

Exhibit L

Protected Areas

**Mist Resiliency Project
August 2024**

Prepared for



Northwest Natural Gas

Prepared by



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Acronyms and Abbreviations

EFSC	Energy Facility Siting Council
LCNHT	Lewis and Clark National Historic Trail
NMCS	North Mist Compressor Station
NWN	Northwest Natural Gas
OAR	Oregon Administrative Rules
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
OPRD	Oregon Parks and Recreation Department
OR-#	Oregon Route
Project	Mist Resiliency Project
RFA	Request for Amendment
US-#	U.S. Highway
WDFW	Washington Department of Fish and Wildlife
ZVI	Zone of Visual Influence

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 L contains information pertaining to potential adverse impacts of construction and operation of the Project on protected areas, as required to meet the submittal requirements in Oregon Administrative Rules (OAR) 345-021-0010(1)(I) paragraphs (A) through (C). This exhibit demonstrates that the Project can comply with the approval requirements found in OAR 345-022-0040:

(1) To issue a site certificate, the Council must find:

(a) The proposed facility will not be located within the boundaries of a protected area designated on or before the date the application for site certificate or request for amendment was determined to be complete under OAR 345-015-0190 or 345-027-0363;

(b) The design, construction and operation of the facility, taking into account mitigation, are not likely to result in significant adverse impact to a protected area designated on or before the date the application for site certificate or request for amendment was determined to be complete under OAR 345-015-0190 or 345-027-0363.

2.0 Analysis Area

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 is the same as the protected areas study area, defined in OAR 345-001-0010(35)(e) as the area within and extending 20 miles from the Site Boundary. The Site Boundary is defined in the Project Description section of this RFA 13 and reflects the information required by OAR 345-021-0010(1)(a) and (b). The Protected Areas Analysis Area is shown on Figure L-1.

3.0 Protected Areas Inventory – OAR 345-021-0010(1)(I)(A)(B)

OAR 345-021-0010(1)(I) Information about the potential impacts of the proposed facility on protected areas in the analysis area, providing evidence to support a finding by the Council as required by OAR 345-022-0040, including:

(A) A list of all protected areas within the analysis area, identifying:

- (i) The distance and direction of the protected area from the proposed facility;*
- (ii) The basis for protection, by reference to a specific subsection of OAR 345-001-0010(26); and*
- (iii) The name, mailing address, phone number, and email address of the land management agency or organization with jurisdiction over the protected area;*

(B) A map showing the location of the proposed facility in relation to the protected areas; and

As previously found by the Energy Facility Siting Council (EFSC), the design, construction and operation of the Project are not likely to result in a significant adverse impact to any protected area in the Analysis Area.¹ Three new protected areas are located within the Analysis Area since the Final Order on RFA 12 was issued: the Lewis and Clark National Historic Trail (LCNHT), Skull and Little Wallace Island and Klaskanine Salmon Hatchery.^{1,2,3,4} Therefore, a total of 17 protected areas were found to occur within the Analysis Area, none of which occur within the Site Boundary. Table L-1 provides an inventory of the 17 protected areas within the Analysis Area and indicates the proximity and direction of each protected area relative to the Site Boundary, the basis for protection under OAR 345-001-0010(26), and the contact information for the relevant land management agencies and organizations. The inventory of protected areas was based on review of best available geographic information system data, maps, and the most current information for the categories of protected areas listed in OAR 345-001-0010(26)⁵. Figure L-1 shows the location of the protected areas identified in the Analysis Area.

¹ Final Order on Requests for Contested Case and Amendment #12 of the Site Certificate (September 2017), p. 12

² Note that the Beaver Creek Hatchery and Fallert Creek Hatchery were previously included in the RFA 11 Exhibit L analysis; however, they are managed by Washington entities and located in Washington and are thus outside the scope of Oregon's RFA process. The Beaver Creek Hatchery is included in this analysis for consistency, but the Fallert Creek Hatchery is outside the analysis area for RFA 13 and thus is not included in this analysis.

³ The Blind Slough Netpen was previously included in the RFA 11 Exhibit L analysis; however, it is classified as a netpen and is not listed as a hatchery by the Oregon Department of Fish and Wildlife (requirement per OAR 345-001-0010[26][p]; ODFW 2023a, ODFW 2012), nor classified as a national hatchery (USFWS 2023a). Therefore, the resource does not qualify as a protected area but is included in this analysis for consistency.

⁴ Final Order on Request for Contested Case and Amendment No. 11 of the Site Certificate (April 2016), p. 94-95.

⁵ Sources: BLM 2023a, BLM 2023b, BLM 2023c, BLM 2023d, BLM 2023e, Google Earth 2023, NOAA 2023, NPS 2023a, NPS 2023b, National Wild and Scenic Rivers System 2023, Natural Atlas 2023, ODFW 2023a, ODFW 2023b, OPRD 2020, OPRD 2023a, OPRD 2023b, OPRD 2023c, OPRD 2023d, OSU 2013, OSU 2022, OSU 2023, USFWS 2023a, USFWS 2023b, USFS 2023a, USFS 2023b, USFS 2023c, USGS 2022, Wilderness Connect 2023.

Table L-1. Inventory of Protected Areas in the Analysis Area

Applicable Protected Area Category	Land Management Agency Contact Information	Area Name	Distance from Site Boundary (miles)	Cardinal Direction from Facility	Description
National Parks OAR 345-001-0010(26)(a)	National Park Service 601 Riverfront Drive Omaha, NE 68102 (402) 661-1804 lecl_information@nps.gov	Lewis and Clark National Historic Trail (LCNHT)	2.8	N	National Historic Trail established under the National Trails System Act in 1978. Analysis Area encompasses a portion of the Trail located within the Columbia River gorge (i.e., accessible only by water); the remainder of the Trail is outside of the Analysis Area.
National Monuments OAR 345-001-0010(26)(b)	N/A	None	N/A	N/A	N/A
Wilderness Areas OAR 345-001-0010(26)(c)	N/A	None	N/A	N/A	N/A
National Wild, Scenic, or Recreational Rivers OAR 345-001-0010(26)(d)	N/A	None	N/A	N/A	N/A
National Wildlife Refuges OAR 345-001-0010(26)(e)	U.S. Fish and Wildlife Service, Lewis and Clark National Wildlife Refuge 46 Steamboat Slough Road Cathlamet, WA 98612 (360) 795-3915 willapa@fws.gov	Lewis and Clark National Wildlife Refuge	13.6	NW	Encompasses over 35,000 acres of islands, tidelands, and open waters stretching along 27 miles of the Columbia River between Astoria, OR, and Skamokowa, WA. Established to preserve wetland habitat for migratory birds, primarily waterfowl and shorebirds.
	U.S. Fish and Wildlife Service, Julia Butler Hansen Refuge 46 Steamboat Slough Road Cathlamet, WA 98612 (360) 642-3860 willapa@fws.gov	Julia Butler Hansen Refuge	1.4	NE	Encompasses over 6,000 acres of Columbia River islands and portions of mainland just west of Cathlamet, WA. Established for the protection of endangered Columbian white-tailed deer.
National Fish Hatcheries OAR 345-001-0010(26)(f)	N/A	None	N/A	N/A	N/A
National Recreation Areas, Scenic Areas, or Special Resources Management Units OAR 345-001-0010(26)(g)	N/A	None	N/A	N/A	N/A
Wilderness Study Areas OAR 345-001-0010(26)(h)	N/A	None	N/A	N/A	N/A
Federal Land Management Plan Designated Lands OAR 345-001-0010(26)(i)	N/A	None	N/A	N/A	N/A

Applicable Protected Area Category	Land Management Agency Contact Information	Area Name	Distance from Site Boundary (miles)	Cardinal Direction from Facility	Description
State Parks, Waysides, Corridors, Monuments, Historic, or Recreation Areas OAR 345-001-0010(26)(j)	Oregon Parks and Recreation Department (OPRD) 725 Summer Street NE, Suite C Salem, OR 97301 (503) 324-0606 No email listed	L.L. Stub Stewart State Park	17.1	SE	1,800-acre park offering a variety of day use and overnight recreation activities.
	OPRD 725 Summer Street NE, Suite C Salem, OR 97301 (503) 861-3170 x 21 No email listed	Bradley State Scenic Viewpoint	10.1	NW	Day-use area on US-30, featuring a view overlooking the Columbia River, Puget Island, and Wauna, OR.
	OPRD 725 Summer Street NE, Suite C Salem, OR 97301 (503) 324-0606 No email listed	Banks-Vernonia State Trail	11.5	S	Easy 21-mile paved multi-use pathway converted from former railroad grade.
Willamette River Greenway OAR 345-001-0010(26)(k)	N/A	None	N/A	N/A	N/A
Oregon Register of Natural Areas Designated Natural Areas OAR 345-001-0010(26)(l)	OPRD 725 Summer Street NE, Suite C Salem, OR 97301 (503) 812-0650 No email listed	Saddle Mountain State Natural Area	17.0	SW	2,784-acre natural area featuring a popular hike to the peak of Saddle Mountain, with panoramic views in all directions from the peak.
	U.S. Fish and Wildlife Service, Julia Butler Hansen Refuge 46 Steamboat Slough Road Cathlamet, WA 98612 (360) 642-3860 willapa@fws.gov	Tenasillahe Island Research Natural Area	11.9	NW	2,000-acre island that forms part of the Julia Butler Hansen Refuge, managed for anadromous salmonid and Columbian white-tailed deer habitat.
	North Coast Land Conservancy PO Box 67 Seaside, OR 97138 (503) 738-9126 nclc@NCLCtrust.org	Blind Slough Swamp Preserve	15.9	NW	902-acre wetland adjacent to Blind Slough and Lewis and Clark National Wildlife Refuge managed to preserve one of the last remaining tracts of Sitka spruce swamp in Oregon.
	Oregon Department of State Lands (ODSL) 775 Summer Street NE, Suite 100 Salem, OR 97301 (503) 986-5200 No email listed	Skull and Little Wallace Island	2.7	N	25-acre island adjacent to the Wallace Island unit of the Julia Butler Hansen Refuge, managed for wildlife and habitat conservation.

Applicable Protected Area Category	Land Management Agency Contact Information	Area Name	Distance from Site Boundary (miles)	Cardinal Direction from Facility	Description
South Slough National Estuarine Research Reserve OAR 345-001-0010(26)(m)	N/A	None	N/A	N/A	N/A
State Scenic Waterways OAR 345-001-0010(26)(n)	N/A	None	N/A	N/A	N/A
State Wildlife Refuges or Management Areas OAR 345-001-0010(26)(o)	Oregon Department of Fish and Wildlife (ODFW), Jewell Meadows Wildlife Area 79878 Highway 202 Seaside, OR 97138 (503) 755-2264 No email listed	Jewell Meadows Wildlife Area	10.2	SW	Humbug Tract and Contract Refuge Tract: 959 acres of ODFW-owned lands, plus 1,826 acres of adjacent private lands (Weyerhaeuser Company and Stimson Lumber Company) and Oregon Department of Forestry lands managed under contract. Wildlife area managed to provide winter habitat and supplemental feeding for Roosevelt elk, black-tailed deer, and other native wildlife. Provides seasonal wildlife viewing/education and hunting in some areas. Beneke Creek and Fish Hawk Creek Tract: 155-acre wildlife area managed to provide winter habitat and supplemental feeding for Roosevelt elk, black-tailed deer, and other native wildlife. Provides seasonal wildlife viewing/education and hunting in some areas.
State Fish Hatcheries OAR 345-001-0010(26)(p)	ODFW, Gnat Creek Hatchery Route 2, Box 2198 Clatskanie, OR 97016 (503) 455-2234 No email listed	Gnat Creek Hatchery	11.6	NW	Oregon State fish hatchery on a lower Columbia River tributary, for incubation and rearing of spring Chinook and winter steelhead.
	ODFW, Big Creek Hatchery Route 4, Box 594 Astoria, OR 97103 (503) 458-6512 No email listed	Big Creek Hatchery	14.4	NW	Oregon State fish hatchery on a lower Columbia River tributary, for incubation and rearing of winter steelhead, fall Chinook, and coho.
	ODFW, Klaskanine Hatchery 82635-202 Hatchery Road Astoria, OR 97103 (503) 325-3653 No email listed	Klaskanine Salmon Hatchery	19.6	NW	Oregon State fish hatchery on a lower Columbia River tributary, for incubation and rearing of winter steelhead, fall Chinook, and coho.
Washington State Fish Hatcheries	Washington Department of Fish and Wildlife (WDFW) 1111 Washington St. SE Olympia, WA 98501 (360) 902-2200 No email listed	Beaver Creek Hatchery	9.0	NW	Washington State hatchery on a lower Columbia River tributary, for incubation and rearing of summer steelhead.
Fish Netpen Sites	Clatsop County, Natural Resources 2001 Marine Drive #253 Astoria, OR 97103 (503) 325-6452 No email listed	Blind Slough Netpen	15.5	NW	Oregon holding area where spring chinook are reared and acclimated to a natural environment prior to release.

Applicable Protected Area Category	Land Management Agency Contact Information	Area Name	Distance from Site Boundary (miles)	Cardinal Direction from Facility	Description
Oregon State University Designated Agricultural Experiment Stations, Experimental Areas, or Research Centers OAR 345-001-0010(26)(q)	N/A	None	N/A	N/A	N/A
Oregon State University Designated Research Forests OAR 345-001-0010(26)(r)	Oregon State University, College of Forestry 140 Peavy Forest Science Center 3100 SW Jefferson Way Corvallis, OR 97331 (541) 737-2004 No email listed	Blodgett Tract Research Forest	1.0	NW	2,440-acre forest managed to test and demonstrate sustainable forestry and timber production practices.
Green shading indicates a protected area added since the last RFA that EFSC reviewed for the facility.					

4.0 Impact Assessment – OAR 345-021-0010(1)(I)(C)

OAR 345-021-0010(1)(I)(C) A description of significant potential impacts of the proposed facility, if any, on the protected areas including, but not limited to, potential impacts such as:

As previously found by EFSC, the design, construction, and operation of the Project, when taking into account mitigation, are not likely to result in any significant adverse impacts to any protected areas in the Analysis Area.^{6,7} The following sections summarize the types of potential adverse impacts that NWN evaluated, and provide summaries of the analysis.

4.1 Noise – OAR 345-021-0010(1)(I)(C)(i)

(i) Noise resulting from facility construction or operation;

Exhibit Y provides an assessment of the existing acoustical environment and anticipated Project sound levels. The methodology for noise modeling is also discussed in detail in that exhibit. Exhibit Y describes sound level thresholds derived from the Oregon Department of Environmental Quality (ODEQ) noise regulations (OAR 340-035-0035), which are used to assess the significance of impacts to noise sensitive properties. As defined in OAR 340-035-0035, “noise sensitive properties” are “real property normally used for sleeping, or normally used as schools, churches, hospitals or public libraries. Property used in industrial or agricultural activities is not Noise Sensitive Property unless it meets the above criteria in more than an incidental manner.” With the exceptions of camping in L.L. Stub Stewart State Park and at Saddle Mountain State Natural Area, none of the protected areas are considered to be noise sensitive properties, and the ODEQ noise regulations do not apply.

Mechanical equipment at the North Mist Compressor Station (NMCS) will create noise; however, the NMCS will be designed to meet ODEQ standards at the nearest residences to the site, which are located near Fishhawk Lake. Noise from operations of the NMCS will be inaudible (or indistinguishable from background/ambient noise levels [35 decibels]) in L.L. Stub Stewart State Park and at Saddle Mountain State Natural Area, and generally at sites beyond 0.5 miles from the NMCS.

The Oregon State Noise Control Regulations specifically exempt noise emanating from construction activities from compliance with the state noise regulations under OAR 340-035-0035(5).

Notwithstanding the arguable inapplicability of the noise regulations to construction activities, the following discussion of construction noise is intended to demonstrate that the Project as modified by RFA 13 continues to meet the evidentiary requirements as previously found by EFSC under OAR

⁶ Final Order on Requests for Contested Case and Amendment #12 of the Site Certificate (September 2017), p. 12.

⁷ Final Order on Request for Contested Case and Amendment No. 11 of the Site Certificate (April 2016), p. 94-95.

345-021-0010(1)(t)(B)(ii), and would not create new noise impacts to protected areas beyond those that were previously identified.^{8,9}

Construction activities will occur at the NMCS Site and along the proposed pipeline route. In these areas there is one primary method of construction: trenched pipe installation. Trenched piping will involve logging and grading of the route, excavation, pipe welding and placement, and backfilling. In general, the types and loudness of sound sources associated with trenched pipe will be similar to logging and silviculture activities that already occur in the proposed trenched pipe section.

Horizontal directional drilling pipe installation will primarily occur along the powerline alignment near the stretch of the mainline road near Highway 202. This Site Boundary area for the powerline alignment is located over 4 miles away from the nearest important protected area (Blodgett Tract, which is not considered a noise sensitive property), thus adverse noise impacts are not anticipated as a result. Note that horizontal directional drilling will occur only during construction, thus noise impacts to the hunting area are anticipated to be temporary in duration, and sound levels will return to current levels upon construction completion.

4.2 Traffic – OAR 345-021-0010(1)(I)(C)(ii)

(ii) Increased traffic resulting from facility construction or operation;

No new significant traffic impacts to protected areas are anticipated from the Project as modified by RFA 13, primarily because most protected areas are located where there will be no Project construction traffic.^{10,11} Most construction traffic would occur on U.S. Highway 30 (US-30), which has adequate capacity to carry all Project construction traffic without creating traffic delays (see traffic impact analysis in Exhibit U). Although access to the two National Wildlife Refuges, the four hatcheries and netpen, Bradley State Scenic Viewpoint, Tenasillahe Island Research Natural Area, and the Blind Slough Swamp Preserve are largely via US-30, there would be no direct traffic impacts at those protected areas, and little likelihood of even temporary delays in reaching those areas due to the capacity of US-30. The LCNHT and portions of the Julia Butler Hansen Refuge closest to the Project and the Skull and Little Wallace Island are islands accessible only by boat, so would be unaffected by Project traffic. Project traffic would also utilize Oregon Highway 47 (OR-47) between Clatskanie and Mist, and some of the local roads north of Clatskanie. None of these roads provide direct access to any protected area. Saddle Mountain State Natural Area, Jewell Meadows Wildlife Area, L.L. Stub Stewart State Park, and the Banks-Vernonia Trail are primarily accessed from U.S. Highway 26 (US-26), which would not carry Project construction traffic. Finally, the Blodgett Experimental Forest is accessible via several routes, including roads from US-30, OR-47, and

⁸ Final Order on Requests for Contested Case and Amendment #12 of the Site Certificate (September 2017), p. 12.

⁹ Final Order on Request for Contested Case and Amendment No. 11 of the Site Certificate (April 2016), p. 91-92.

¹⁰ Final Order on Requests for Contested Case and Amendment #12 of the Site Certificate (September 2017), p. 12.

¹¹ Final Order on Request for Contested Case and Amendment No. 11 of the Site Certificate (April 2016), p. 92-93.

Oregon Highway 202 (OR-202). While some of the access roads cross or run within the Site Boundary and may experience some temporary disruption during Project construction, these are private timber roads that would not typically be accessible to the public, and alternative routes to the area are available such that the Blodgett Experimental Forest would remain accessible throughout Project construction.

In the unlikely event that users of any protected area experience access disruptions or delays due to delivery of Project materials or construction equipment, these impacts would be brief, intermittent and temporary, and traffic levels would return to normal following construction. During construction, best management practices as detailed in Exhibit U will ensure that access restrictions to any protected area will be temporary and timed to avoid peak traffic flow.

The operational phase of the Project would not generate amounts of traffic that could adversely impact protected areas; the Project would not require additional staffing to operate, so operational traffic levels would be similar to current, pre-project levels. Therefore, there will be no significant impacts to protected areas due to Project traffic.

Traffic impacts are addressed in greater detail in Exhibit U, which provides additional information on anticipated traffic volumes, peak construction traffic times, potential delays, and temporary road closures; mitigation measures that would be implemented by NWN and the construction contractor to avoid significant traffic impacts; and required coordination with Oregon Department of Transportation and county road officials for necessary road improvements, road closures, and permits for construction and oversized load movements.

4.3 Water Use and Wastewater – OAR 345-021-0010(1)(I)(C)(iii)(iv)

(iii) Water use during facility construction or operation;

(iv) Wastewater disposal resulting from facility construction or operation;

The Project as modified by RFA 13 would not have new significant permanent water demands or generate wastewater that could affect nearby protected areas.^{12,13} Water used for construction and operation would be obtained from existing permitted sources with available capacity (see Exhibit O); water used for Project construction would not affect the amount of water available to protected areas or the quality of the water in protected areas. The Project would not generate wastewater by itself and would not increase the amount of industrial water use or wastewater generated at NWN's existing facilities. Water used for hydrostatic testing of the pipeline will be released pursuant to a discharge permit issued by ODEQ; pressure test water is not industrial process discharge and would not carry pollutants (see Exhibit W).

¹² Final Order on Requests for Contested Case and Amendment #12 of the Site Certificate (September 2017), p. 12.

¹³ Final Order on Request for Contested Case and Amendment No. 11 of the Site Certificate (April 2016), p. 93.

4.4 Visual – OAR 345-021-0010(1)(I)(C)(v)(vi)

(v) Visual impacts of facility structures or plumes, including, but not limited to, changes in landscape character or quality; and

(vi) Visual impacts from air emissions resulting from facility construction or operation, including, but not limited to, impacts on Class 1 Areas as described in OAR 340-204-0050.

No new significant visual impacts to protected areas are anticipated from the Project as modified by RFA 13.^{14,15} OAR 345-021-0010(1)(I)(C)(v) requires an assessment of “Visual impacts of facility structures or plumes, including, but not limited to, changes in landscape character or quality.” The Project would not generate any emissions plumes, so would not cause any visual impacts from air emissions. OAR 345-021-0010(1)(I)(C)(vi) requires an assessment of “Visual impacts from air emissions resulting from facility construction or operation, including, but not limited to, impacts on Class I Areas as described in OAR 340-204-0050.” Class I areas, as defined in OAR 340-204-0050, consist of the 12 federally designated Wilderness Areas in Oregon, none of which are located within the Analysis Area.

Nearly all Project facilities would be underground, so visual effects of the Project are largely limited to potential views of construction activities (including activity at the temporary laydown yards), and potential views of the area along the pipeline right-of-way and powerline alignment right-of-way that would be cleared of vegetation. All of these would be temporary impacts; construction will be phased lasting from approximately July 2025 through November 2029, and any cleared rights-of-way would be revegetated following completion of construction. Permanent above-ground facilities as proposed by RFA 13 are limited to infrastructure at the NMCS and above-ground appurtenances at the Newton, Stegosaur, and Medicine well pads. All of these locations are surrounded by mature forest vegetation that would effectively screen them from public view. Additionally, potential views of these facilities from nearly all protected areas would be blocked by terrain, as indicated in Table L-2 and Figure L-2. Table L-2 describes the locations of the identified protected areas and geographic features that would serve to block potential views of the Project; Figure L-1 is a set of topographic maps that show the scenic resource locations and intervening terrain and Figure L-2 includes a Zone of Visual Influence (ZVI) viewshed analysis. The ZVI was performed using Esri geographic information system software and a bare-earth 30-meter digital elevation model to identify those areas from which the aboveground components might be visible. The ZVI bare-earth modeling approach (based only on the effects of terrain on visibility) results in a highly conservative assessment of potential visibility for several reasons. First, a bare-earth analysis does not take into account the effects of vegetation or buildings, which will in practice block or screen views in some places. Finally, the model does not account for distance, lighting, weather, and atmospheric attenuation factors that diminish visibility under actual field conditions. Height assumptions used in the ZVI include a typical viewing height of 1.8 meters (6 feet) and 20

¹⁴ Final Order on Requests for Contested Case and Amendment #12 of the Site Certificate (September 2017), p. 12.

¹⁵ Final Order on Request for Contested Case and Amendment No. 11 of the Site Certificate (April 2016), p. 94-95.

feet for the maximum height of the above-ground appurtenances at the well pads. The following maximum heights for the NMCS infrastructure were assumed:

- Gas compressor building – 48 feet
- Glycol regeneration building – 43 feet
- Office/control building – 18 feet

All other components proposed with RFA 13 were deemed less visually impactful (due to height, overall footprint, and/or adjacent or collocated with taller infrastructure) and are encompassed by the assessment of the NMCS infrastructure and well pad appurtenances¹⁶.

As described in Table L-2, the visual impact of the Project on all protected areas would be negligible at worst, and none for most protected areas. Based on an assessment of screening due to topography, nine of the 17 protected areas may have partial views of the Project (see Figure L-2). However, from all but three of those nine protected areas, the only portions of the Project that may be visible are the cleared pipeline right-of-way and cleared powerline alignment right-of-way located within the timber lands south of US-30, and actual views are likely to be partially or entirely screened by vegetation. If visible, the cleared rights-of-way would be seen in the context of a patchwork of actively managed timber lands including clearcuts and regenerating areas and a network of logging roads. In addition, the long viewing distances would make these features difficult to distinguish. The cleared rights-of-way through the timber lands, therefore, would not represent an unusual visual feature in the area, and would not be considered a significant change to existing visual quality.

Only three of the protected areas would potentially have a view of the NMCS or any other permanent above-ground feature: Saddle Mountain State Natural Area, the Blodgett Tract Research Forest, and the Humbug Tract of the Jewell Meadows Wildlife Area. All above-ground infrastructure proposed by RFA 13 will have a height that is equal to or less than infrastructure that was previously approved by EFSC.¹⁷ If the NMCS infrastructure, including the components described above, prove to be visible at all from these areas—which appears unlikely given the existing forest vegetation surrounding the site (which the ZVI does not account for)—the visual impact would be negligible. In the case of Saddle Mountain State Natural Area, the NMCS site would be 17.8 miles away and would be unlikely to command the attention of viewers; additionally, most of the Saddle Mountain State Natural Area would not experience any view of the Project. A view of the NMCS infrastructure may be possible from a few high vantage points in the Blodgett Tract Research Forest; however, this is a working forest for which scenic qualities are not a concern, and the NMCS infrastructure and the remainder of the Project would be hidden from view by terrain from most of the Research Forest (see Figure L-2). A view of the NMCS infrastructure may be possible from two high points within the Humbug Tract of the Jewell Meadows Wildlife Area (see Figure L-2);

¹⁶ Note that the Stegosaur well pad is located adjacent to the NMCS and thus impacts are deemed to be encompassed by the ZVI assessment of the NMCS components.

¹⁷ Final Order on Request for Contested Case and Amendment No. 11 of the Site Certificate (April 2016), p. 94-95.

however, these high points are accessible only by gated logging roads so are considered unlikely to experience much visitation, and the Project would be out of sight from the meadows where wildlife viewing occurs.

Table L-2. Potential Visual Impacts to Protected Areas

Protected Area	Potential Project Visibility	Potential Visual Impact
Lewis and Clark National Historic Trail	Some potential visibility of portions of the cleared rights-of-way; View of the NMCS infrastructure and well pad appurtenances blocked by terrain and/or vegetation (see Figure L-1 and L-2).	Negligible. Potential views of the Project along the LCNHT are largely blocked by vegetation and terrain. Some portions of the pipeline and powerline alignment rights-of-way may be visible, at a minimum viewing distance of at least 8.7 miles. However, where visible, the rights-of-way would be seen in the context of actively managed commercial timber lands with a network of logging roads and a patchwork of clearcuts and recovering harvested areas, so would not represent new or unusual visual features in the landscape. The NMCS infrastructure and well pad appurtenances would not be visible from any point along the LCNHT.
Lewis and Clark National Wildlife Refuge	Some potential visibility of portions of Project in hills south of US-30 from the islands at the easternmost end of the Refuge; potential views of the Project blocked by terrain, primarily by the Clatsop Crest and Nicolai Ridge (over 800 feet and up to 2,200 feet in elevation), for the majority of the Refuge. View of the NMCS infrastructure and well pad appurtenances blocked by terrain for entirety of the Refuge (see Figure L-1 and L-2).	None to negligible. Although topography indicates potential Project visibility, actual visibility is likely to be blocked by vegetation. If visible, the Project would not introduce a new or substantially different visual feature in the landscape, and visual impacts would be temporary. Where portions of the cleared pipeline and powerline alignment rights-of-way in timber lands may be visible, they would be seen in the context of actively managed commercial timber lands with a network of logging roads and a patchwork of clearcuts and recovering harvested areas, and at a distance of at least 14.6 miles, making the pipeline and powerline alignment rights-of-way difficult to discern; no portion of the pipeline or powerline alignment are aligned in such a way as to provide a long view down the cleared corridors. Potential view of the NMCS infrastructure and, well pad appurtenances, and control and operations building blocked by existing forest vegetation and also likely by terrain.
Julia Butler Hansen Refuge	Some potential visibility of portions of Project in hills south of US-30, from island units nearest the Project. View of the NMCS infrastructure and well pad appurtenances blocked by terrain and/or vegetation for entirety of the Refuge (see Figure L-1 and L-2).	Negligible. Potential views of the Project from refuge headquarters and primary public use areas in the Mainland Unit are largely blocked by vegetation within the Refuge and also by terrain. Some portions of the pipeline and powerline alignment rights-of-way may be visible from the Mainland Unit, at a distance of at least 11.7 miles. Some portions of some of the island units closer to the Analysis Area may have increased views of pipeline and powerline alignment rights-of-way at a minimum viewing distance of about 4.6 miles. However, where visible, the rights-of-way would be seen in the context of actively managed commercial timber lands with a network of logging roads and a patchwork of clearcuts and recovering harvested areas, so would not represent new or unusual visual features in the landscape. Additionally, the island units are accessible only by water and reportedly receive little public use (USFWS 2010) so there would be few viewers affected. The NMCS infrastructure and, well pad appurtenances, and control and operations building would not be visible from any point in the Refuge.
L.L. Stub Stewart State Park	None; views of the Project are blocked by terrain from all developed use areas including the viewpoint at the high point within the park, located at over 1,500 feet elevation. Potential views of the Project are blocked by a high hill located southeast between the Park and above-ground Project components located over 21 miles away at approximately 1,100 feet elevation (see Figure L-1 and L-2).	None
Bradley State Scenic Viewpoint	Some potential visibility of portions of Project in hills south of US-30. View of the NMCS infrastructure and well pad appurtenances blocked by terrain (see Figure L-1 and L-2).	None to Negligible. Although topography indicates potential Project visibility, actual visibility is likely to be blocked by vegetation. If visible, the Project would not introduce a new or substantially different visual feature in the landscape, and visual impacts would be temporary. Where portions of the cleared pipeline and powerline alignment rights-of-way in timber lands may be visible, they would be seen in the context of actively managed commercial timber lands with a network of logging roads and a patchwork of clearcuts and recovering harvested areas, and at a distance of over 10.1 miles, making the pipeline and powerline alignment rights-of-way difficult to discern; no portion of the pipeline or powerline alignment are aligned in such a way as to provide a long view down the cleared corridors. The rights-of-way may be more visible during construction due to clearing of up to 80 feet in width, but would be effectively hidden once revegetated, with the 10 foot-wide rights-of-way maintained clear of trees replicating natural tree spacing in the surrounding forest. Potential view of the NMCS infrastructure and, well pad appurtenances, and control and operations building would be blocked by several high hills, including one rising to over 1,400 feet just north of the NMCS infrastructure and, well pad appurtenances, and control and operations building sites.

Protected Area	Potential Project Visibility	Potential Visual Impact
Banks-Vernonia State Trail	None; views of the Project are blocked by terrain and vegetation. The Trail runs through heavily forested lands, with much of the Trail down in a valley with limited views. Even where a long view may occur along the Trail, potential views of the Project are blocked by several high hills located south between the Trail and the above-ground Project components located over 14 miles away at approximately 1,100 feet elevation (see Figure L-1 and L-2).	None
Saddle Mountain State Natural Area	Some potential visibility of the NMCS infrastructure and well pad appurtenances, and portions of the rights-of-way in timber lands (see Figure L-1 and L-2).	None to Negligible. Saddle Mountain is a prominent Coastal Range peak, known for its panoramic 360-degree view; this high vantage point would allow a line of sight view to the NMCS site. However, at a distance of over 19.3 miles from the peak, the NMCS infrastructure and well pad appurtenances, would not be a prominent feature in the view. Additionally, the NMCS infrastructure and well pad appurtenances are likely to be hidden by existing forest vegetation surrounding the NMCS infrastructure and well pad appurtenances. Where portions of the cleared pipeline and powerline alignment rights-of-way may be visible, they would be seen in the context of actively managed commercial timber lands with a network of logging roads and a patchwork of clearcuts and recovering harvested areas, making the pipeline and powerline alignment rights-of-way difficult to discern. The Project would be visible only from portions of the trail near the peak of Saddle Mountain; the remainder of the Natural Area, including the campground at the trailhead, would be unaffected.
Tenasillahe Island Research Natural Area	Some potential visibility of portions of Project in hills south of US-30. View of the NMCS infrastructure and well pad appurtenances blocked by terrain (see Figure L-1 and L-2).	None to Negligible. Although topography indicates potential Project visibility, actual visibility is likely to be blocked by vegetation on Tenasillahe Island and Puget Island. If visible, the Project would not introduce a new or substantially different visual feature in the landscape, and visual impacts would be temporary. Where portions of the cleared pipeline and powerline alignment rights-of-way in timber lands may be visible, they would be seen in the context of actively managed commercial timber lands with a network of logging roads and a patchwork of clearcuts and recovering harvested areas, and at a distance of over 12.5 miles, making the pipeline and powerline alignment rights-of-way difficult to discern; no portion of the pipeline or powerline alignment are aligned in such a way as to provide a long view down the cleared corridors. The NMCS infrastructure and, well pad appurtenances, and control and operations building would not be visible from any point at the Research Natural Area.
Blind Slough Swamp Preserve	None; views of the Project are blocked by terrain. The swamp preserve is a tidal, forested area just above sea level. Potential views of the Project are blocked by Clatsop Crest and Nicolai Ridge, which rise to over 800 feet and up to 2,200 feet elevation between the Preserve and the above-ground Project components located over 16.6 miles away at approximately 1,100 feet elevation (see Figure L-1 and L-2).	None
Skull and Little Wallace Island	Some potential visibility of portions of Project in hills south of US-30. View of the NMCS infrastructure and well pad appurtenances blocked by terrain (see Figure L-1 and L-2).	Negligible. Potential views of the Project from the Island are largely blocked by vegetation and terrain. Some portions of the Island may have increased views of pipeline and powerline alignment rights-of-way. However, where visible, the rights-of-way would be seen in the context of actively managed commercial timber lands with a network of logging roads and a patchwork of clearcuts and recovering harvested areas, so would not represent new or unusual visual features in the landscape. Where portions of the cleared pipeline and powerline alignment rights-of-way in timber lands may be visible, they would be seen in the context of actively managed commercial timber lands with a network of logging roads and a patchwork of clearcuts and recovering harvested areas, and at a distance of over 6.1 miles, making the pipeline and powerline alignment rights-of-way difficult to discern; no portion of the pipeline or powerline alignment are aligned in such a way as to provide a long view down the cleared corridors. Additionally, the island is accessible only by water so there would be few viewers affected. The NMCS infrastructure and, well pad appurtenances, and control and operations building would not be visible from any point on the Island.

Protected Area	Potential Project Visibility	Potential Visual Impact
Jewell Meadows Wildlife Area	<p><i>Humbug Tract and Contract Refuge Tract:</i> Minimal potential visibility of the NMCS infrastructure and well pad appurtenances, and portions of the rights-of-way in timber lands only from high points in Wildlife Area; views from most of the Wildlife Area, including from all of the open meadow areas, blocked by terrain (see Figure L-1 and L-2).</p> <p><i>Beneke Creek and Fish Hawk Creek Tract:</i> None; Potential views of the Project are blocked by terrain. The Wildlife Area encompasses several open meadows adjacent to US-26, at about 440 feet elevation. Potential views of the Project are blocked by hills rising to over 800 feet just northeast of the Wildlife Area, on the opposite side of US-26, between the Wildlife Area and the above-ground Project components located over 11 miles away at approximately 1,100 feet elevation (see Figure L-1 and L-2).</p>	<p><i>Humbug Tract and Contract Refuge Tract:</i> None to Negligible. There would be no views of the Project from the most frequent use (wildlife viewing) areas in the open meadows, due to many intervening hills and terrain within the Wildlife Area. Some portions of the pipeline and powerline alignment rights-of-way, and possibly of the NMCS infrastructure and well pad appurtenances, may be possible from a few high vantage points within the Wildlife Area; however, these high points are accessible only by gated logging roads so are likely to have few visitors. Potential views of the NMCS infrastructure and well pad appurtenances (located over 11 miles away), are likely blocked by forest vegetation surrounding the site. Where portions of the cleared pipeline and powerline alignment rights-of-way may be visible, they would be seen in the context of actively managed commercial timber lands with a network of logging roads and a patchwork of clearcuts and recovering harvested areas, and at a distance of over 10.6 miles, making the pipeline and powerline alignment rights-of-way difficult to discern.</p> <p><i>Beneke Creek and Fish Hawk Creek Tract:</i> None</p>
Gnat Creek Hatchery	None; views of the Project are blocked by terrain. The Hatchery is located at about 220 feet elevation and is adjacent to US-30 and a transmission line right-of-way, but is largely surrounded by forest vegetation. Potential views of the Project are blocked by Clatsop Crest and Nicolai Ridge, which rise to over 800 feet and up to 2,200 feet elevation between the Hatchery and the above-ground Project components located over 12.4 miles away at approximately 1,100 feet elevation (see Figure L-1 and L-2).	None
Big Creek Hatchery	None; views of the Project are blocked by terrain. The Hatchery is located in tidal waters just above sea level. Potential views of the Project are blocked by Nicolai Ridge, which rises to over 2,200 feet elevation between the Hatchery and the above-ground Project components located over 15.1 miles away at approximately 1,100 feet elevation (see Figure L-1 and L-2).	None
Klaskanine Salmon Hatchery	None; views of the Project are blocked by terrain. The Hatchery is located at about 100 feet elevation and is adjacent to OR-202/Nehalem Highway and a transmission line right-of-way, but is largely surrounded by forest vegetation. Potential views of the Project are blocked by Clatsop Crest and Nicolai Ridge, which rise to over 800 feet and up to 2,200 feet elevation between the Hatchery and the above-ground Project components located over 20 miles away at approximately 1,100 feet elevation (see Figure L-1 and L-2).	None
Beaver Creek Hatchery	None; views of the Project are blocked by terrain. The Hatchery is located at about 62 feet elevation and is 2.6-miles northeast of SR-4 and the Columbia River but is largely surrounded by forest vegetation. Potential views of the Project are blocked by two mountain ridges on either side of the Columbia River gorge, which rise to up to 1,572 feet elevation between the Hatchery and the above-ground Project components located over 11.8 miles away at approximately 1,100 feet elevation (see Figure L-1 and L-2).	None
Blind Slough Netpen	None; views of the Project are blocked by terrain. The Netpen is located at about 10 feet elevation and is 2-miles north of US-30 and a transmission line right-of-way, but is largely surrounded by water and forest vegetation. Potential views of the Project are blocked by Clatsop Crest and Nicolai Ridge, which rise to over 800 feet and up to 1,710 feet elevation between the Hatchery and the above-ground Project components located over 14.7 miles away at approximately 1,100 feet elevation (see Figure L-1 and L-2).	None
Blodgett Tract Research Forest	Some potential visibility of the NMCS infrastructure and well pad appurtenances, and portions of the rights-of-way in timber lands (see Figure L-1 and L-2).	Negligible. The Blodgett Tract is a working research forest, consisting of a patchwork of clearcuts and recovering harvest areas, with a network of logging roads and log decks; it is not managed for scenic qualities. From a few high vantage points in the Tract, the NMCS infrastructure and well pad appurtenances, may be visible (located over 1.7 miles away); however, for most of the Tract the NMCS infrastructure and well pad appurtenances would be hidden from view by high hills just to the northwest of the site, as well as by terrain in the Tract and by forest vegetation surrounding the NMCS infrastructure and well pad appurtenances. Some portions of the pipeline and powerline alignment rights-of-way may also be visible where permitted by terrain and clearcuts; where visible, the cleared rights-of-way would not represent new or unusual features in the landscape.

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5.0 Conclusions

The Project as modified by RFA 13 would have no direct impacts to any protected area. Most protected areas would experience no indirect impacts from the Project, as they are too far away for Project noise to be audible, construction traffic would not be routed near them, views of the Project would be blocked by terrain and/or vegetation, and there would be no water or wastewater impacts. Up to nine protected areas may have partial views of the Project, primarily of the pipeline and powerline alignment rights-of-way through the timber lands south of US-30; of these, three may have a view of the NMCS infrastructure and well pad appurtenances. However, the long viewing distances, existing vegetative screening, and context of the Project, in addition to the lack of management direction applicable to preservation of scenic qualities in those areas, render the visual impacts of the Project negligible for all protected areas.

6.0 References

- BLM (U.S. Bureau of Land Management). 2023a. Areas of Critical Environmental Concern. Accessed July 6, 2023. <https://www.blm.gov/programs/planning-and-nepa/planning-101/special-planning-designations/acec>.
- BLM. 2023b. Oregon and Washington National Conservation Lands. Accessed July 6, 2023. <https://www.blm.gov/programs/national-conservation-lands/oregon-washington>.
- BLM. 2023c. Oregon Similarly Designated Areas. Accessed July 6, 2023. <https://www.blm.gov/programs/national-conservation-lands/ncas-and-similar-designations/oregon-washington>.
- BLM. 2023d. Wilderness and Wildness Study Areas. Accessed July 6, 2023. <https://www.blm.gov/programs/national-conservation-lands/wilderness>.
- BLM. 2023e. BLM National Data. Accessed July 6, 2023. <https://blm-egis.maps.arcgis.com/apps/webappviewer/index.html?id=6f0da4c7931440a8a80bfe20edd7550>.
- Google Earth. 2023. Imagery Date: 6/1/2023.
- NOAA (National Oceanic and Atmospheric Administration). 2023. South Slough National Estuarine Research Reserve. <https://coast.noaa.gov/nerrs/reserves/south-slough.html>.
- NPS (National Park Service). 2023a. Oregon, Find a Park. Accessed July 6, 2023. <https://www.nps.gov/state/or/index.htm>.
- NPS. 2023b. Wild and Scenic Rivers. Accessed July 6, 2023. <https://nps.maps.arcgis.com/apps/View/index.html?appid=ff42a57d0aae43c49a88daee0e353142>.

- National Wild and Scenic Rivers System. 2023. Oregon. Accessed July 6, 2023.
<https://www.rivers.gov/oregon.php>.
- Natural Atlas. 2023. National Scenic Areas. <https://naturalatlas.com/national-scenic-areas>.
- ODFW (Oregon Department of Fish and Wildlife). 2012. Select Area Sites.
https://www.dfw.state.or.us/fish/OSCRP/CRM/docs/2012/SAFE_Facts_handout.pdf.
- ODFW. 2023a. Visit ODFW Hatcheries. <https://myodfw.com/visit-odfw-hatcheries>.
- ODFW. 2023b. Visit ODFW Wildlife Areas. <https://myodfw.com/visit-odfw-wildlife-areas>.
- OPRD (Oregon Parks and Recreation Department). 2020. Oregon Natural Areas Plan.
https://inr.oregonstate.edu/sites/inr.oregonstate.edu/files/2020_nap_draft.pdf.
- OPRD. 2023a. List of Scenic Waterways. Accessed July 6, 2023.
<https://www.oregon.gov/oprd/bwt/pages/ssw-list.aspx>.
- OPRD. 2023b. Oregon State Scenic Waterway Water Courses. July 6, 2023.
https://www.arcgis.com/home/webmap/viewer.html?url=https%3A%2F%2Fmaps.prd.state.or.us%2Farcgis%2Frest%2Fservices%2FAdmin_boundaries%2FAD_SCENIC_WATERWAYS%2FFeatureServer%2F0&source=sd.
- OPRD. 2023c. Find a Park. <https://stateparks.oregon.gov/index.cfm?do=visit.find>.
- OPRD. 2023d. Willamette River Greenway and Water Trail.
<https://stateparks.oregon.gov/index.cfm?do=park.profile&parkId=194>.
- OSU (Oregon State University). 2013. Interagency Natural Areas Network.
<https://www.fsl.orst.edu/rna/images/RNA%20low.jpg>.
- OSU. 2022. Research and Experiment Stations.
<https://agsci.oregonstate.edu/home/outreach/research-experiment-stations#experiment>.
- OSU. 2023. Welcome to the OSU Research Forests. <https://cf.forestry.oregonstate.edu/>.
- USFS (U.S. Forest Service). 2023a. Interactive Visitor Map. Accessed July 6, 2023.
<https://www.fs.usda.gov/ivm/index.html?minx=-13645989&miny=5667056&maxx=-13467126&maxy=5768870&exploremenu=no>.
- USFS. 2023b. Experimental Forests and Ranges. Accessed July 6, 2023.
<https://www.fs.usda.gov/research/forestsandranges>.
- USFS. 2023c. Wildernesses in the Pacific Northwest. Accessed July 6, 2023.
<https://www.fs.usda.gov/detail/r6/specialplaces/?cid=stelprdb5227694>.
- USFWS (U.S. Fish and Wildlife Service). 2010. Lewis and Clark National Wildlife Refuge and Julia Butler Hansen Refuge for the Columbian White-tailed Deer Comprehensive Conservation Plan. USFWS Willapa National Wildlife Refuge Complex, Ilwaco, Washington. August 2010.
https://www.fws.gov/sites/default/files/documents/ccp-jbh-nwr_0.pdf.

USFWS. 2023a. Visit National Fish Hatcheries. Accessed July 6, 2023. <https://www.fws.gov/visit-us/hatcheries?type=%5B%22National%20Fish%20Hatchery%22%5D>.

USFWS. 2023b. Our Facilities. Accessed July 6, 2023. <https://www.fws.gov/our-facilities?type=%5B%22National%20Wildlife%20Refuge%22%5D>.

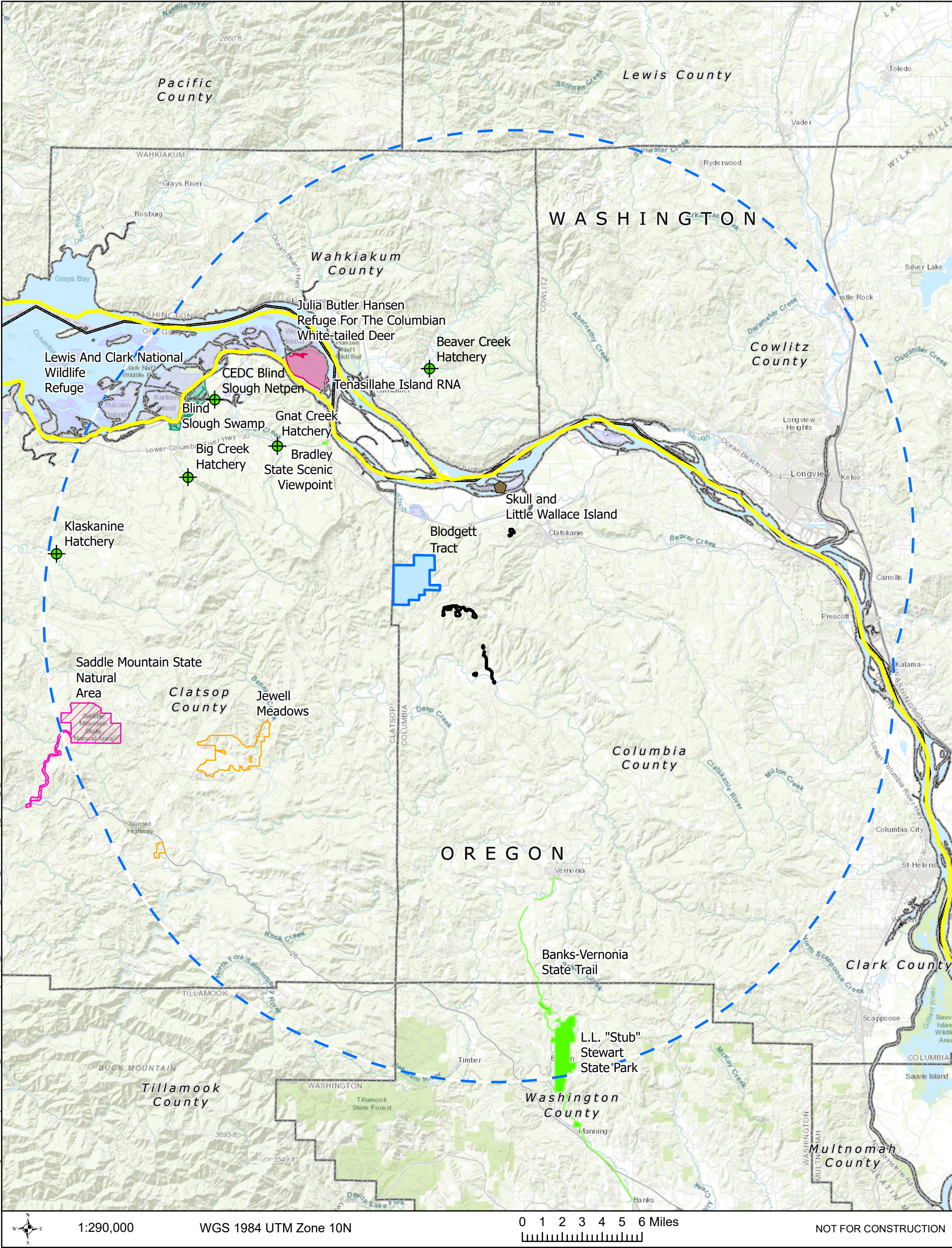
USGS (U.S. Geological Survey). 2022. Protected Areas Database of the United States. <https://maps.usgs.gov/padus/>.

Wilderness Connect. 2023. Wilderness Areas of the United States. Accessed July 6, 2023. <https://umontana.maps.arcgis.com/apps/webappviewer/index.html?id=a415bca07f0a4be9f0e894b0db5c3b6>.

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Figures

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Mist Resiliency Project

Figure L-1 Protected Areas

COLUMBIA COUNTY, OREGON

Site Boundary

Analysis Area (20-mile Buffer)

State Boundary

County Boundary

Fish Hatchery

ODSL/Oregon Register of Natural Areas Designated Natural Area

Lewis and Clark National Historic Trail

National Wildlife Refuge (USFWS)

Oregon Natural Area

Research Natural Area

State Park, Wayside, Corridor, Monument, Historic, or Recreation Area (OPRD)

State Wildlife Refuge or Management Area (ODFW)

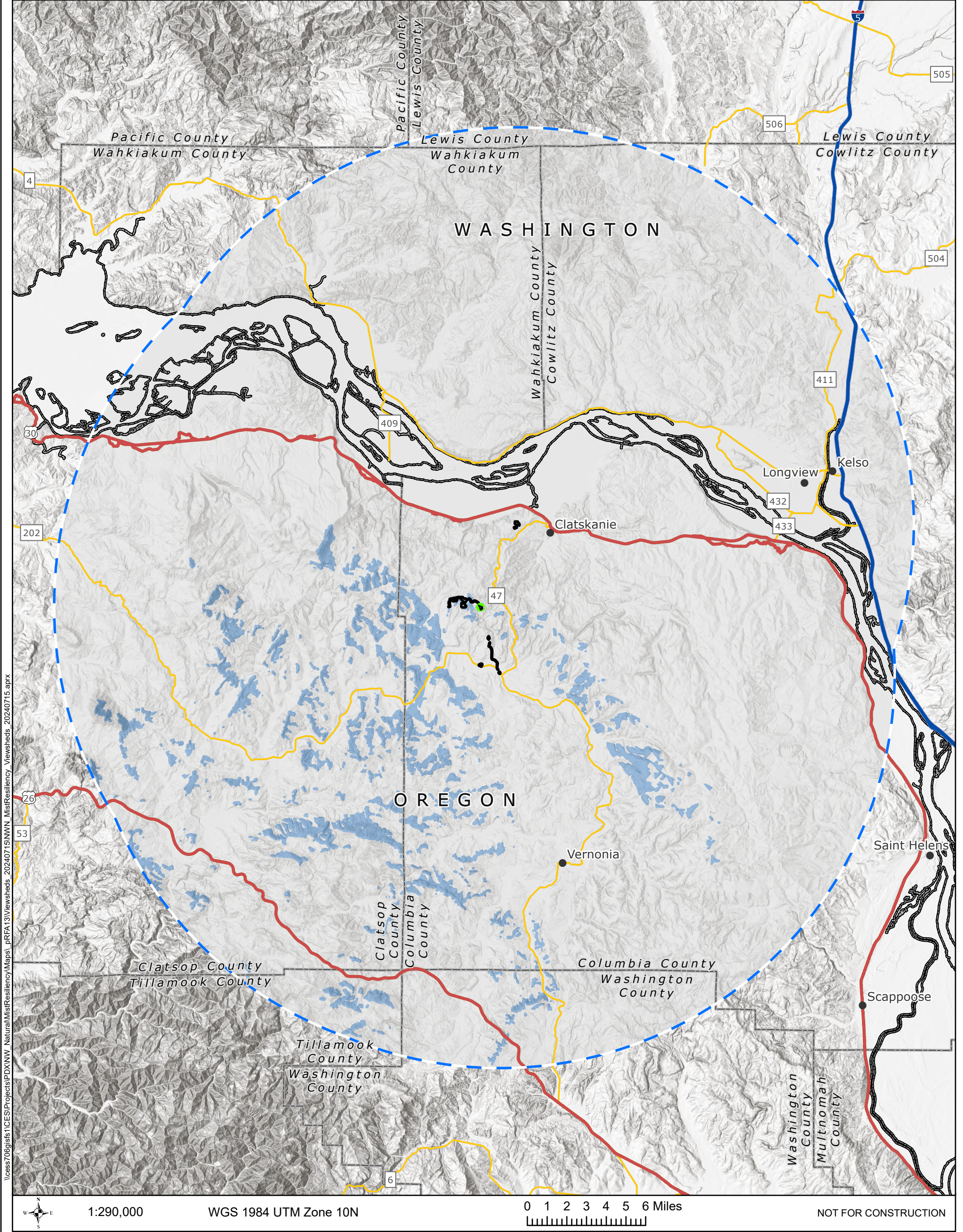
Wilderness Study Area

State Natural Area

OSU Research Forest

Reference Map

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




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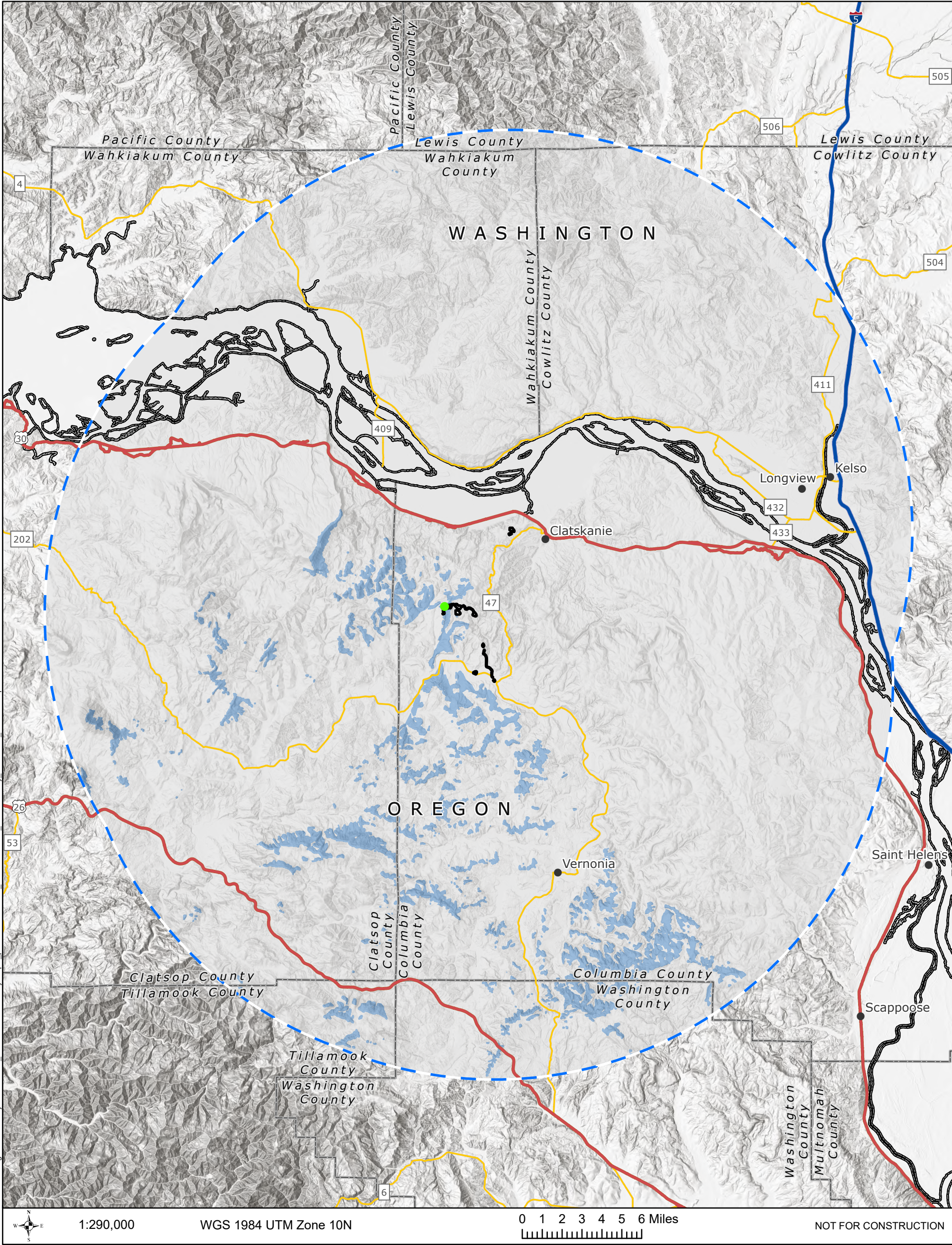
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WGS 1984 UTM Zone 10N

0 1 2 3 4 5 6 Miles

NOT FOR CONSTRUCTION

<div>Mist Resiliency Project</div> <div>Figure L-2.1 Medicine Well pad Liquid Storage Tank Viewshed</div> <div>COLUMBIA COUNTY, OREGON</div>	<div> Site Boundary</div> <div> Medicine Wellpad Liquid storage tank</div> <div> Analysis Area (20-mile Buffer)</div> <div> City/Town</div> <div> Interstate Highway</div> <div> US Highway</div> <div> State Highway</div> <div> State Boundary</div> <div> County Boundary</div>	<div>Viewshed Results</div> <div> Potentially Not Visible</div> <div> Potentially Visible</div> <div><p>*Potential liquid storage tank visibility calculated using a 30 meter bare-earth digital elevation model with a maximum storage tank height of 20 feet (6.1 meters) and a viewing height of 6 feet (1.8 meters).</p></div>	<div>Reference Map</div> <div></div>
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Mist Resiliency Project

Figure L-2.2
Newton Well pad
Liquid Storage Tank
Viewshed

COLUMBIA COUNTY, OREGON

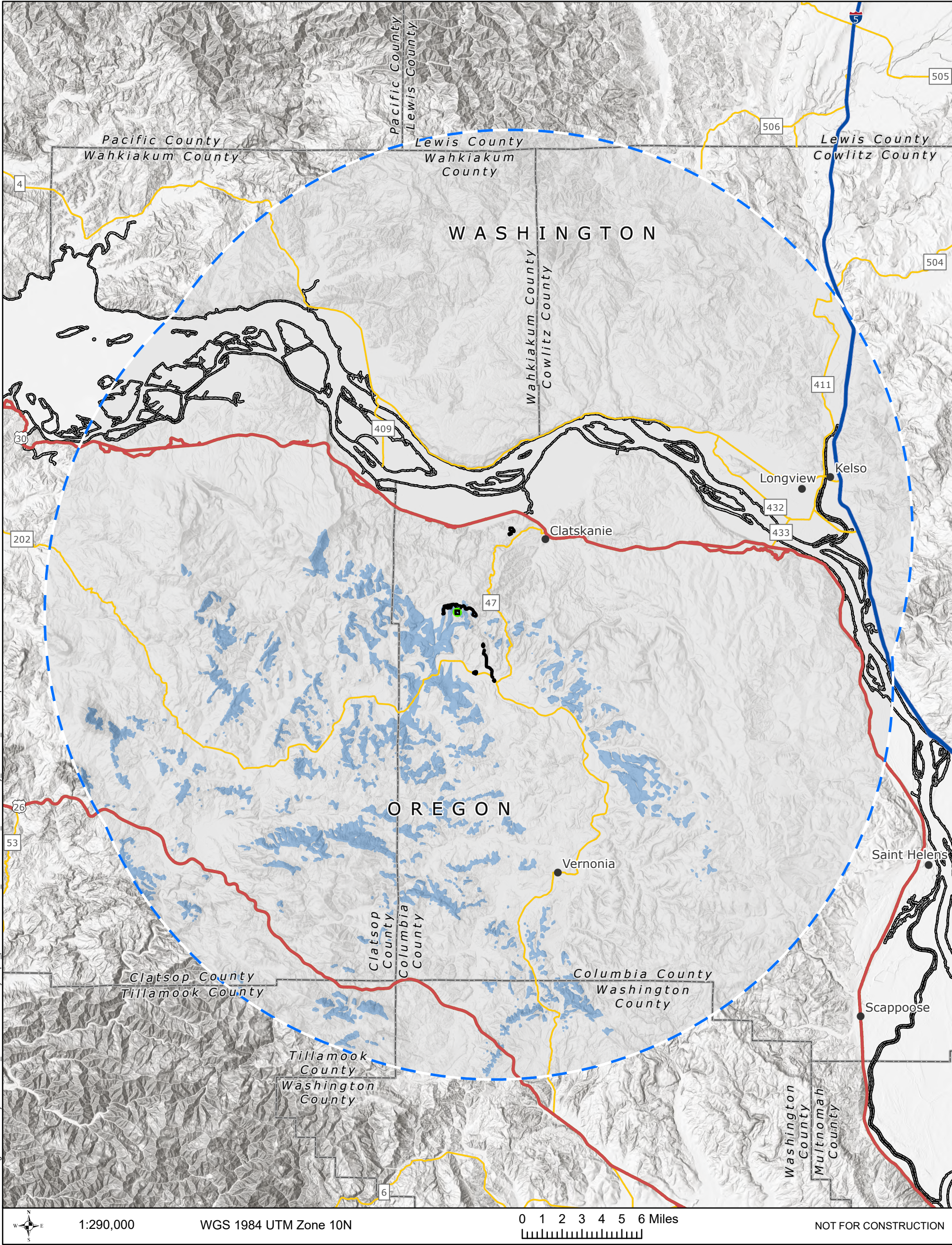
- Site Boundary
- NMCS Gas Compressor Building
- Analysis Area (20-mile Buffer)
- City/Town
- Interstate Highway
- US Highway
- State Highway
- State Boundary
- County Boundary

Viewshed Results

- Potentially Not Visible
- Potentially Visible

*Potential liquid storage tank visibility calculated using a 30 meter bare-earth digital elevation model with a maximum storage tank height of 20 feet (6.1 meters) and a viewing height of 6 feet (1.8 meters).





Mist Resiliency Project

Figure L-2.3
NMCS Gas Compressor Building Viewshed

COLUMBIA COUNTY, OREGON

Site Boundary

Analysis Area (20-mile Buffer)

NMCS Gas Compressor Building

City/Town

Interstate Highway

US Highway

State Highway

State Boundary

County Boundary

Viewshed Results

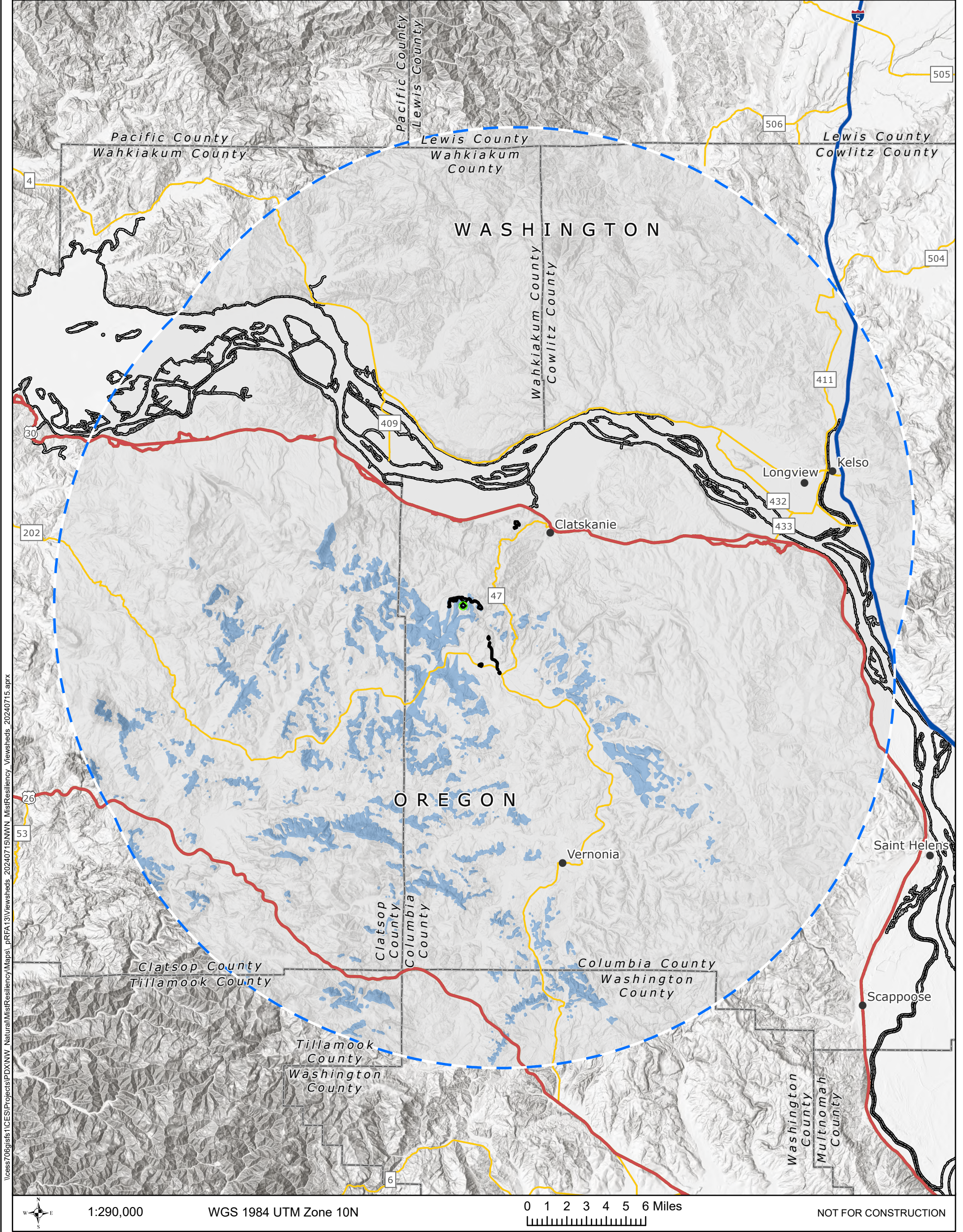
Potentially Not Visible

Potentially Visible

*Potential gas compressor building visibility calculated using a 30 meter bare-earth digital elevation model with a maximum building height of 48 feet (14.63 meters) and a viewing height of 6 feet (1.8 meters).

Reference Map

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Mist Resiliency Project

Figure L-2.4
NMCS Glycol Regeneration Building Viewshed

COLUMBIA COUNTY, OREGON

Site Boundary

Analysis Area (20-mile Buffer)

NMCS Glycol Regeneration Building

City/Town

Interstate Highway

US Highway

State Highway

State Boundary

County Boundary

Viewshed Results

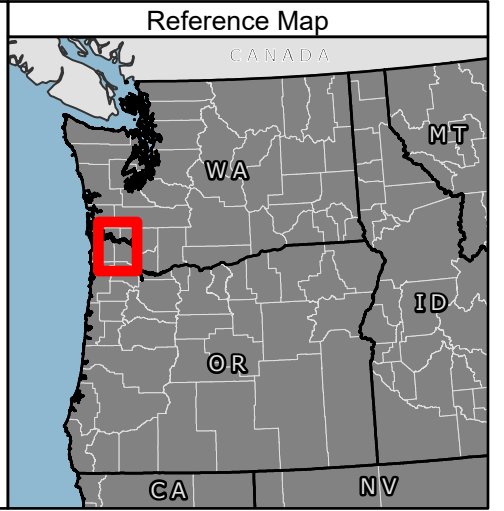
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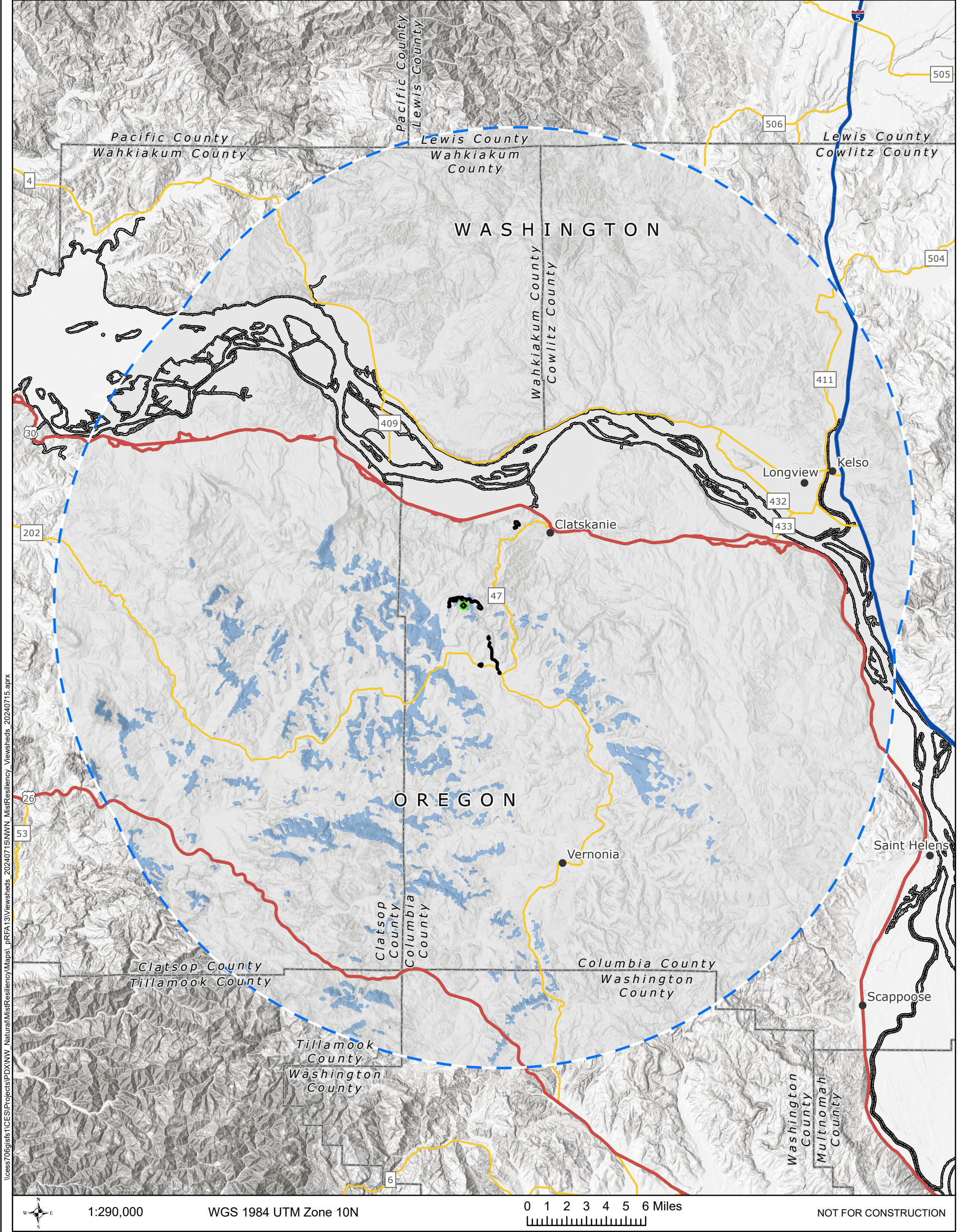
Potentially Visible

*Potential glycol regeneration building visibility calculated using a 30 meter bare-earth digital elevation model with a maximum building height of 43 feet (13.1 meters) and a viewing height of 6 feet (1.8 meters).

TETRA TECH

NW Natural





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Mist Resiliency Project

Figure L-2.5
NMCS Office Control Building Viewshed

COLUMBIA COUNTY, OREGON

- Site Boundary

Analysis Area (20-mile Buffer)

NMCS Office Control Building

City/Town

Interstate Highway

US Highway

State Highway

State Boundary

County Boundary

Viewshed Results

Potentially Not Visible

Potentially Visible

*Potential office control building visibility calculated using a 30 meter bare-earth digital elevation model with a maximum building height of 18 feet (5.48 meters) and a viewing height of 6 feet (1.8 meters).

TETRA TECH

NW Natural

