

Enbridge Line 5 Wisconsin Segment Relocation Project
USACE Regulatory File No. 2020-00260-WMS
Route Segment Alternatives Analysis – High Quality Wetlands

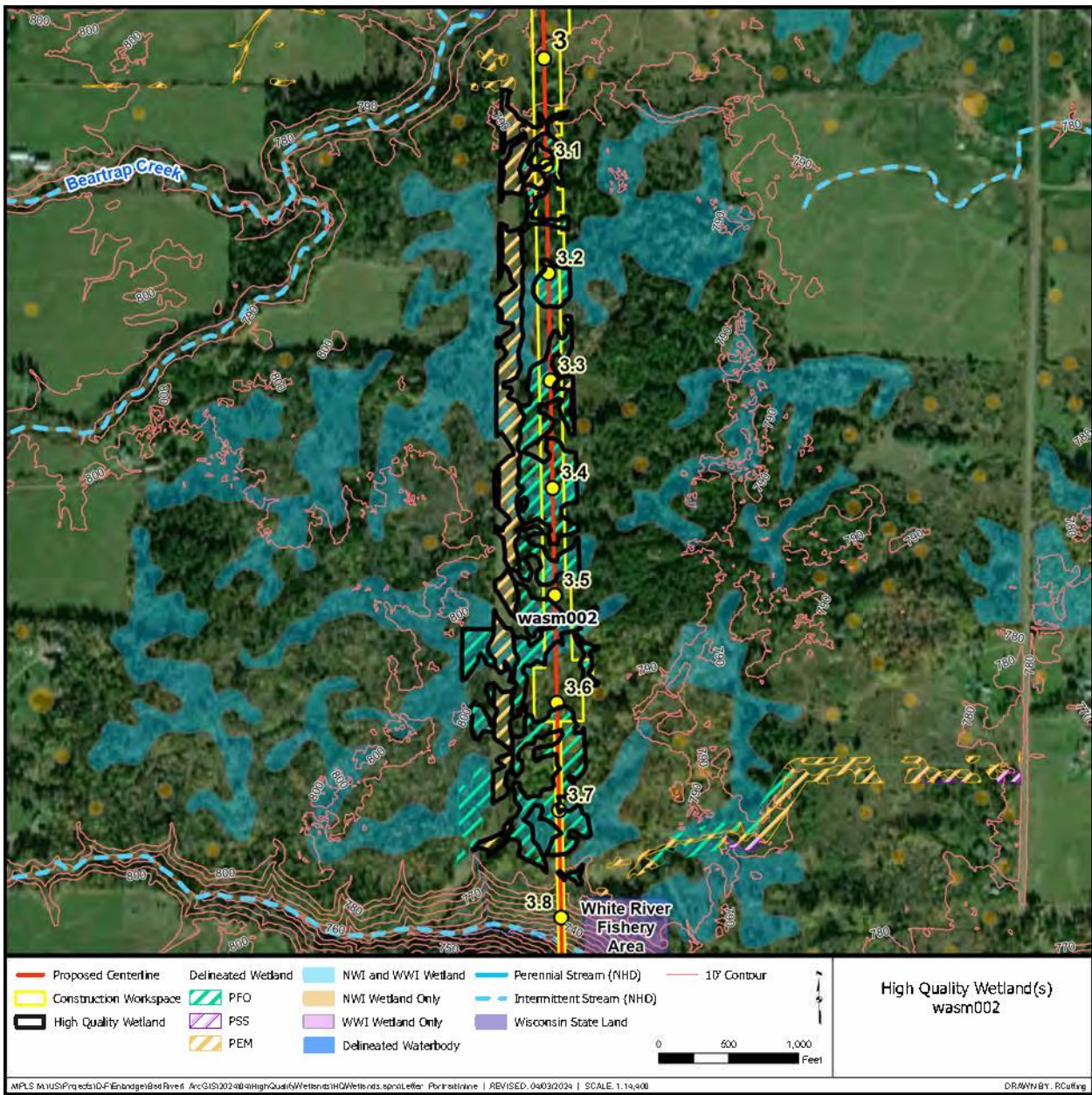
Per the U.S. Army Corps of Engineers ("USACE") request, Enbridge completed a desktop analysis of potential opportunities to further reduce disturbance of wetlands with a Wisconsin Rapid Assessment Method ("WRAM") Functional Value Rating of "High" that are greater than approximately 100 feet in pipeline centerline total crossing length.

Enbridge submitted a written description of the routing process used by Enbridge for the Line 5 Wisconsin Segment Relocation Project ("Project") to avoid and minimize wetland and waterbody disturbance. This written description was submitted to the Wisconsin Department of Natural Resources ("WDNR") on November 22, 2023, as part of Enbridge's responses to a WDNR Information Request, dated October 13, 2023. Following submission of the written description, Enbridge presented the routing process to the WDNR on December 1, 2023. Enbridge conducted a similar routing session with the USACE and EPA on December 18, 2024.

In general, the Project routing on the west avoided larger forested areas, including large-forested wetlands, staying in farmed areas to the extent practicable. On the south and east side of the Project, the route encounters larger forested areas, including forested wetlands with an overall WRAM value of "High". Due to the abundance and size of forested areas, including forested wetlands, routing was not able to avoid all features, but attempted to minimize the disturbance to the extent practicable. The Project minimized wetland disturbance through reducing the construction workspace (i.e., "necking down") in wetlands from 120-foot-wide right-of-way width to 95-foot-wide right-of-way width in wetlands and by adopting minor route adjustments where practicable based on landowner approval and engineering constraints to avoid wetlands or cross the wetland at the shortest crossing point when able. As requested by USACE, Enbridge further looked at high quality wetlands with crossing lengths of greater than 100 ft and provide the following below:

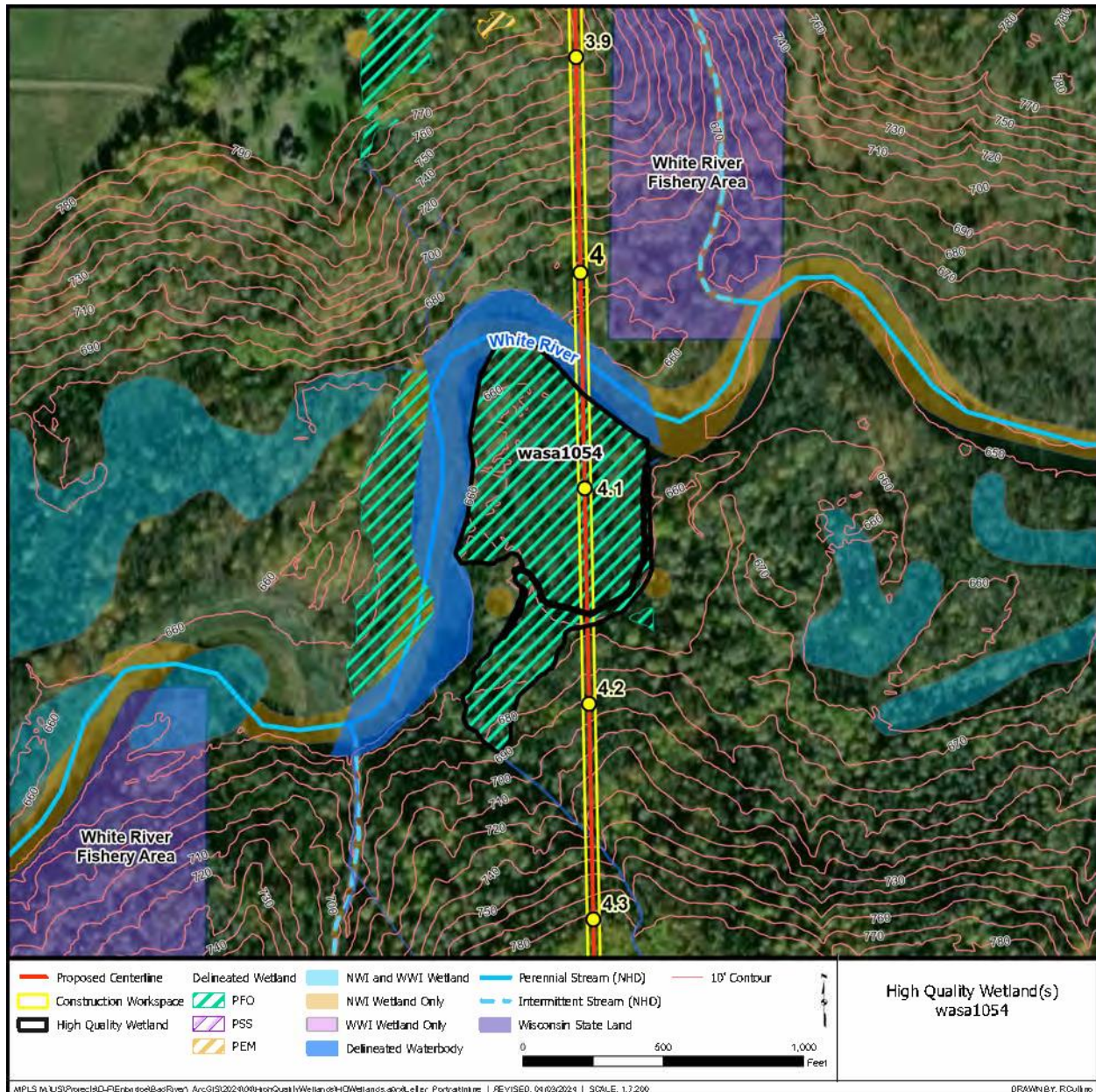
Mile Post ("MP") 3.08 - Wetland wasm002

Wetland wasm002 is a forested/emergent wetland complex with an overall WRAM Functional Value rating of high. The wetland complex is a mosaic of upland-wetland areas extending from approximately MP 3.08 to approximately MP 3.75, with the Project workspace intersecting exiting portions of the wetland throughout the corridor. The Project centerline crosses approximately 2,240 feet of the wetland and will temporarily disturb approximately 4.47 acres of wetland, including workspace required for the horizontal directional drill ("HDD") of the White River and associated workspace for assembly of the HDD pipe segment. Approximately 2.13 acres of forested wetland will be converted to emergent wetland within the Project permanent easement following construction. Enbridge has reduced overall impacts to this wetland by narrowing the construction corridor to the extent practicable to accommodate the White River HDD and construction of the pipeline mainline and has co-located with an existing overhead utility line where feasible. The overall alignment within the wetland cannot be effectively altered to further reduce wetland impacts and still accommodate the White River HDD.



MP 4.08 – Wetland wasa1054

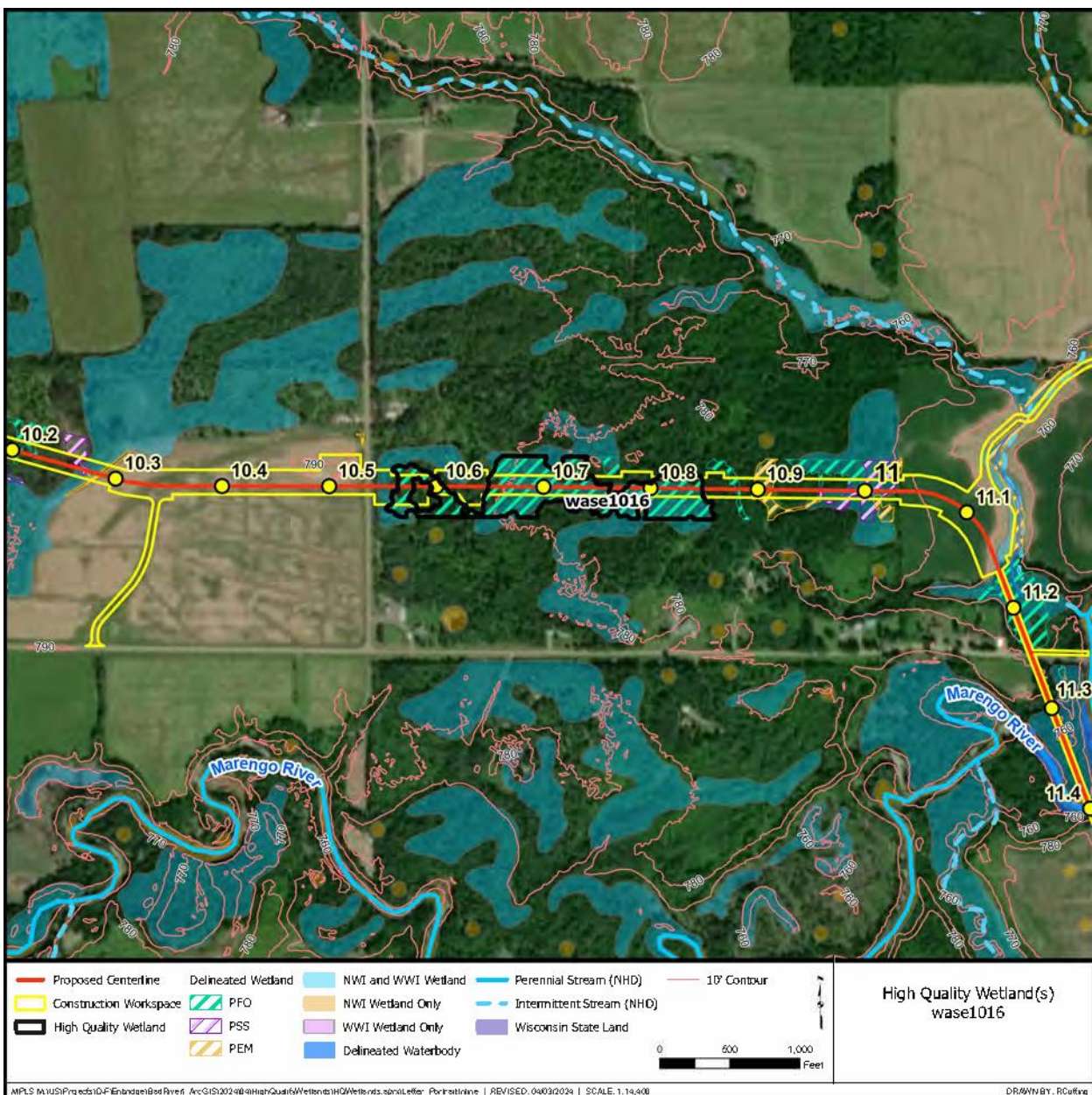
Wetland wasa1054 is a forested wetland located within the floodplain of the White River with an overall WRAM Functional Value rating of high. The Project centerline crosses approximately 564 feet of the wetland and will temporarily disturb approximately 0.39 acre of wetland. The entire 0.39 acre of forested wetland will be converted to emergent wetland within the Project permanent easement following construction. Enbridge has reduced overall impacts to this wetland by crossing the wetland using the HDD method and by narrowing the maintained corridor to 30 feet. The overall alignment within the wetland cannot be effectively altered to further reduce wetland impacts and still accommodate the White River HDD. Enbridge has not identified a practicable alternative that would further reduce impacts to this wetland complex.

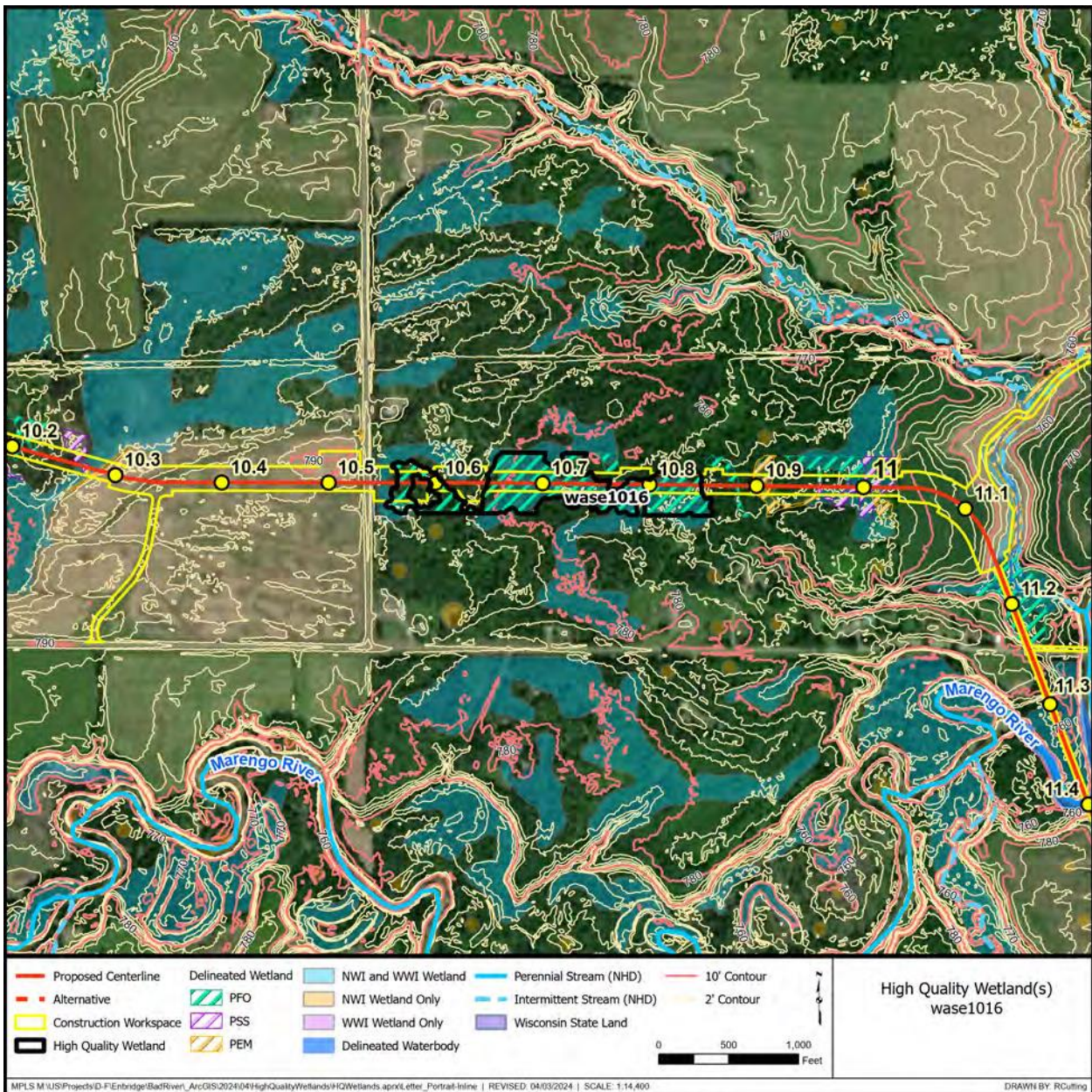


MP 10.57 – Wetland wase1016

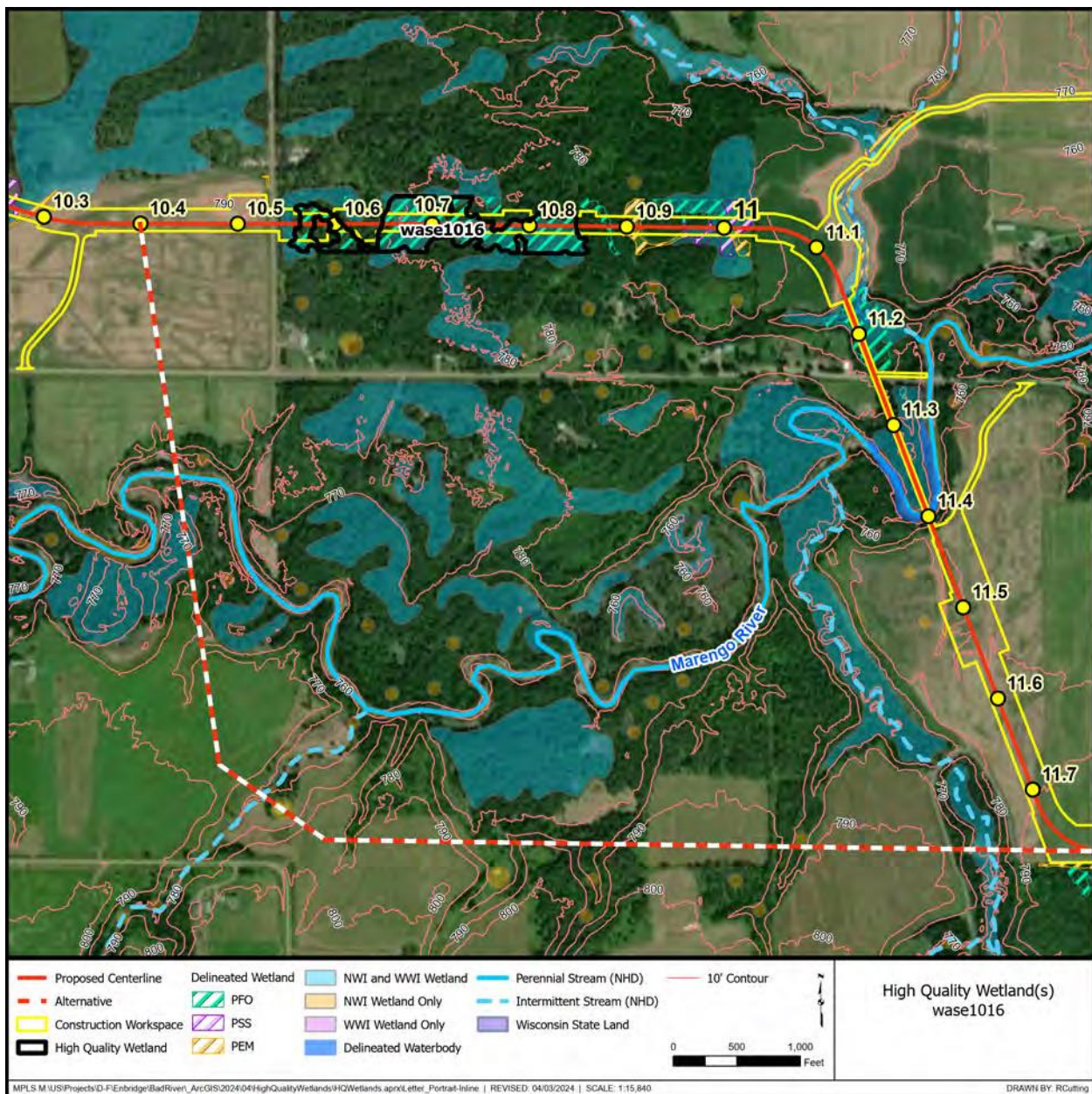
Wetland wase1016 is a forested wetland with an overall WRAM Functional Value rating of high. The Project centerline crosses approximately 1,127 feet of the wetland beginning at approximately MP 10.57 and extending to approximately MP 10.85. Construction of the Project will temporarily disturb approximately 2.45 acres. Approximately 1.28 acres of the wetland will be converted from forested wetland to emergent wetland within the permanent easement.

Field delineations, Wisconsin Wetland Inventory ("WWI") data, National Wetland Inventory ("NWI") data, and topographic information indicate that the wetland complex likely extends further north and south for the Project route, beyond the limits of the survey corridor. Minor route shifts to the north or south would place the pipeline closer to existing residences located along Marengo River Road and Richardson Road. These minor route shifts would have similar forest clearing impacts and would likely have similar wetland disturbance impacts based on WWI/NWI information and topography through the forested area.





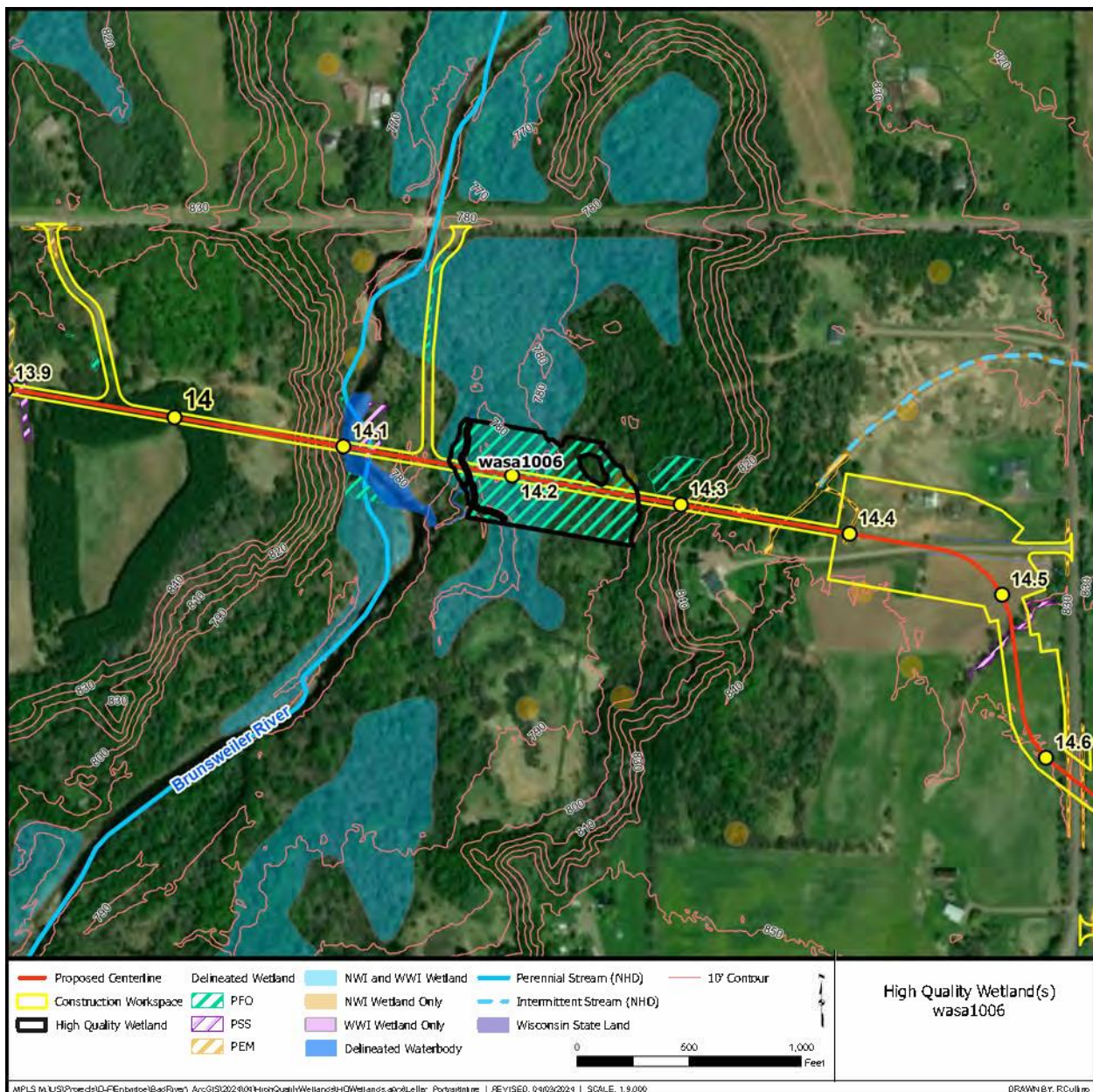
Enbridge completed a desktop analysis of a theoretical segment alternative that would avoid the referenced wetland by relocating the proposed route further south. Although in theory, this alternative could be constructible, no surveys have been conducted along this route, including geotechnical analysis to determine if the Marengo River could still be crossed using a Direct Pipe method. Although this route appears to reduce wetland impacts based on publicly available information, field survey data would be needed to confirm. This segment alternative would also cross one additional waterbody (based on WDH flowlines), with topographic information indicating that additional ephemeral/intermittent streams likely present. The route would also cross one more waterbody by open cut versus by direct pipe than the current route. Additionally, this theoretical route would affect three new landowners that have not given consent for surveys or indicated that they would be amenable to having the Project on their property. No documented cultural resource sites are present along this route; however, surveys would need to be conducted to verify that no cultural resources would be impacted.



In summary, the route reviewed here may have some potential to reduce high quality wetland impacts. However, the forest areas along this route could have wetlands similar to the proposed route. This is theorized based on the fact the forested areas are next to farm fields, which typically indicated the forested areas are wetter or they would have been converted to farm fields themselves. The two additional open cut waterbody crossings would increase waterbody disturbance from the proposed route. Based on these items this route depicted would not provide benefit when compared to the proposed route.

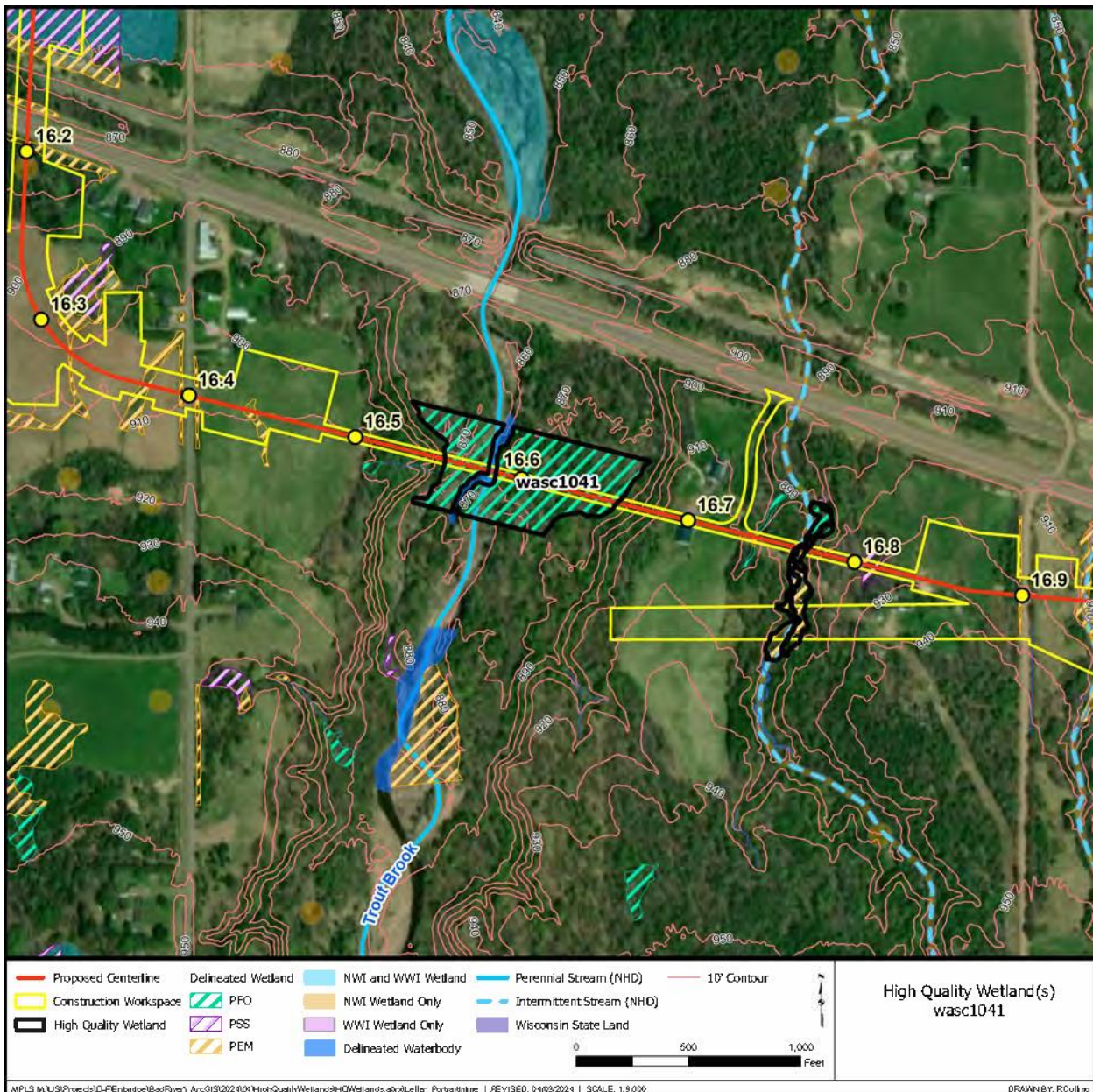
MP 14.17 – Wetland wasa1006

Wetland wasa1006 is a forested wetland located near the Brunsweller River. The wetland was determined to have an overall WRAM Functional Value rating of high. The Project centerline crosses approximately 576 feet of the wetland and will temporarily disturb approximately 0.39 acre of wetland. The entire 0.39 acre of forested wetland will be converted to emergent wetland within the Project permanent easement following construction. Enbridge has reduced overall impacts to this wetland by crossing the wetland using the HDD method and by narrowing the maintained corridor to 30 feet. The overall alignment within the wetland cannot be effectively altered to further reduce wetland impacts and still accommodate the Brunsweller River HDD. Enbridge has not identified a practicable alternative that would further reduce impacts to this wetland complex.



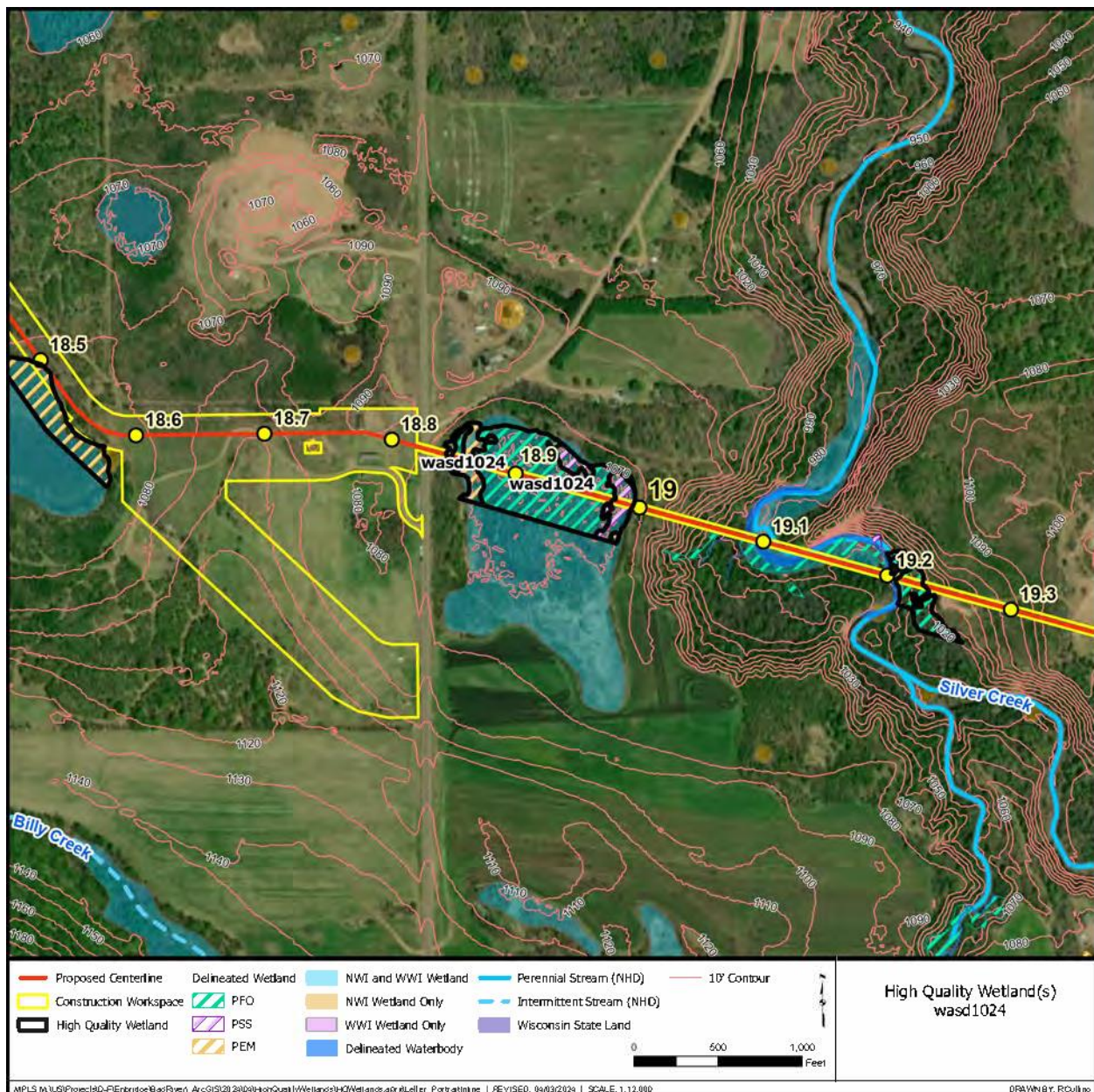
MP 16.57 – Wetland wasc1041

Wetland wasc1041 is a forested wetland located adjacent to Trout Brook. The wetland was determined to have an overall WRAM Functional Value rating of high. The Project centerline crosses approximately 523 feet of the wetland and will temporarily disturb approximately 0.36 acre of wetland. The entire 0.36 acre of forested wetland will be converted to emergent wetland within the Project permanent easement following construction. Enbridge has reduced overall impacts to this wetland by crossing the wetland using the HDD method and by narrowing the maintained corridor to 30 feet. The overall alignment within the wetland cannot be effectively altered to further reduce wetland impacts and still accommodate the Trout Brook HDD. Enbridge has not identified a practicable alternative that would further reduce impacts to this wetland complex.



MP 18.85 – Wetland wasd1024

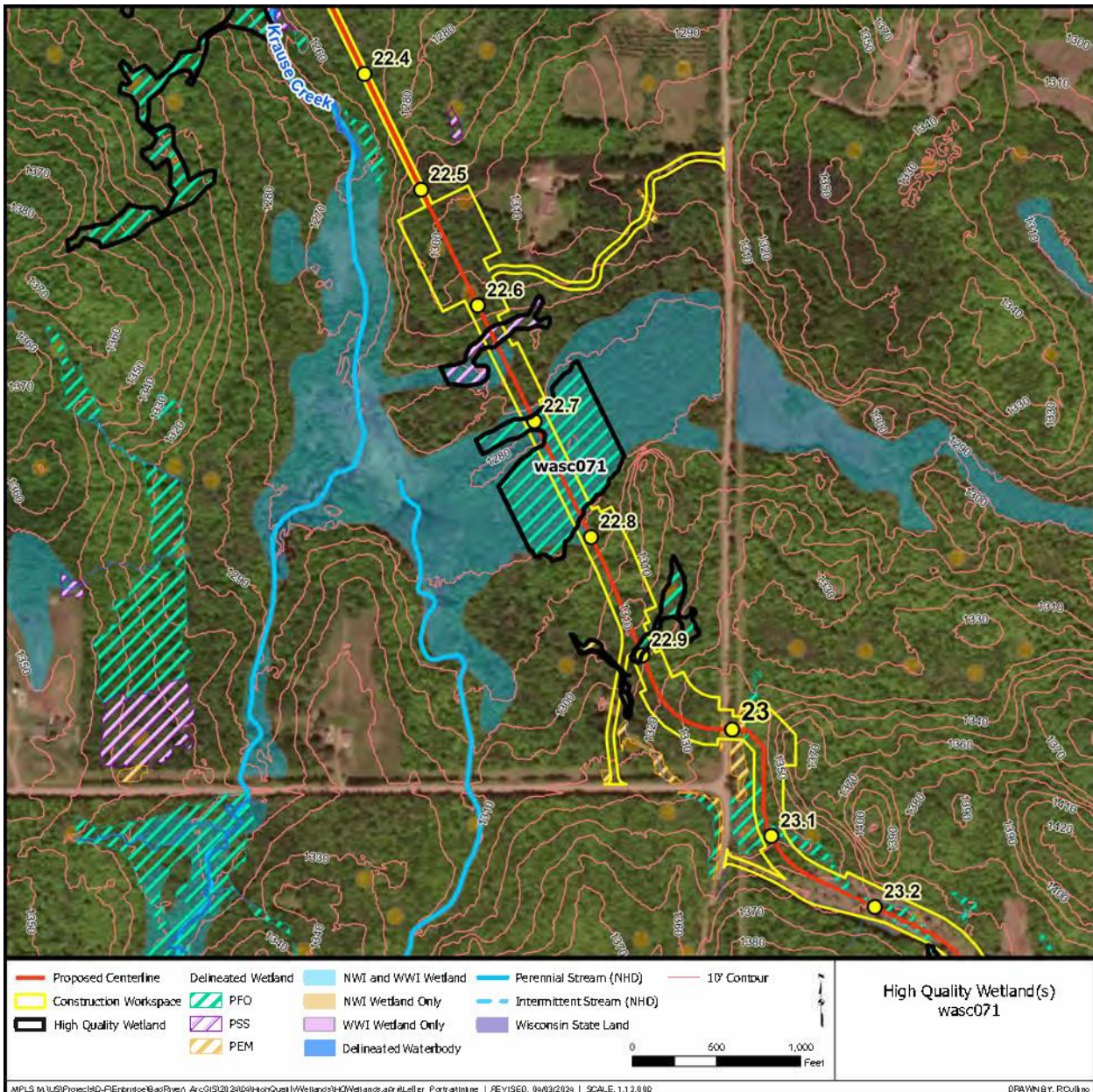
Wetland wasd1024 is wetland complex including components of fresh (wet) meadow, hardwood swamp, coniferous bog, and open bog. The wetland was determined to have an overall WRAM Functional Value rating of high. The Project centerline crosses approximately 795 feet of the wetland and will temporarily disturb approximately 0.55 acre of wetland. Approximately 0.48 acre of forested/scrub-shrub wetland will be converted to emergent wetland within the Project permanent easement following construction. Enbridge has reduced overall impacts to this wetland by crossing the wetland using the HDD method as part of the Silver Creek HDD and by narrowing the maintained corridor to 30 feet. The overall alignment within the wetland cannot be effectively altered to further reduce wetland impacts and still accommodate the Silver Creek HDD.



Enbridge evaluated a route that would have avoided this wetland by shifting the route to the south; however, this route was not approved by the landowners.

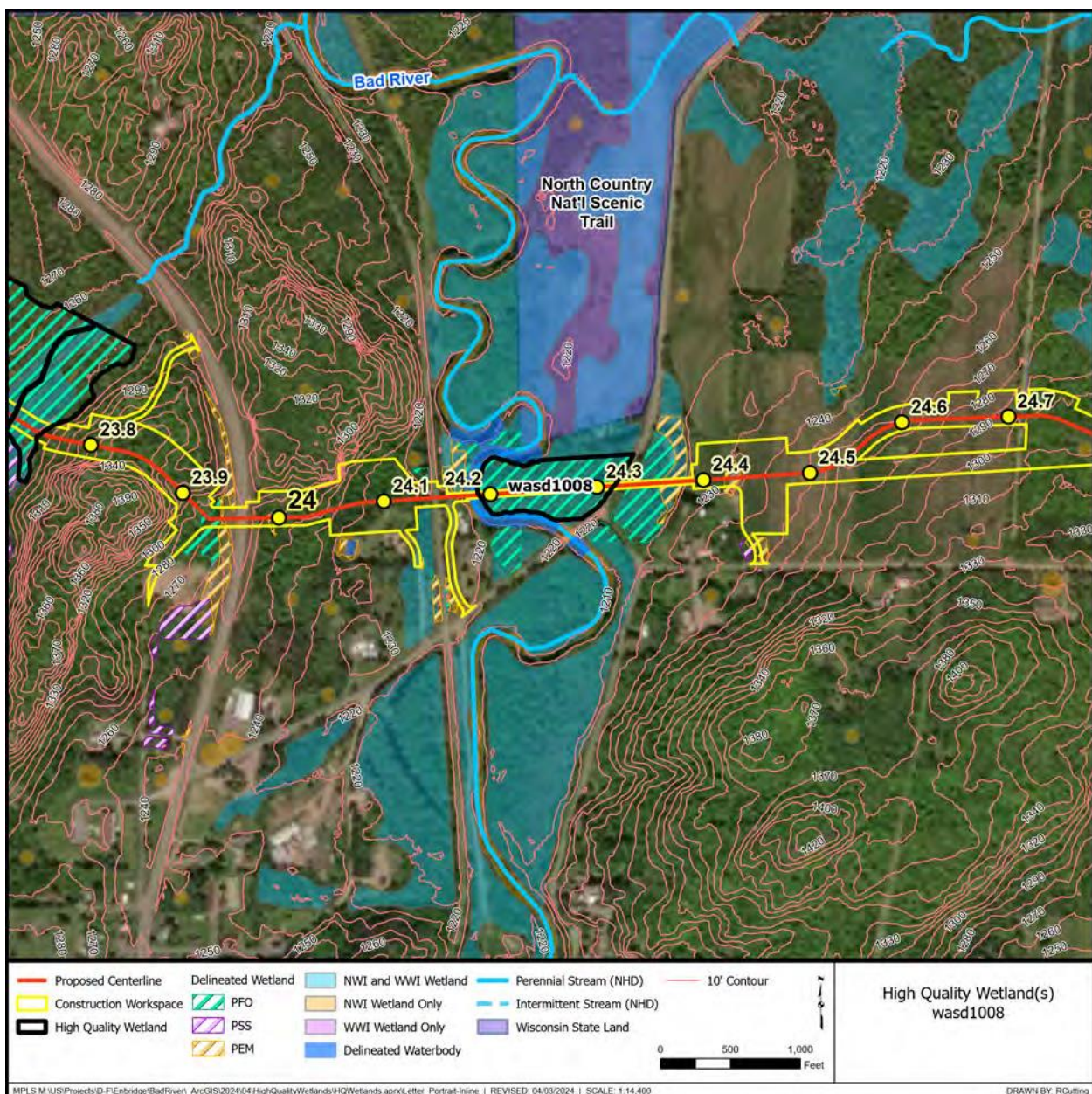
MP 22.70 – Wetland wasc071

Wetland wasc071 is a forested wetland with an overall WRAM Functional Value rating of high. The Project centerline crosses approximately 408 feet of the wetland and temporarily disturbs approximately 0.92 acre. Approximately 0.48 acre will be converted from forested wetland to emergent wetland following construction. Based on NWI/WWI information, the portion of the wetland crossed by the Project route is part of a larger wetland complex extending both east across Golf Course Road and west to Krause Creek. The Project route crosses the wetland at the narrowest location practicable to still accommodate the Krause Creek HDD. Enbridge has not identified a practicable alternative that would further reduce impacts to this wetland complex.



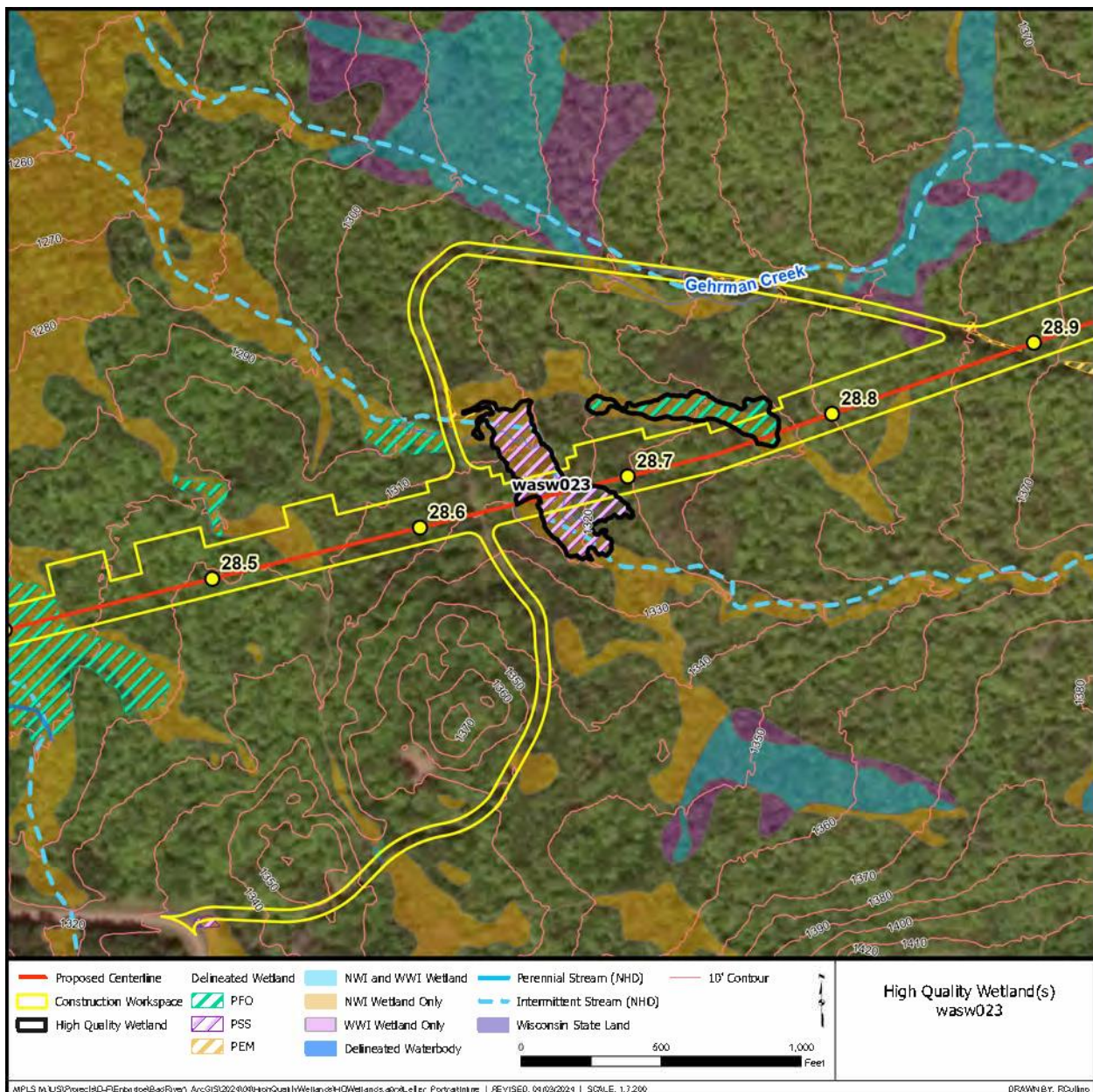
MP 24.19 – Wetland wasd1008

Wetland wasd1008 is a forested wetland adjacent to the Bad River and with an overall WRAM Functional Value rating of high. The Project centerline crosses approximately 669 feet of the wetland and temporarily disturbs approximately 0.46 acre. The entire 0.46 acre will be converted from forested wetland to emergent wetland following construction. Enbridge has reduced overall impacts to this wetland by crossing the wetland using the HDD method as part of the Bad River HDD and by narrowing the maintained corridor to 30 feet. The overall alignment within the wetland cannot be effectively altered to further reduce wetland impacts and still accommodate the Bad River HDD. Enbridge has previously provided a route segment alternative analysis (Mellen South), which describes an alternative to avoid this wetland. Potential alternatives north of this crossing would place the pipeline on property owned and managed by the State of Wisconsin or within the Copper Falls State Park. Enbridge has not identified a practicable alternative that would further reduce impacts to wetlands/waterbodies at this location.

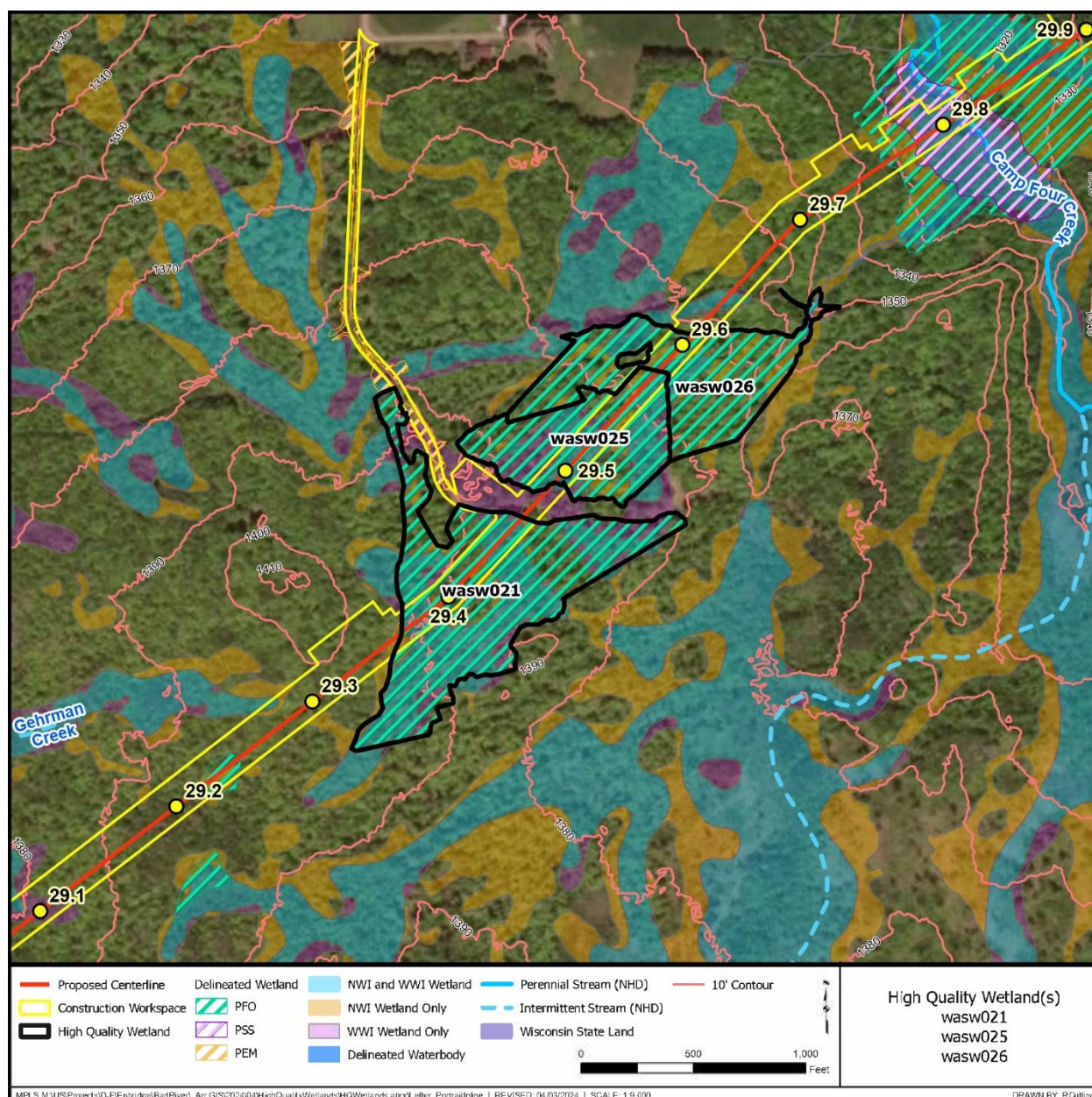


MP 28.67 – Wetland wasw023

Wetland wasw023 is a scrub-shrub wetland located adjacent to UNT Gehrman Creek with an overall WRAM Functional Value rating of high. The Project centerline crosses approximately 125 feet of the wetland and temporarily disturbs approximately 0.30 acre. Approximately 0.16 acre will be converted from scrub-shrub wetland to emergent wetland following construction. Based on NWI/WWI information, the portion of the wetland crossed by the Project route is likely part of a larger wetland complex extending along the UNT Gehrman Creek corridor and outside of the Project's delineated corridor. Shifting the pipeline route north or south to an alternative crossing site of Gehrman Creek may not reduce wetland impacts. Enbridge has not identified a practicable alternative that would further reduce impacts to wetlands/waterbodies at this location.

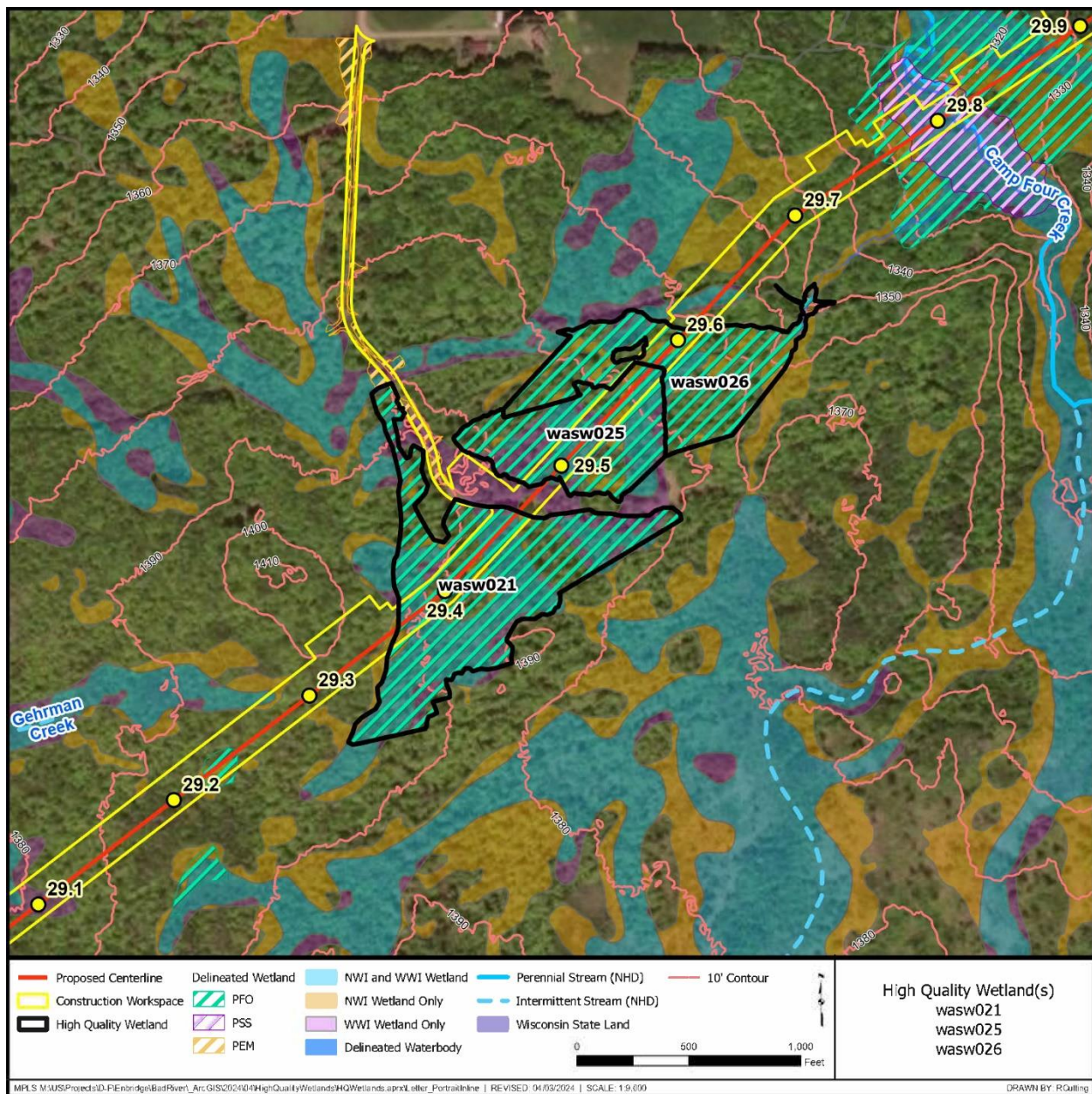


Wetland wasw021 is a forested wetland with an overall WRAM Functional Value rating of high. Based on NWI/WWI information, the wetland appears to be part of a larger wetland complex. The Project centerline crosses approximately 515 feet of the wetland and temporarily disturbs approximately 1.12 acres. Approximately 0.60 acre will be converted from forested wetland to emergent wetland following construction. Field delineations identified a much larger wetland than what is identified by NWI/WWI data. A review of NWI/WWI information, topographic information, and general aerial photography indicate that there is likely substantial wetlands to the east and west of the Project route. Enbridge has not identified a practicable alternative that would further reduce impacts to wetlands/waterbodies at this location.



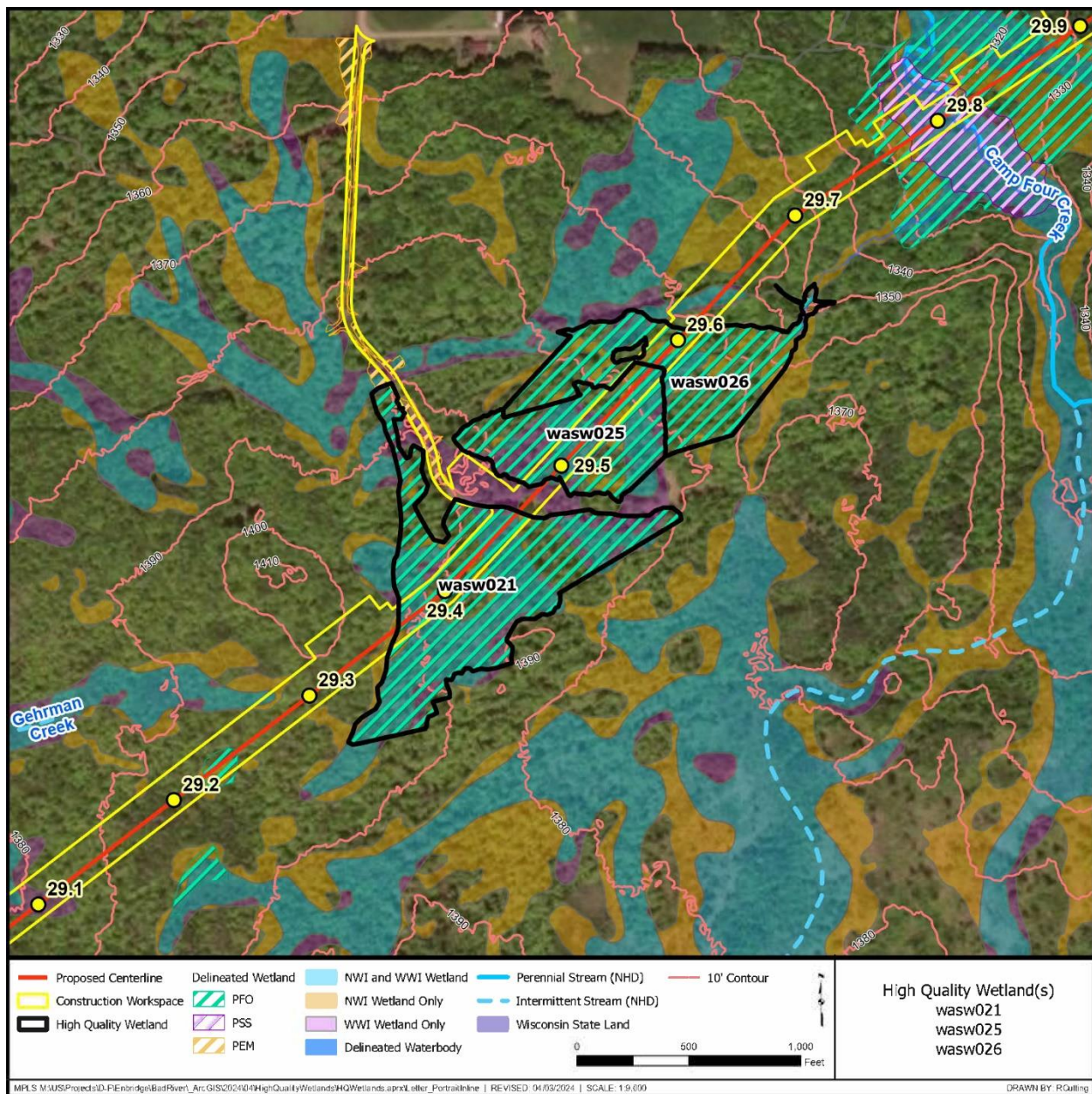
MP 29.50 – Wetland wasw025

Wetland wasw025 is a forested wetland with an overall WRAM Functional Value rating of high. Based on NWI/WWI information, the wetland appears to be part of a larger wetland upland-wetland mosaic complex. The Project centerline crosses approximately 469 feet of the wetland and temporarily disturbs approximately 1.05 acres. Approximately 0.55 acre will be converted from forested wetland to emergent wetland following construction. Field delineations identified a much larger wetland than what is identified by NWI/WWI data. This wetland is likely hydrologically connected with wetland wasw021 discussed above. A review of NWI/WWI information, topographic information, and general aerial photography indicate that there are likely substantial wetlands to the east and west of the Project route. Enbridge has not identified a practicable alternative that would further reduce impacts to wetlands/waterbodies at this location.



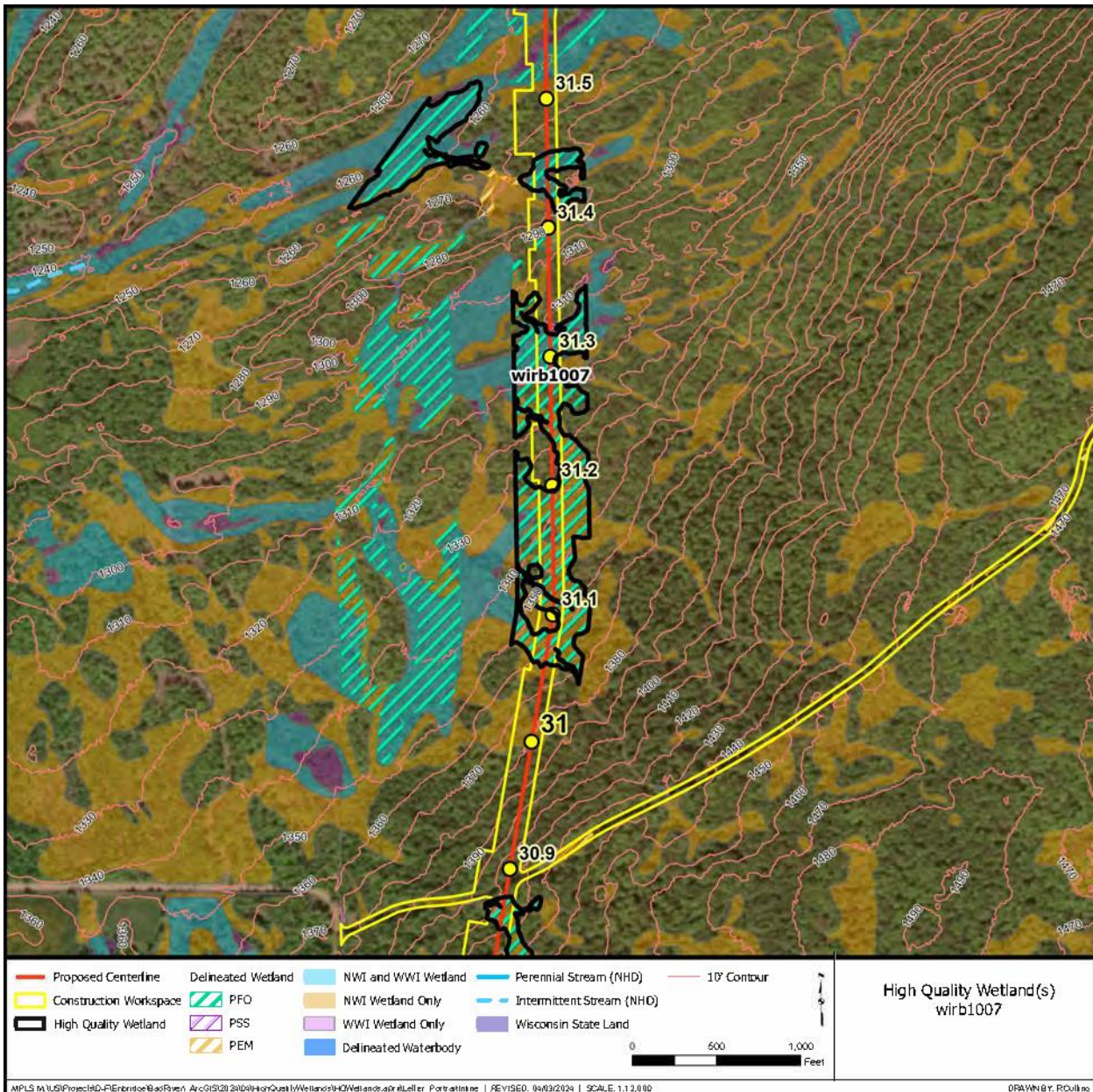
MP 29.59 – Wetland wasc026

Wetland wasw026 is a forested wetland with an overall WRAM Functional Value rating of high. Based on NWI/WWI information, the wetland appears to be part of a larger wetland upland-wetland mosaic complex. The Project centerline crosses approximately 155 feet of the wetland and temporarily disturbs approximately 0.36 acre. Approximately 0.18 acre will be converted from forested wetland to emergent wetland following construction. Field delineations identified a much larger wetland than what is identified by NWI/WWI data. This wetland is likely hydrologically connected with wetland wasw021 and wasw025 discussed above. A review of NWI/WWI information, topographic information, and general aerial photography indicate that there is likely substantial wetlands to the east and west of the Project route. Enbridge has not identified a practicable alternative that would further reduce impacts to wetlands/waterbodies at this location.



MP 31.07 – Wetland wirb1007

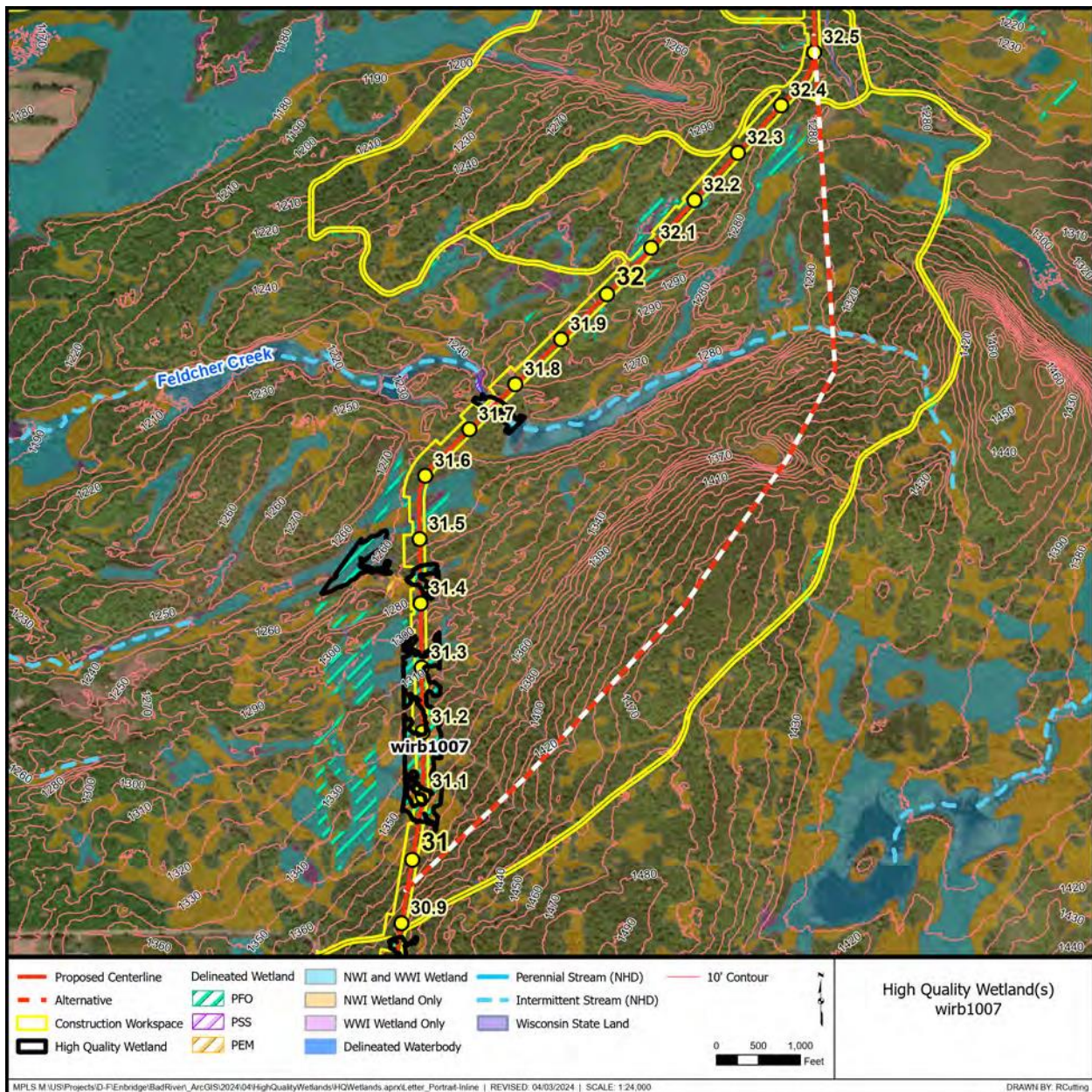
Wetland wirb1007 is a forested wetland with an overall WRAM Functional Value rating of high. The Project centerline crosses approximately 1,060 feet of the wetland and temporarily disturbs approximately 2.39 acres. Approximately 1.24 acres will be converted from forested wetland to emergent wetland following construction. The portion of the wetland crossed by the Project route is part of a larger wetland complex extending mostly west of the Project Route. Enbridge surveyed a potential alternative route west of the Project route, however, this route had similar overall wetland impacts and would have placed the route through a cultural resource site (47IR0052).



Enbridge has completed a desktop analysis of an alternative route that would avoid/minimize impacts to this wetland. The alternative would place the pipeline route east of and upslope of the wetland. Based on desktop data, the alternative would cross fewer wetland resources, but would place the line on steeper topography and side-slope areas. While the route may be technically feasible based on a desktop review, no field constructability analysis has been

completed for this alternative; therefore, no additional information is available on field wetland/waterbody delineations, cultural resources, depth to bedrock/blasting, analysis of Felcher Creek crossing, or workspace requirements is available.

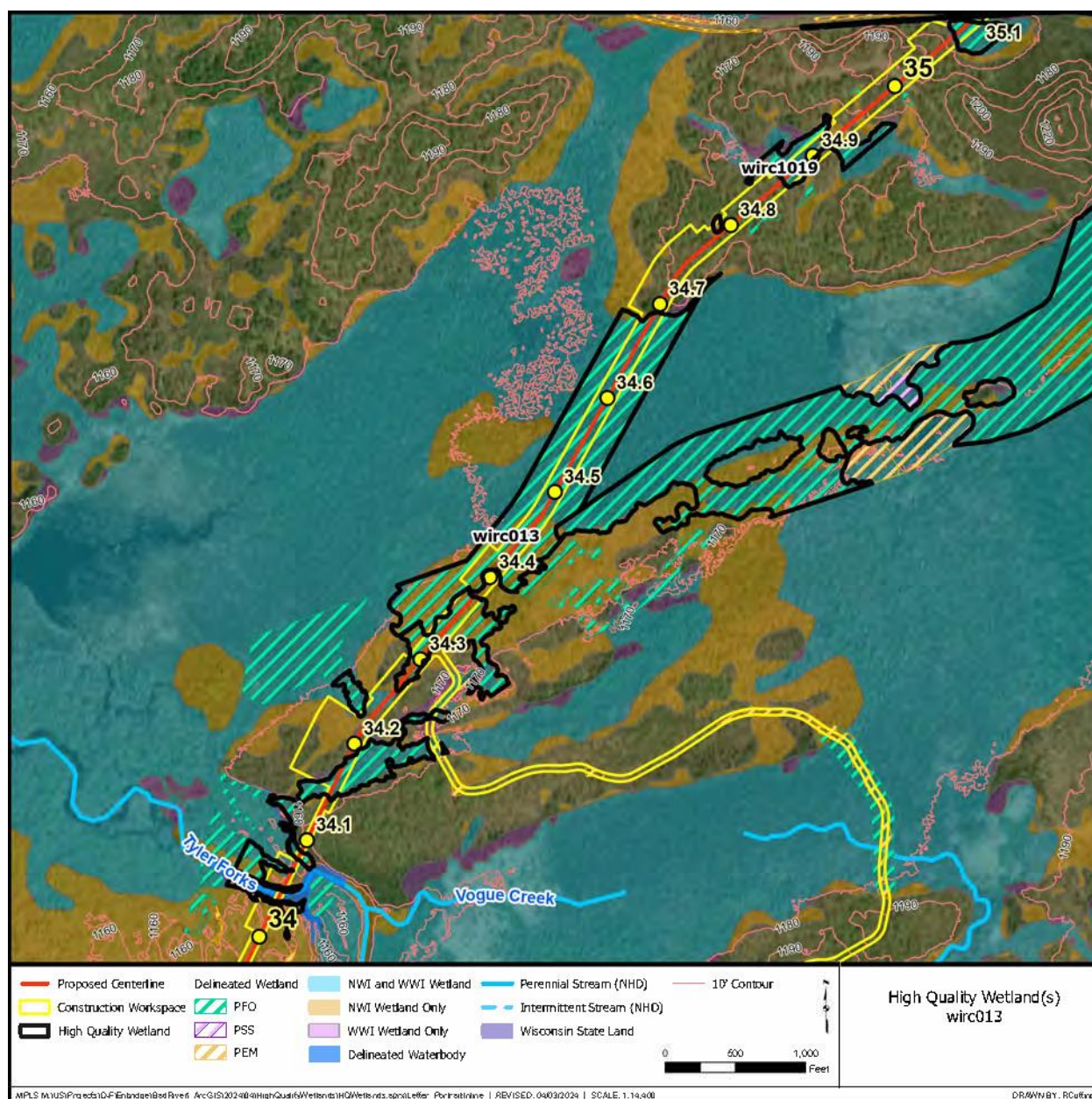
The aerial imagery appears to indicate more wetlands than shown on NWI data layers, similar to the proposed route. The crossing of Felcher Creek is more complex than the proposed route and the side slopes and potential for bedrock on this route do not make it beneficial.



In summary, the route reviewed here has some potential to reduce high quality wetland impacts. However, there may be forested wetlands along this alternative route segment of equal quality to the area crossed by the Project route. Additionally, there may be areas of cultural significance, similar to the area surveyed further west. Due to the potential presence of unknown resources, increase in side slope construction, potential for shallow bedrock requiring additional blasting, and increased complexity crossing Felcher Creek, this route segment alternative does not provide benefit when compared to the proposed route.

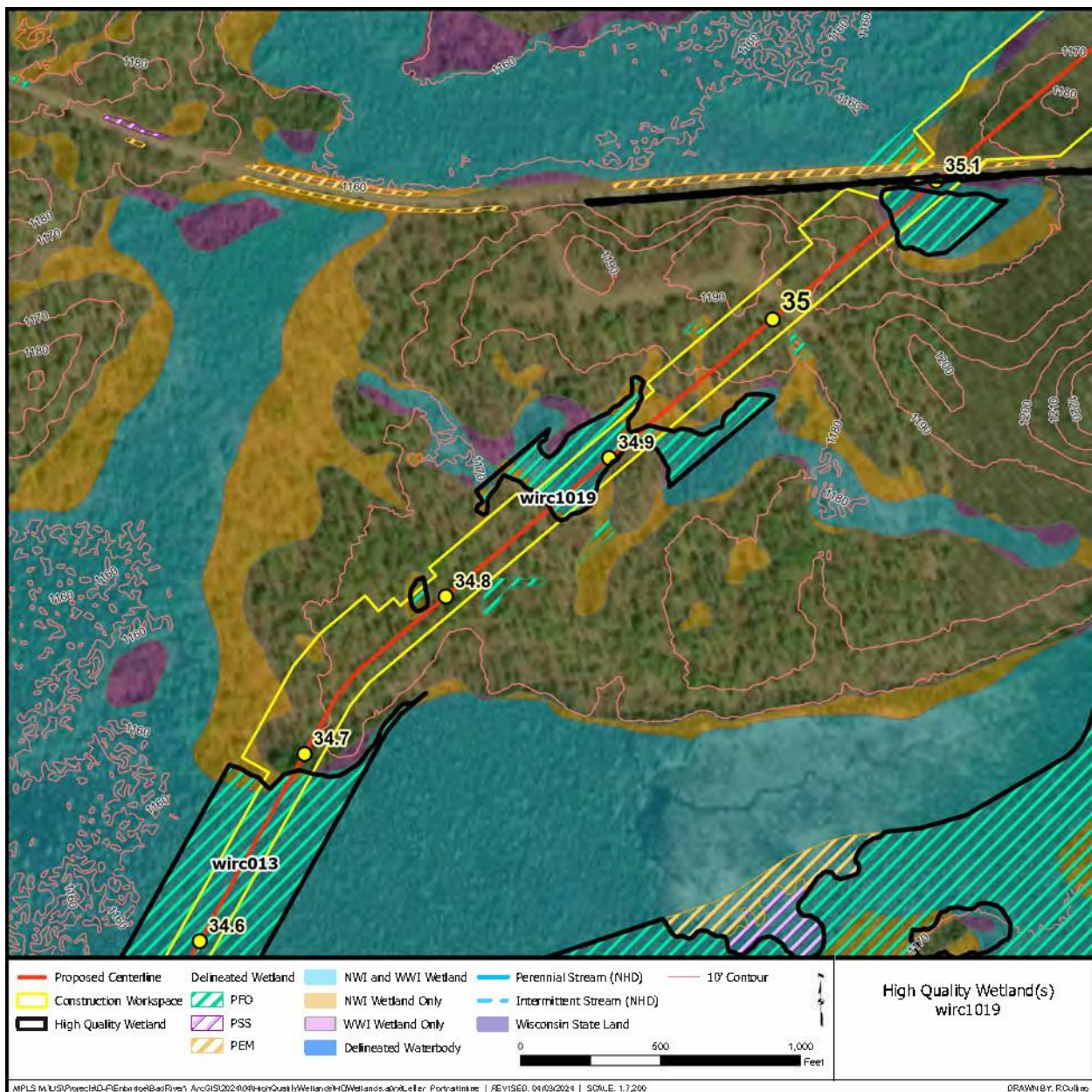
MP 34.33 – Wetland wirc013

Wetland wirc013 is a forested wetland with an overall WRAM Functional Value rating of high. The Project centerline crosses approximately 1,533 feet of the wetland and temporarily disturbs approximately 3.65 acres. Approximately 1.75 acres will be converted from forested wetland to emergent wetland following construction. The portion of the wetland crossed by the Project route is part of a larger wetland complex extending both east and west of the Project Route. Enbridge's Project route minimizes wetland disturbance by crossing the wetland in as narrow a location as practicable. Enbridge has not identified a practicable route alternative that would avoid this large wetland complex.



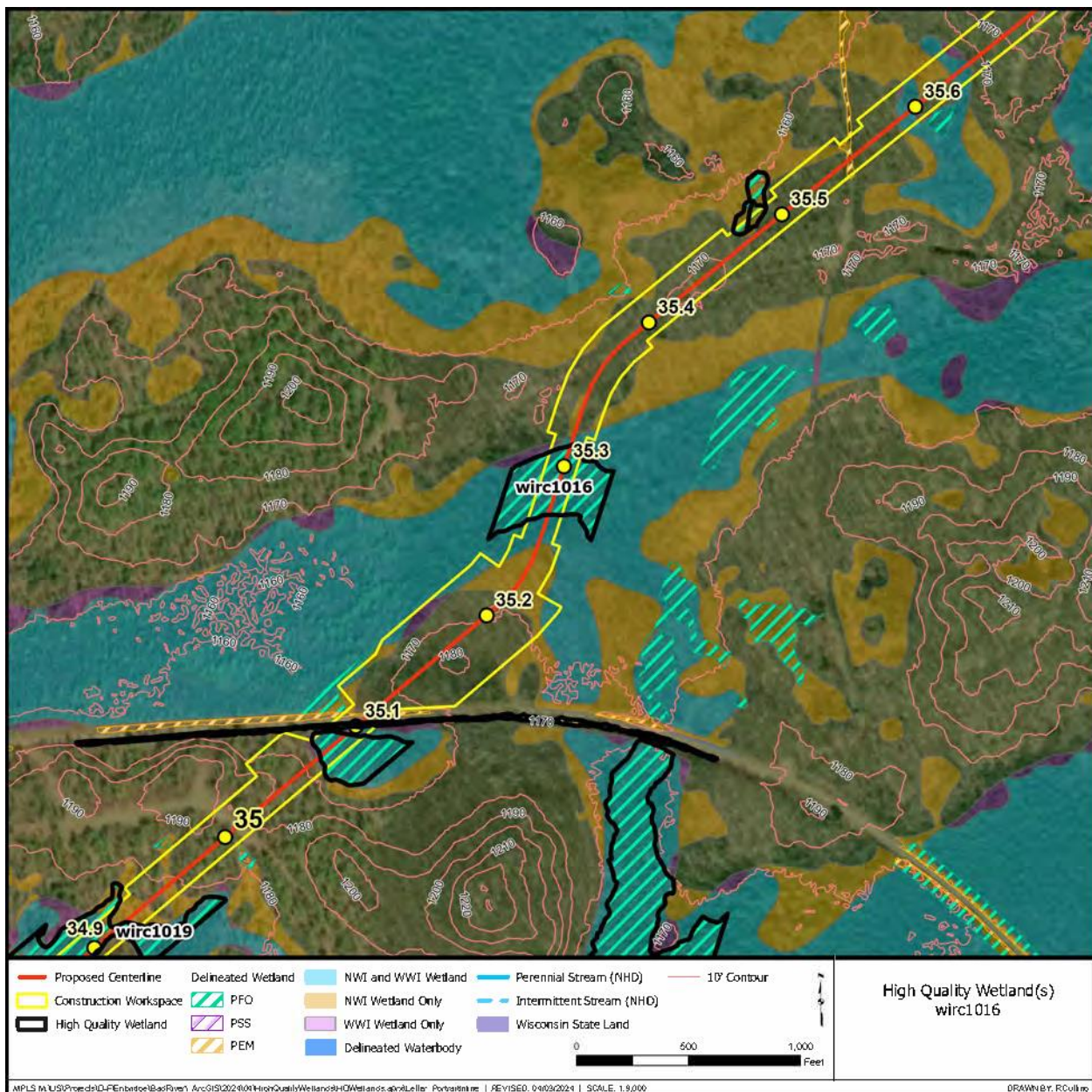
MP 34.88 – Wetland wirc1019

Wetland wirc1019 is a forested wetland with an overall WRAM Functional Value rating of high. The Project centerline crosses approximately 312 feet of the wetland and temporarily disturbs approximately 0.58 acre. Approximately 0.31 acre will be converted from forested wetland to emergent wetland following construction. Based on aerial imagery, the wetland appears to be a depressional area within an upland area where a recent timber harvest occurred. Routing further west would likely place the pipeline in a larger wetland complex north of Vogues Road. Routing further east would increase the overall length of the pipeline and permanently convert more forest to open land.



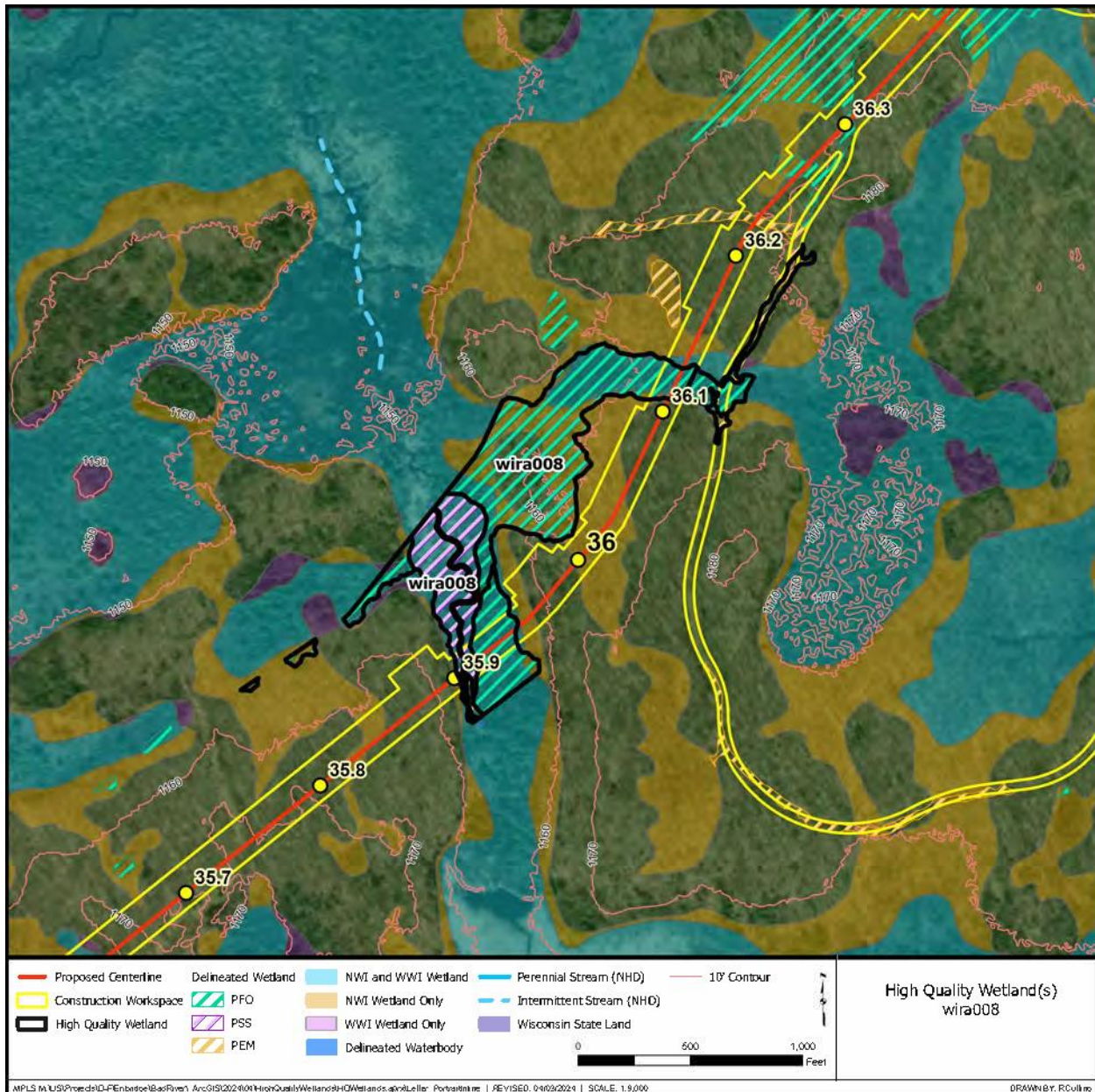
MP 35.29 – Wetland wirc1016

Wetland wirc1016 is a forested wetland with an overall WRAM Functional Value rating of high. The Project centerline crosses approximately 225 feet of the wetland and temporarily disturbs approximately 0.48 acre. Approximately 0.25 acre will be converted from forested wetland to emergent wetland following construction. The portion of the wetland crossed by the Project route is part of a larger wetland complex extending both east and west of the Project Route. Enbridge's Project route minimizes wetland disturbance by crossing the wetland in as narrow a location as practicable. Enbridge has not identified a practicable route alternative that would avoid this large wetland complex.



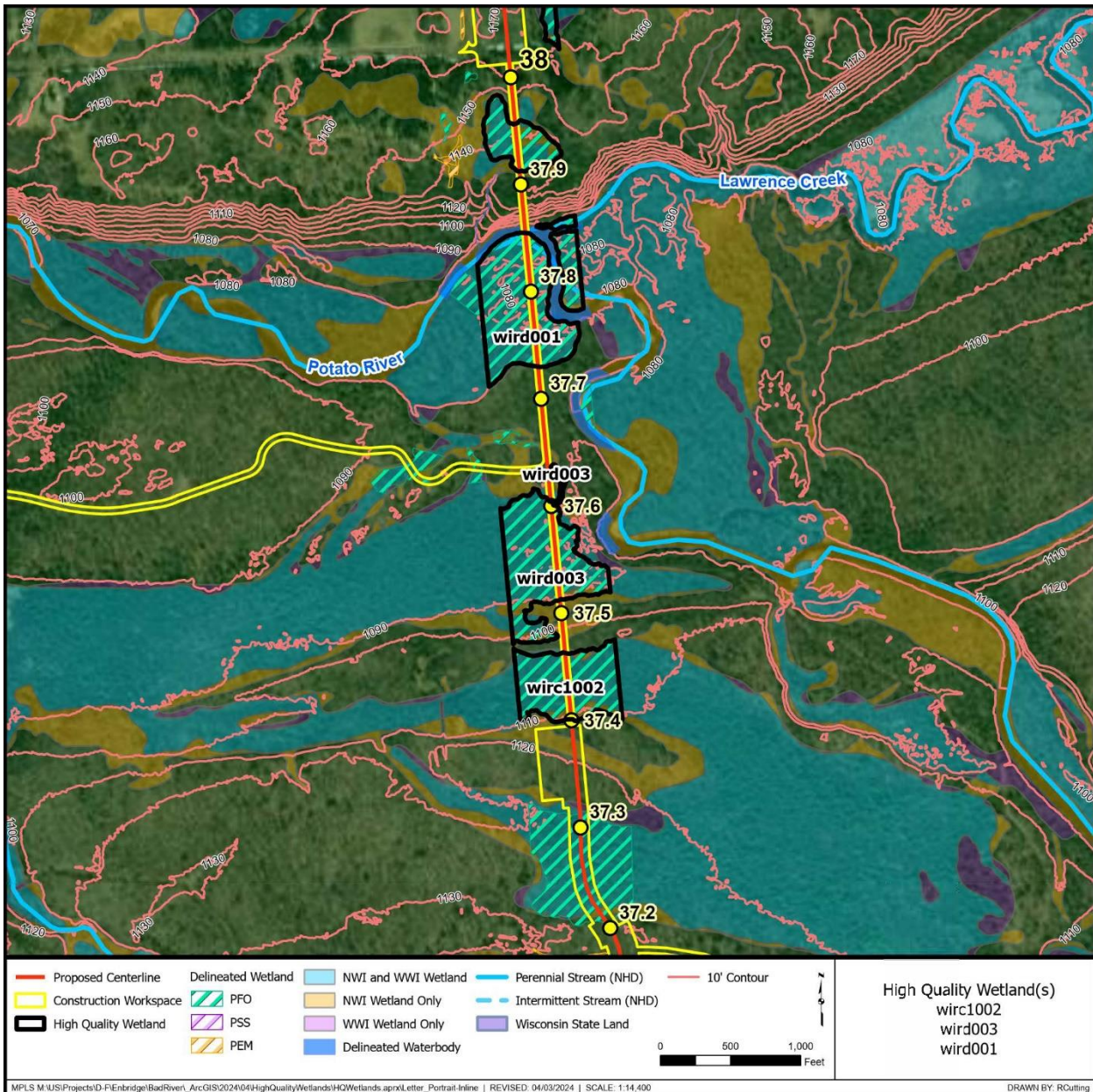
MP 35.90 – Wetland wira008

Wetland wira008 is a forested/emergent/shrub-scrub wetland complex with an overall WRAM Functional Value rating of high. The Project centerline crosses approximately 328 feet of the wetland and temporarily disturbs approximately 0.72 acre. Approximately 0.35 acre will be converted from forested/shrub-scrub wetland to emergent wetland following construction. The portion of the wetland crossed by the Project route is part of a larger wetland complex extending both north and south of the Project Route. Enbridge's Project route minimizes wetland disturbance by crossing the wetland in as narrow a location as practicable. Enbridge has not identified a practicable route alternative that would avoid this large wetland complex.



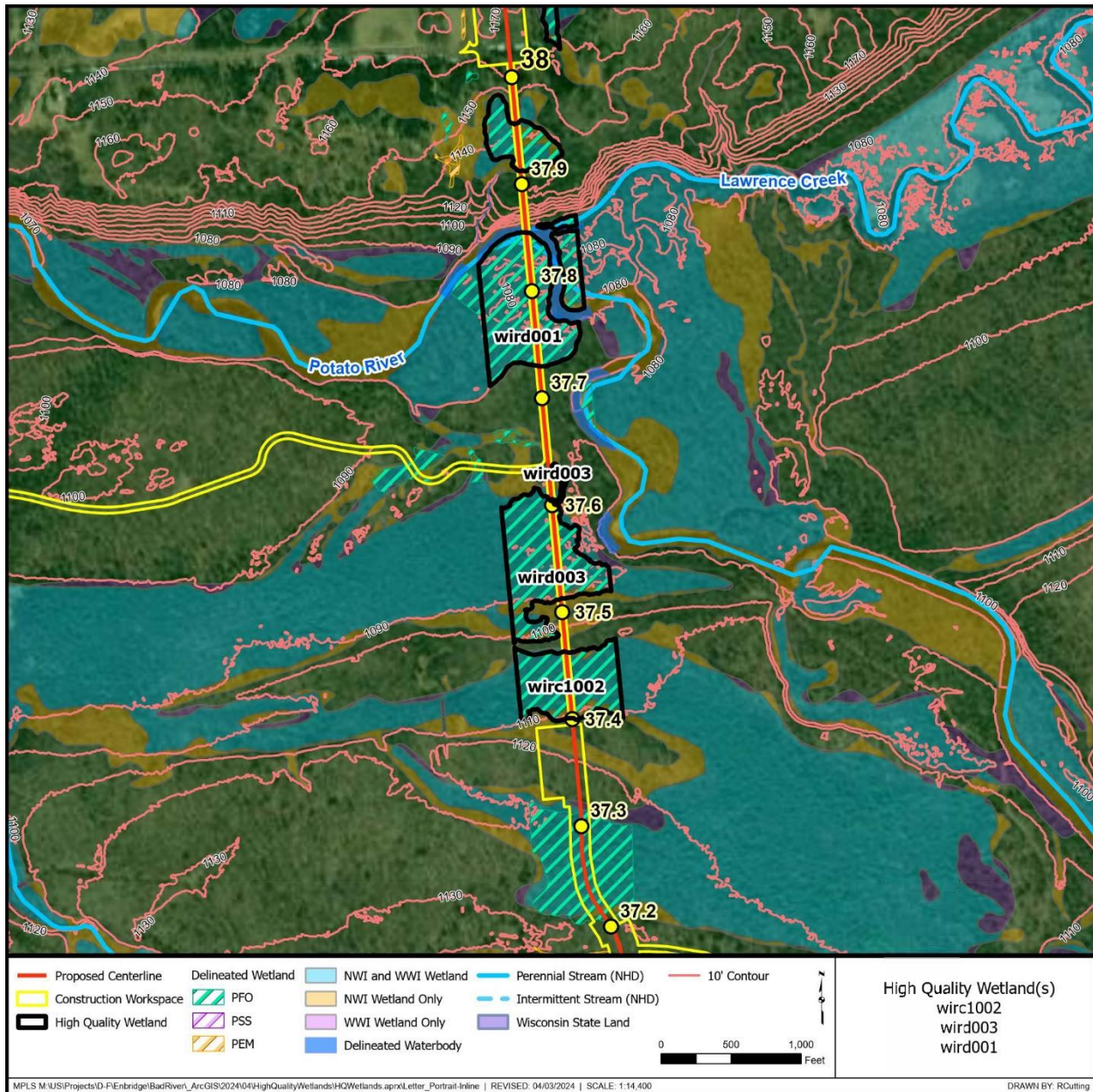
MP 37.43 – Wetland wirc1002

Wetland wirc1002 is a forested wetland with an overall WRAM Functional Value rating of high. The Project centerline crosses approximately 327 feet of the wetland and temporarily disturbs approximately 0.23 acre. Enbridge has reduced overall impacts to this wetland by crossing the wetland using the HDD method and by narrowing the maintained corridor to just 30 feet. The overall alignment within the wetland cannot be effectively altered to further reduce wetland impacts and still accommodate the Potato River HDD. Enbridge has not identified a practicable alternative that would further reduce impacts to this wetland complex.



MP 37.56 – Wetland wird003

Wetland wird003 is a forested wetland with an overall WRAM Functional Value rating of high. The Project centerline crosses approximately 482 feet of the wetland and temporarily disturbs approximately 0.33 acre. Enbridge has reduced overall impacts to this wetland by crossing the wetland using the HDD method and by narrowing the maintained corridor to just 30 feet. The overall alignment within the wetland cannot be effectively altered to further reduce wetland impacts and still accommodate the Potato River HDD. Enbridge has not identified a practicable alternative that would further reduce impacts to this wetland complex.



MP 37.77 – Wetland wird001

Wetland wird001 is a forested wetland with an overall WRAM Functional Value rating of high. The Project centerline crosses approximately 658 feet of the wetland and temporarily disturbs approximately 0.45 acre. Wetland disturbance has been minimized by conducting the crossing as part of the Potato River HDD, thereby limiting the disturbance to the 30-foot-wide cleared area within the permanent easement.

