Moderately to highly fractured rock*
3. *Entry near a drainageway and exit near a stream*
4. *Rock fragments, cobbles, and boulders*

**<u>Enbridge Response to WDNR Data Request Question HP-13:</u>**

1. See response for WDNR Data Request Question HP-10-1 above.
2. The drill path will pass through poor-quality Freda sandstone and conglomerate over a majority of the crossing length. There is potential for drilling fluid in the annulus to find an alternate flow path through the rock fractures and into the overburden soil. It is unlikely that the drilling fluid will be pressured high enough to then fracture the surrounding soil and flow to the surface. If the rig operator identifies a sustained loss in drilling fluid pressure or a loss of circulation, the steps outlined in the "Prevention" section of the Inadvertent Return Plan will be followed.
3. With a majority of the crossing passing through rock, the risk of hydrofracture is low. Concerning the risk of hydrofracture at the entry and exit points, the hydrofracture analysis indicates that the soil confining capacity will increase quickly with depth. Estimated Annular pressures are not anticipated to exceed the soil confining capacity near the entry or exit point where depth of cover is shallow. The design meets the safety factor of 2 with the exception of the last approximately 75 feet at the HDD exit.

4. See Enbridge's response to WDNR Data Request Question HP-8-2 above. Additionally, see Enbridge's response to WDNR Data Request Questions 4i and HP-6 above describe how the risks were addressed during design and HDD execution.

**WDNR Data Request Question HP 14:**

*How will the followings site-specific IR risks be addressed at the Silver Creek HDD Crossing:*

1. *Variable soil textures*
2. *Moderately to highly fractured rock*
3. *A well is located near the entry*
4. *Entry near a drainageway*
5. *Exit is near groundwater fed wetland and a sand and gravel pit*
6. *Rock fragments, cobbles, and boulders*

**Enbridge Response to WDNR Data Request Question HP-14:**

1. See response for WDNR Data Request Question HP-10-1 above.
2. The drill path will pass through poor-quality Freda sandstone, siltstone, and conglomerate with volcanic clast over a majority of the crossing length. There is potential for drilling fluid in the annulus to find an alternate flow path through the rock fractures and into the overburden soil. It is unlikely that the drilling fluid will be pressured high enough to then fracture the surrounding soil and flow to the surface. If the rig operator identifies a sustained loss in drilling fluid pressure or a loss of circulation, the steps outlined in the "Prevention" section of the Inadvertent Return Plan will be followed.
3. With a majority of the crossing passing through rock, the risk of hydrofracture is low. Concerning the risk of hydrofracture at the entry point, the hydrofracture analysis indicates that the soil confining capacity will increase quickly with depth. Estimated Annular pressures are not anticipated to exceed the soil confining capacity near the entry where depth of cover is shallow. If there is additional concern of IRs of drilling fluid impacting the well, drainageway, or structures that are all located within the entry workspace, preventative containment measures can be put into place prior to construction. These can include silt fence, hay bales, or other barriers.
4. See Enbridge's response to WDNR Data Request Question HP-14.3 above.
5. There is an existing gravel and sand pit approximately 80 feet north of the proposed alignment near station 35+00. Based on hydrofracture calculations, the estimated annular pressure is not anticipated to exceed the soil confining capacity at this location. Increased surface monitoring can be performed by crew members as the bit passes through this area during the pilot hole to catch any surficial drilling fluid as it surfaces to mitigate any additional impact. The HDD profile provided shows the location of the sand and gravel pit and the hydrofracture analysis shows the soil confining capacity at this location which is still above the required safety factor.

6. See Enbridge's response to WDNR Data Request Question HP-8-2 above. Additionally, see Enbridge's response to WDNR Data Request Questions 4i and HP-6 above which describe how the risks were addressed during design and HDD execution.

**WDNR Data Request Question HP 15:**

*How will the followings site-specific IR risks be addressed at the Krause Creek HDD Crossing:*

1. *Sandy soils*
2. *Moderately to highly fractured rock near exit end*
3. *Entry near wetlands*

**Enbridge Response to WDNR Data Request Question HP-15:**

1. While a majority of this crossing passes through granite bedrock, dense sandy soil and glacial outwash are anticipated in the overburden soils near the endpoints. On average, the sand shows fairly high blow counts and provides good soil strength as indicated by the soil confining capacities calculated within the hydrofracture analysis.
2. While the transition zone between the sandy glacial outwash and the Mellen Complex Granite may be fractured and contain gravel, overall, the granite samples show high rock quality designation ("RQD") percentages and high unconfined compressive strengths.
3. On the entry side, the drill path passes beneath a wetland as the first obstacle. The depth of cover is close to 20 feet at this location with the drill path well within bedrock showing good RQD values around 88%. As the wetlands are just outside of the entry workspace, increased surface monitoring along the right of way and surrounding area can take place as the bit passes beneath the wetland during the pilot hole. The HDD profile provide shows the location of the wetland near the entry (approx. 300 feet) hydrofracture analysis shows the soil confining capacity at this location which is still above the required safety factor before entry into the bedrock.

   See Enbridge's response to WDNR Data Request Questions 4i and HP-6 above for an additional description of how the risk was addressed during design and will be addressed during the HDD execution.

**WDNR Data Request Question HP 16:**

*How will the followings site-specific IR risks be addressed at the Bad River HDD Crossing:*

1. *Gravel in soils*
2. *Cobbles*
3. *Entry is near a sanitary manhole—suggest verifying if this is related to public or private wastewater system. No well is shown on the property-has this been verified with property owner?*
4. *Shallow groundwater*

5. *Exit within wetlands*

**Enbridge Response to WDNR Data Request Question HP-16:**

1. See Enbridge's response to WDNR Data Request Question HP-8-2 above.
2. See Enbridge's response to WDNR Data Request Question HP-8-2 above.
3. The purpose and location of the sanitary manhole will be confirmed prior to construction as well as the potential location of a private well.
4. See Enbridge's response to WDNR Data Request Question HP-10-2 above.
5. Wetlands are located within the exit side workspace boundary and will be covered or bridged with construction matting. The hydrofracture analysis indicates that the soil confining capacity is exceeded by the estimated annular pressure in the final 37 feet of the drill path. IRs that occur near the exit point as the bit approaches the surface can happen but are rarely problematic as they usually occur within the temporary workspace limits and can easily be contained. To prevent significant drilling fluid flow near the exit point as the bit reaches the surface, the driller will typically reduce pump pressure. Crew members in radio communication with the driller will be stationed on the exit side during punch out of the drill bit along with drilling fluid containment materials. The HDD profile provide shows the location of the wetland near the exit (approx. 1500 feet of the HDD). The hydrofracture analysis shows the soil confining capacity at this location which is still at the required safety factor when exiting this wetland.

   See Enbridge's response to WDNR Data Request Questions 4i and HP-6 above for a further description of how the risk was addressed during design and will be addressed during the HDD execution.

**WDNR Data Request Question HP 17:**

*How will the followings site-specific IR risks be addressed at the Tyler Forks HDD Crossing:*

1. *Sandy soils*
2. *Moderately to highly fractured rock*
3. *Shallow groundwater*
4. *Entry and exit near wetlands*
5. *Limited soil confining pressure in last 100 feet of drill path*

**Enbridge Response to WDNR Data Request Question HP-17:**

1. While a majority of this crossing passes through basalt and rhyolite bedrock, dense sandy soil and glacial till containing gravel, cobbles, and boulders are anticipated in the overburden soils near the endpoints. On average, the sand shows fairly high blow counts which increase with depth and provide good soil strength as indicated by the soil confining capacities calculated within the hydrofracture analysis.
2. The drill path will pass through the Kallander Creek Volcanics rhyolite and basalt bedrock over a majority of the crossing length. The rock quality looks poor near the entry point of the crossing and increases in quality moving southwest along the drill path. There is potential for drilling fluid

in the annulus to find an alternate flow path through the rock fractures and into the overburden soil. It is unlikely that the drilling fluid will be pressured high enough to then fracture the surrounding soil and flow to the surface. If the rig operator identifies a sustained loss in drilling fluid pressure or a loss of circulation, the steps outlined in the "Prevention" section of the Inadvertent Return Plan will be followed.

3. See Enbridge’s response to WDNR Data Request Question HP-10-2 above.
4. Wetlands are located within the entry side workspace boundary and will be covered or bridged with construction matting. The hydrofracture analysis indicates that the soil confining capacity will increase quickly with depth. Estimated Annular pressures are not anticipated to exceed the soil confining capacity near the entry point where depth of cover is shallow. The HDD profile shows the location of the wetland near the entry which is within the HDD workspace and will be restored after construction. The hydrofracture analysis shows the soil confining capacity increases rapidly at this location and is still at the required safety factor because the estimated annular pressure is low. Following completion of the HDD, the workspace, including wetlands within the workspace, will be restored to pre-construction elevations. Enbridge notes that there are no wetlands within 50 feet of the exit. The low estimated annular pressure at the exit is very unlikely to have a potential IR impact on a wetland.

   To prevent drilling fluid flowing outside of the workspace boundary near the exit point, the driller will typically reduce pump pressure as the bit approaches the ground surface. Crew members in radio communication with the driller will be stationed on the exit side during punch out of the drill bit along with drilling fluid containment materials. See also Enbridge’s response to WDNR Data Request Questions 4i and HP-6 above which further describes how the risks were addressed during design and HDD execution.

**WDNR Data Request Question HP 18:**

*How will the followings site-specific IR risks be addressed at the Potato River HDD Crossing:*

1. Variable soil textures
2. Moderately to highly fractured rock
3. Boulders
4. Shallow groundwater

**Enbridge Response to WDNR Data Request Question HP-18:**

1. See Enbridge’s response to WDNR Data Request Question HP-10-1 above.
2. The drill path will pass through fairly poor-quality Portage Lake Volcanics rhyolite, andesite, and basalt over a majority of the crossing length. There is potential for drilling fluid in the annulus to find an alternate flow path through the rock fractures and into the overburden soil. It is unlikely that the drilling fluid will be pressured high enough to then fracture the surrounding soil and flow to the surface. If the rig operator identifies a sustained loss in drilling fluid pressure or a loss of circulation, the steps outlined in the "Prevention" section of the Inadvertent Return Plan will be followed.

3. See Enbridge's response to WDNR Data Request Question HP-8-2 above.
4. See Enbridge's response to WDNR Data Request Question HP-10-2 above.

Wetlands are located just beyond the entry side workspace boundary. The drill path achieves a minimum of 20 feet of cover beneath the wetlands. The hydrofracture analysis indicates that the estimated annular pressure is very close to the soil confining capacity in approximately the first 180 feet of the crossing. Casing can be installed at the entry point down through the softer soils near the surface to seal off this section of the bore from the surrounding soil to eliminate the increased risk of IRs. Closer to station 2+00, the soil confining capacity greatly increases with depth until entering bedrock. Crew members will monitor the alignment and surrounding area as the bit passes through any of the higher risk areas to catch any drilling fluid as it surfaces. The exit point is also located near wetlands which are outside of the workspace boundary. There is potential for drilling fluid to surface within the exit workspace as the drill bit loses cover closer to the exit point. To prevent drilling fluid flowing outside of the workspace boundary near the exit point, the driller may reduce pump pressure as the bit approaches the ground surface. Crew members in radio communication with the driller will be stationed on the exit side during punch out of the drill bit along with drilling fluid containment materials. Addressed in the previous response (HP-18-5). The HDD profile provide shows the location of the wetlands at the exit. In this case since it proposed as an intercept drill, each side is an entry during the pilot hole process. The hydrofracture analysis shows the soil confining capacity provides the required safety factor at these wetland locations. Also see Enbridge's response to WDNR Data Request Questions 4i and HP-6 above describe how the risks were addressed during design and HDD execution.

**<u>WDNR Data Request Question HP 19:</u>**

*How will the followings site-specific IR risks be addressed at the Vaughn Creek HDD Crossing:*

1. *Sandy soils with layers of clay*
2. *Highly fractured rock*
3. *Potential to encounter artesian aquifer*
4. *Entry near wetlands*
5. *Cobbles*
6. *Limited soil confining pressure in last 50 feet of drill path*

**<u>Enbridge Response to WDNR Data Request Question HP-19:</u>**

1. See Enbridge's response to WDNR Data Request Question for HP-10-1 above.
2. The proposed Vaughn Creek drill path remains above the sandstone rock formation within the glacial till over the entire crossing length. On average, the sand shows fairly high blow counts which increase with depth and provide good soil strength as indicated by the soil confining capacities calculated within the hydrofracture analysis.
3. The artesian aquifer was encountered in Boring 46WB approximately 35 feet into the argillite bedrock. As the Vaughn Creek drill path remains in the glacial till above the bedrock, it is not anticipated that the aquifer will be encountered.

4. Wetlands are located within the entry side workspace boundary and will be covered or bridged with construction matting. The hydrofracture analysis indicates that the soil confining capacity will increase quickly with depth. Estimated Annular pressures are not anticipated to exceed the soil confining capacity near the entry point where depth of cover is shallow. The HDD profile shows the location of the wetlands and the hydrofracture analysis shows the soil confining capacity at the wetland locations. The required safety factor is achieved at these locations. Additionally, the wetlands at the entry point are within the workspace and will be restored after construction.
5. See Enbridge's response to WDNR Data Request Question HP-8-2 above.
6. To prevent drilling fluid flowing outside of the workspace boundary near the exit point, the driller will typically reduce pump pressure as the bit approaches the ground surface. Crew members in radio communication with the driller will be stationed on the exit side during punch out of the drill bit along with drilling fluid containment materials.

Enbridge's response to WDNR Data Request Questions 4i and HP-6 above describe how the risks were addressed during design and HDD execution.

**WDNR Data Request Question HP 20:**

*At the Vaughn Creek crossing, there is reference to soil borings CN-1 and CN-2 but the geotechnical report did not include the logs for these locations. Please provide, along with logs for any other locations where borings were taken but not included in the geotechnical report.*

**Enbridge Response to WDNR Data Request Question HP-20:**

Borings CN-1 and CN-2 were commissioned to establish bedrock level and difficulty in crossing a CN railroad track just south of the Vaughn Creek HDD and only go to a depth of approximately 40 feet. They were reviewed by Enbridge's contracted HDD Design firm but don't provide significant engineering input to substantiate the design of the Vaughn Creek HDD and were listed on the HDD profile drawing for reference. Data for CN-1 and CN-2 are included as Attachment 6. All other geotechnical bore logs/reports referenced by HDD profile drawings have been previously submitted.

**WDNR Data Request Question HP 21:**

*Please provide more detail on the inputs used to determine the soil confining pressure for the hydrofracture analysis curves.*

**Enbridge Response to WDNR Data Request Question HP-21:**

The soil confining capacity was calculated using the "Delft Method", which is described in Appendix B of an U.S. Army Corps of Engineers publication titled *Recommended Guidelines for Installation of Pipelines beneath Levees using Horizontal Directional Drilling*. The Delft Method is based on cavity expansion theory and allows for calculation of the pressure at which the soil in the zone surrounding the borehole begins to deform plastically, as well as the point at which the plastic zone expands vertically until it reaches the ground surface. The inputs used to determine the soil confining pressure for the hydrofracture curves are the following: elastic modulus, moist density, cohesion, friction angle, poisson's ratio, and shear modulus of the soil. These soil properties used in the hydrofracture calculations were pulled from each crossing's Subsurface Investigation Report prepared by Braun Intertec.

**DOCUMENT: STORMWATER POLLUTION PREVENTION PLAN**

**WDNR Data Request Question SWPPP 1:**

*There is a lot of conditional language that leaves the department unclear on whether the performance standards in s. NR 151.11, Wis. Adm. Code will be met. While it is understood that minor adjustments may be made in the field in response to variations in topography that were not captured by LIDAR or other topographic information sources, the report reads as if almost all decisions on whether to install specific erosion and sediment control devices are left to Enbridge field staff. Please provide more definite statements about what will be done. If there are situations where Enbridge believes a particular storm water practice would not be warranted, please describe those conditions.*

**Enbridge Response to WDNR Data Request Question SWPPP-1:**

As discussed in Enbridge's response to WDNR Data Request Question ECM-1 above, Enbridge's Erosion Control and Stormwater Management Plan is developed to show the base conditions anticipated to be encountered during construction and restoration of the Project. The plan is intended to be adaptive based on actual field conditions at the time of construction. Enbridge is committed to complying with the control reduction and mass limitation requirements of NR 151.11 Wis. Adm. Code. The specific stormwater practices to be utilized are set forth in the EPP and ESCP.

**WDNR Data Request Question SWPPP 2:**

*SWPPP page 8 of .pdf: Silt fence is recommended around soil stockpiles, not compost-filled filter sock to avoid clods of dirt overshooting the perimeter control. Perimeter controls should be placed until vegetation has been established to a 70% density on the stockpiles. Perimeter controls are needed around the ends of stockpile gaps placed to maintain concentrated flow paths. Narrative says that 'perimeter controls may include…' Are there other perimeter control types under consideration? Stabilization methods also use 'may'.* Need clarity and commitment.

**Enbridge Response to WDNR Data Request Question SWPPP-2:**

Enbridge will prevent or reduce discharge of sediment eroding from soil stockpiles existing for more than 7 days by temporarily stabilizing soil stockpiles or installing perimeter controls. Stabilization methods for soil stockpiles include application of temporary seeding, mulch (straw or hydro mulch), and/or erosion control blanket (see section 8.4 of the EPP). Perimeter controls include installation of silt fence (for larger longer-term stockpiles) and compost filled filter sock or biologs (for smaller short-term stockpiles) on the downslope side of soil stockpiles (see Section 8.3 of the EPP) In addition, erosion from stockpiles will be reduced by creating stockpile gaps to allow for natural drainage of ditches, swales, and waterways (see Section 9.0 of the EPP). All other disturbed areas in which construction activities have paused for more than 14 days will be temporarily stabilized, in accordance with the EPP.

**WDNR Data Request Question SWPPP 3:**

*"Enbridge does not anticipate vehicle or equipment washing…" this statement does not account for washing needed to prevent the spread of invasive species.*

**Enbridge Response to WDNR Data Request Question SWPPP-3:**

Enbridge is committed to minimizing the spread of invasive and noxious species ("INS") as defined by Chapter NR 40, Wis. Adm. Code., including invasive and noxious terrestrial plants, aquatic invasive species, and tree pests, along the construction ROW, work areas, and associated access roads. Enbridge developed a Project-specific Invasive and Noxious Species Management Plan ("INS Plan"), which outlines the management strategies that will be used to minimize the introduction and spread of INS identified within the Project construction workspace and access roads in compliance with applicable laws or regulations. Management strategies will be implemented where applicable and appropriate prior to construction, and during Project construction, restoration, and post-construction monitoring phases. This INS Plan is complimentary to Enbridge's EPP.

As described in Enbridge INS Plan, the treatment method selected for an INS population will be dependent on a number of factors, including the time of year and species-specific biology, proximity to sensitive species, and construction activities and the timing of those activities. Where existing INS occurrences have been documented, pre-treatment management will be implemented where possible. The pre-treatment objective will be to reduce the observable aboveground vegetative growth and seed production by INS at known locations. The intended effects of pre-treatment are to reduce potential spread of INS plants, seeds (observable on above-ground seed heads), and propagules by reducing INS populations prior to clearing and ground-disturbing activities. Pre-treatment will be prioritized for INS listed by the WDNR as Restricted Noxious Weeds that must be eradicated or controlled in Wisconsin (Table 1). Where possible, Enbridge will pre-treat known locations of terrestrial plant INS by flagging the populations, spot mowing, mechanical removal (e.g., hand-pulling, digging), spot herbicide application, prescribed burning, spot propane weed torching, or an integrated management approach that combines two or more of these techniques prior to clearing. Any of these methods or a combination thereof may also be used during construction, restoration, and/or post-construction monitoring as needed. Pre-treatment will commence when all necessary permits and authorizations, and the necessary landowner or land-managing agency permissions are in place and will continue until the start of clearing or other construction activities.

In areas where INS occurrences have been documented and pre-treatment cannot be implemented prior to clearing or between clearing and construction, or pre-treatment has not had the intended effect, a combination of the following BMPs may be implemented, where appropriate and as determined to limit spread of INS.

Topsoil Segregation

Enbridge may implement topsoil segregation of the infested area to minimize the spread of INS and to allow equipment to work through the area after topsoil has been stripped, as long as equipment stays on the subsoil.

Stored topsoil in heavily infested areas will be covered or sprayed with tackifier or mulch to reduce the viability of INS seeds and rootstock prior to the restoration phase and prevent transport by wind. Weed-infested stockpiles will be marked with clearly visible signage until the restoration phase. During restoration, Enbridge will return topsoil and vegetative material from infestation sites to the areas from which they were stripped and will not move soil and/or vegetative matter outside of the identified and marked noxious weed infestation areas.

<u>Installation of Construction Mats</u>

In areas of the construction workspace where pre-treatment of the INS population or topsoil segregation is not feasible, Enbridge will install and work off of construction mats or equivalent to cover the INS source. Construction mats will then be cleaned before use at another non-infested site as described in the "Cleaning Stations" section. Enbridge will also consider the use of construction mats in pre-treated areas with heavy infestations of INS.

<u>Cleaning Stations</u>

In areas where pre-treatment of terrestrial plant INS has not been implemented prior to clearing, Enbridge may establish cleaning stations to remove visible dirt and plant material from equipment and mats when exiting a known terrestrial INS infestation area along the construction workspace (Section 4.1 of the EPP). Cleaning stations may also be implemented at select sites during construction, restoration, or post-construction monitoring, as needed. Construction mats utilized in an INS site will either be cleaned at designated cleaning stations or will be transported to constructions yards for storage and/or cleaning prior to re-use. Construction mats will be covered and contained in plastic tarps or geotextile fabric when they are transported and stored to minimize the spread of INS seeds.

Mechanical means (initial scrape down followed by blow down with air or water) will be the primary method used to remove dirt and plant materials from vehicles, equipment, and construction mats at the cleaning stations or construction yards. Enbridge does not propose the exclusive use of high-pressure wash stations due to the need for additional water and space, and the challenges with containing and disposing of the cleaning water. Removal of dirt and plant material will be documented in a cleaning log (see Attachment C of Enbridge's INS Plan). Off-site cleaning stations will be placed in existing disturbed areas (e.g., construction yards that were previously used as construction yards, rail yards, sand/gravel mines) that are clearly designated as a cleaning station area, and where the appropriate erosion and sediment control BMPs have been implemented to prevent off-site surface run-off.

**<u>WDNR Data Request Question SWPPP 4:</u>**

*"Project specific permit conditions and/or landowner agreements will supercede…alternate construction procedures…" Significant changes to the erosion and sediment control plan may require advance approval from regulatory agencies.*

**Enbridge Response to WDNR Data Request Question SWPPP-4:**

Enbridge understands that significant changes to the planned erosion and sediment controls may require advanced approval from regulatory agencies. Enbridge will coordinate with the applicable agencies, as needed, should significant changes be required.

**WDNR Data Request Question SWPPP 5:**

*"Why would a one-call regulation necessitate delay in repair or replacement of erosion control devices? Compost-filled silt sock could be used in interim if post installation needs to be delayed.*

**Enbridge Response to WDNR Data Request Question SWPPP-5:**

In limited situations, a non-functional erosion control may be identified near existing buried utilities, such as near roadways or within utility crossings. Where ground disturbance is required to repair or replace non-functioning erosion controls in these locations, an active one-call for foreign utility locates will be required prior to the ground disturbance. During that interim period Enbridge will take measures to temporarily contain stormwater/eroded material until the utility call is confirmed and ECDs can be repaired, replaced, or supplemented.

**WDNR Data Request Question SWPPP 6:**

*There is a statement "ditch checks may be used" that lacks commitment. Please indicate what will be done. For conditional statements, please clearly indicate the circumstances that something either will be done or won't be done. What is the plan if the contributing drainage area is more than one acre?*

**Enbridge Response to WDNR Data Request Question SWPPP-6:**

Ditch checks will be installed and maintained in accordance with WDNR Technical Standard 1062 in locations of concentrated flow with a contributing drainage area less than one acre. Please see Enbridge's response to WNDR Data Request Question SWPPP-2 above for areas with contributing drainage more than one acre.

**WDNR Data Request Question SWPPP 7:**

*There are wells near parts of the proposed construction that have indicators of artesian conditions. Please provide a section in the SWPPP discussing what measures will be taken to address erosion control should flowing water be encountered.*

**Enbridge Response to WDNR Data Request Question SWPPP-7:**

Enbridge completed multiple studies to identify potential shallow confined aquifers along the proposed pipeline route. This included analysis of publicly available aquifer information; analysis of publicly available well records in the Project area; review of geologic, hydrologic, and topographic setting; and field investigations.

As part of its engineering and constructability analysis, Enbridge conducted extensive geotechnical investigation in 2020. The geotechnical investigations were primarily targeted towards HDD/DPI crossings and valve settings. Groundwater levels were estimated based on the moisture level observed within geotechnical boring samples and were measured at the end of each boring where possible. This investigation documented multiple areas where shallow unconfined groundwater was encountered.

Aquifer breaches during construction occur where the construction activities extend deep enough to penetrate the confining layer above an aquifer. Enbridge reviewed the Project route and determined the maximum depth of construction activities along the route. Maximum depth of construction activities included HDD locations, areas where sheet piling may be used, valve site locations, and crossings of existing utilities as examples.

Enbridge also completed aquifer analysis studies in 2022. The studies looked at publicly available aquifer information, analysis of publicly available well records in the Project area, and/or review of geologic, hydrologic, and topographic setting.

The depth of construction analysis was combined with the aquifer analysis to determine areas where confined aquifers may be encountered by construction activities, confirming that there are no areas with “High Likelihood” of encountering artesian conditions. The majority of the Project alignment was defined as having a “Low Likelihood” of encountering aquifers with artesian conditions. Limited areas were defined as having “Moderate Likelihood” for encountering artesian conditions.

Enbridge’s investigations for shallow confined aquifers did not identify locations where artesian conditions will be encountered at the planned construction depths. Based on geotechnical analysis, it is unlikely the proposed HDDs will encounter confined aquifers. However, if the HDD encounters a confined aquifer, the HDD installation methodologies can control/seal the drill path as drilling progresses.

In the unlikely event that a shallow confined aquifer is encountered that results in water discharge, Enbridge would implement erosion and sediment controls as described in Enbridge’s EPP for stormwater runoff and trench dewatering activities. The need to add more erosion controls would be evaluated on a site-specific basis based on the rate of confined aquifer discharge, topography, and other site conditions. If encountered, Enbridge would work collaboratively with the respective agencies to develop a remediation plan to seal the confined aquifer breach.

**WDNR Data Request Question SWPPP 8:**

*Please provide additional clarification on how the project will proceed. Specifically, clarify how work will be planned so that the entire project area is not all disturbed at the same time. How many segments are expected to be under construction simultaneously? When will restoration work commence? Will there be multiple restoration crews?*

**Enbridge Response to WDNR Data Request Question SWPPP-8:**

As described in the Enbridge response to WDNR Data Request Question ECM-21 above, construction involves a series of discrete activities typically conducted in a linear sequence. These activities include survey and staking, clearing and grading, pipe stringing, bending, and welding, trenching, lowering-in and backfilling, hydrostatic testing, final tie-in, commissioning, and ROW cleanup and restoration. In addition, site-specific construction activities will be carried out by specialized crews at select areas such as at waterbody crossings, HDDs, and road/railroad crossings. An expanded description of these processes can be found in Sections 4.3 and 4.5 of Enbridge's Environmental Impact Report (August 2020), submitted as part of Enbridge's application materials to the WDNR for a Chapter 30 Wetland/Waterbody permit. The Project will be constructed as one overall construction spread with construction activities occurring across the entire Project length. Initial cleanup (e.g., removal of construction debris) and rough-grading activities will occur following pipeline installation and backfilling and may take place simultaneously. Rough and final grading includes restoring disturbed areas as near as practicable to preconstruction conditions, returning the topsoil, preparing seedbeds (where applicable) for permanent seeding, installing or repairing temporary erosion control measures, repairing/replacing fences, and installing permanent erosion controls. Construction work area cleanup and stabilization will commence within 72 hours after backfilling the trench, as weather permits. Final grading, topsoil replacement, seeding, and installation of permanent erosion control structures will be completed within 20 days after backfilling the trench (10 days in residential areas). If the construction progress extends longer than anticipated, or field conditions prevent compliance with these timeframes, temporary ECDs will be installed and maintained until conditions allow completion of cleanup. The process will be coordinated to the extent practicable to minimize the total time an individual tract of land is disturbed as well as the duration of bare exposed soil; however, final restoration will be delayed in areas where access is still required to complete construction. Additional restoration crews may be utilized to meet permit requirements and internal guidelines.