

Exhibit Q

Threatened and Endangered Species

Mist Resiliency Project
August 2024

Prepared for



Northwest Natural Gas

Prepared by



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Acronyms and Abbreviations

BMP	best management practice
ESU	Evolutionarily Significant Unit
HDD	Horizontal directional drill
NWN	Northwest Natural Gas
OAR	Oregon Administrative Rules
ODA	Oregon Department of Agriculture
ODFW	Oregon Department of Fish and Wildlife
ORBIC	Oregon Biodiversity Information Center
ORS	Oregon Revised Statutes
Project	Mist Resiliency Project
RFA	Request for Amendment
USFWS	U.S. Fish and Wildlife Service

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1.0 Introduction

Northwest Natural Gas (NWN), the Certificate Holder, proposes to amend the Site Certificate for its underground natural gas storage facility at the Mist Resiliency Project (Project) in Columbia County, Oregon. Exhibit Q provides information pertaining to threatened, endangered, and candidate plant and animal species that may be affected by the Project, as required to meet the submittal requirements in Oregon Administrative Rules (OAR) 345-021-0010(1)(q) paragraphs (A) through (G). This exhibit demonstrates that the Project can comply with the approval requirements found in OAR 345-022-0070:

To issue a site certificate, the Council, after consultation with appropriate state agencies, must find that:

(1) For plant species that the Oregon Department of Agriculture has listed as threatened or endangered under ORS 564.105(2), the design, construction and operation of the proposed facility, taking into account mitigation:

(a) Are consistent with the protection and conservation program, if any, that the Oregon Department of Agriculture has adopted under ORS 564.105(3); or

(b) If the Oregon Department of Agriculture has not adopted a protection and conservation program, are not likely to cause a significant reduction in the likelihood of survival or recovery of the species; and

(2) For wildlife species that the Oregon Fish and Wildlife Commission has listed as threatened or endangered under ORS 496.172(2), the design, construction and operation of the proposed facility, taking into account mitigation, are not likely to cause a significant reduction in the likelihood of survival or recovery of the species.

The Analysis Area is the area for which NWN must describe the impacts of the proposed Project changes in this Request for Amendment (RFA) 13. The Analysis Area for Exhibit Q is defined as the Site Boundary, as surface facilities related to an underground gas storage reservoir, transmission lines, and pipelines are exempted from the 5-mile study area applicable to other energy facilities pursuant to OAR 345-001-0010(35)(f) and (g). This Analysis Area applies to all species in Exhibit Q. The Site Boundary is defined in the Project Description section of this RFA 13 that reflects the information required by OAR 345-021-0010(1)(a) and (b). The Analysis Area is shown in Figure Q-1.

2.0 Identification of Species – OAR 345-021-0010(1)(q)(A)

OAR 345-021-0010(1)(q) Information about threatened and endangered plant and animal species that may be affected by the proposed facility, providing evidence to support a finding by the Council as required by OAR 345-022-0070. The applicant must include:

(A) Based on appropriate literature and field study, identification of all threatened or endangered species listed under ORS 496.172(2) and ORS 564.105(2) that may be affected by the proposed facility;

In compliance with OAR 345-021-0010(1)(q)(A), NWN identified all threatened and endangered species listed under Oregon Revised Statutes (ORS) 496.172(2) (state threatened and endangered wildlife species), ORS 564.105(2) (state threatened and endangered plant species), and 16 United States Code §1533 (federal Endangered Species Act) that may be affected by the Project. Federal and state candidate and species proposed for listing were also identified due to their potential to become listed during the site certificate amendment process.

2.1 Desktop Review

NWN used a variety of sources to identify state and federal threatened, endangered, candidate, and proposed species that may be affected by the Project. Data collection has been ongoing in the area since 2013 with updates to account for changes to species status and changes to the Project.

To identify listed, candidate, and proposed species with the potential to occur within the Analysis Area, NWN requested known occurrence locations from ORBIC within the Analysis Area and vicinity. Occurrence locations outside of the Analysis Area were requested to ensure all species with the potential to occur within the Analysis Area were included in this analysis, not just species that are known to occur within the Analysis Area. Data requested covers portions of Columbia County, Oregon.

The ODFW (ODFW 2023a, ODFW 2023b), Oregon Department of Agriculture (ODA; ODA 2023), ORBIC (ORBIC 2019, ORBIC 2023a), USFWS (USFWS 1983, USFWS 2016, USFWS 2023) and National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries 2022a, NOAA Fisheries 2023) websites were queried for additional literature on listed species. The StreamNet (2024) and ODFW (2023b) databases were searched for listed fish species within 5 miles of the Analysis Area. Finally, several botanical resources were reviewed to identify proposed, candidate, threatened, and endangered plant species that could occur near the Analysis Area (Burke Museum Herbarium 2022a, CPNWH 2023, ODA 2022, Oregon Flora Project 2023, WNHP 2022). The results of the literature review were used to generate a list of state and federal listed and candidate species with the potential to occur in the Analysis Area.

Once a preliminary species list was developed through the initial desktop review described above, aerial photo imagery of the habitat in the Analysis Area was compared to the species' habitat requirements to guide species-specific and general field survey efforts and inform preliminary desktop siting. Data sources analyzed included aerial photography (Google Earth 2023), National Wetland Inventory, U.S. Geological Survey National Hydrography Dataset, Natural Resources Conservation Service soils, and the Northwest Regional Gap Analysis Project data.

Based on the review of existing data, 15 species or populations listed as federally or state threatened, endangered, or candidate were identified as having the potential to occur within the Analysis Area (Table Q-1). These included one mammal, 11 vascular plants, and three fish. No

species with a status of proposed for listing were identified as having the potential to occur within the Analysis Area.

Several species initially considered for inclusion in Exhibit Q were excluded, as they are not known or expected to occur within the Analysis Area. Species excluded because they are very unlikely to occur within the Analysis Area due to lack of suitable habitat include pink sandverbena (*Abronia umbellata* var. *brevifolia*), Fender’s blue butterfly (*Icaricia icarioides fender*), Taylor’s checkerspot butterfly (*Euphydryas editha taylor*), Oregon spotted frog (*Rana pretiosa*), Pacific marten (*Martes caurina*), northern spotted owl (*Strix occidentalis caurina*; ORBIC 2023b)¹, marbled murrelet (*Brachyramphus marmoratus*; Davis et al. 2011, ORBIC 2023b), and streaked horned lark (*Eremophila alpestris strigata*; ORBIC 2023b). Species considered because their range includes Columbia County but excluded because the Project is outside the current range of the species include: Snake River Chinook salmon (fall-run, spring/summer-run), Upper Willamette River Chinook salmon, Lower Columbia River steelhead trout, Middle Columbia River steelhead trout, Upper Willamette River steelhead trout, Columbia River chum salmon (*Oncorhynchus keta*), eulachon (*Thaleichthys pacificus*), bull trout (*Salvelinus confluentus*), and green sturgeon (*Acipenser medirostris*, southern distinct population segment; NOAA Fisheries 2022a, NOAA Fisheries 2022b, ORBIC 2023a, ORBIC 2023b, StreamNet 2024).

Table Q-1. Federal and State Listed and Candidate Species with the Potential to Occur within the Analysis Area

Species ¹	Federal Status	State Status	Occurrence within Analysis Area ^{2,3}
Mammals			
Columbian white-tailed deer <i>Odocoileus virginianus leucurus</i>	T	T	No
Fish			
Coho salmon (Oregon Coast Evolutionarily Significant Unit [ESU]) <i>Oncorhynchus kisutch</i>	T	S	Yes
Coho salmon (Lower Columbia River ESU) <i>Oncorhynchus kisutch</i>	T	E	Yes
Chinook salmon (Lower Columbia River ESU, spring run and fall run) <i>Oncorhynchus tshawytscha</i>	T	SC	Yes
Vascular Plants			
Tall bugbane <i>Actaea elata</i> var. <i>elata</i> (syn. <i>Cimicifuga</i>)	—	C	No

¹ ORBIC identifies a single northern spotted owl territory approximately 4 miles from the Site Boundary, which is approximately three times the territorial home range radius of the species. The lack of habitat combined with the distance from the Site Boundary to this spotted owl territory support the species’ exclusion.

Exhibit Q: Threatened and Endangered Species

Species¹	Federal Status	State Status	Occurrence within Analysis Area ^{2,3}
Willamette Valley larkspur <i>Delphinium oregonum</i>	SOC	C	No
Peacock larkspur <i>Delphinium pavonaceum</i> (syn. <i>Delphinium menziesii</i> ssp. <i>pallidum</i>)	SOC	E	No
Coast Range fawn-lily <i>Erythronium elegans</i>	SOC	T	No
Queen-of-the-forest <i>Filipendula occidentalis</i>	—	C	No
Howell's montia <i>Montia howellii</i>	—	C	Yes
Saddle Mt. saxifrage <i>Saxifraga hitchcockiana</i> (syn. <i>Micranthes hitchcockiana</i>)	SOC	C	No
Meadow checkermallow <i>Sidalcea campestris</i>	—	C	No
Bristly-stemmed sidalcea <i>Sidalcea hirtipes</i>	—	C	No
Nelson's sidalcea <i>Sidalcea nelsoniana</i>	DL	T	No
Oregon sullivantia <i>Sullivantia oregana</i>	SOC	C	No
<p>Federal Status Definitions: T = Threatened, E = Endangered, C = Candidate, SOC = Species of Concern, DL = Delisted</p> <p>Oregon Status Definitions: T = Threatened, E = Endangered, C = Candidate, SC = Sensitive Critical S = Sensitive</p> <p>1. Species shown include only those that are listed as threatened, endangered, or candidate species on Oregon and/or federal lists. Other Oregon or federal designation categories are only shown for species that fit one of the primary listing categories. Other Oregon sensitive species are addressed in Exhibit P.</p> <p>2. Plant occurrence is based on documented field surveys combined with ORBIC occurrence data. Mammal occurrence is based on ORBIC data combined with observational data during general biological/habitat categorization surveys.</p> <p>3. The Analysis Area for all species is the proposed Site Boundary.</p>			

2.2 Field Surveys

NWN conducted two primary field survey efforts to evaluate potential presence of state or federally listed or candidate species: a general biological and habitat categorization survey and a botanical survey.

2.2.1 Botanical Survey

NWN conducted field surveys for listed and candidate plant species in 2022 and 2023 (Figure Q-2). Surveyors used the intuitive controlled transect method to document the presence or absence of target plant species. Surveys were conducted within the Site Boundary in suitable habitat and when an area with high potential for target plants was encountered (e.g., wetland). In 2022, field surveys were conducted during the appropriate time of year to capture target species during blooming or fruiting. In 2023, surveys of additional areas were conducted in September, outside of target species blooming periods. Areas were characterized as having potentially suitable habitat for a number of species. These additional areas will be surveyed in full prior to construction. For additional details on botanical survey methods, see Exhibit P, Attachment P-1.

2.2.2 General Biological and Habitat Categorization Survey

NWN conducted wildlife and habitat categorization surveys in 2022. Transect surveys were performed to characterize habitat throughout the Site Boundary, with simultaneous searches for special status wildlife species and special habitats. No proposed, candidate, threatened, or endangered wildlife species were observed. For additional details on the general wildlife and habitat categorization survey methods, see Exhibit P, Attachment P-1.

3.0 Occurrence and Potential Adverse Effects – OAR 345-021-0010(1)(q)(B)

(B) For each species identified under (A), a description of the nature, extent, locations and timing of its occurrence in the analysis area and how the facility might adversely affect it;

In compliance with OAR 345-021-0010(1)(q)(B), this section provides a description of the nature, extent, location, and timing of occurrence in the Analysis Area of each species identified in Table Q-1 and describes how the Project might adversely affect each species. Potential adverse effects to each species that will result from the construction of the Project are based on each species' potential for occurrence within the Analysis Area.

3.1 Wildlife

3.1.1 Columbian White-tailed Deer (Lower Columbia River Population Only)

Threatened (Federal); Threatened (State)

The Lower Columbia River population of the Columbian white-tailed deer is federally listed as Threatened and is Sensitive Critical in the state of Oregon. The Columbian white-tailed deer occurs in two distinct populations separated by 200 miles of unsuitable or discontinuous habitat: (1) the Lower Columbia River population, which occurs on both banks of the river in Clatsop and Columbia

counties, Oregon, and Wahkiakum and Cowlitz counties, Washington; and (2) the Douglas County, Oregon, population.

The Columbian white-tailed deer prefers wet prairie and lightly wooded bottomlands or "tidelands" along streams and rivers; woodlands are particularly attractive when interspersed with grasslands and pastures. Habitat information is based on the Columbian White-tailed Deer Recovery Plan (USFWS 1983) and most recent 5-year review (USFWS 2016). Along the Columbia River, Sitka spruce, dogwood, cottonwood, red alder, and willow dominate the woodland vegetation. Plants commonly found in suitable adjacent grass/forb fields include fescue, orchard grass, clover, bluegrass, velvetgrass, buttercup, and ryegrass. Reed canary grass and water foxtail are common invasive species in wet sites, and species of *Rubus*, *Juncus*, *Carex*, *Rosa*, *Sambucus*, and *Symphoricarpos* are commonly used as food and cover. Historically, Columbian white-tailed deer evolved as a prairie edge/woodland-associated species and were not confined to river valleys. Breeding occurs from mid-September through late February, with a peak in November (USFWS 2016). Fawns are born in late summer (June 1–July 31) after an approximately 200-day gestation period (USFWS 2016).

Columbian white-tailed deer were not observed during the habitat categorization field survey on June 7, 8, and 9, 2022. As the Analysis Area is outside of the known range for the Columbian white-tailed deer (Columbia County 2011, ORBIC 2023b, ODFW 2017, ODFW 2023a, UFWS 2016), they are not expected to occur within the Analysis Area. However, due to the mobility of this species there is potential for individuals to occur incidentally within suitable habitat outside of their known range. Thus, while unlikely, Columbian white-tailed deer could occur incidentally within the northernmost portion of the Analysis Area, which is located just south of U.S. Highway 30 (US-30) and west of Clatskanie.

For the purposes of this Project, suitable habitat was defined as the following habitat types within the Analysis Area and species' range: westside riparian, westside lowlands conifer-hardwood forest, irrigated pasture and hay meadows. Within the Analysis Area a total of 230.9 acres of suitable habitat occurs: westside riparian (30.6 acres), westside lowlands conifer-hardwood forest (4,637.5 acres), irrigated pasture and hay meadows (0.24 acre).

Because the Analysis Area is outside of the known range for the Columbian white-tailed deer, adverse effects to this species are not expected as a result of the Project.

3.2 Fish

Two fish species that are federally or state listed or are a candidate or proposed for federal or state listing were found to have the potential to occur within the Analysis Area based on desktop review.

3.2.1 Coho Salmon (Oregon Coast ESU and Lower Columbia River ESU Only)

The Oregon Coast ESU of coho salmon is federally listed as Threatened and is Sensitive in the state of Oregon; the Lower Columbia River ESU is federally listed as Threatened and is listed as Endangered in the state of Oregon. Mature coho salmon typically enter freshwater to spawn from

late summer to late autumn, and spawning occurs between November and January. Coho salmon spawn in small tributaries with moderate to low gradient stream reaches. After spawning, eggs typically hatch within 45 to 140 days, depending on water temperature, with longer incubation in colder water (ODFW 2007). Fry emerge between early spring to early summer, and freshwater rearing occurs until the following spring when the juveniles undergo smoltification and migrate to salt water (ODFW 2010). Juvenile coho salmon migrate to the ocean as smolts in the spring, typically from late April, May, and early June. As smolts, coho may be present in estuaries for up to a month during their migration to the ocean (ODFW 2007).

Coho salmon are mapped to occur in Lindgren Creek and the Nehalem River (ODFW 2024, StreamNet 2024). The Project will cross Lindgren Creek, which is mapped as spawning habitat for this species. Lindgren Creek will be crossed via horizontal directional drill (HDD), avoiding stream impacts. NWN proposes to use HDD to avoid impacts to listed fish species. This technology avoids potential impacts to fish-bearing streams by using advanced drilling technology to bore a hole and install the pipeline without disturbing the streambed or the riparian vegetation adjacent to the stream channel. HDD is less intrusive than open trenching, where habitats sustain direct soil disturbance. The HDD procedure uses bentonite slurry, a non-toxic fine clay material, as a drilling lubricant. Inadvertent release of bentonite is a potential concern when HDD is used under fish-bearing streams. Measures to minimize the risk of inadvertent release and any associated impacts are described in Section 4.2. The Project's best management practices (BMPs) will include procedures to identify and respond to inadvertent release, thereby minimizing any potential impacts. Because impacts to the stream bed and riparian vegetation adjacent to the stream channel will be eliminated, adverse effects such as increased turbidity, increased sediment, and changes in stream temperature associated with vegetation clearing will be avoided. Erosion control BMPs will be described in the 1200-C Erosion Control Permit obtained from the Oregon Department of Environmental Quality (ODEQ).

3.2.2 Chinook Salmon (Lower Columbia River ESU Only)

The Lower Columbia River ESU of Chinook salmon is federally listed as Threatened and is Sensitive Critical in the state of Oregon. Chinook salmon have varied adult and juvenile life histories. The Lower Columbia River ESU of Chinook represents both spring-run and fall-run populations. Spring-run Chinook salmon spend a longer rearing period in freshwater than fall-run Chinook salmon. Spring-run Chinook salmon enter freshwater in March and April and spawn in August and September; their fry emerge in winter or early spring, then rear for a year until migrating downstream the following spring. Fall-run Chinook enter freshwater in mid-August and spawn within a few weeks; their fry emerge in the spring and migrate downstream after as little as a month of freshwater rearing (ODFW 2010).

Within the Analysis Area the Nehalem River is mapped as spawning habitat for spring-run and fall-run Chinook salmon, and Lindgren Creek is mapped as spawning habitat for the fall-run (ODFW 2024). The Project will cross Lindgren Creek via HDD, avoiding stream impacts. Therefore, no adverse effects to Chinook salmon are anticipated as a result of the Project.

3.3 Plants

Eleven plant species that are federally or state listed or are a candidate or proposed for federal or state listing were found to have the potential to occur within the Analysis Area based on desktop review. Only one of these, Howell’s montia (state Candidate species), was found to occur within the Site Boundary during Project surveys (Table Q-2).

Table Q-2. Plant Blooming Period, Occurrence, and Likelihood of Adverse Effects

Species	Blooming Period ¹	Potential for Occurrence within Analysis Area ¹				Potential Adverse Effects ²
		Potential Habitat within Site Boundary	ORBIC Records (Analysis Area)	County Records	Observed during Surveys?	
Tall bugbane	late May–early August	Yes	No	No	No	No
Willamette Valley larkspur	May–July	Yes	No	No	No	No
Peacock larkspur	April–June	Yes	No	No	No	No
Coast Range fawn-lily	May–June	Yes	No	No	No	No
Queen-of-the-forest	late May–August	Yes	No	No	No	No
Howell's montia	Mar–May	Yes	Yes	Yes	Yes	Yes
Saddle Mt. saxifrage	late May–July	Yes	No	No	No	No
Meadow checkermallow	May–July	Yes	No	No	No	No
Bristly-stemmed sidalcea	(late April) early June–August (early November)	Yes	Yes	No	No	No
Nelson's sidalcea	late May–mid July (September)	Yes	Yes	No	No	No
Oregon sullivania	late May–August	Yes	No	Yes	No	No

1. Peak blooming period with full blooming period in parentheses; Sources: Burke Museum Herbarium 2022a, Burke Museum Herbarium 2022b, ORBIC 2023, Oregon Flora Project 2023

2. Potential for adverse effects not considering avoidance, minimization, and mitigation measures.

3.3.1 Tall Bugbane

No Status (Federal); Candidate (State)

Tall bugbane is a state Candidate species, but it has no special status at the federal level. This coarse perennial herb grows 3–7 feet in height and blooms between late May and early August (Oregon Flora Project 2023). Tall bugbane is known to occur west of the Cascade Mountains from southwestern British Columbia through Oregon including Columbia County (Oregon Flora Project 2023). Tall bugbane grows along the margins of mature Douglas fir (*Pseudotsuga menziesii*) and bigleaf maple (*Acer macrophyllum*) forests. The primary threat is habitat degradation or loss due to timber management practices with close spacing of newly planted trees quickly negating the initial benefit of opening up the canopy through timber harvest (Kaye and Cramer 2003, WNHP 2014). Other threats include competition from invasive weedy species, residential development, collecting by herbalists, and trampling of plants as a result of recreational use (WNHP 2014).

Tall bugbane was not observed during Project surveys, and the Oregon Flora Project (2023) atlas and ORBIC (2023b) do not include reported observations within the Analysis Area. However, because suitable habitat is present within the Analysis Area and it has been identified in the vicinity, it was included as a species with the potential to occur. In 2023, surveys of additional areas were conducted in September, outside of the tall bugbane blooming period. Potentially suitable habitat was identified. These additional areas will be surveyed in full prior to construction and if any tall bugbane are identified they will be avoided. Therefore, the species is not expected to be adversely affected by the Project.

3.3.2 Willamette Valley Larkspur

Species of Concern (Federal); Candidate (State)

Willamette Valley larkspur is a state Candidate species and a federal Species of Concern. This slender perennial herb grows 31 inches in height and blooms between May and July (Oregon Flora Project 2023). Willamette Valley larkspur is endemic to the Willamette Valley and high elevation peaks in the northern Coast Range. At low elevation sites the Willamette Valley larkspur is most commonly found in wet prairies with shrubby or Oregon ash (*Fraxinus latifolia*) overstory, but it also occurs along roadsides and fencerows and on dry oak woodlands, open hillsides, and well-drained native prairies. At high elevation sites, it occurs on open and moderately moist slopes. The primary threat to this species is continued loss of habitat to development, herbicides, disturbance associated with road maintenance, successional encroachment, and habitat invasion by exotic species (USFWS 2010).

The Willamette Valley larkspur was not observed during Project surveys, and the Oregon Flora Project (2023) atlas and ORBIC (2023b) do not include reported observations within the Analysis Area. An occurrence of an isolated population near the west bank of the Columbia River in Cowlitz County, Washington, and far from other known populations suggested the potential for this species to occur in unforeseen locations, and suitable habitat exists within the Analysis Area. Therefore, it was included as a species with the potential to occur in the Analysis Area. In 2023, surveys of

additional areas were conducted in September, outside of the Willamette Valley larkspur blooming period. Potentially suitable habitat for Willamette Valley larkspur was identified. These additional areas will be surveyed in full prior to construction and if any Willamette Valley larkspur are identified they will be avoided. Therefore, the species is not expected to be adversely affected by the Project.

3.3.3 Peacock Larkspur

Species of Concern (Federal); Endangered (State)

Peacock larkspur is a state Endangered species and a federal Species of Concern. This slender perennial herb grows 35 inches in height and blooms between April through June (Oregon Flora Project 2023). Peacock larkspur is endemic to the Willamette Valley of Oregon. Peacock larkspur occurs in native wet prairies, Oregon ash (*Fraxinus latifolia*) and Oregon white oak (*Quercus garryana*) woodlands, and roadsides and fences rows where suitable moisture and soil conditions are present. Peacock larkspur is most commonly found on silty soils in the Willamette River floodplain. The primary threat to this species is continued loss of habitat to development, herbicides, disturbance associated with road maintenance, successional encroachment, and habitat invasion by exotic species (ODA 2022).

Peacock larkspur was not observed during Project surveys, and the Oregon Flora Project (2023) atlas and ORBIC (2023b) do not include reported observations within the Analysis Area. The species is primarily found within Benton, Marion, and Polk counties, its largest occurrences located in William L. Finley National Wildlife Refuge in Benton County, Washington. Peacock larkspur does occur in Multnomah and Clackamas counties far from other known populations, suggesting the potential for this species to occur in unforeseen locations, and suitable habitat exists within the Analysis Area. Therefore, it was included as a species with the potential to occur in the Analysis Area. However, as the species was not observed during Project surveys, it is not expected to occur within the Analysis Area and is not expected to be adversely affected by the Project.

3.3.4 Coast Range Fawn-lily

Species of Concern (Federal); Threatened (State)

Coast Range fawn-lily is a state Threatened species and a federal Species of Concern. This wildflower grows 5–12 inches in height and blooms between May and June (Oregon Flora Project 2023). Coast Range fawn-lily is known to occur in the northern Oregon Coast Range and the Olympic Mountains of Washington where it grows at high elevation on open sites including rocky slopes and cliffs, bog edges, meadows, and rocky balds (Oregon Flora Project 2023). The primary threats are plant and habitat destruction due to timber harvest, herbivory and grazing, fungal infection, and plant collection (Guerrant 1999 as cited in Center for Plant Conservation 2020).

The Coast Range fawn-lily was not observed during Project surveys, and the Oregon Flora Project (2023) atlas and ORBIC (2023b) do not include reported observations within the Analysis Area. The Coast Range fawn-lily's known distribution is primarily restricted to high elevation sites above the

Analysis Area. However, the Oregon Flora Project (2023) atlas identifies a record as low as 1,401 feet elevation, an elevation that occurs within the Analysis Area. As there was some potential for suitable habitat within the Analysis Area and the species is known from neighboring counties, it was included as a species with the potential to occur. Nevertheless, as the species was not observed during Project surveys, it is not expected to occur within the Analysis Area and is not expected to be adversely affected by the Project.

3.3.5 Queen-of-the-Forest

No Status (Federal); Candidate (State)

Queen-of-the-forest is a state Candidate species. This erect perennial herb grows 3–7 feet in height and blooms between late May and August (Oregon Flora Project 2023). Queen-of-the-forest is endemic to northwestern Oregon and southwestern Washington where it occurs on high elevation Coast Range peaks and coastal river systems. The species grows in damp sites including riverbanks, rock crevices and seeps, damp salmonberry (*Rubus spectabilis*) shrublands, and moist rock cliffs (Oregon Flora Project 2023). The primary threats are timber management activities that lead to alterations in hydrology and increased solar radiation due to canopy removal, road and bridge construction, exposure to herbicides, and plant collection (Meinke 1982, NatureServe 2023).

Queen-of-the-forest was not observed during Project surveys, and the Oregon Flora Project (2023) atlas and ORBIC (2023b) do not include reported observations within the Analysis Area. The queen-of-the-forest's known distribution is west of Columbia County and the Analysis Area. As there was some potential for suitable habitat within the Analysis Area and the species is known from neighboring counties, it was included as a species with the potential to occur. However, as the species was not observed during Project surveys, it is not expected to occur within the Analysis Area and is not expected to be adversely affected by the Project.

3.3.6 Howell's Montia

No Status (Federal); Candidate (State)

Howell's montia is a state Candidate species, but it has no special status at the federal level. This low-growing annual herb has spreading stems 1–2 inches in length and blooms between March and May (Burke Museum Herbarium 2022a, Gisler 2004). Howell's montia occurs west of the Cascades from British Columbia to California. Howell's montia occurs in sparsely vegetated moist to seasonally wet areas such as river and pond edges, cattle and game trails, open fields, vernal pools, seeps, and wet prairies (Renner et al. 2012). Threats to the species include timber harvest, road construction and maintenance, vehicles, and competition (Gisler 2004, Renner et al. 2012).

During 2022 surveys, a single population consisting of approximately 2,700 plants growing densely within the two-track road matrix comprising approximately 800-square feet (Figure Q-4; Exhibit P, Attachment P-1). Two additional Howell's montia sub-populations consisting of one plant and eight dispersed plants (35 square foot area) were 15 and 40 feet further north along the mainline road's

eastern edge (Figure Q-4; Exhibit P, Attachment P-1). Impacts to this species would be avoided by identifying and marking individuals prior to Project construction and operation.

In 2023, surveys of additional areas were conducted in September, outside of the Howell's montia blooming period. Potentially suitable habitat for Howell's montia was identified. These additional areas will be surveyed in full prior to construction and if any Howell's montia are identified they will be avoided. Therefore, the species is not expected to be adversely affected by the Project.

3.3.7 Saddle Mountain Saxifrage

Species of Concern (Federal); Candidate (State)

Saddle Mountain saxifrage is a state Candidate species and a federal Species of Concern. This perennial herb has flower stalks that grow 4–10 inches tall, and it blooms between late May and July (Oregon Flora Project 2023). Saddle Mountain saxifrage is endemic to higher peaks in the north Oregon Coast Range. The species grows on grassy balds; on thin, rocky soils; and in rock crevices (Oregon Flora Project 2023). The primary threats to the species are timber harvest and grazing (Meinke 1982).

Saddle Mountain saxifrage was not observed during Project surveys, and the Oregon Flora Project (2023) atlas and ORBIC (2023b) do not include records from Columbia County. As there was some potential for suitable habitat within the Analysis Area and the species is known from neighboring counties, it was included as a species with the potential to occur. However, as the species was not observed during Project surveys, it is not expected to occur within the Analysis Area and is not expected to be adversely affected by the Project.

3.3.8 Meadow Checkermallow

No Status (Federal); Candidate (State)

Meadow checkermallow is a state Candidate species, but it has no special status at the federal level. This upright perennial herbaceous wildflower grows 20–71 inches tall and blooms between May and July (Young-Matthews 2012). Meadow checkermallow is endemic to the Willamette Valley in Oregon where it grows in meadows and prairies, along roadsides and fencerows, and at the edges of woodlands, wetlands and riparian areas. The primary threats to the species are herbicide use, habitat loss to agricultural and urban development, displacement by invasive weeds, and encroachment by trees and shrubs (Young-Matthews 2012).

Meadow checkermallow was not observed during Project surveys, and the Oregon Flora Project (2023) atlas and ORBIC (2023b) do not include reported observations within the Analysis Area. As there was some potential for suitable habitat within the Analysis Area and the species is known from neighboring counties, it was included as a species with the potential to occur. However, as the species was not observed during Project surveys, it is not expected to occur within the Analysis Area and is not expected to be adversely affected by the Project.

3.3.9 Bristly-stemmed Sidalcea

No Status (Federal); Candidate (State)

Bristly-stemmed sidalcea is a state Candidate species. This large perennial wildflower grows 28–51 inches in height and blooms as early as late April until as late as early November, with the dominant blooming period occurring June–August (Oregon Flora Project 2023). Bristly-stemmed sidalcea is endemic to western Oregon and Washington, occurring in the Oregon Coast Range, coastal areas, and southern Washington. The species grows in open meadows, grasslands, balds, coastal bluffs, and mountain peaks (Oregon Flora Project 2023). Threats to bristly-stemmed sidalcea include plant succession that results in the conversion of meadow habitat to closed-canopy forest or overtopping shrubs, invasive plant infestation, off-highway vehicles, urban development, possible in-breeding depression due to barriers to gene flow, seed predation by weevils, possible loss of pollinators, and the effects of climate change (USFS and BLM 2011).

Bristly-stemmed sidalcea was not observed during Project surveys and there are no known occurrences within the Analysis Area. As there was some potential for suitable habitat within the Analysis Area and the species is known from neighboring counties, it was included as a species with the potential to occur. In 2023, surveys of additional areas were conducted in September, outside of the bristly-stemmed sidalcea blooming period. Potentially suitable habitat for bristly-stemmed sidalcea was identified. These additional areas will be surveyed in full prior to construction and if any bristly-stemmed sidalcea are identified they will be avoided. Therefore, the species is not expected to be adversely affected by the Project.

3.3.10 Nelson’s Sidalcea

Delisted (Federal); Threatened (State)

Nelson’s sidalcea was delisted from the ESA in 2023 due to recovery but remains listed as Threatened at the state level. This erect perennial wildflower grows 24–39 inches in height and blooms between late May and September (Oregon Flora Project 2023). Nelson’s sidalcea is endemic to Oregon and Washington, occurring in the Willamette Valley and occasionally in the Coast Range in Oregon and north to Lewis County in central Washington. The species grows in relatively open areas on damp soil with sites including meadows, wet prairie remnants, fencerows, roadsides, deciduous forest edges, and occasionally Oregon ash wetlands (Oregon Flora Project 2023).

Primary threats to Nelson’s sidalcea include habitat loss due to agricultural and urban development, ecological succession resulting in the encroachment of trees and woody shrubs into open prairie habitats, and exotic weed invasions (ODA 2023, USFWS 2010). Additional threats include seed predation by weevils, possible inbreeding depression due to small population sizes and habitat fragmentation, and interspecific hybridization (ODA 2023, USFWS 2010).

Nelson’s sidalcea was not observed during Project surveys and there are no known occurrences within the Analysis Area. As there was some potential for suitable habitat within the Analysis Area and the species is known from neighboring counties, it was included as a species with the potential

to occur. In 2023, surveys of additional areas were conducted in September, outside of the Nelson's sidalcea blooming period. Potentially suitable habitat for Nelson's sidalcea was identified. These additional areas will be surveyed in full prior to construction and if any Nelson's sidalcea are identified they will be avoided. Therefore, the species is not expected to be adversely affected by the Project.

3.3.11 Oregon Sullivantia

Species of Concern (Federal); Candidate (State)

Oregon sullivantia is a state Candidate species and a federal Species of Concern. This delicate perennial wildflower typically grows 2–8 inches in height and blooms between late May and August (Oregon Flora Project 2023). Oregon sullivantia is endemic to Oregon and Washington, occurring in the Columbia River Gorge, northern Willamette Valley and Cascade Mountains in Oregon and ranging into Skamania County in southern Washington. The species grows on moist, shaded cliffs, especially near waterfalls with the surrounding forest dominated by Douglas fir (Oregon Flora Project 2023). Primary threats to Oregon sullivantia include collecting, recreational rock climbing, and significant changes in hydrology (Camp and Gamon 2011).

Oregon sullivantia was not observed during Project surveys. Because the Oregon Flora Project (2023) atlas and ORBIC (2023b) include Columbia County within the species' known range and there was some potential for suitable habitat within the Analysis Area, it was included as a species with the potential to occur. However, as the species was not observed during Project surveys, it is not expected to occur within the Analysis Area and is not expected to be adversely affected by the Project.

4.0 Avoidance and Mitigation – OAR 345-021-0010(1)(q)(C)

(C) For each species identified under (A), a description of measures proposed by the applicant, if any, to avoid or reduce adverse impact;

In accordance with OAR 345-021-0010(1)(q)(C), this section provides a description of measures proposed to avoid and minimize adverse effects to species listed in Table Q-1 and their critical habitat. Only species for which potential adverse impacts are anticipated are included.

4.1 Wildlife

4.1.1 Fish

4.1.1.1 Avoidance

Coho salmon and Chinook salmon occur in Lindgren Creek within the Analysis Area. Stream impacts will be avoided via the use of HDD to bore beneath the streambed, thereby avoiding impacts to fish species.

4.1.1.2 *Minimization*

The following BMPs will be used to minimize the risk of impacts to fish species:

- NWN will minimize the use of herbicides to the extent practicable including avoiding their use in the vicinity of sensitive environments or species. If use of herbicides are required to control the growth of vegetation in the pipeline corridor, NWN will comply with all applicable federal and state regulations.
- NWN has developed an Inadvertent Return Response Plan (Attachment 2 to Division 27 document) detailing procedures to identify and respond to an inadvertent release during HDD.
- An HDD Design has been prepared to reduce the risk of impacts to Lindgren Creek. This design includes analysis of hydraulically fracturing the bore hole during drilling, which could lead to drilling fluid surface release, and adjusting the depth of the HDD profile such that the risk of drilling fluid surface release is minimized. In addition, entry and exit points are set back from Lindgren Creek between approximately 175 and 185 feet to minimize impacts to the creek and riparian areas surrounding the creek. Entry and exit workspace are located within Mainline Road or an adjacent pull out to reduce impacts to surrounding areas.
- Silt fence will be installed adjacent to the entry and exit workspaces to limit migration of any surface water or drilling fluid. However, the risk of drilling fluid leaving the workspace is low as discussed in the following bullet point.
- Drilling fluid will be contained in drilling fluid returns pits excavated at the entry and exit points. These pits are typically 4 feet wide by 4 feet long by 4 feet deep. Drilling fluid used during drilling will return to these pits where they will be pumped to a vacuum truck and hauled off site.
- Drilling fluids can be inadvertently release to the ground surface during HDD operations. The likelihood of drilling fluid surface release is typically higher near the HDD entry/exit pits. Therefore, the HDD is being designed to cross the stream in the HDD profile's bottom tangent (deepest depth of the profile). Hydraulic fracture analyses completed during preliminary design of the HDD indicates that the risk of hydraulic fracture (and subsequent drilling fluid release to Lindgren Creek) is low, with calculated factors of safety against hydraulically fracturing the bore hole greater than 1.5.
- Drilling fluid returns to the entry or exit pits are visually monitored during drilling to verify that drilling fluid returns are maintained to the entry or exit pits at all times during construction. If a decrease in drilling fluid returns is observed (which could indicate a blockage downhole that could lead to hydraulic fracture and subsequent drilling fluid surface release) the contractor will take measures such as tripping out tooling to clean the hole and reestablish drilling fluid returns. Provided drilling fluid returns are maintained

during drilling, there is typically a low risk of hydraulic fracture and subsequent inadvertent returns.

- The HDD contractor will designate a person to continually monitor the HDD alignment for surface indications of drilling fluid surface release. If observed, the contractor will immediately disengage drilling fluid pumps to minimize the release and will immediately contain and clean the release.
- Downhole drilling fluid pressures will be monitored during construction and compared to the hydraulic fracture analysis. If drilling fluid pressures are significantly higher than anticipated, the contractor will implement mitigation measures to reduce the downhole drilling fluid pressures. Such measures may include tripping out tooling to clean the hole, adjusting drilling fluid properties to more effectively clean the hole and reduce drilling fluid pressures or performing partial reaming passes to enlarge the hole thereby creating more annular space downhole for drilling fluid flow which in turn reduces downhole annular pressures.
- An HDD design and associated report are being prepared, including specifications for deviance from the HDD profile depth and HDD alignment. The contractor will be required to maintain the HDD alignment and profile specifications, follow the designed HDD alignment and profile, and follow recommendations contained within the HDD design report. Requiring the contractor to follow the HDD design alignment and profile, alignment and profile specifications, and recommendations of the HDD design report will reduce the risk of impact on essential fish habitat.

4.2 Plants

As discussed, in 2023 surveys of additional areas were conducted in September, outside of target species blooming periods. Areas were characterized as having potentially suitable habitat for a number of species. These additional areas will be surveyed in full prior to construction and any identified locations will be avoided.

4.2.1 Howell's Montia

4.2.1.1 Avoidance

The locations of Howell's montia within the Analysis Area were identified during Project surveys. Locations of rare plants will be avoided during construction.

4.2.1.2 Minimization

The following BMPs will be used to minimize the risk of impacts to any unidentified individuals:

- Prior to initiation of construction, a botanist will survey the full extent of the area where Howell's montia was identified during the 2022 botanical survey, as well as a 250-foot buffer, to identify any new plants.

- Areas with Howell's montia will be flagged with a 250-foot buffer, and those that occur in areas where proposed permanent or temporary construction activities will occur will be protected using construction safety fencing or a similar visual and physical barrier.

5.0 Protection and Conservation Program Compliance/Impacts – OAR 345-021-0010(1)(q)(D)

(D) For each plant species identified under (A), a description of how the proposed facility, including any mitigation measures, complies with the protection and conservation program, if any, that the Oregon Department of Agriculture has adopted under ORS 564.105(3);

There are no species with the potential to occur within 0.5 miles of the Project for which ODA is running a recovery program. As a result, the Project is not likely to impact any of ODA's recovery efforts, nor is the Project likely to cause a significant reduction in the likelihood of survival or recovery of plants for which ODA has developed a protection or conservation program under ORS 564.105(3).

6.0 Potential Impacts to Plants, Including Mitigation Measures – OAR 345-021-0010(1)(q)(E)

(E) For each plant species identified under paragraph (A), if the Oregon Department of Agriculture has not adopted a protection and conservation program under ORS 564.105(3), a description of significant potential impacts of the proposed facility on the continued existence of the species and on the critical habitat of such species and evidence that the proposed facility, including any mitigation measures, is not likely to cause a significant reduction in the likelihood of survival or recovery of the species;

In compliance with OAR 345-021-0010(1)(q)(E), this section describes, for plant species listed in Table Q-1 that ODA has not adopted a protection and conservation program under ORS 564.105(3), the significant potential impacts of the Project on their continued existence and on their critical habitat. This section also provides evidence, considering mitigation measures, that the Project is not likely to cause a significant reduction in their likelihood of survival or recovery.

6.1 Species Found Not to Occur

Ten species listed in Table Q-1 are not known to occur within the Analysis Area. Based on distribution information reviewed during the desktop analysis and in preparation for field work, they were considered to have the potential to occur; however, these species were not observed during surveys for the Project. Potentially suitable habitat was identified for some of these species during a botanical season conducted outside of the blooming period. A full survey will be conducted prior to construction and the species will be avoided if found. For now, we assume they are not

present in the Analysis Area. As none of these species are known to occur within the Analysis Area, the Project will not cause a significant reduction in the likelihood of survival or recovery of these species:

- Tall bugbane;
- Willamette Valley larkspur;
- Peacock larkspur;
- Coast Range fawn-lily;
- Queen-of-the-forest;
- Saddle Mountain saxifrage;
- Bristly-stemmed sidalcea;
- Nelson's sidalcea;
- Meadow checkermallow; and
- Oregon sullivania.

6.2 Species Found or Previously Known to Occur

Howell's montia, which was observed within the Site Boundary during Project surveys, is not expected to be adversely affected by the Project because the Project will avoid plants during construction. Furthermore, this species is a state candidate for listing, and receives no formal protection under the Oregon or federal ESA.

7.0 Potential Impacts to Animals, Including Mitigation Measures – OAR 345-021-0010(1)(q)(F)

(F) For each animal species identified under (A), a description of significant potential impacts of the proposed facility on the continued existence of such species and on the critical habitat of such species and evidence that the proposed facility, including any mitigation measures, is not likely to cause a significant reduction in the likelihood of survival or recovery of the species; and

In compliance with OAR 345-021-0010(1)(q)(F), this section describes the significant potential impacts of the Project on the continued existence and on the critical habitat of all animal species listed in Table Q-1, and provides evidence, taking into account mitigation measures, that the Project is not likely to cause a significant reduction in their likelihood of survival or recovery.

No impacts are anticipated to animal species identified in Table Q-1 because the Project will use HDD technology to avoid impacts to streams.

8.0 Monitoring – OAR 345-021-0010(1)(q)(G)

(G) *The applicant's proposed monitoring program, if any, for impacts to threatened and endangered species.*

No monitoring is proposed as no impacts to threatened and endangered species are not anticipated.

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Figures

(Figure Q-3 and Figure Q-4 are confidential and submitted under a separate cover.)

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