

APPENDIX N

SITE-SPECIFIC VARIANCES TO THE FERC STAFF'S WETLAND AND WATERBODY CONSTRUCTION AND MITIGATION PROCEDURES

TABLE N-1

Variations Requested for Construction Right-of-Way Widths Greater Than 75 Feet

| Milepost | Wetland | Cowardin Type ^a | Variance Rationale | Approval Status |
|----------|---------|----------------------------|---|-----------------|
| 1481.02 | S-9 | PSS/R | A crossover was designed to avoid the creek encroachment on the east side of the right-of-way, which requires flipping the working side of the right-of-way at this waterbody crossing. The trench is expected to be excessively wide at the crossing due to the groundwater table, as well as the unconsolidated and saturated materials that would be excavated in the vicinity of the wetland. These conditions prevent vertical trenching and require the trench to be sloped off of vertical. The additional construction right-of-way width would also be necessary to contain the saturated spoil material because these materials generally spread out when they are stacked. Furthermore, the burial depth of the loop at the waterbody crossing and adjacent agricultural areas would be 5 feet compared to the standard 3-foot burial depth for non-agricultural uplands. With a 5-foot burial depth, the total trench depth would be approximately 9 feet assuming the 36-inch-diameter loop would be coated with several inches of concrete at the waterbody crossing. | Approved. |
| 1480.93 | S-10 | PEM/PFO | The crossover location and side slope topography prevent necking down the construction right-of-way to less than 95 feet in this wetland. | Approved. |
| 1480.01 | S-16 | R/PEM/PFO | The location of the North Pass Road open-cut crossing, the need for egress/ingress, as well as the location of a hydrostatic test break prevent necking down the construction right-of-way to less than 95 feet in this wetland. | Approved. |
| 1476.80 | S-27 | PEM/PFO | The location of the Gilmore Road open-cut crossing, the need for egress/ingress, and the need to maintain residential access along an existing driveway prevent necking down the construction right-of-way to less than 95 feet in this wetland. | Approved. |
| 1475.77 | S-33 | PEM | Necking down the construction right-of-way to minimize impacts on this emergent wetland (which is dominated by invasive species) would require the addition of temporary extra workspaces, which would affect residential tree screens. Impacts are expected to be temporary and short term (one growing season) because of the low quality, emergent condition of the wetland. | Approved. |
| 1475.75 | S-34 | PSS | Wetland S-34 is dominated by invasive shrubs (e.g., Himalayan blackberry). Necking down the construction right-of-way to 75 feet would not have a functional effect in minimizing wetland impacts. Impacts are expected to be temporary and short term (one growing season) because of the low quality condition of the wetland. | Approved. |

TABLE N-1 (cont'd)

Variations Requested for Construction Right-of-Way Widths Greater Than 75 Feet

| Milepost | Wetland | Cowardin Type ^a | Variance Rationale | Approval Status |
|----------|-------------------------------|----------------------------|--|-----------------|
| 1475.19 | S-39 | PEM | The construction right-of-way would need to be greater than 75 feet wide in two areas within this wetland. One area is a disturbed emergent hayfield/pasture and the second area is at the crossing of an unnamed tributary. The first area (open-cut crossing of Wallace Lane) requires additional spoil storage and egress/ingress. In addition, the trench is expected to be excessively wide at the road crossing due to the high groundwater table and unconsolidated and saturated soils in the wetland area immediately adjacent to the road crossing. The trench would be wider because the loop would be coated with several inches of concrete to compensate for pipe buoyancy in the wetland, which increases the overall pipe diameter. In addition, the burial depth of the loop at the road crossing would be 5 feet compared to the standard 3 feet to compensate for traffic loads. Furthermore, the additional construction right-of-way width would be necessary to contain the expected saturated spoil material on the right-of-way because these materials generally spread out when they are stacked. Wetland S-39 is a low quality, disturbed emergent wetland and impacts associated with the wider construction right-of-way would be temporary and short term. To minimize disturbance to forested areas at the crossing of the Unnamed Tributary, no additional temporary extra workspaces are proposed; therefore, the additional construction right-of-way width would facilitate the tributary crossing. | Approved. |
| 1472.56 | S-53 | PEM | Wetland S-53 is a low quality, highly disturbed wetland that is a pasture/hayfield. The construction right-of-way width would need to be greater than 75 feet in this wetland because the trench is expected to be excessively wide due to the high groundwater table and unconsolidated and saturated soils in the wetland. The trench would also be wider because the loop would be coated with several inches of concrete to compensate for pipe buoyancy in the wetland, which increases the overall pipe diameter. In addition, the burial depth of the loop at a driveway crossing would be 5 feet compared to the standard 3 feet to compensate for traffic loads at the road crossing. These conditions would require a wider construction right-of-way for greater spoil storage requirements. In addition, the wider construction right-of-way at this crossing would be necessary to contain the expected saturated spoil material on the right-of-way because these materials generally spread out when they are stacked. Wetland impacts associated with the 95-foot-wide construction right-of-way are expected to be temporary and short term (one growing season) because of the low quality, emergent condition of the wetland. | Approved. |
| 1470.83 | S-58 | PEM | Wetland S-58 is a low quality, disturbed wetland that is a pasture/hayfield and impacts from the project on this wetland would be temporary and short term (one growing season). Therefore, necking down the construction right-of-way width to 75 feet would not provide reductions in additional impacts on this wetland. | Approved. |
| 1470.76 | S-59 (Mitchell Creek – ditch) | R | The construction right-of-way runs parallel with this waterbody; therefore, a deviation and crossover were designed to minimize impacts on the stream. The deviation and crossover require the proposed 95-foot-wide construction right-of-way. Although the construction right-of-way overlaps the waterbody for approximately 180 feet, direct impacts on the waterbody channel would be minimized except at the actual pipeline crossing location. | Approved. |

TABLE N-1 (cont'd)

Variations Requested for Construction Right-of-Way Widths Greater Than 75 Feet

| Milepost | Wetland | Cowardin Type ^a | Variance Rationale | Approval Status |
|-------------------------------|-----------------------------------|----------------------------|--|--|
| 1469.92 | S-61 | PEM | Wetland S-61 is a low quality, pasture/hayfield wetland. The trench is expected to be excessively wide in this wetland due to the high groundwater table and unconsolidated and saturated soils. The trench would also be wider because the loop would be coated with several inches of concrete to compensate for pipe buoyancy in the wetland, which increases the overall pipe diameter. The proposed 95-foot-wide construction right-of-way in this wetland would be necessary to ensure that the saturated spoil stored in the wetland would be contained on the right-of-way because these materials generally spread out when stacked. Impacts are expected to be temporary and short term (one growing season) because of the low quality, emergent condition of the wetland. | Approved. |
| 1469.80 | S-62 (Trib. to Mitchell Creek) | R | Wetland S-62 (Trib. to Mitchell Creek) has been channelized and confined to a ditch. The alignment of the trench and the construction right-of-way prevent narrowing the construction right-of-way to 75 feet. | Approved. |
| 1468.84 1468.81 1468.77 | S-66 S-67A S-67B | R | The construction right-of-way width would need to be greater than 75 feet across these tributaries because the horizontal directional drill (HDD) entry point for the North Fork Nooksack River is immediately south of wetland S-67B. During the HDD, if the drill rig needs to be moved to the south side of the river, the drill stem pullback would need to extend down the right-of-way and around a curve. The wider construction right-of-way would be necessary to rope the drill stem around the curve in the easement and across the tributaries. | Additional justification needed. The Washington State Department of Ecology (WDOE) commented that the soils, vegetation, and hydrologic conditions in forested areas on either side of the pipeline right-of-way in this location should be evaluated and requested an explanation of how the variance would affect Northwest's ability to save the large trees adjacent to the existing cleared right-of-way in the event this variance is granted. |
| 1466.62 | S-77 | PEM/PSS | The construction right-of-way width would need to be greater than 75 feet across a portion of wetland S-77 because the trench is expected to be excessively wide in this wetland due to the extensive length of the wetland, the high groundwater table, and the unconsolidated and saturated soils. The loop would be coated with several inches of concrete to compensate for pipe buoyancy in the wetland, which increases the overall pipe diameter. The proposed 95-foot-wide construction right-of-way in this wetland would be necessary to ensure that the construction activities and storage of saturated spoil material are contained on the right-of-way because saturated materials generally spread out when stacked. Wetland S-77 is a low-quality, disturbed emergent wetland that is an abandoned hayfield/pasture. Impacts on the wetland from the project would be temporary and short term (one growing season). | Approved. |
| 1466.81 1465.83 | S-76 S-78 | PFO/PSS/ PEM/R | The trench is expected to be excessively wide because of the extensive length of the wetlands, the high groundwater table, and the unconsolidated and saturated soils. The loop would be | Approved. |

TABLE N-1 (cont'd)

Variances Requested for Construction Right-of-Way Widths Greater Than 75 Feet

| Milepost | Wetland | Cowardin Type ^a | Variance Rationale | Approval Status |
|--------------------|--------------|----------------------------|--|-----------------|
| 1465.62 1465.01 | S-79 S-82 | | coated with several inches of concrete to compensate for pipe buoyancy in the wetland, which increases the overall pipe diameter. The proposed 95-foot-wide construction right-of-way in these wetlands would be necessary to ensure that the construction activities and storage of saturated spoil material are contained on the right-of-way because saturated materials generally spread out when stacked. | |
| 1463.75 | S-86A&B | PEM | A construction right-of-way width greater than 75 feet would be necessary through these wetland ditches because of the open-cut crossing of Homesteader Road and egress/ingress. The high groundwater table, saturated and unconsolidated materials, and 5-foot loop burial depth at the road crossing require the additional construction right-of-way width. These conditions create the potential for the trench to be excessively wide, and the saturated materials would need additional area to be stored. Impacts on these wetland ditches would be temporary and short term because they are low quality, artificial conveyance systems. | Approved. |
| 1463.26 | S-88 | R | This tributary is a 2-foot-wide intermittent waterbody. Narrowing the construction right-of-way width to 75 feet would not benefit habitat conditions of this tributary, which does not support fish. | Approved. |
| 1429.30 | MV-2 | PEM | The construction right-of-way width was necked down to 85 feet, but side slopes prevent necking the construction right-of-way width down to 75 feet. | Approved. |
| 1428.74 | MV-6 | PEM | Staging for steep slope construction immediately to the north of this wetland prevents narrowing the construction right-of-way width to 75 feet. The wetland at the crossing is also a previously disturbed emergent wetland within the pipeline right-of-way and adjacent powerline corridor. Impacts are expected to be temporary and short term (one growing season) because of the low quality, emergent condition of the wetland. | Approved. |
| 1421.19 | MV-24 | PEM | Wetland MV-24 is a disturbed emergent wetland dominated by reed canarygrass and the construction right-of-way width would need to be greater than 75 feet at a ditch that is about 6 feet wide. Impacts are expected to be temporary and short term (one growing season) because of the low quality, emergent condition of the wetland. | Approved. |
| 1419.33 | MV-32A, B | PSS/PEM/ PFO | <p>Because of the extensive length and saturated/open water characteristics of the wetland in this area, the construction right-of-way width would need to be greater than 75 feet between mileposts (MP) 1419.65 and 1419.31. A crossover was included in the design because the trench is expected to be excessively wide from excavating saturated unconsolidated materials. The crossover would offset the proposed 36-inch-diameter loop 30 feet west of the existing 26-inch-diameter pipeline and outside Northwest's existing permanent easement, which requires Northwest to acquire 30 feet of new permanent easement. In addition, Northwest would utilize the existing 75-foot-wide permanent easement and 20 feet of temporary right-of-way to install the crossing for a total construction right-of-way width of 125 feet.</p> <p>Because of expected saturated and unconsolidated conditions, the construction right-of-way would need to be greater than 95 feet wide through two additional areas within wetland MV-32B (near MPs 1419.06 and 1418.79). However, these areas occur within previously</p> | Approved. |

TABLE N-1 (cont'd)

Variations Requested for Construction Right-of-Way Widths Greater Than 75 Feet

| Milepost | Wetland | Cowardin Type ^a | Variance Rationale | Approval Status |
|----------|---------|----------------------------|---|--|
| | | | disturbed/cleared areas within the loop and powerline corridor and support primarily emergent vegetation. | |
| 1418.62 | MV-32.2 | PEM | The areas of wetland MV-32.2 that would be disturbed would be within the existing pipeline right-of-way and a parallel road easement that supports disturbed emergent wetland conditions. Necking down the non-working side of the construction right-of-way would not be practical in this area because the parallel road would be used as egress/ingress. Additionally, necking down the working side of the right-of-way would not effectively reduce impacts on the wetland because of its configuration, which narrows to a small point on the west edge of the construction right-of-way. Impacts are expected to be temporary and short term (one growing season) because of the low quality, emergent condition of the wetland. | Approved. |
| 1416.51 | MV-41 | PAB/PEM/ PSS/PFO | The construction right-of-way width would need to be 95 feet through this wetland system because of its extensive length and saturated/open water characteristics. Because of these conditions, the proposed 36-inch-diameter loop has been offset 30 feet east of the existing 30-inch-diameter pipeline because the trench is expected to be excessively wide from excavating saturated unconsolidated materials. | Additional justification needed. The WDOE commented that alternative means of reducing the construction right-of-way width, including constructing during the dry season, locating spoil piles outside of the wetlands, and using construction methods that limit the width of the pipeline trench should be evaluated. The WDOE also commented that additional impacts on forest and scrub-shrub wetlands that would be affected by the increased construction right-of-way width in the event this variance is granted should be identified. |
| 1411.55 | MV-59A | PEM | A 95-foot-wide construction right-of-way would be necessary through this wetland system because of its length, a high groundwater table, and the saturated, unconsolidated characteristics of the material to be excavated. Because of these conditions, the trench is expected to be excessively wide. Impacts would be temporary and short term because this wetland is previously disturbed and emergent. | Approved. |
| 1411.06 | MV-62 | R | A 90-foot-wide construction right-of-way would be required for the flumed crossing of Little Pilchuck Creek. The proposed construction right-of-way width would be required to ensure adequate construction workspace to properly install the flume and in the event the trench width becomes excessively wide during the crossing due to the high groundwater table. | Approved. |
| 1409.26 | MV-67A | POW/PEM | A 95-foot-wide construction right-of-way would be necessary through this wetland system | Approved. |

TABLE N-1 (cont'd)

Variations Requested for Construction Right-of-Way Widths Greater Than 75 Feet

| Milepost | Wetland | Cowardin Type ^a | Variance Rationale | Approval Status |
|----------|-----------|----------------------------|--|-----------------|
| | | | because the trench is expected to be excessively wide. The trench would be wider because the loop would be coated with several inches of concrete to compensate for pipe buoyancy in the wetland, which increases the overall pipe diameter. The increased right-of-way would be necessary to ensure that the saturated spoil stored in the wetland would be contained on the right-of-way because these materials generally spread out when stacked. Impacts would be temporary and short term (one growing season) because of the emergent and previously disturbed condition of the wetland. | |
| 1383.66 | SN-42 | PSS | A 95-foot-wide construction right-of-way would be necessary through this wetland system because of its length and because the trench is expected to be excessively wide. The trench would be wider because the loop would be coated with several inches of concrete to compensate for pipe buoyancy in the wetland, which increases the overall pipe diameter. The increased right-of-way would be necessary to ensure that the saturated spoil stored in the wetland would be contained on the right-of-way because these materials generally spread out when stacked. Impacts would be temporary and short term (one growing season) because of the previously disturbed condition of the wetland. | Approved. |
| 1328.71 | FL-17 | R/PEM | A 95-foot-wide construction right-of-way across Lacamas Creek would be required because of the high groundwater table in the floodplain and the potential for the trench to be excessively wide during the flumed crossing. Lacamas Creek is a channelized tributary within an agricultural field and has no functional riparian habitat; therefore, impacts would be minor. | Approved. |
| 1324.29 | FL-35A, B | R | It is not feasible to construct an open-cut crossing of the Nisqually River within a 75-foot-wide construction right-of-way. At the river, Northwest's existing 30-inch-diameter pipeline is offset 50 feet to the east of the existing 26-inch-diameter pipeline, and the proposed 36-inch-diameter loop would be offset 35 feet to the east of the 30-inch-diameter pipeline. The offset of the loop would be necessary to ensure that the existing pipelines are not destabilized during excavation in the stream and to prevent heavy equipment from working over them. No in-stream work is proposed over the existing pipelines, except for potential spoil storage. | Approved. |
| 1316.73 | FL-52 | PEM/PSS | Side hill topography requires a 95-foot-wide construction right-of-way through this wetland. | Approved. |

^a Wetland types according to Cowardin et al. (1979):

- PFO = palustrine forested
- PSS = palustrine scrub-shrub
- PEM = palustrine emergent
- POW = palustrine open water
- PAB = palustrine aquatic bed
- R = riverine

TABLE N-2

Variations Requested for Temporary Extra Workspaces (TEWS) Located Less Than 50 Feet From Wetlands or Waterbodies

| Milepost | Wetland | Cowardin Type ^a | Temporary Extra Workspace ID | Variance Rationale | Approval Status |
|--------------------|--------------------|----------------------------|--|--|-----------------|
| 1482.80 1482.81 | S-4B | R/PEM | S-TEWS-10.5 S-TEWS-11.5 | Steep incised banks and the location of the crossing of Saar Creek prevent locating workspace S-TEWS-10.5 and S-TEWS-11.5 50 feet from the waterbody. | Approved. |
| 1480.93 | S-10 & S-11 | PEM/PFO | S-TEWS-17.3 | Location of a crossover, wetland S-11, and side slope topography prevents locating workspace S-TEWS-17.3 50 feet from this wetland. | Approved. |
| 1480.06 | S-15 | PSS | S-TEWS-19 | Side slope topography and the location of the open-cut crossing of North Pass Road prevent locating workspace S-TEWS-19 50 feet from the wetland. | Approved. |
| 1479.06 | S-21 | PFO/PEM | S-TEWS-24 | The location of the crossover, which would be necessary to avoid a home, and the need to flume Kinney Creek prevent locating workspace S-TEWS-24 50 feet from the wetland. | Approved. |
| 1476.80 | S-28 | PEM | S-TEWS-40 | Wetland S-28 is a low quality, abandoned pasture/hayfield that supports a monotypic stand of reed canarygrass. Workspace S-TEWS-40 would be required for an open-cut crossing of a driveway. | Approved. |
| 1474.70 | S-42 | PEM/PSS | S-TEWS-64 | Workspace S-TEWS-64 would be required for side slope construction and the topography prevents locating this workspace 50 feet from wetland S-42. | Approved. |
| 1473.70 | S-47 | R | S-TEWS-74 S-TEWS-75 | These workspaces would be necessary for the crossing of wetland S-47 (Trib. to Sumas River). Workspaces cannot be located on the north side of the creek because of steep slopes; therefore, workspaces S-TEWS-74 and S-TEWS-75 must be located on the south side of the creek. The minimum 5-foot depth of cover over the pipeline at the tributary requires both of these workspaces to be located as close to the creek as possible. Workspace S-TEWS-75 would be located in an emergent area that has been previously cleared and would not disturb any functional riparian habitat. | Approved. |
| 1472.22 | S-54 (Smith Creek) | R | S-TEWS-87 | Workspace S-TEWS-87 would be necessary for spoil storage for the crossing of Smith Creek, as well as the unnamed road crossing. The unnamed road cannot be closed during construction because it provides access to several residences. Setting the workspace farther from the road crossing would not be feasible because of the proximity of the industrial building on the north side of the road. | Approved. |
| 1469.16 1469.14 | S-64 | PEM/R | S-TEWS-122 S-TEWS-124 S-TEWS-125 S-TEWS-126 S-TEWS-128 S-TEWS-130 | These workspaces would be necessary for the open-cut crossing of Marshall Road, the crossing of wetland S-64 (Unnamed Tributary), and steep slope construction. The alignment of the construction right-of-way in relation to the wetland, road crossing, and steep slopes prevents locating these workspaces 50 feet from the wetland. Workspaces S-TEWS-124 and S-TEWS-125 would be located in upland pasture and would not disturb functional riparian habitat. | Approved. |

TABLE N-2 (cont'd)

Variations Requested for Temporary Extra Workspaces (TEWS) Located Less Than 50 Feet From Wetlands or Waterbodies

| Milepost | Wetland | Cowardin Type ^a | Temporary Extra Workspace ID | Variance Rationale | Approval Status |
|----------|-----------|----------------------------|------------------------------|---|-----------------|
| 1468.10 | S-71 | PFO | S-TEWS-139 | Workspace S-TEWS-139 would be necessary for egress/ingress and to abandon the 26-inch-diameter facilities at the existing aboveground facility located immediately adjacent to wetland S-71. This workspace would primarily be located on an existing access road to Northwest's aboveground facility. | Approved. |
| 1467.06 | S-75 | PEM/PSS | S-TEWS-145 | Workspace S-TEWS-145 would be necessary for egress/ingress onto Carroll Road. However, the road is located between the workspace and the wetland, which prevents the use of a 50-foot buffer adjacent to the wetland. The workspace would be 30 feet from the wetland. | Approved. |
| 1463.26 | S-88 | R | S-TEWS-164.1 | Although workspace S-TEWS-164.1 would be located within deciduous forested vegetation, this vegetation provides little riparian benefit to wetland S-88, which is an intermittent ditch tributary that does not support fish and is expected to be dry at the time of the crossing. Therefore, setting the workspace 50 feet from this ditch drainage does not provide functional benefit to the waterbody. | Approved. |
| 1423.49 | MV-16 | PEM/POW/R | MV-TEWS-43 | Workspace MV-TEWS-43 would be required for the South Fork Stillaguamish River HDD exit point. This workspace would be located almost entirely in previously disturbed farmed uplands. However, a narrow row of shrubs borders the wetland on the edge of the workspace. Northwest would attempt to avoid disturbing these shrubs during the HDD. | Approved. |
| 1422.24 | MV-20 | PSS | MV-TEWS-54 | The configuration of wetland MV-20 prevents locating workspace MV-TEWS-54 more than 50 feet from the wetland. This extra workspace is necessary to cross the tributary. Setting the workspace back 50 feet would make the workspace unusable, and the workspace would then be less than 50 feet from wetland MV-21. | Approved. |
| 1422.22 | MV-25 | PEM | MV-TEWS-56 MV-TEWS-57 | These workspaces would be necessary for the open-cut crossing of 212 th Street NE and for egress/ingress. Workspaces MV-TEWS-56 and MV-TEWS-57 would be located 30 and 40 feet, respectively, from the wetland, which is an isolated, low quality disturbed emergent wetland dominated by reed canarygrass. | Approved. |
| 1419.65 | MV-32A, B | PSS/PEM | MV-TEWS-65 MV-TEWS-66 | Workspaces MV-TEWS-65 and MV-TEWS-66 would be required for the crossover located at MP 1419.65 and to cross the extensive wetland system at this location. These workspaces cannot be set back 50 feet from the wetland based on the location of the crossover and the saturated/open water condition at the north end of this wetland. | Approved. |
| 1419.34 | MV-32A | PFO | MV-TEWS-68 | Workspace MV-TEWS-68 would be required for a crossover. The steep side slopes in the area would prevent the workspace from being set back 50 feet from the wetland. | Approved. |

TABLE N-2 (cont'd)

Variations Requested for Temporary Extra Workspaces (TEWS) Located Less Than 50 Feet From Wetlands or Waterbodies

| Milepost | Wetland | Cowardin Type ^a | Temporary Extra Workspace ID | Variance Rationale | Approval Status |
|----------|-----------|----------------------------|------------------------------|--|-----------------|
| 1419.12 | MV-32A, B | PFO | MV-TEWS-71 | Workspace MV-TEWS-71 would be required for egress/ingress and intersects the right-of-way and wetland system less than 50 feet from the wetland. | Approved. |
| 1411.35 | MV-61 | PFO | MV-TEWS-130.1 | Workspace MV-TEWS-130.1 would be required for the road bore of Highway 92. Although this workspace would be less than 50 feet from wetland MV-61, it would be located entirely within the highway easement and primarily within previously disturbed areas. | Approved. |
| 1411.06 | MV-62 | R | MV-TEWS-141 MV-TEWS-143 | Because of the alignment of the creek with the construction right-of-way, workspaces MV-TEWS-141 and MV-TEWS-143 cannot be located 50 feet from the waterbody. These workspaces would be necessary because of the high groundwater table in the floodplain. The trench may become excessively wide and the workspaces would ensure that all activities are confined to the construction work area. | Approved. |
| 1408.79 | MV-71 | PSS/PEM/ PFO | MV-TEWS-178 | Workspace MV-TEWS-178 would be required for egress/ingress both during construction and operation because a new permanent access road (MV-PAR-1) would be installed to access the pig receiver and mainline valve at MP 1408.80. The alignment of MV-PAR-1 was selected to avoid permanent impacts on wetland MV-71. | Approved. |
| 1390.20 | SN-22 | R | SN-TEWS-20 SN-TEWS-21 | Workspaces SN-TEWS-20 and SN-TEWS-21 would be required for the crossing of Struve Creek (wetland SN-22). The confined construction right-of-way (60 feet in width) and side sloping topography on either side of the waterbody require these workspaces to be located less than 50 from the waterbody banks. The workspaces have been set back more than 10 feet from the wetland boundary. | Approved. |
| 1385.47 | SN-39.4 | POW | SN-TEWS-57 | Workspace SN-TEWS-57 would be required to cross Union Hill Road NE and for egress/ingress. This workspace cannot be located 50 feet from wetland SN-39.4 and still be functional for the road crossing. | Approved. |
| 1328.12 | FL-21 | PEM/PSS | FL-TEWS-36 | Workspace FL-TEWS-36 would be required for the open-cut crossing of 40 th Avenue S/Hawk Peterson Road and for egress/ingress. This workspace cannot be located 50 feet from the wetland and still be functional for the road crossing. | Approved. |
| 1316.73 | FL-52 | PSS/PEM | FL-TEWS-97 | Workspace FL-TEWS-97 would be required for egress/ingress. Because of side hill topography in the area, the workspace cannot be located 50 feet from the wetland but instead would be located immediately adjacent to the wetland (which would also be disturbed by the construction right-of-way). | Approved. |

TABLE N-2 (cont'd)

Variations Requested for Temporary Extra Workspaces (TEWS) Located Less Than 50 Feet From Wetlands or Waterbodies

| Milepost | Wetland | Cowardin Type ^a | Temporary Extra Workspace ID | Variance Rationale | Approval Status |
|----------|---------|-------------------------------|------------------------------------|--------------------|-----------------|
|----------|---------|-------------------------------|------------------------------------|--------------------|-----------------|

^a Wetland types according to Cowardin et al. (1979):
 PFO = palustrine forested
 PSS = palustrine scrub-shrub
 PEM = palustrine emergent
 POW = palustrine open water
 PAB = palustrine aquatic bed
 R = riverine

TABLE N-3

Variations Requested for Temporary Extra Workspaces (TEWS) Located Within Wetlands or Waterbodies

| Milepost | Wetland | Cowardin Type ^a | Temporary Extra Workspace ID | Variance Rationale | Approval Status |
|----------|---------|----------------------------|------------------------------|--|-----------------|
| 1484.34 | S-1 | PEM | S-TEWS-2 | Workspace S-TEWS-2 would be located in a low quality, farmed wetland at a hydrostatic test water discharge location, and would be needed for equipment staging, mobilization, and demobilization. | Approved. |
| 1483.86 | S-2 | PEM | S-TEWS-6 | Workspace S-TEWS-6 would be located in a low quality, deeply incised roadside wetland ditch and would be needed because of the presence of a foreign line crossing and for egress/ingress. | Approved. |
| 1480.73 | S-12 | PEM/PFO | S-TEWS-17.1 | Side slope topography and staging for steep slope construction prevent locating workspace S-TEWS-17.1 outside the wetland. | Approved. |
| 1480.01 | S-16 | R | S-TEWS-21 | The location of the open-cut crossing of North Pass Road prevents locating workspace S-TEWS-21 outside the wetland. | Approved. |
| 1477.60 | S-23 | R | S-TEWS-33 S-TEWS-34 | The sand and small gravel bed materials of Swift Creek require the proposed loop to be offset 40 feet from the existing 30-inch-diameter pipeline because the trench width at this crossing is expected to become excessively wide, which could affect the potential stability/integrity of the existing 30-inch-diameter pipeline. Offsetting the proposed loop requires placing workspaces S-TEWS-33 and S-TEWS-34 in wetland S-23 (Swift Creek). The existing stream channel at the crossing is disturbed and confined to dikes to facilitate removal of sediment from annual gravel mining operations. | Approved. |
| 1475.46 | S-37 | PEM | S-TEWS-58 | Workspace S-TEWS-58 would be necessary for staging and would be located in a low quality, disturbed emergent wetland that is an abandoned hayfield/pasture to avoid impacts on residences and forested areas. Other staging areas in the vicinity are not available because of the limited access, extent of adjacent wetlands, and residential and forested areas. The wetland is expected to be dry in the late spring and summer during construction. Although the wetland would be temporarily affected, it is expected to be fully restored functionally within one growing season. | Approved. |

TABLE N-3 (cont'd)

Variations Requested for Temporary Extra Workspaces (TEWS) Located Within Wetlands or Waterbodies

| Milepost | Wetland | Cowardin Type ^a | Temporary Extra Workspace ID | Variance Rationale | Approval Status |
|----------|---------|----------------------------|------------------------------|---|-----------------|
| 1475.19 | S-39 | PEM | S-TEWS-60 | Workspace S-TEWS-60 would need to be located within wetland S-39 because of the open-cut crossing of Wallace Lane, the need for additional spoil storage, and egress/ingress. The trench is expected to be excessively wide at the road crossing because of the high groundwater table and unconsolidated and saturated soils in the wetland area immediately adjacent to the road crossing. The trench would also be wider because the loop would be coated with several inches of concrete to compensate for pipe buoyancy in the wetland, which increases the overall pipe diameter. In addition, the burial depth of the loop at the road crossing would be 5 feet compared to the standard 3 feet to compensate for traffic loads. Wetland S-39 is a low quality, disturbed emergent wetland and impacts associated with the project would be temporary and short term. The location of workspace S-TEWS-60 was placed on the south side of Wallace Lane to avoid forested wetland impacts and residential tree screens on the north side of the road. | Approved. |
| 1474.77 | S-41 | PFO | S-TEWS-62 | Workspace S-TEWS-62 would be necessary to install a prefabricated fitting at the sharp PI that would require additional excavation and spoil storage. The location of the PI and the adjacent steep slopes prevent locating this workspace outside of wetland S-41. This workspace would be located primarily in immature deciduous forested areas (alders) and would not disturb mature trees. Impacts on the wetland from this workspace would be temporary and minor. Northwest would replant the forested wetland according to the Washington State Department of Natural Resources Forest Practices Act. | Approved. |
| 1474.77 | S-41 | PEM | S-TEWS-63 | Workspace S-TEWS-63 would be located entirely within Northwest's abandoned pipeline corridor for the 26-inch- and 30-inch-diameter pipelines and would be partially located within wetland S-41, which is a disturbed emergent wetland dominated by reed canarygrass. This workspace would be needed for staging for steep and side slope construction both to the north and south of this location. | Approved. |
| 1474.70 | S-29 | PEM | S-TEWS-42 | Workspace S-TEWS-42 is necessary for the crossings of the Trib. to Sumas River. The construction right-of-way would impact most of the wetland; only 0.01 acre of wetland S-29 would be affected by this workspace. This impact would not affect the functions of this low quality wetland that supports a monotypic stand of reed canarygrass. | Approved. |
| 1472.56 | S-53 | PEM | S-TEWS-82 S-TEWS-83 | Wetland S-53 is a low quality, disturbed pasture/hayfield wetland. Workspaces S-TEWS-82 and S-TEWS-83 would be needed for staging for steep slope construction, an open-cut driveway crossing, and the wetland crossing. The trench is expected to be excessively wide at the driveway crossing because of a high groundwater table and unconsolidated and saturated soils in the wetland area. The trench would also be wider because the loop would be coated with several inches of concrete to compensate for pipe buoyancy in the wetland, which | Approved. |

TABLE N-3 (cont'd)

Variations Requested for Temporary Extra Workspaces (TEWS) Located Within Wetlands or Waterbodies

| Milepost | Wetland | Cowardin Type ^a | Temporary Extra Workspace ID | Variance Rationale | Approval Status |
|--------------------|--|----------------------------|--|---|-----------------|
| | | | | increases the overall pipe diameter. The burial depth of the loop at the road crossing in the wetland would be 5 feet compared to the standard 3 feet to compensate for traffic loads at the road crossing, which also increases the trench width. The location of these workspaces in wetland S-53 would be necessary to ensure that the saturated spoil stored for the driveway and wetland crossings would be contained on the right-of-way because these saturated materials generally spread out when stacked. Impacts on this wetland are expected to be temporary and short term (one growing season). | |
| 1470.83 | S-58 | PEM | S-TEWS-100 | Workspace S-TEWS-100 would be necessary for staging and spoil storage for the crossing of wetland S-57.1 (Trib. to Mitchell Creek). Wetland S-58 is a low quality, disturbed pasture/hayfield wetland and locating the workspace in the wetland would not disturb any functional riparian or wetland habitat. Impacts on this wetland are expected to be temporary and short term (one growing season). | Approved. |
| 1470.14 | S-60 | PEM | S-TEWS-113 | Workspace S-TEWS-113 would be needed for spoil storage associated with the reverse loop installation between MPs 1470.35 and 1470.02 that would be required for the crossover in this area. The spoil is also expected to be saturated because of a high groundwater table in the vicinity of the wetland and would require additional area for storage because these saturated materials generally spread out when stacked. Impacts on this wetland from project activities are expected to be temporary and short term (one growing season) because of the low quality, emergent condition of the wetland. | Approved. |
| 1469.92 1469.80 | S-61 S-62 (Trib. to Mitchell Creek) | PEM/R | S-TEWS-115 S-TEWS-118 | Wetland S-61 is a low quality pasture/hayfield wetland and wetland S-62 (Trib. to Mitchell Creek) has been channelized and confined to a ditch (wetland S-63). The alignment of the trench and the construction right-of-way makes it infeasible to locate workspace S-TEWS-115 outside the wetland. The trench is expected to be excessively wide in these wetlands because of a high groundwater table and unconsolidated and saturated soils in the wetland area. The trench would also be wider because the loop would be coated with several inches of concrete to compensate for pipe buoyancy in the wetland, which increases the overall pipe diameter. The locations of workspaces S-TEWS-115 and S-TEWS-118 would be necessary to ensure that the saturated spoil stored in the wetland would be contained on the right-of-way because these materials generally spread out when stacked. Impacts on these wetlands are expected to be temporary and short term (one growing season). | Approved. |
| 1469.00 | S-65 | PEM | S-TEWS-132 S-TEWS-133 S-TEWS-134 | Wetland S-65 is a low quality pasture/hayfield wetland and these workspaces would be necessary for the bored crossing of the Mount Baker Highway. These workspaces cannot be placed outside the wetland because of the length and location of the wetland immediately adjacent to the highway. | Approved. |

TABLE N-3 (cont'd)

Variations Requested for Temporary Extra Workspaces (TEWS) Located Within Wetlands or Waterbodies

| Milepost | Wetland | Cowardin Type ^a | Temporary Extra Workspace ID | Variance Rationale | Approval Status |
|-------------------------------|------------------------|----------------------------|------------------------------|---|-----------------|
| 1468.84 1468.81 1468.77 | S-66 S-67A S-67B | R | S-TEWS-131 | Workspace S-TEWS-131 would be the entry point for the North Fork Nooksack River HDD. Because it may be necessary to move the drill rig to the south side of the river during the HDD, the drill stem pullback would need to extend down the easement to the north and across the waterbodies (intermittent - 2 feet wide) within this workspace. The curve in the alignment may prevent the drill stem from being confined to the existing easement; therefore, workspace S-TEWS-131 would be necessary to rope the drill stem around the curve of the easement and across the tributaries. | Approved. |
| 1466.62 | S-77 | PEM/PSS | S-TEWS-147 S-TEWS-148 | Workspaces S-TEWS-147 and S-TEWS-148 would need to be located within wetland S-77 because of the open-cut crossing of Potter Road and the need for additional spoil storage and egress/ingress. The trench is expected to be excessively wide at the road crossing because of the high groundwater table and unconsolidated and saturated soils in the wetland area immediately adjacent to the road crossing. The trench would also be wider because the loop would be coated with several inches of concrete to compensate for pipe buoyancy in the wetland, which increases the overall pipe diameter. In addition, the burial depth of the loop at the road crossing would be 5 feet compared to the standard 3 feet to compensate for traffic loads at the road crossing. The locations of workspaces S-TEWS-147 and S-TEWS-148 would be necessary to ensure that the saturated spoil stored in the wetland would be contained on the right-of-way because these materials generally spread out when stacked. Wetland S-77 is a low-quality, disturbed emergent wetland that is an abandoned hayfield/pasture. Impacts on the wetland from the project would be temporary and short term (one growing season). | Approved. |
| 1465.83 | S-78 | PEM/PSS/ PFO | S-TEWS-152 | Workspace S-TEWS-152 would be necessary for additional staging because of the extensive length of this wetland (approximately 2,000 feet). | Approved. |
| 1465.01 | S-82 | PFO/R/PEM | S-TEWS-157 S-TEWS-158 | The trench is expected to be excessively wide in this wetland because of a high groundwater table and unconsolidated and saturated soils in the wetland. The trench would also be wider because the loop would be coated with several inches of concrete to compensate for pipe buoyancy in the wetland, which increases the overall pipe diameter. The locations of workspaces S-TEWS-157 and S-TEWS-158 would be necessary to ensure that the saturated spoil stored in the wetland would be contained on the right-of-way because these materials generally spread out when stacked. Workspace S-TEWS-158 would also be necessary for the open-cut crossing of Strand Road. | Approved. |
| 1464.72 | S-83 | PEM | S-TEWS-160 | The location of the crossover in this wetland prevents workspace S-TEWS-160 from being located outside of wetland S-83. No other suitable upland areas are available in the vicinity to locate the crossover outside wetlands. Wetland S-83 is a low quality, disturbed wetland pasture; therefore, impacts on this wetland are | Approved. |

TABLE N-3 (cont'd)

Variations Requested for Temporary Extra Workspaces (TEWS) Located Within Wetlands or Waterbodies

| Milepost | Wetland | Cowardin Type ^a | Temporary Extra Workspace ID | Variance Rationale | Approval Status |
|--------------------|-----------------|----------------------------|------------------------------|---|-----------------|
| | | | | expected to be temporary and short term (one growing season). | |
| 1463.74 | S-86A&B S-87 | PEM | S-TEWS-160.2 S-TEWS-160.3 | Workspaces S-TEWS-160.2 and S-TEWS-160.3 would be required for the open-cut crossing of Homesteader Road and for egress/ingress. The expected high groundwater table and saturated and unconsolidated materials as well as the 5-foot loop burial depth at the road crossing require the workspaces to traverse these wetland ditches. The soil and groundwater conditions create the potential for the trench width to become excessively wide, and the saturated spoil materials would require additional area for storage because they typically spread out when stacked. | Approved. |
| 1463.01 1463.00 | S-89A, B | PEM | S-TEWS-165 S-TEWS-166 | Workspaces S-TEWS-165 and S-TEWS-166 would be required for the open-cut crossing of Wildrose Road and for egress/ingress. The 5-foot loop burial depth at the road crossing requires that these workspaces be located across the wetland ditches. These low quality wetland ditches support few wetland functions except for surface water conveyance. Impacts on the wetland ditches would be temporary and short term, lasting only for the duration of construction. The ditches would be fully restored after construction. | Approved. |
| 1428.62 | MV-7 | R | MV-TEWS-11 | Workspace MV-TEWS-11 would be required for the open-cut crossing of Pilchuck Creek. The proposed loop would be installed in the trench of the 26-inch-diameter pipeline after it is removed. This construction technique requires that workspace MV-TEWS-11 be located in the river for use during removal of the 26-inch-diameter pipeline and installation of the 36-inch-diameter loop. Spoil would be stored in the creek downstream (west) of the proposed 36-inch-diameter loop. It would be stacked in separate piles with gaps in between to allow the water to flow freely through so as not to create a dam. The working side would be east of the proposed 36-inch-diameter loop. Precautions would be taken to protect the 30-inch-diameter pipeline. | Approved. |
| 1428.60 | MV-8 | PEM/PSS | MV-TEWS-11 MV-TEWS-12 | Workspaces MV-TEWS-11 and MV-TEWS-12 would be required for staging and for the open-cut crossing of Pilchuck Creek and for steep slope construction on the south side of the creek. Workspace MV-TEWS-11 would be required to descend the steep slope to access the creek crossing and cannot be adjusted to avoid impacts on this wetland. Workspace MV-TEWS-12 would be necessary for staging for the creek crossing as well as the steep slope. Wetland MV-8 is a disturbed emergent pasture and is expected to be dry during the late spring and summer construction window. | Approved. |
| 1422.96 1422.88 | MV-17 MV-18 | PEM | MV-TEWS-45 MV-TEWS-47 | Workspaces MV-TEWS-45 and MV-TEWS-47 would be required for the pullback for the South Fork Stillaguamish River HDD. Wetlands MV-17 and MV-18 are low quality, farmed wetlands; therefore, impacts on these wetlands associated with the pullback activities would be negligible and short term. | Approved. |

TABLE N-3 (cont'd)

Variations Requested for Temporary Extra Workspaces (TEWS) Located Within Wetlands or Waterbodies

| Milepost | Wetland | Cowardin Type ^a | Temporary Extra Workspace ID | Variance Rationale | Approval Status |
|----------|----------|----------------------------|------------------------------|---|---|
| 1420.64 | MV-28 | PEM/PSS | MV-TEWS-60 | Workspace MV-TEWS-60 would be required for the open-cut crossing of Burns Road, a private drive, and for egress/ingress. The configuration of the wetland as well as the construction right-of-way prevents locating this workspace outside the wetland. | Approved. |
| 1419.33 | MV-32A,B | PSS/PEM/ PFO | MV-TEWS-67 MV-TEWS-73 | Workspace MV-TEWS-67 would be necessary for the crossover at MP 1419.31 that was located at this point to minimize impacts on landowners. Locating the crossover farther south, which would move the workspace out of the wetland, would require Northwest to acquire additional permanent easement from these landowners (e.g., Crowell and Lewis) that would further encumber these properties. Workspace MV-TEWS-73 would be located in wetland MV-32B because the alignment of the construction right-of-way runs parallel to 156 th Avenue NE. The workspace would be required to maintain residential access. | Additional justification needed. The WDOE commented that the crossover should be relocated south, outside of the wetland, in accordance with WDOE policy on avoidance of wetland impacts. |
| 1416.51 | MV-41 | PAB/PEM/ PSS/PFO | MV-TEWS-84 | Workspace MV-TEWS-84 would be necessary for the open-cut crossing of 120 th Street (Beechcraft Drive) and for egress/ingress. The expected high groundwater table and saturated and unconsolidated materials, as well as the 5-foot loop burial depth at the road crossing, require this workspace to be located in the wetland. The soil and groundwater conditions create the potential for the trench to become excessively wide, and the saturated spoil materials would require additional area for storage because they typically spread out when stacked. | Approved. |
| 1412.12 | MV-55 | PEM/R/PFO/ PAB | MV-TEWS-121 | Workspace MV-TEWS-121 would be required for the crossover and cannot be moved outside the wetland because the crossover is based on the location of the ending point for the Machias Replacement Project Segment E. | Approved. |
| 1411.35 | MV-61 | PFO | MV-TEWS-129 | Workspace MV-TEWS-129 would be required for the bore of Highway 92 and cannot be adjusted to avoid the wetland because of the required area to construct the bore pit. | Approved. |
| 1411.06 | MV-62 | R | MV-TEWS-139 | Workspace MV-TEWS-139 would be required for the flumed crossing of Little Pilchuck Creek. A crossover was included in the crossing design to avoid disturbing several large overflow culverts that are installed in the elevated road fill of the private drive located north of the creek crossing at MP 1411.10. Disturbing the culverts would restrict access to several residences during construction. The workspace would be required to ensure that there is adequate construction space to properly install the flume and to provide adequate space in the event the trench becomes excessively wide during trenching operations. | Additional justification needed. The WDOE commented that temporary alternative access should be provided to the residences to avoid disturbance to this wetland in accordance with WDOE policy on avoidance of wetland impacts. |

TABLE N-3 (cont'd)

Variations Requested for Temporary Extra Workspaces (TEWS) Located Within Wetlands or Waterbodies

| Milepost | Wetland | Cowardin Type ^a | Temporary Extra Workspace ID | Variance Rationale | Approval Status |
|-------------------------------|-------------------------|----------------------------|--|---|-----------------|
| 1391.40 1391.31 | SN-18 and SN-20 | PEM/PSS/ PFO | SN-TEWS-17 SN-TEWS-19 | Workspaces SN-TEWS-17 and SN-TEWS-19 would be required for the road bore of Woodinville Duvall Road NE. Workspace SN-TEWS-17 was expanded for parking/staging because the area would be primarily located in scrub-shrub vegetation and would minimize disturbance to residential tree screens. Impacts on wetland SN-18 would be temporary and short term, lasting two to three growing seasons, as shrubs would quickly revegetate from existing root systems because grading in the wetland should not be required. The location of SN-TEWS-19 was chosen to minimize impacts on conifers. | Approved. |
| 1383.66 | SN-42 | PSS/PFO/ PEM/POW | SN-TEWS-65 | Workspace SN-TEWS-65 would be required for staging during the crossing (push-pull) of wetland SN-42 (Evans Creek). The workspace would be located primarily in an upland lawn. However, to access the construction right-of-way, a portion of the workspace must be located in the wetland. This wetland is an extensive, saturated/open water wetland system, and the configuration of the wetland and construction right-of-way prohibits locating this workspace 50 feet from the wetland. | Approved. |
| 1328.94 1328.65 1328.30 | FL-16 FL-18 FL-19 | PEM | FL-TEWS-34 FL-TEWS-35 | The existing 26-inch-diameter pipeline throughout this agricultural wetland is shallow and cannot be worked over during construction to ensure its integrity. Workspaces FL-TEWS-34 and FL-TEWS-35 would be required because the existing right-of-way cannot be used by heavy equipment. Impacts on this wetland would be insignificant because the farmed wetland is cultivated annually. | Approved. |
| 1324.29 | FL-34 FL-35A,B | PFO/R | FL-TEWS-58 FL-TEWS-59 | Workspaces FL-TEWS-58 and FL-TEWS-59 would be required for the open-cut crossing of the Nisqually River. At this crossing, the existing 30-inch-diameter pipeline is offset 50 feet to the east of the existing 26-inch-diameter pipeline, and the proposed 36-inch-diameter loop would be offset 35 feet to the east of the 30-inch-diameter pipeline. The offsets would be necessary to ensure that the existing pipelines are not destabilized during excavation in the stream. These workspaces would be used as the working side of the right-of-way so that heavy equipment does not work over the existing pipelines in the river. | Approved. |
| 1323.85 | FL-37 | Centralia Canal | FL-TEWS-62 | This workspace would be required to install the span across this diversion canal. | Approved. |
| 1289.35 | CS-1A,B,D,E | PEM | C-TEWS-4 C-TEWS-5 C-TEWS-6 C-TEWS-7 | Workspaces C-TEWS-4, C-TEWS-5, C-TEWS-6, and C-TEWS-7 would be required to support design changes needed to comply with county requirements. No other practical upland space is available to site these workspaces. | Approved. |

N-17

TABLE N-3 (cont'd)

Variations Requested for Temporary Extra Workspaces (TEWS) Located Within Wetlands or Waterbodies

| Milepost | Wetland | Cowardin Type ^a | Temporary Extra Workspace ID | Variance Rationale | Approval Status |
|----------|---------|-------------------------------|------------------------------------|--------------------|-----------------|
|----------|---------|-------------------------------|------------------------------------|--------------------|-----------------|

^a Wetland types according to Cowardin et al. (1979):
 PFO = palustrine forested
 PSS = palustrine scrub-shrub
 PEM = palustrine emergent
 POW = palustrine open water
 PAB = palustrine aquatic bed
 R = riverine

TABLE N-4

Variations Requested for a Wet Open-Cut Crossing of the North Forth Nooksack River, North Fork Stillaguamish River, and South Fork Stillaguamish River

| Milepost | Wetland | Cowardin Type ^a | Temporary Extra Workspace ID | Variance Rationale | Approval Status |
|---|-----------------|----------------------------|--------------------------------|--|---|
| Variations Requested for Temporary Extra Workspaces (TEWS) Located Less Than 50 feet From Wetlands or Waterbodies | | | | | |
| 1424.32 1424.26 | MV-13B MV-14 | PSS/R | MV-TEWS-39.6A | Workspace MV-TEWS-39.6A would be necessary for staging for a wet open-cut crossing of the North Fork Stillaguamish River in the event the proposed HDD crossing is unsuccessful. Placement of the workspace on the north side of the waterbody would accommodate pipe stringing. It is not possible to set the workspace 50 feet back from the wetland or from the waterbody because of the proximity of wetlands MV-13B and MV-14 (the waterbody). The workspace would also be required to store the large volume of spoil that is expected at this crossing because of the elevated banks above the waterbody. | Approved only if the HDD is unsuccessful. |
| 1423.84 | MV-15 | R | MV-TEWS-40.4A MV-TEWS-40.5A | Workspaces MV-TEWS-40.4A and MV-TEWS-40.5A would be necessary for staging for a wet open-cut crossing of the South Fork Stillaguamish River in the event the proposed HDD crossing is unsuccessful. Workspace MV-TEWS-40.4A would be primarily located in a previously cleared area that is currently in hay and Christmas tree production. However, based on the location of wetland MV-15 and the alignment of the proposed loop, it would not be possible to set these workspaces 50 feet back from the waterbody and associated wetlands and complete the crossing. These workspaces would also be required in the event a dragline must be staged to assist in construction of the crossing because of the waterbody's depth at the time of the crossing or other site-specific conditions and the potential need to set sheet piling in order to stabilize the excavated trench. These workspaces were designed to store the volume of fill that would be excavated and graded along the right-of-way because of the elevated banks above the waterbody. | Approved only if the HDD is unsuccessful. |
| Variations Requested for TEWS Located Within Wetlands or Waterbodies | | | | | |
| 1468.68 | S-68 | R | S-TEWS-133A | Workspace S-TEWS-133A would be required for a flumed crossing of Jim Creek in the event the proposed HDD crossing is unsuccessful. The trench is expected to be excessively wide due to the high groundwater table, saturated and unconsolidated soils, and steeply incised conditions at the crossing location. The workspace would also be necessary to contain the saturated spoil material because these materials generally spread out when they are stacked. | Approved only if the HDD is unsuccessful. |

TABLE N-4 (cont'd)

Variances Requested for a Wet Open-Cut Crossing of the North Forth Nooksack River, North Fork Stillaguamish River, and South Fork Stillaguamish River

| Milepost | Wetland | Cowardin Type ^a | Temporary Extra Workspace ID | Variance Rationale | Approval Status |
|--------------------|------------------|----------------------------|---|--|---|
| 1468.20 | S-69 S-70 | R | S-TEWS-136A | Workspace S-TEWS-136A would be required for a wet open-cut crossing of the North Fork Nooksack River in the event the proposed HDD crossing is unsuccessful. At the crossing location, the proposed 36-inch-diameter loop would be offset 60 feet east of the 30-inch-diameter pipeline. The 60-foot offset is necessary to ensure that the existing pipelines would not be destabilized during excavation in the waterbody. The workspace would be used as the working side of the right-of-way so that heavy equipment would not have to work over the existing pipelines in the waterbody. The workspace would also be required to temporarily store trench spoil (stacked in separate piles with gaps in between to allow for water passage) within the waterbody as well as allow adequate area to push the spoil back into the trench (backfill) after the pipeline is installed. | Approved only if the HDD is unsuccessful. |
| 1424.37 1424.32 | MV-13A MV-13B | PSS | MV-TEWS-39.3A MV-TEWS-39.4A MV-TEWS-39.5A | Workspaces MV-TEWS-39.3A, MV-TEWS-39.4A, and MV-TEWS-39.5A would be necessary for staging and pipe string layout for a wet open-cut crossing of the North Fork Stillaguamish River in the event the proposed HDD crossing is unsuccessful. The pipe string would be laid out on the north side of the river and sufficiently sized upland areas would not be available to avoid placement of these workspaces in wetlands MV-13A and MV-13B. Also, the presence of steep slopes north of wetland MV-13A prevent locating workspace MV-TEWS-39.3A 50 feet from the wetland. Furthermore, the loop would cross an abandoned railroad grade that would require excavation through a significant volume of elevated fill. The trench is expected to become excessively wide due to the high groundwater table, saturated and unconsolidated soils, and steeply incised conditions at the crossing location. The workspace would also be necessary to contain the saturated spoil material because these materials generally spread out when they are stacked. Workspaces MV-TEWS-39.4A and MV-TEWS-39.5 would be required in the event a dragline must be staged to assist in construction of the crossing because of the waterbody's depth at the time of the crossing or other site-specific conditions and the potential need to set sheet piling in order to stabilize the excavated trench. These workspaces were designed to store the volume of fill that would be excavated and graded along the right-of-way because of the elevated banks above the waterbody. | Approved only if the HDD is unsuccessful. |
| 1424.26 | MV-14 | R | MV-TEWS-39.7A | Workspace MV-TEWS-39.7A would be required for a wet open-cut crossing of the North Fork Stillaguamish River in the event the proposed HDD crossing is unsuccessful. The workspace would be used as the working side of the right-of-way so that heavy equipment would not work over the existing pipelines in the waterbody. The workspace would also be required to temporarily store trench spoil (stacked in separate piles with gaps in between to allow for water passage) within the waterbody as well as allow adequate area to push the spoil back into the trench (backfill) after the pipeline is installed. | Approved only if the HDD is unsuccessful. |

TABLE N-4 (cont'd)

**Variations Requested for a Wet Open-Cut Crossing of the North Forth Nooksack River,
North Fork Stillaguamish River, and South Fork Stillaguamish River**

| Milepost | Wetland | Cowardin Type ^a | Temporary Extra Workspace ID | Variance Rationale | Approval Status |
|----------|---------|----------------------------|--------------------------------|--|---|
| 1424.20 | MV-13C | PSS | MV-TEWS-39.8A MV-TEWS-39.9A | Workspaces MV-TEWS-39.8A and MV-TEWS-39.9A would be required for staging of a wet open-cut crossing of the North Fork Stillaguamish River in the event the proposed HDD crossing is unsuccessful. Upland areas are not available in the vicinity of the crossing to avoid placement of these workspaces in wetland MV-13C. The trench is expected to become excessively wide due to the high groundwater table and saturated and unconsolidated soils at the crossing location. The workspaces would be necessary to contain the saturated spoil material because these materials generally spread out when they are stacked. These workspaces would also be required in the event a dragline must be staged to assist in construction of the crossing because of the waterbody's depth at the time of the crossing or other site-specific conditions and the potential need to set sheet piling in order to stabilize the excavated trench. These workspaces were designed to store the volume of fill that would be excavated and graded along the right-of-way because of the elevated banks above the waterbody. | Approved only if the HDD is unsuccessful. |
| 1423.84 | MV-15 | R | MV-TEWS-40.6A | Workspace MV-TEWS-40.6A would be required for a wet open-cut crossing of the South Fork Stillaguamish River in the event the proposed HDD crossing is unsuccessful. The workspace would ensure that the existing pipelines are not destabilized during excavation in the waterbody. The workspace would also be used as the working side of the right-of-way so that heavy equipment would not work over the existing pipelines in the waterbody. In addition, the workspace would be required to temporarily store trench spoil (stacked in separate piles with gaps in between to allow for water passage) within the waterbody during the crossing as well as allow adequate area to push the spoil back into the trench (backfill) after the pipeline is installed. | Approved only if the HDD is unsuccessful. |
| 1423.46 | MV-16 | PEM/R | MV-TEWS-40.11A | Workspace MV-TEWS-40.11A would be required to cross wetland MV-16 in the event the proposed HDD crossing of the South Fork Stillaguamish River is unsuccessful. The trench is expected to become excessively wide due to the high groundwater table and saturated and unconsolidated soils at the crossing location. The workspace would be necessary to contain the saturated spoil material because these materials generally spread out when they are stacked. | Approved only if the HDD is unsuccessful. |

^a Wetland types according to Cowardin et al. (1979):

- PFO = palustrine forested
- PSS = palustrine scrub-shrub
- PEM = palustrine emergent
- POW = palustrine open water
- PAB = palustrine aquatic bed
- R = riverine