Oregon State Agency Comments
Oregon LNG and Washington Expansion Projects
Draft Environmental Impact Statement
CP09-6-001; CP09-7-001; CP13-507-000
October 5, 2015

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Introduction

The State of Oregon reviewed and analyzed the draft Environmental Impact Statement ("DEIS") to ensure it provides a full and accurate analysis of the significant environmental impacts that may result from the siting, construction and operation of the proposed LNG Development Company (d/b/a Oregon LNG) import / export terminal facility and the Oregon Pipeline Company, LLC, pipeline project (hereinafter collectively referred to as, the "Project") as well as the comparative impacts resulting from a reasonable range of alternatives to the proposed action. *See* 40 C.F.R. § 1502.1; *see also* 40 C.F.R. § 1502.1 ("An environmental impact statement is more than a disclosure document. It shall be used by federal officials in conjunction with other relevant material to plan actions and make decisions."). Accordingly, Oregon provides the following general comments as well as specific comments and recommendations from each state agency with technical expertise in its respective program area to assist the Federal Energy Regulatory Commission ("Commission") refine this DEIS to meet the National Environmental Protection Act's ("NEPA's") requirements.

1. ***The Commission and Other Agencies May Not Rely Upon Insufficiently Detailed and Unenforceable Mitigation Described in this DEIS to Justify its Conclusion the Implementation of Mitigation will Reduce the Project's Adverse Environmental Impacts to "Less-Than-Significant Levels"***

Agencies relying upon this DEIS to support their decisions must ensure that mitigation measures alleged to be reducing impacts "to less-than-significant levels," see Section 5.1, are mandatory, specifically described, and fairly evaluated. *See* 40 C.F.R. §§ 1502.14(f) (requiring discussion of possible mitigation measures in alternatives), 1502.16(h) (requiring discussion of mitigation in addressing environmental consequences of proposed action). The U.S. Supreme Court has stated that "omission of a reasonably complete discussion of possible mitigation measures [] undermine[s] the 'action-forcing' function of NEPA. Without such a discussion, neither the agency nor other interested groups and individuals can properly evaluate the severity of the adverse effects." *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 352 (1989). If proposed mitigation measures are unenforceable, or lack monitoring commitments or sufficient resources to assure performance, the Commission has no reasonable basis to conclude that such measures will effectively reduce environmental impacts. *See* 40 C.F.R. §§ 1505.2(c), 1508.25(b); *see also* Memo to Heads of Federal Departments and Agencies, *Draft Guidance for Implementing NEPA Mitigation and Monitoring*, at 4 (Feb. 18, 2010) ("When an agency identifies mitigation in an EIS and commits to implement that mitigation to achieve an environmentally preferable outcome . . . then the agency should ensure that the mitigation is adopted and implemented."). Here, the Commission has represented to decision-makers and the public in this DEIS that mitigation measures will effectively reduce environmental impacts to less-than-significant levels. However, as identified in the specific state agency comments that follow, the Commission has not sufficiently developed enforceable and reasonably definite mitigation measures to support that conclusion in the DEIS, and therefore, to meet NEPA's mandate FERC should both carefully evaluate the agencies' recommended mitigation measures in the final EIS and require such measures as conditions of any authorization it may issue.

Significantly, the DEIS states that the Commission's staff finds that "if the projects are constructed and operated *in accordance with applicable laws and regulations*, *the mitigating measures discussed in this EIS, and our recommendations*, most of the adverse impacts would be reduced to less than significant levels." *See* DEIS, section 5.1; *see also* ES-3. Thus, the Commission is *relying upon* (a) measures required by applicable laws and regulations, (b) the applicant's proposed mitigation, and (c) Commission-developed measures to conclude that most of the disclosed significant environmental impacts will be reduced to "less-than-significant levels." However, the Commission staff only evaluated the latter two categories of mitigation measures in this DEIS and it only recommended measures listed in Section 5.2 to be attached as mandatory conditions of the Commission's authorization. Any mitigation that support's the Commission's conclusion that most significant environmental impacts have been reduced to less-than-significant levels should be evaluated in this DEIS and listed as required measures in Section 5.2. Accordingly, Section 5.2 should contain both (a) measures required by, for example, the Oregon Department of Environmental Quality ("ODEQ") for compliance with the Clean Water Act (CWA) section 401, and (b) the applicant's proposed mitigation measures. These omissions leave no opportunity for the public and decision-makers to review and analyze the sum total of required mitigation, and more significantly, are misleading because the applicant has no obligation to comply with its *proposed* mitigation measures disclosed and analyzed in this DEIS but that are not incorporated as required conditions in the Commission's authorizations. Moreover, the DEIS' listing of applicable laws and regulations is incomplete, as identified in agency specific comments below, such that the final EIS should clearly specify to the public and decision-makers which state permits and agency approvals the Applicant must obtain prior to construction and operation.

2. The Commission and Other Agencies Relying Upon this DEIS Must Correct the Deficiencies Related to Missing or Inaccurate Data and Scientific Analysis, as well as Unconsidered Environmental Impacts of the Proposed Action and Alternatives

NEPA requires that the Commission utilize "high quality" information and accurate scientific analysis," see 40 C.F.R. § 1500.1(b), and ensure "professional integrity, including scientific integrity, of the discussions and analyses" within an EIS. 40 C.F.R. § 1502.24. In addition, NEPA requires disclosure and analysis of *all* direct, indirect, and cumulative environmental impacts of the proposed action. *See* 40 C.F.R. §§ 1508.7, 1508.25(c), 1502.16. Oregon state agencies have, however, identified in the DEIS numerous errors and both deficient identification and analysis of impacts, as specifically set forth below, which the Commission must address to appropriately disclose and analyze potential significant environmental impacts to comply with that mandate. The State urges the Commission to resolve the following deficient analysis in this DEIS relative to undisclosed and unconsidered environmental impacts of the proposed action.

As one specific example, NEPA defines "indirect effects" as those that are "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." 40 C.F.R. § 1508.8(b). However, the DEIS fails to describe and assess the potential impacts on lands and waters in Oregon due to air contaminant emissions, including greenhouse gas ("GHG") emissions, beginning from the transportation of LNG during natural gas exploration, all the way through collection, distribution, export to markets and consumption outside the United States. The DEIS refers to these impacts as "'life-cycle' cumulative environmental impacts," but nonetheless states such impacts are "out-of-scope issues" because they are "far beyond the jurisdictional authority of the FERC or the activities directly related to the project." See DEIS, Section 1.4.8. These conclusions are legally incorrect. For example, as the Ninth Circuit Court of Appeals has explained relevant to the U.S. Army Corps' similar error in

construing NEPA, "while it is the development's impact on jurisdictional waters that determines the scope of [that federal agency's] *permitting authority*, it is the impact of the permit on the environment at large that determines [a federal agency's] NEPA responsibility." *See Save Our Sonoran v. Flowers,* 408 F.3d 1113, 1122 (9th Cir. 2005) (emphasis added).

Notably, the U.S. Supreme Court held that when "an agency has no ability to prevent a certain effect due to its limited statutory authority over the relevant actions, the agency cannot be considered a legally relevant 'cause' of the effect" so as to require that agency to disclose such effects in its EIS. *Dep't of Transp. v. Pub. Citizen,* 541 U.S. 752, 770 (2004). Here though, in contrast, there is no doubt that if FERC did not approve the siting of the Project the "life-cycle" emissions associated with this Project would not be emitted into the atmosphere – no Presidential authorization allows for LNG to be extracted, sent to Oregon, and then shipped overseas. *See id.* at 769. Further, this is not a case where the effect is a "risk" as opposed to an effect on the physical environment. Instead, there is a direct (not attenuated) causal connection between FERC's approval of this LNG export facility and the impact on the physical environment (e.g., emissions) resulting from transportation, for example, of that LNG from where it is extracted, to Oregon, and then overseas. *See Metro. Edison Co. v. People Against Nuclear Energy*, 460 U.S. 766, 774-75 (1983). Moreover, the State is not asking for more than a "reasonably thorough discussion" and disclosure of the air contaminant emissions that may result as a consequence of this approval – even if the extent of such emissions are uncertain. *See S. Coast Air Quality Mgmt. Dist. v. FERC*, 621 F.3d 1085, 1094-95 (9th Cir. 2010) (holding that an EIS's reasonable, even though limited, disclosure and analysis of emissions resulting from burning of natural gas supplied by a pipeline subject to FERC's approval "contain[ed] a reasonably thorough discussion of the environmental impact of its actions, based on information then available to it."); 40 C.F.R. § 1502.22 (addressing how an agency should handle incomplete or unavailable information in an EIS). While the Commission staff argues that life-cycle emission impacts cannot "be reasonably calculated, given the number of unknown elements in the chain," this claim lacks merit. *See* DEIS, Section 1.4.8. An estimate or potential range of quantified emissions could be identified and discussed in the DEIS without undue effort. We urge the Commission to adhere to the CEQ guidance released on December 18, 2014, which describes how the Commission should consider the effects of GHG emissions and climate change in their NEPA reviews.

Secondly, with respect to natural gas price increases and impacts to land values due to pipeline placement, these indirect effects will likely result in socioeconomic impacts within the State and beyond; therefore, this EIS should disclose and analyze such impacts to inform decision-makers and the public that these consequences have been considered. Although CEQ regulations state that "economic or social effects are not intended by themselves to require preparation of an environmental impact statement," in this instance the economic and social effects are interrelated with the impacts on the physical environment such that this EIS should address all such impacts. *See* 40 C.F.R. § 1508.14. This DEIS should, therefore, disclose the potential increase in domestic natural gas prices and resulting socioeconomic impacts, including the likely impact to land values reduced due to the pipeline or terminal's location. Further, since the applicant has made several claims regarding the positive potential economic effects of its planned terminal and pipeline, the Commission should assure itself that no potentially adverse economic effects negate those claims if it will rely upon this DEIS to justify its conclusion as to whether this terminal is in the public interest or whether the construction and operation of the pipeline is required by the present or future public convenience or necessity. *See* Natural Gas Act, 15 U.S.C. §§ 717b(a), 717f(e); *see also* Certification of New Interstate Natural Gas Pipeline Facilities, 88 FERC ¶ 61,227, at 27 (Sept. 15, 1999) ("The strength of the benefit showing will need to be proportional to the applicant's proposed exercise of eminent domain procedures."). *See generally* 40 C.F.R. § 1500.1(b).

3. The Commission and Other Agencies Relying Upon this DEIS Must Not Foreclose Consideration of Reasonable Alternatives to the Proposed Action

As part of its scoping comments, the State of Oregon recommended that the Commission abandon its practice of issuing conditional orders before receiving authorizations delegated to the State under the Clean Water Act (CWA), the Coastal Zone Management Act (CZMA), and the Clean Air Act (CAA) (as well as authorizations from other federal agencies). Again, the State urges the Commission to await such authorizations to avoid violating NEPA's procedural provisions, see 40 C.F.R. 1502.14[1], as well as the substantive provisions of the above-listed federal laws. *See* 33 U.S.C. § 1341(a); 16 U.S.C. § 1456(c)(3)(A); 42 U.S.C. § 7416; 16 U.S.C. § 1536(d); *see also* 40 C.F.R. § 402.09. NEPA mandates that federal agencies "[r]igorously explore and objectively evaluate all reasonable alternatives" as well as to "[i]nclude appropriate mitigation measures not already in the proposed action or alternatives." 40 C.F.R. § 1502.14(a),(f). However, if the Commission issues a conditional approval after completion of this NEPA process but before completion of necessary state authorizations under the CWA, CAA, and CZMA, see 5 U.S.C. § 717b(d), this practice will foreclose the formulation of an alternative that an Oregon state agency may deem necessary, and may propose when carrying out its delegated authority under those laws. It is unwarranted to assume that the ODEQ's review in accordance with CWA section 401, for example, will lead to a determination that the proposed Project will not violate state water quality standards (or alternatively to assume that any exceedance may be effectively mitigated) without potentially necessitating a change in routing of the pipeline. We urge the Commission not to circumvent ODEQ's review that may disclose potentially significant environmental impacts that this DEIS did not disclose and consider. In short, the Commission's completion of its NEPA process before issuance of the state's necessary authorizations under the CWA, CAA, and CZMA will foreclose the consideration of reasonable alternatives to the proposed action raised as part of, for example, the Department of Land Conservation and Development's consistency review under the CZMA. We urge the Commission to negate the necessity of supplementing its EIS or otherwise violating NEPA by conditionally approving this Project before the relevant state agencies complete their on-going authorization processes.

Additionally, this DEIS fails to sufficiently evaluate a reasonable range of alternatives for both the terminal facility location and pipeline route locations. The cumulative environmental impacts analysis of alternatives was unduly limited to a single terminal facility location with only different pipeline alternatives analyzed, which necessarily eliminated the reasonable range of combined terminal and pipeline scenarios. For example, the net environmental impacts of a terminal further down the Columbia river with various pipeline routes was never analyzed so as to compare against the cumulative impacts of the proposed upper river terminal (with corresponding different pipeline routes). The State urges the Commission to consider additional alternatives for the terminal facility location and compare the cumulative impacts of each of those options along with the full range of pipeline route options in the final EIS to allow the public and decision-makers to truly compare the cumulative environmental impacts of all reasonable alternatives to the proposed action.

In light of the Commission's NEPA obligations, the State of Oregon urges the Commission to consider carefully each of Oregon's comments and recommendations and to modify specified sections of the DEIS to address cited concerns, and where appropriate, to incorporate agency recommendations as required conditions in the Commission's authorizations to support the Commission's conclusion that most significant environmental impacts have been reduced to "less-than-significant levels."

[1] Or alternatively, requiring FERC to issue a supplemental EIS, see 40 C.F.R. 1502.9(c)(1).

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Citation: Chapter 4.1.9.1 – Astoria Regional Airport Page 4-241

Issue Discussion: The Draft Environmental Impact Statement (DEIS) stated that "The LNG storage tanks at the terminal would extend 25.5 feet into airspace of the Astoria Regional Airport. We received several comments that relayed concern about the potential for a collision of an airplane with the terminal facilities, specifically the LNG storage tanks." The DEIS further stated "The FAA reviewed the location of the LNG storage tanks on the East Skipanon Peninsula in relation to flight operations at the Astoria Regional Airport and determined the storage tanks pose no hazard to air navigation (FAA, 2011). For each of the two LNG storage tanks, the FAA conducted an aeronautical study on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules. They issued a "Determination of No Hazard to Air Navigation" in November 2008."

Issue Identified: The DEIS identifies that the LNG storage tanks would extend into airspace of the Astoria Regional Airport. Although the DEIS did not specifically state that it has obtained determinations from the Oregon Department of Aviation, the structures have been reviewed by this state agency. However, those determinations expire 12 months from the date of ODA determination if "construction has not been started." There were eight (8) letters issued to the Oregon LNG project on April 4, 2014 by the Department of Aviation (ODA).

Recommended Resolution: Oregon LNG shall resubmit form FAA 7460-1 to both the FAA and Oregon Department of Aviation once final construction documents have been completed to ensure that any potential tall structure can be reviewed and possible mitigation requirements can be determined, including lights, markings or change in flight procedures.

Citation: Chapter 4.1.9.2 – Air Traffic Page 4-297

Issue Discussion: The DEIS states: "Because the LNG storage tanks would protrude into protected airspace in the vicinity of the airport, the FAA conducted an aeronautical study to evaluate whether the LNG storage tanks would be a hazard to navigation at the Astoria Regional Airport (under the provisions of 49 U.S.C. Section 44718 and 14 CFR Part 77). The FAA found that the LNG storage tanks would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities, and issued a Determination of "No Hazard to Air Navigation" (FAA, 2011). The FAA's determination, however, was updated in 2014 due to the revised terminal design, and the FAA imposed certain conditions on Oregon LNG to ensure aircraft safety.

The applicants states in their dEIS (page 4-241 – Astoria Regional Airport) "Under the terms and conditions of the FAA's determination, Oregon LNG would minimize the overall height of the tanks by mounting any ladders, walkways, valves, and vent lines on the side of the storage tanks instead of on the top as in typical configuration for LNG storage tanks. Oregon LNG would also place navigation lights on the tanks per FAA guidance. In addition, Oregon LNG would upgrade the conventional very high frequency omni-directional radio navigational signal at the Astoria Regional Airport to a new Doppler

very high frequency omni-directional radio to mitigate the impact of the two LNG storage tanks on the existing navigation signals. These measures would allow for the intrusion of the LNG storage tanks into the navigation airspace without disrupting visual or instrument flight paths."

Issue Identified: As stated above, this project will have LNG storage tanks protruding into protected airspace. The FAA has issued specific conditions of approval on this application, including minimizing the overall height of the tanks by mounting any ladders, walkways, valves, and vent lines on the side of the storage tanks instead of on the top of the LNG storage tanks. In addition, the applicant must place navigation lights on each tank and upgrade the radio navigation signal with a new Doppler radio.

Recommended Resolution: FERC should require as a condition of its license that Oregon LNG design the project to minimize potential hazards to air navigation by placing these accessary structures on the side of the storage tanks, upgrade the radio navigation aid, and place navigation lights on the tanks per FAA guidance as proposed in the DEIS.

Citation: Chapter 5.1.9.1 – Oregon LNG Project Page 5-19

Issue Discussion: The DEIS states: "The FAA determined the terminal facilities would not pose a hazard to air navigation. Under the terms and conditions of the FAA determination, Oregon LNG would place navigation lights on the LNG storage tanks and minimize the overall height of the tanks by mounting any ladders, walkways, valves, and vent lines on the side of the storage tanks. In addition, Oregon LNG would upgrade the radio navigational system at the Astoria Regional Airport. These measures would allow for the intrusion of the LNG storage tanks into the navigation airspace without disrupting visual or instrument flight paths." (page 5-19 – Oregon LNG Project)

Issue Identified: The DEIS states that these measures will be taken and installed to minimize any potential hazard to air navigation. These measures include the placement of navigation lights on the LNG tanks and mounting any accessary structures or equipment to the sides of the storage tank. In addition to the installation of a Doppler radio system.

Recommended Resolution: FERC should require as a condition of its license that Oregon LNG design the project to minimize potential hazards to air navigation by placing these accessary structures on the side of the storage tanks, upgrade the radio navigation aid, and place navigation lights on the tanks per FAA guidance as proposed in the DEIS.

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Note: The Oregon Department of Energy usually uses the acronym ODOE to represent our agency. In the following comments we have adopted the acronym "ODE" that FERC used in its DEIS to avoid confusion.

NO.	Citation	Issue Identification	Recommended Resolution
1	1.5.2.1 Pg 1-18	The draft EIS indicates the second MOU with Oregon LNG is expected to address carbon dioxide (CO2) emissions and financial obligations for facility retirement.	This MOU was originally executed in 2009. An update was executed on September 10, 2015, and is included here as Appendix A.
2	2.1.2.2 Pg 2-24	The draft EIS mentions only one of the conditions for determining if a transmission line in Oregon falls under the jurisdiction of the Energy Facility Siting Council (EFSC). The more complete definition has more facets to it.	ODE recommends modifications to the sentence be included in the final EIS beginning "With regard to permitting requirements for the terminal transmission line." Replace the remainder of the sentence with… "electric transmission lines that meet the definition of "energy facility" in the Oregon Revised Statutes (ORS 469.300(11)(a)(C) fall under the jurisdiction of the Oregon Energy Facility Siting Council."
3	Table 4.3-1 Pg 4-662	Mist Underground Gas Storage Facility and South Mist Pipeline Extension are EFSC-jurisdiction facilities, and these facilities should be noted as such.	Reword the first sentence of the description as follows: Existing Underground Natural Gas Storage Facility near Mist, OR and South Mist Extension Pipeline, each with its own site certificate through the Oregon Energy Facility Siting Council. In addition, Include a footnote (c) indicating, "Should a connection to the South Mist Pipeline Extension be proposed in the future, the project would likely fall under EFSC jurisdiction and require an application for site certificate or amendment to one of the current site certificates through the Oregon Department of Energy."

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ODE is the lead state agency responsible for ensuring that all LNG applicants adhere to the state's minimum standards for protecting public health and safety beginning from construction and throughout the life of the project. ODE has reviewed Section 4.1.13 on Reliability and Safety in the Draft EIS and indicated below where the text states inaccurate information or otherwise relied upon inaccurate information in its analysis. ODE's recommendations are intended to assist FERC to amend its analysis to correct such deficiencies in its final EIS.

Note: The Oregon Department of Energy usually uses the acronym ODOE to represent our agency. In the following comments we have adopted the acronym "ODE" that FERC used in tis DEIS to avoid confusion.

NO.	Citation	Issue Identification	Recommended Resolution
1	4.1.13.9 Pg. 4-430	Emergency Response and Evacuation – This section fails to properly characterize Oregon LNG's Emergency Response Plan (ERP). Oregon LNG provided to FERC in Resource Report 13 as a part of its initial filing, a generic template or a strawman of an ERP. This document is not a viable draft ERP. It fails to include even the most basic information including the listing of accurate state and local agencies to notify and coordinate response efforts in the event of an incident at the Oregon LNG terminal or waterway transit route.	ODE recommends the following revisions be made: "The FERC must approve the ERP prior to any final approval to begin construction. ~~Oregon LNG has provided a draft of its ERP.~~ Oregon LNG will develop a facility specific draft ERP that includes response strategies for the waterway transit route. As a condition of this license, the final ERP must be evaluated by appropriate emergency response personnel and officials and meet the minimum LNG Emergency Preparedness requirements established by the State of Oregon in Appendix C2."
2	4.1.13.12 Pg. 4-432	ODE Safety Advisory Report – This section fails to accurately characterize the MOU between Oregon LNG and ODE regarding the state's minimum standards for the development of an emergency preparedness program for the terminal. This section alludes to Appendix C2, but fails to specifically mention Appendix C2.	ODE recommends the following revisions be made: "Appendix C1 provides FERC's response to the ODE Safety Advisory Report for the Oregon LNG project. ~~We also note that Oregon LNG has entered into an MOU with ODE regarding the development of an emergency planning and preparedness program for the terminal.~~ Insert new paragraph that reads "We also note that Oregon LNG has entered into an MOU with the ODE on September 10, 2015 for the development of an LNG emergency preparedness program (Appendix C2). The

			MOU establishes the State of Oregon's minimum standards and requirements, which as a condition of this license Oregon LNG must comply with in the development of the facility ERP to ensure the protection of public health and safety in the event of an incident at the Oregon LNG terminal, associated facilities, or along the waterway transit route.
3	Appendix C2	MOU between Oregon LNG and ODE – The Appendix C2 included in the DEIS wrongly includes the scope of work and funding agreement between Oregon LNG and ODE instead of the MOU between the two entities, which establishes the state's minimum requirements for LNG Emergency Preparedness in Oregon.	ODE recommends replacing Appendix C2 included in the DEIS with the updated and signed MOU for the Final EIS titled "Memorandum of Understanding and Agreement No. 15-017 By and Between the Oregon LNG Project and the State of Oregon for LNG Emergency Preparedness." That updated MOU is attached in Appendix B.

Appendix Oregon Department of Energy:
Appendix A – MOU and Agreement No. 15-018 for CO2 and Financial Assurance for Facilities Retirement
Appendix B – MOU and Agreement No. 15-017 for LNG Emergency Preparedness

Environmental Quality, Oregon Department of (ODEQ)

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General Comments

NO.	Citation	Issue Identification	Recommended Resolution
1	**Erosion Control** Multiple erosion control plan references	There are multiple Oregon specific erosion control plan references in the document, including: • *Upland Erosion Control, Revegetation, and Maintenance Plan* (Oregon LNG's Plan) • *Stormwater Pollution Prevention Plan for Construction of the Oregon LNG Terminal and Pipeline* (SWPPP) • *Erosion Prevention and Sediment Control Plan* (EPSCP) • *Spill Prevention, Control, and Countermeasures Plan* (SPCC) • *Frac-Out Contingency Plan* • *Plan for the Unanticipated Discovery of Contaminated Environmental Media* • *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures) • *NPDES permit* (1200-C), • *NPDES Construction Stormwater Permit* (CWA Section 402), In addition, there are multiple erosion control plan references in the document specific to work in Washington State, including: • *Erosion Control and Revegetation Plan* (ECRP) • *Unanticipated Discovery of Contamination Plan* There are also general references such as: • Temporary erosion control devices, • Temporary sedimentation control	DEQ recommends that the Erosion Control Plans, Procedures and general erosion and sediment control references be consistently used throughout the final EIS and within license conditions. Lack of coordination could lead to potentially negative impacts associated with construction. Erosion plan and procedure references should align with the appropriate project segment (Oregon LNG or WEP), and the appropriate project segment timeframe (pre-construction, construction, post-construction or during operation.) Erosion Plans and Procedures should not conflict with each other, and should be cross-referenced when appropriate. Erosion Plans and Procedures should cohesively address emergency/unexpected events during construction, including identification and managing potentially contaminated media, spills, and extraordinary weather events.

		measures, • Permanent erosion control measures, and • Environmental compliance inspection and mitigation monitoring.	
2	**401 WQC** General comment	OLNG provided ODEQ information to facilitate analysis of project effects on water quality.	Section 401 of the federal Clean Water Act (CWA) authorizes states to determine whether a federally approved action which causes discharge to waters of the state will comply with CWA Sections 301, 302, 303, 306, and 307, state water quality standards, and other relevant portions of state law. ODEQ is the state agency authorized to certify requests for federal permits pursuant to CWA Section 401 and may conditionally grant, deny, or waive certification based on our analysis of project-related impacts. ODEQ reserves the right to request additional information to complete its analysis and fulfill its CWA Section 401 obligations.
3	**Housing/ Stormwater** General comment	The DEIS indicates no temporary housing will be required, however availability of adequate and sufficient housing in the proposed project area is significantly limited.	In the event that temporary housing is needed, stormwater management will be required, both during construction and post construction.

References to Oregon Laws and Regulations

No.	Citation	Issue Identification	Recommended Resolution
4	Section 1.5.2	The DEIS does not identify OAR 340-041-0007 as an applicable Clean Water Act requirement.	Cite Oregon Administrative Rule 340-041-0007(15)(a)(B): Minimum design criteria for treatment and control of wastes.
5	**OR Department of Agriculture** Section 1.5.2	There is no mention of ODA Senate Bill 1010 AWQMAP. The proposed riparian activities would lessen stream side shade which would reduce the potential to reach TMDL identified shade targets on private lands supporting agricultural uses. See individual AWQMAPs for riparian management goals and requirements: http://www.oregon.gov/ODA/programs/NaturalResources/Pages/AgWaterQuality.aspx	The final EIS should describe Oregon Department of Agriculture's (ODA) Senate Bill 1010 Agricultural Water Quality Management Area Plans (AWQMAP). AWQMAPs are part of Oregon's NPS management plan under CWA Section 319. AWQMAPs detail how lands under the jurisdiction of ODA will meet the TMDL.

6	**TMDL/401** Section 1.5.2	There is no mention of the applicant being required to develop a Source Specific Implementation Plan. There is no mention of OLNG becoming a Nonpoint Source Designated Management Agency (DMA) in areas where TMDLs apply. Oregon Administrative Rules (OAR) 340-042-0030(7) defines a "Source" as any process, practice, activity or resulting condition that causes or may cause pollution or the introduction of pollutants to a waterbody. As a source, responsible entities are required to develop a Source-Specific Implementation Plan (OAR 340-052-0030 (11)). In areas with existing Total Maximum Daily Loads, OLNG will be identified as a new nonpoint source. This will require the applicant to develop a Source Specific Implementation Plan to be submitted to ODEQ as per OAR 340-042-0080 (1-4). Where TMDL thermal load allocations have not yet been established, ODEQ's 401 Water Quality Certification will require the development of a Water Protection Plan, consistent with a Source Specific Implementation Plan, and a mitigation plan to address project impacts on thermal loading. This process needs to be acknowledged and discussed in the final EIS.	The final EIS must address OLNG's role as a Total Maximum Daily Load (TMDL) non-point source (NPS) and a need for an implementation plan or water protection plan development to address thermal impacts. We recommend that as a condition of the license the applicant must develop a Water Quality Implementation Plan focusing on the identification of sensitive areas and management measures that will minimize adverse impacts to WQ throughout the lifetime of the project. Measures should include tree height management rather than tree removal at stream crossings in the entire 10 to 30 foot wide corridor. Note: The required elements of an implementation plan are described in OAR 340-042-0080.
7	**Emergency Response** Section 1.5.2	The DEIS fails to acknowledge that Oregon LNG will be required to submit a spill contingency plan to DEQ prior to conducting a transfer over waters of the state. LNG is defined as an "oil" in ORS 468b.300.	This final EIS must require as a condition of the license the need for a spill contingency plan to be approved by DEQ prior to operations. Applicant should also be required to submit a spill contingency plan to DEQ at least 90 days prior to the first expected transfer of LNG over waters of the state.

8	**State of Oregon Permits** Section 1.5.4.1; Page 1-24	Under DEQ's Section 402 authority, the DEIS fails to specifically identify wastewater from the cooling tower blowdown as a source for which an NPDES permit must be issued.	Please add "cooling tower blowdown" to the list in this section of the final EIS.
9	**State of Oregon Permits** Section 1.5.4.1; Page 1-24	Table 1.5.4-1 does not specifically differentiate between two NPDES 1200-C Construction Stormwater Discharge Permits required. Permit coverage for treatment and discharge of stormwater during construction of the terminal will be permitted separately from construction of the pipeline.	Please add to Table 1.5.4-1: NPDES Construction Stormwater Discharge Permit 1200-C (pipeline) Status – General permit application for pipeline construction was determined to lack necessary Land Use Compatibility Statement.
10	**State of Oregon Permits** Section 1.5.4.1; Page 1-24	In Table 1.5.4-1, under Section 402 of the CWA Status, includes a statement relating to NPDES 1200-C Construction Stormwater Permit application for construction of the pipeline. DEQ recommends listing this permit application separately in the table.	Remove the following from Section 402 of the CWA Status: "General permit application for pipeline construction was determined to lack necessary Land Use Compatibility Statement."
11	**Ballast Water Management** Section 4.1.5.2; Page 4-95	Oregon Ballast Water Management Requirements are not fully or accurately identified in the second to last paragraph on p. 4-95.	Oregon Ballast Water Management Requirements should be referenced by including the authorizing statute (ORS 783.620-640) and the administrative rules in OAR 340-143. Specific ballast management requirements, discharge prohibitions and exemptions are identified under OAR 340-143-0020, while reporting/recordkeeping (-0020), vessel inspections (-0030), alternative management (-0040), treatment system use (-0050) and ballast tank sediment management (-0060) are identified in subsequent rules.

Specific Citation Comments

No.	Citation	Issue Identification	Recommended Resolution
12	**Dredging** Section 2.1.1.1; Page 2-3; and Section 4.1.1.1; Page 4-3	One section states that 83 acres of the turning basin area would be dredged, while another states the area is 109 acres.	Please clarify in the final EIS to provide accurate information to the public and decision makers regarding the extent of dredging required for the Project.

13	**Concrete** Section 2.1.1.1; Page 2-3	Discusses cast-in-place concrete pile caps, but does not discuss how potential pH issues will be avoided.	Include a discussion of potential impacts to pH due to concrete cast-in-place of concrete pile caps and include as a condition of the license appropriate mitigation for such adverse impacts.
14	**Dredge Disposal** Section 2.1.1.1; Page 2-5; Section 3.3.3 and multiple dredge disposal references	The DEIS assumes that all material to be dredged qualifies for in-water disposal. If not approved for in-water disposal or if sediments will be placed upland rather than disposed of in-water, the applicant may need a DEQ solid waste permit, permit exemption or beneficial use determination for upland placement of dredged sediment that does not meet clean fill criteria. Similarly, should beach nourishment be reconsidered as an option for dredge material placement, material must be evaluated and qualify as clean fill.	The final EIS should discuss that not all material to be dredged may qualify for in-water disposal and the license should require compliance with Oregon Administrative Rules 340 Division 093 for clean fill criteria, permit and permit exemption criteria and permitting requirements, beneficial use criteria and approval requirements. The Portland Sediment Evaluation Team (PSET) must evaluate sediment sampling and agree that the sediment is sufficiently clean to qualify for in-water disposal. If the sediment does not qualify for in-water disposal the applicant should work with Oregon DEQ's solid waste program to determine whether the material meets the criteria to be considered clean fill. If the dredged material does not qualify as clean fill, ODEQ will determine if the sediment needs to be regulated for upland disposal through a DEQ solid waste permit, permit exemption, or can be approved by DEQ for beneficial use.
15	**Stormwater** Section 2.1.1.1; Page 2-10, Water System and Wastewater Management and throughout document	The DEIS discusses stormwater at the terminal, indicating that the stormwater would discharge to the POTW outfall. It is unclear if the stormwater in the "POTW outfall" will be piped to the POTW for treatment, or if this outfall discharges to a waterbody.	Please clarify, and address potential environmental impacts of the intended action.

16	**Stormwater** Section 2.1.1.1; Page 2-10, Water System and Wastewater Management and throughout document	Although the DEIS discusses stormwater treatment from the terminal, this is not adequate to meet DEQ's Post Construction Requirements. A full Post Construction Stormwater Plan is required. Additionally, the DEIS only discusses stormwater at the terminal; there is no discussion of post construction stormwater treatment for the road leading to the terminal, for pipeline access roads, for compressor stations, mainline valve locations, meter stations, etc. Post construction stormwater treatment must be provided for all impervious surfaces associated with this project.	A Post Construction Stormwater Management Plan is required for all impervious surfaces associated with the terminal and pipeline. Low impact development practices are highly encouraged.

17	**Astoria Marine Construction Company (ECSI #1898)** Section 2.1.1.2; Page 2-14; and Appendix E1, Figure 3 and Appendix E3, Figure 1	DEIS omits identifying and discussing the pipeline alignment at milepost 3.25 as it traverses the offsite portion of the ODEQ Cleanup Site known as Astoria Marine Construction Co. (ECSI #1898). Historic dredge spoils were placed in this area of the former Olsen property. Surface soil has been found to contain elevated concentrations of PCBs, cadmium, copper, lead, mercury, zinc, and benzo(a)pyrene. Concentrations are below DEQ risk screening values and risk assessment found that there are no unacceptable human health or ecological risks associated with the use of the area as ranch land.	ODEQ recommends that the final EIS discuss the option of avoiding the dredge spoil area by requiring a minor reroute of the pipeline. The minor route variation (not selected) shown in E3, Figure 1 and labeled "Highway 101" would avoid this area. ODEQ recommends that if this minor route change is not required that as a condition of the license the applicant be required to review the prior results from sampling of DU-18 in the Remedial Investigation for the property before proceeding with construction planning. While unacceptable risks were not identified in previous sampling, because the soil contains contaminants, future work in the area should consider: • Any soil moved during construction needs to be managed as solid waste and in a manner to prevent migration (erosion, tracking, etc.) to other properties or to nearby water bodies (Lewis and Clark River, Jeffers Slough); • Site work be conducted under a site-specific health and safety plan to minimize potential worker exposure to known contaminants; and • Following construction that the site be graded, compacted and revegetated to prevent future erosion or tracking of contaminants.
18	**Appendix E, Figure 3**	The proposed HDD alignment between Stations 135 and 170 (Pipeline Milepost 3.0 approx.) may conflict with ongoing remedial site investigations and future contaminant clean-up at the Astoria Marine Construction Company (AMCCO) on the Lewis and Clark River. This site was recently deferred from the Environmental Protection Agency's National Priorities List and is currently under the purview of Oregon Department of Environmental Quality's, Environmental Clean-up Program.	The final EIS should identify this issue and discuss how parties will coordinate directly with ODEQ regarding HDD alignment in this area. This coordination should be required as a condition of authorization.

19	**Wetland and Stream Mitigation** Section 2.1.1.3	The document states that "Oregon LNG has initiated interaction with various regulatory agencies to collaborate on the development of the compensatory mitigation and strategies", and discusses the need for an Adaptive Management Team for "undefined mitigation actions". This statement is vague and ambiguous.	The final EIS should identify specifically which regulatory agencies the applicant has collaborated with or developed mitigation plans to address potentially significant adverse environmental impacts, and it should specifically describe these plans so that the public and decision makers may evaluate the sufficiency of this mitigation to address such impacts. The final EIS should also discuss that DEQ has not been involved in conversations specific to mitigation; however, DEQ does regulate impacts to wetlands and waterways, and often requires mitigation for water quality impacts. The interaction referenced in the DEIS is incomplete, and should at least require as a condition of the license that any discussion of mitigation strategies must include DEQ.
20	**Wetland and Stream Mitigation** Section 2.1.1.3	DEQ is concerned that the DEIS has not addressed all impacts to waterways. For example, some actions, such as culvert replacements associated with proposed mitigation, have been identified but not defined or assessed for potential water quality impacts. All such actions should be discussed in the final EIS.	Please define and include a complete and detailed discussion of all mitigation actions relied upon to reduce adverse environmental impacts to less than significant levels.
21	**Riparian Losses** Section 2.1.1.3	The DEIS discusses the purchase of conservation easements to mitigate for riparian losses at a 1:1 ratio, which would be selected by the Adaptive Management Team and completed within 2 years of construction.	We recommend that the final EIS discuss justification for this approach as ODEQ finds that there will still be an overall loss of riparian habitat and shading, including the temporal loss of the functions and values of riparian areas that are not adequately accounted for under this approach.
22	**Wetland Mitigation** Section 2.1.1.3	The DEIS omits any specific discussion of in-kind mitigation. For example, how will impacted high quality forested and/or scrub shrub wetlands be mitigated following "no net loss"? How will the applicant mitigate for temporal losses?	Please include a discussion of temporal losses and mitigation, specifically with higher quality forested and scrub/shrub wetlands.

23	**Dredging Section 2.1.4.1**	The document states that Oregon LNG would "likely" use a hydraulic hopper dredge. Dredging methods should be clearly identified.	Please identify all dredging methods that will be used and discuss adverse impacts associated with such methods as well as appropriate means of reducing such impacts.
24	**Dredging**	The DEIS did not consider side slope sloughing and bank erosion due to deepening of this area. Additionally, areas that may slough, including banks, have not been analyzed for sediment quality. Review by the Portland Sediment Evaluation Team does not obviate the need to analyze and discuss sediment quality in this EIS. DEQ is concerned about side slope sloughing and possible contamination and redistribution of contaminants.	The final EIS should identify and discuss potential contamination of sediments outside of the immediate dredging areas due to pesticides, fertilizer, or other contaminants, and FERC should require appropriate conditions to reduce potential impacts associated with side slope sloughing and possible contamination and redistribution of contaminants.
25	**Concrete Batch Plant** Section 2.1.4.1 and Table 1.5.4-1	The DEIS fails to identify applicable permitting requirements associated with the on-site concrete batch plant.	Add the 1200-A and/or 1000-A permit to the table. The final EIS should identify that a concrete batch plant will require ODEQ permitting under a NPDES General Permit (1200-A) or a WPCF General Permit (1000-A), and require as a condition of the license that all truck wash out areas/pits must be maintained on-site with no discharges to a waterbody.
26	**pH Impacts** Section 2.1.4.1	The DEIS insufficiently addresses the potential impacts of the proposed ground improvement technique of cement deep soil mixing (CDSM). CDSM presents the potential for impacting the pH of surface water flowing across the work area.	DEQ recommends that these impacts be discussed in stormwater plans, and/or that work procedures be documented to mitigate this potential impact. The final EIS should more completely discuss how the CDSM work area will be managed in stormwater plans, and/or how work practices will be documented to minimize this exposure.
27	**Construction** Section 2.1.4.2	The DEIS discusses crossing some wetland areas with construction equipment but omits discussion of appropriate mitigation for this action to reduce resulting adverse impacts.	We recommend FERC require that all wetland areas crossed with construction equipment must use a timber or wetland crossing mat to avoid compaction.

28	**Construction** Section 2.1.4.2	The document discusses the open-trench method for laying the pipeline through dry creeks but fails to identify and discuss how erosion be controlled during rain events (because construction of the pipeline is anticipated to take 18 months).	The final EIS must include a discussion of open-trench pipeline construction in dry streams during rain events, including strategies for erosion control.
29	**Construction** Section 2.1.4.2	The DEIS includes a discussion of pipeline construction in rugged terrain but fails to identify and discuss how stream crossings in rugged terrain be constructed differently than other stream crossings.	Please include such a discussion in the final EIS.
30	**Construction** Section 2.1.6	The DEIS' discussion of "third-party compliance monitors" is insufficient.	Please identify and discuss how many monitors would be hired and what would be the credentials for such monitors.
31	**Erosion Control** Sections 2.1.4 and 4.1	Incomplete discussion of erosion control methods.	ODEQ does not recommend the use of straw bales as sediment barriers because straw bales tend to pond water instead of filter water when they are used as sediment barrier devices. We recommend that the final EIS discuss alternative erosion control measures.
32	**Stormwater Runoff** Section 401 and Section 402 of the CWA General comment	The DEIS inaccurately references Clean Water Act sections related to stormwater runoff. The construction of a stormwater management system (Section 401) to gather runoff from impervious surfaces within the terminal is separate from the EPSCP (Section 402) that protects stormwater during construction.	The final EIS should identify that construction of a stormwater management system (Section 401) to gather runoff from impervious surfaces within the terminal is separate from the EPSCP (Section 402) that protects stormwater during construction. The final EIS should identify these two CWA sections consistently when referencing "stormwater runoff".

33	**Erosion Control** General comment	Incomplete discussion of erosion control methods.	Silt fences are referenced throughout the document as one of the main BMPs to be used for sediment barriers. The final EIS should discuss that there are several other BMPs that may be less expensive, easier to haul to remote sites, and won't need to be completely removed and taken to a land fill for disposal. The final EIS should discuss and FERC should require as a condition of license other sediment barrier BMPs such as compost socks, straw wattles, or other re-usable devices.
34	**Erosion Control** Section 4.1.1.1	This section is insufficient: it refers to a "shoreline erosion control plan" and the potential need for shoreline armoring but that plan has not been included, and the DEIS fails to identify that shoreline armoring requires a 401 Water Quality Certification.	Please make these changes in the final EIS.
35	**Pipeline Construction** Oregon LNG Pipeline Sections 4.1.1.2, 4.1.2.2, 4.1.4.2, 4.1.6.2, 4.1.7.2	The DEIS generally suggests several actions to minimize impacts resulting from pipeline construction; however, it does not specifically identify actions that would be required to respond to an event that occurs during construction that results in significant impacts not anticipated by Oregon LNG's Plan and Procedures, or exceeds the response capacity.	The final EIS and specific Plan and Procedures should describe response actions by the applicant should an event occur during construction that results in significant impacts not anticipated by the Plan, or exceeds the Plan's response capacities.
36	**Groundwater Use and Water Supply Wells** Section 4.1.3.1; Pages 4-41 through 4-44	The DEIS inaccurately states that public water supply wells and wellhead protection areas are not located within 150 feet of the proposed pipeline construction right-of-way. It appears that the proposed pipeline may cross the delineated drinking water source area for public water supplies using groundwater from wells or springs. The reference for "ODHS,2013" is for an on-line data system that does	Please correct this discrepancy. GIS layers of delineated drinking water source areas are available on DEQ's website at: http://www.deq.state.or.us/msd/gis/gis.htm. GIS layers of public water supply wells, springs and intakes are not available on line but can be obtained from DEQ or OHA to evaluate the potential impacts from pipeline construction and operation (contact Steve Aalbers at 503-229-6798). The GIS data will provide the boundaries of the delineated drinking water source areas so that they are

		not give mapped location information for public water supply wells or springs or for the associated drinking water source area.	part of the project maps and evaluation. The final EIS should discuss potential impacts of proposed pipeline construction and operation on the full delineated drinking water source areas in addition to impacts on wells that are within 150 feet of the construction right-of-way.
37	**Groundwater Use and Water Supply Wells** Section 4.1.3.1; Page 4-41	The proposed pipeline (between MP 36 and MP37) also appears to cross the drinking water source area adjacent to the spring source for Elderberry Nehalem Water System, a public water supply serving approximately 140 people through 60 connections. Based on the Source Water Assessment for Elderberry Nehalem, the aquifer in the source area is considered highly sensitive to contamination due to the thin overburden thickness observed at the outflow location and high infiltration potential in local soils. In addition, numerous fault and fracture zones dominate the area providing additional pathways for infiltration where faults and/or fracture zones intercept the surface. Elderberry Nehalem WS is currently treating source water only with chlorination and has no other treatment system required or in place. Any increase in turbidity or contaminants that requires additional treatment of the spring water may be a significant hardship on the community. In addition, this is the only source of water for the community and changes in water quantity potentially caused by land use changes in the recharge area would also impact the community.	As noted above, DEQ or OHA can provide ONLG with GIS information on the spring location and source area. In order to minimize potential impacts to Elderberry Nehalem Water System, we would request that ONLG re-evaluate the potential risk to the recharge area for the spring-fed groundwater supply from pipeline placement or construction techniques to insure protection of the community's drinking water supply. This evaluation should be included in the final EIS, and appropriate mitigation should be required as a condition of the license.

38	**Water Supply** Section 4.1.3.1; Page 4-44	ODEQ finds the proposed mitigation for water supply impacts to be insufficient. For example, FERC recommends that prior to pipeline construction, Oregon LNG should file with the Secretary, for review and written approval by the Director of OEP, the following: a. final field-verified list of all water wells and springs used for water supply within 150 feet of the construction right-of-way, including the distance from the construction right-of-way; b. measures for marking and protecting any water supply wells within or immediately adjacent to the construction right-of-way; and c. details of preconstruction and post-construction well monitoring such as timing and parameters.	FERC should also include a requirement that the plan include a description of what actions Oregon LNG will take to provide a temporary and permanent water supply if construction affects someone's water supply well.
39	**303(d) List** Section 4.1.3.2	This section does not identify that the EPA is likely to approve 2012 303(d) list (with additions) by end of year.	The final EIS should include the most current 303(d) listings and any potential changes that are needed.
40	**Impaired Waterbodies** Section 4.1.3.2	The DEIS fails to discuss relevant TMDLs.	Include a discussion of TMDLs.
41	**Stormwater** Section 4.1.3.2	The DEIS fails to identify that ODEQ waste/stormwater permit programs will need to verify whether the proposed reuse of stormwater (post-treatment) for cooling water with excess to be discharged through Warrenton POTW outfall is an acceptable plan.	The final EIS should identify and FERC should require as a condition of the license that DEQ waste & stormwater permitting will need to confirm this plan (reuse of stormwater) is allowable.
42	**Turning Basin** Section 4.1.3.2	This section is incomplete because it refers to hydrodynamic modeling, in addition to sediment transport modeling, but it does not provide this information.	Please provide this information.

43	**Dredging & Turbidity** Section 4.1.3.2; Page 4-45, Second paragraph	The DEIS section is incomplete/inaccurate because it states that turbidity from dredging would be less than natural turbidity levels, but does not address the natural variation in turbidity or acknowledge that a 10% increase in turbidity may not occur.	We recommend that the applicant be required to conduct turbidity monitoring during initial dredging activities to verify that turbidity level aren't increased 10% above current conditions. The final EIS should provide information from other similar projects that demonstrated that dredging did not increase turbidity levels more than 10% above current conditions.
44	**Water Use** Section 4.1.3.2; Page 4-47, Second paragraph	This section is incomplete/inaccurate, because it indicates City of Warrenton will supply 5.7 million gals for annual consumption at OLNG plant but it does not discuss how the City will meet that requirement with the current water available or potential resulting impacts.	The final EIS should discuss whether the City of Warrenton can provide water volume as outlined in the DEIS, or if additional water sources for the City are required. An evaluation will be needed to determine Warrenton's ability to supply the water and to identify potential impacts to surface and groundwater if such amounts are consumed by the project.
45	**Water Use** Section 4.1.3.2; Page 4-47, Fourth paragraph	The DEIS states about 1.7 million gallons per year of Skipanon River water would be required for weekly and annual testing of the deluge fire suppression system but fails to identify that withdrawing this amount would result in potentially significant adverse environmental impacts.	The final EIS must include an assessment of potential impacts on dissolved oxygen and temperature in the Skipanon River because that river is water quality limited for dissolved oxygen and flow modification. This amount of water withdrawal has the potential to negatively affect Dissolve Oxygen levels directly and possible through temperature increases from the water return system. There was not sufficient information provided in the DEIS to assess the possible adverse impacts.
46	**LNG Marine Carrier Cooling Water Discharges** Section 4.1.3.2; Pages 4-50 and 4-94	These two discussions appear to contradict each other: Page 4-50: "Cooling water intake and discharge scenarios for the classes of LNG marine carriers that would be docked at the terminal are summarized as follows: • **148,000 m3 LNG Marine Carrier**—2,478 m3/hour cooling water flow rate; discharge water temperature 44°F greater than intake water temperature; and • **173,000 m3 LNG Marine Carrier**—2,040 m3/hour cooling water"	Review and correct values if necessary.

		Page 4-94: "The cooling water temperature at the discharge point from LNG marine carriers would be no more than about 11 to 16 °F warmer than at intake."	
47	**LNG Marine Carrier Cooling Water Discharges** Section 4.1.3.2; Page 4-51	The DEIS incorrectly cites an anti-degradation IMD (2001) for temperature implementation. The temperature and anti-degradation rules have been updated and the 2001 IMD is no longer current.	The final EIS should refer to anti-degradation language in OAR 340-041-0004. Specifically Section 3(c), which states that "insignificant temperature increases authorized under 340-041-0028(11) and (12) are not considered a reduction in water quality." In addition, any permit application would need to include a Tier 1 anti-degradation review to ensure that there will be no adverse effects to "existing uses."
48	**Temperature Management Plans** Section 4.1.3.2; Page 4-51	The DEIS incorrectly references the need for a temperature management plan.	A temperature management plan would not be required if the applicant is seeking a NPDES permit for LNG marine carrier discharges. Under OAR 340-041-0028(12)(e), temperature management plans are only required, on a case-by-case basis, for nonpoint sources.
49	**Mixing Zone Rules** Section 4.1.3.2; Page 4-51	The DEIS fails to sufficiently address mixing zone rules.	The final EIS should require the applicant to meet mixing zone rules in OAR 340-041-0053, which include minimizing adverse effects on indigenous biological community (we now have a listed species, the eulachon, which could be adversely affected) and the temperature thermal plume limitations in -0053(d).
50	**Cooling Water & Mixing Zone** Section 4.1.3.2; Page 4-51	The DEIS' discussion of impact of temperature from ship cooling water discharge is insufficient and inaccurate because it did not identify potential effects at the mouth of the Skipanon River adjacent to the facility. Increases in temperature of the Skipanon River could have impacts to fish use from higher temperature and from associated effects on dissolved oxygen levels.	Discussion focuses on impacts of cooling water to Columbia River and ignores potential impact to Skipanon & possibly Young's Bay systems. The final EIS should include an evaluation of the near field mixing zone impacts to address the large volumes of cooling water discharge proposed, and appropriate mitigation should be required as a condition of the license.

51	**Water Quality Limited Streams** Section 4.1.3.2; Page 4-51 and Table 4.1.3-5	This table does not correctly identify 303(d) listed waterbodies. The Nehalem River for example is listed for dissolved oxygen, temperature, and flow modification at river mile 33.5. It is listed for fecal coliform from river mile 0 to 14.7. The Lewis and Clark River is listed for dissolved oxygen, fecal coliform, flow modifications and temperature in the lower sections of the river. Does the MP category in the table represent mile post or river miles?	The table should be updated and corrected for the main waterbodies that the project will potentially impact to allow DEQ to confirm that the appropriate BMPs for the impaired waterbodies will be implemented.
52	**Existing Surface Water Resources** Section 4.1.3.2; Pages 4-52 through 4-53	The DEIS fails to identify the likely potential adverse impacts to surface water resulting from the project. For example, the DEIS limited identification of surface water intakes for public water supply to within 3 miles downstream of any waterbody crossing (and found none). However, in-stream construction further upstream in the drinking water source area also has the potential to impact water quality at the intake. The proposed pipeline crosses three mapped source areas that serve four regulated public water systems: the City of Vernonia and Berndt Creek Water Corp. (using Rock Creek) and Georgia Pacific CPLP Wauna and City of Rainier (using the Columbia River).	Potential impacts to these public water systems from pipeline construction and operation should be evaluated in the final EIS. As noted above, GIS information on the intake locations and source areas is available on-line or from DEQ/OHA. Potential impacts of proposed pipeline construction and operation on the full delineated drinking water source areas should be evaluated. Measures to address impacts from in-water construction activities or construction disturbance on slopes adjacent to waterbodies should be addressed. Pesticide use to maintain right-of-way upstream of public water supply intakes should also be addressed. SPCC Plan should include provisions to notify public water supply owners or operators if unanticipated releases occur.
53	**HDD – Dust Control & Hydrostatic Testing** Section 4.1.3.2; Page 4-59, Last paragraph	The DEIS fails to identify the source of water required for this project, stating only: “About 2.3 million gallons of water would be used from various sources for dust control. As detailed in table 4.1.3-9, an additional 6.8 million gallons would be needed for the HDD method.” Identifying the source of water is crucial to understanding the nature and extent of potentially significant environmental effects.	More clarity is needed on the sources of water needed for dust control and hydrostatic testing. If the Columbia River is not the source for these water needs it is not possible to establish the potential water quality effects of water withdrawal without the source streams identified.

54	**Streams/ Wetlands** General comment	The DEIS lacks specific functional information regarding streams/wetlands; making it difficult to assess the quality of these waters. Additionally, the DEIS does not indicate that the US Army Corps of Engineers will need to provide a final Jurisdictional Determination.	Please provide a timeline of when all streams and wetlands are to be surveyed. DEQ recommends that the final Jurisdictional Determination be a part of the final EIS.
55	**Herbicide Use** Section 4.1.4	DEIS discussion is insufficient regarding herbicide use. The DEIS generally recommends that if herbicides are to be used near waters of the state, that appropriate state and federal permits be obtained.	Ensure the final EIS identifies that appropriate DEQ permits for herbicide (pesticide permit) application near waters of the state must be obtained as needed, and require such permits as a condition of the license.
56	**DEQ/DSL** Sections 4.1.4.1, 4.1.4.2 and throughout document	DEIS inaccurately states in several areas that the Oregon Department of State Lands issues 401 Water Quality Certifications. These permits are issued by ODEQ.	Please correct throughout the DEIS, indicating that ODEQ issues 401 Water Quality Certifications.
57	**Dredging** Section 4.1.5; Pages 4-78, 4-82, 4-96	The DEIS insufficiently identifies and discusses potential significant environmental impacts associated with the timing of dredging. For example, the DEIS states: "Oregon LNG proposes to dredge the turning basin and berth area during the period between June 1 and September 30, depending on the availability of dredge vessels."	The final EIS must identify and discuss the potential significant environmental impacts to Skipanon River water quality due to dredging during this time period, and propose alternatives that will mitigate such effects. The timing of this activity coincides with the time when the Skipanon River is most vulnerable to low dissolved oxygen levels. DO levels could be negatively affected for sediment release to the mouth by dredging activities at the OLNG facility. Also the Skipanon is not identified on page 4-82 in the "Increased Turbidity and Suspended Sediment" section and page 4-96 "Maintenance Dredging". These discrepancies should be corrected.
58	**Water Temperature Impacts** Section 4.1.5.2	This section mentions that the applicant completed "Water temperature and diffusion modeling" but the DEIS does not include this modeling as an Appendix to allow for review and evaluation.	Please provide this information in the final EIS.

59	**Water Use** Section 4.1.5; Page 4-90, Hydrostatic Testing	The DEIS fails to discuss whether the City of Warrenton has the capacity to provide all or a portion of the 28 million gals identified as needed for hydrostatic testing, or whether this increased use affects Warrenton's ground or surface source waters.	The final EIS should include a complete discussion of the Project's water use needs, including the intended water source. ODEQ recommends that the EIS evaluate the City of Warrenton's ability to supply the water and to identify potential impacts to surface and groundwater resulting from such withdrawals. This discussion should include appropriate mitigation and alternatives that will reduce or avoid potential significant environmental impacts of the project's water use.
60	**Terminal Operations – Marine Carriers** Section 4.1.5.2; Page 4-91	This section identifies potential impacts associated with engine cooling water discharges (e.g., thermal plume affects), but fails to identify or evaluate any potential adverse environmental impacts from ballast water discharge. The DEIS identifies the rate and total volume of engine cooling water anticipated for discharge, but does not provide comparable details and analysis for ballast water discharges.	In addition to modeling potential effects of cooling water discharge from LNG vessels, the EIS must also evaluate affects from ballast discharge and potential risks to resident or migratory fish species (e.g. osmotic shock). Results may also need to be addressed under section 4.1.5.3 – essential fish habitat).
61	**Cooling Water Discharge** Section 4.1.5; Page 4-94, Cooling Water Discharges	The discussion of temperature discharge fails to identify and evaluate the effects that may occur at the mouth of the Skipanon River. The Skipanon is much smaller than the Columbia and it is unclear if there is a potential of a thermal barrier to form at the mouth of the river under certain conditions during cooling water discharges.	The final EIS must discuss potential significant impacts due to the anticipated large volumes of cooling water on the Skipanon and possibly Young's Bay systems. FERC should require an evaluation of the near field mixing zone impacts to be performed, including analysis of the overall thermal loading of the receiving stream(s).
62	**Ballast Water Discharge and Exotic Species Introductions** Section 4.1.5.2; Page 4-95	This section fails to adequately evaluate the scope of ballast water discharge activity proposed and potential risks for introducing new non-indigenous or potentially invasive species to the region. Current ballast water management practices are risk-reduction strategies – not 100% effective exclusionary practices. Therefore, a proposed significant increase in ballast volume discharge should be	Please provide a more detailed analysis of invasive species risks from ballast water discharge. Specific questions that require analysis include: What is the anticipated rate and total volume of ballast water discharge? How much of an increase in ballast discharge volume would this project represent to State of Oregon waters and specifically to the Youngs Bay/lower CR estuary region? How do the environmental factors of the ballast source area and discharge location compare? How do these various risk criteria translate

		evaluated for its additive increase in potential risk. The cost of managing aquatic invasive species, if not prevented, can be very high and should be considered when evaluating these proposed new activities.	into propagule pressure and the risk for introducing new species? How many non-indigenous species have been introduced to the lower CRE from ballast discharge mediated activities and what type of monitoring will be conducted to validate claims that the proposed activities won't result in new introductions?
63	**Ballast Water Discharge** Section 4.1.5.2; Page 4-95, Ballast Water Discharge and Exotic Species Introductions	The DEIS does not consider ballast discharge effects on salinity during different semidiurnal tidal periods locally within the Lower Columbia River Estuary, Youngs Bay and Skipanon River.	An evaluation must be provided on the degree to which large volumes of ballast discharge will disrupt semidiurnal salinity patterns in the localized area of the Lower Columbia River Estuary, Youngs Bay and Skipanon River and the impact this disruption may have on aquatic species.
64	**Vessel Biofouling Risks** Section 4.1.5.2; Page 4-95	The final paragraph on p. 4-95 suggests that vessel biofouling risks are mitigated by certain voyage characteristics. However, no data or analysis is provided to substantiate these claims. The DEIS also does not adequately evaluate the full range of biofouling risk criteria or how proposed LNG carrier activities would relate to these characteristics.	An analysis of biofouling risk criteria based on specific characteristics of vessels and port source/destination regions involved in this project would allow for a more robust analysis of potential risks. Characteristics including vessel layup duration and vessel biofouling management regimen should be considered. If vessel and voyage specific characteristics cannot be provided for this project, then the assumptions about low or mitigated risk are inappropriate and misleading. Moreover, biofouling threats are not limited to the facility location, but should also be considered for the higher salinity zones of the lower estuary and nearshore coastal environment that the vessels will be transiting through en route to the facility.

65	**Establishing and/or Re-establishing Vegetation** Section 4.1.5; Page 4-103, Riparian Vegetation	"After pipeline construction, Oregon LNG would revegetate the right-of-way to preconstruction riparian conditions. Plantings would consist of a mixture of native tree, shrub, and grass/forb/legume species." The DEIS does not adequately discuss how the successful establishment of woody vegetation in riparian corridors will be measured and monitored over time.	The final EIS must identify criteria for vegetative success; incorporate survival, density, and free to grow metrics; describe vegetation maintenance activities that will be conducted (plant augmentation, control of competitive non desirable vegetation (reed canary, black berry, watering, etc). The establishment of vegetation routinely requires monitoring and management for 3-5 years until woody vegetation reaches a free to grow state. This should be discussed in the final EIS. The discussion should also analyze what will guide woody and shrub species selection, as well as how vegetative prescriptions will be developed.
66	**HDD & Temperature** Section 4.1.5; Page 4-103, Water Temperature	The DEIS' discussion of HDD and temperature impacts is insufficient, stating only: "Oregon LNG would cross all of the waterbodies listed (CWA 303(d)) as temperature sensitive using HDD, thereby avoiding loss of streamside vegetation." There are 21 temperature-limited streams in the Nehalem Watershed. It is challenging to align the various proposed stream crossing with these listed streams to confirm that HDD techniques are being used at the appropriate sites. In addition, it challenging to access the number of crossing that might occur in tributaries of temperature limited streams. These issues should be resolved.	As per the applicable TMDLs, ODEQ recommends that FERC require cumulative thermal impacts to be assessed as changes in percent effective shade or thermal load occur.

67	**Temperature – Cumulative Impacts** Section 4.1.5; Page 4-103	The DEIS inadequately assesses cumulative impacts of the proposed action. For example, associated with the disturbances to the streams and wetlands themselves, are significant impacts to riparian and wetland vegetation. For instance, most existing riparian trees along the pipeline route will be removed. Selective replanting is proposed except for areas of 10 to 30 feet (for mowing and aerial observation) over the center of the pipeline. Even so, temporal losses of wetland and water quality function will be experienced for 1-3 years for wetland shrubs and up to 20 years for trees in forested wetland areas and riparian areas. This riparian vegetation, and in particular trees, is essential to providing water quality and habitat function. Such services as shade to reduce stream temperature, nutrient and pollutant uptake, stormwater treatment and infiltration, and bank stabilization through root structure will be lost in the impacted areas for years to decades.	The final EIS should not isolate impacts from the pipeline alone to draw conclusions of minimal impact to the water quality benefits of shading, etc. The final EIS must account for cumulative effects occurring in the areas that will be impacted by pipeline construction.

68	**Thermal Impacts** Section 4.1.5; Page 4-104, Water Temperature	DEIS incorrectly states that: "Temperatures would be expected to equilibrate to ambient conditions within 500 to 1,000 feet downstream, as has been shown in effects of vegetation removal studies (Zwieniecki and Newton, 1999). Over time, as riparian trees grow and mature, the impacts on streamside shade would be reduced and preconstruction conditions would return. Instream temperature changes are anticipated to be minimal." ODEQ disagrees with this conclusion on the following basis: Thermal impacts that exceed OAR 340-041-0028(11) Protecting Cold Water (PCW) criterion have been documented by ODF from harvest using FPA private forest RMAs for small and medium fish-bearing streams (Groom et al 2011; see Board of Forestry Rules analysis). Also the model used for the analysis of temperature impacts (USGS) may not be as robust as models the DEQ has used (e.g., HeatSource) to develop TMDL loads in the watersheds that the project will be crossing.	ODEQ recommends that more stringent state forest Riparian standards* (for RMAs) be followed. *See Current Forest Management Plans (FMP) [ODF, 2010]) riparian buffers* http://www.oregon.gov/odf/pages/state_forests/forest_management_plans.aspx At the September 2014 meeting, the Board of Forestry directed the Department of Forestry (ODF) to work in conjunction with Regional Forest Practices Committees and stakeholders to: • Continue analysis of a) Geographic Regions in western Oregon to which the rule should apply and b) to which stream segments the rule should apply; and • Develop prescriptions for a new Riparian Protection Rule. The 25 foot riparian management area (RMA) is not adequate to ensure thermal load reduction and meet TDML thermal load reduction targets. Revise the final EIS to reflect level of RMA protection needed to meet shade targets and protect cold water on private lands.

69	**Large Woody Debris** Section 4.1.5; Page 4-104, Large Woody Debris	The DEIS inadequately discusses large woody debris, stating only: "In addition, Oregon LNG would stockpile cleared, unmerchantable LWD for redistribution to the site as part of postconstruction rehabilitation, particularly the portion of the construction corridor outside the 50-foot, permanent right-of-way." The DEIS does not evaluate how OLNG will document and track unmerchantable timber, or whether unmerchantable timber includes trees that are felled as part of this project that would not otherwise be allow to felled under the forest practices act or other riparian ordinances or rules.	The final EIS must correct these deficiencies. OLNG or their contractor should be required to coordinate with the Oregon Dept. of Forestry to ensure that the project complies with the Northwest Forest Plan (NWFP) and correctly identifies "unmerchantable timber."
70	**Water Use** Section 4.1.5; Page 4-105, Water Withdrawals and Discharges	The DEIS fails to identify source streams for hydrostatic testing, stating only: "Hydrostatic testing of the pipeline and HDD drilling techniques may require withdrawal of water from selected streams and rivers." Without source streams identified it is impossible to access potential water quality effects of water withdrawals. It would also be helpful to identify the total potential withdrawal from the Columbia River if all or a portion of alternative water sources are not available.	The final EIS must include a more thorough evaluation of the sources of water required for hydrostatic testing and resulting potential significant environmental effects associated with using such sources.
71	**Dewatering** Section 4.1.5; Page 4-106	The DEIS does not identify or discuss impacts of dewatering, stating only: "Discharge pipes would be anchored for safety and the overall rate of discharge would be controlled to prevent flooding and erosion." If trench dewatering does result in surface runoff, it must be conducted to ensure that turbid water does not reach a surface water of the state,	The final EIS should discuss and FERC should require as a condition of the license that if dewatering is likely to impact waters of the state, the dewatering activity must be stopped and the dewatering process re-evaluated.

		and does not result in the deposition of sand, silt, and/or sediment. If such deposition is occurring or is likely to impact waters of the state, the dewatering activity should be stopped to prevent a water quality violation as per the numeric turbidity standard (OAR 340-041-0036) and narrative sedimentation standard (ORS 468B.025(1)(a)).	
72	**Pipeline – Cumulative effects, TMDL requirements** Section 4.1.5; Page 4-108, Cumulative Effects of Multiple Stream Crossings	The DEIS insufficiently identifies and discusses potential significant cumulative effects of the action. For example, it states: "Oregon LNG would remove vegetation only within the construction corridor. Considering the entire amount of riparian clearing within a drainage basin, the project would result in the clearing of a maximum of 0.09 percent of the entire riparian length in any of the river basins crossed. These estimates assume that all existing areas have fully functional riparian zones, which is not the case." The DEIS should analyze and consider the percentage of OLNG riparian removal from currently functioning riparian areas. Analysis should include ATWS's that will be in place during construction and the years that it will take mature tree to reestablish at these locations. Much of the Nehalem Watershed is water quality limited for temperature. Temperatures in the mainstem Nehalem at Fishhawk Road have been recorded above 80 degrees Fahrenheit. Permanent riparian removal in tributary streams of the mainstem Nehalem River has the potential to limit temperature improvement in the mainstem Nehalem and affect compliance with	The final EIS should indicate that OAR 340-042-0080 (WQMP) requires submission of a TMDL implementation plan to ODEQ for review and approval. For geographic areas, and the associated waterbody-pollutant segments covered by temperature TMDLs, OLNG will be identified as a "new source", and thus required to develop source-specific TMDL implementation plans. The final EIS should indicate and FERC should require that specific riparian vegetation targets be identified through the source-specific Implementation Plan.

		water quality standards. The DEIS does not identify that source-specific TMDL implementation plans are required for water bodies with 303d impairments. In the case of the parameter temperature, longer-term or permanent removal of riparian vegetation in areas where TMDLs have been issued is incompatible with achieving shade targets in the TMDLs, associated Water Quality Management Plans, and DMA implementation plans for the TMDLs in the affected areas.	
73	**Pipeline – Easements & buffer strips** Section 4.1.5; Page 4-109, First paragraph	The DEIS insufficiently identifies and discusses potential significant environmental impacts associated with the pipeline.	The final EIS should describe how previous land use is compatible with OLNG easements for buffer strips. FERC should require an increase in riparian reestablishment (buffer size) when 25ft is lower than standard required for other riparian restoration projects. The final EIS should address or require the applicant to maintain vegetation, or identify whether previous land use dictate how vegetation in the pipeline easement will be managed.
74	**Herbicide Use** Section 4.1.5; Page 4-109, Second to last paragraph	The DEIS discussion on herbicide use is inadequate, stating only: "Oregon LNG would not apply herbicide unless absolutely necessary." A strategy for herbicide use was not discussed in relationship to proposed riparian restoration activities. Additionally, the potential water quality impacts from herbicide use were not addressed. Without a plan for where and when herbicide applications will occur, DEQ is unable to evaluate potential water quality impacts.	Provide additional information regarding how herbicides will, or will not, be used. If herbicide application is planned within 3 feet of surface waters, a 2300-A general pesticide permit may be required.

75	**Mitigation** Sections 2.1.1.3 and 4.1.5.2; Page 4-111, Other Compensatory Mitigation	Mitigation actions are not well defined in the DEIS. The mitigation measures identified in this section (and elsewhere in the DEIS) will need to be coordinated and reviewed by ODEQ as part of riparian restoration (thermal impacts) and Section 401 requirements (wetland mitigation). As it is only a Conceptual Mitigation Plan in the DEIS, overall mitigation needs and requirements need to be coordinated across both state and federal agencies.	Please define all mitigation actions in detail. The evaluation currently in the DEIS is insufficient to assess whether water quality standards can and will be met without more specific details regarding mitigation for impacts. ODEQ must review and approve all mitigation actions.
76	**Terminal Construction – Historic Dredge Disposal** Section 4.1.7.1; Page 4-132	The DEIS does not recognize that historic dredge spoils placed upland may contain contaminants that exceed clean fill screening levels and may require regulatory oversight if moved or relocated. During terminal construction, the applicant should evaluate whether existing dredge spoils to be removed from the site meet clean fill criteria or contain contaminants that may limit reuse of the material.	FERC should require that prior to removal of historic dredge materials offsite, the applicant should evaluate whether the sediments to be removed from the site meet clean fill criteria. See Oregon Administrative Rules 340 Division 093 for clean fill criteria. The final EIS should identify that reuse of contaminated sediments may be allowed through a beneficial use determination.
77	**Definitions** Section 4.1.12.1; Page 4-329	The DEIS inaccurately states the following regulation is applicable to this project: 40 CFR Part 60, Subpart LLL. This is incorrect because Oregon LNG is not a natural gas processing plant because it does not process raw natural gas; it processes pipeline gas. See definitions below. Source: US Department of Transportation, http://primis.phmsa.dot.gov/comm/FactSheets/FSNaturalGasProcessingPlants.htm Fact Sheet: Natural Gas Processing Plants Definition:	Replace paragraph with the following: “40 CFR Part 60, Subpart LLL applies to “natural gas processing”. Natural gas processing is a process that is performed on raw natural gas as it comes from the well and is intended to remove impurities to produce pipeline quality natural gas. Oregon LNG is not a natural gas processing plant because it does not process raw natural gas; it processes pipeline gas. Therefore Subpart LLL does not apply.”

		A natural gas processing plant is a facility designed to “clean” raw natural gas by separating impurities and various non-methane hydrocarbons and fluids to produce what is known as 'pipeline quality' dry natural gas. A gas processing plant is also used to recover natural gas liquids (condensate, natural gasoline and liquefied petroleum gas) and sometimes their substances such as sulfur. Source: http://naturalgas.org/naturalgas/processing-ng/ Gas wells typically produce raw natural gas by itself, while condensate wells produce free natural gas along with a semi-liquid hydrocarbon condensate. Whatever the source of the natural gas, once separated from crude oil (if present) it commonly exists in mixtures with other hydrocarbons; principally ethane, propane, butane, and pentanes. In addition, raw natural gas contains water vapor, hydrogen sulfide (H2S), carbon dioxide, helium, nitrogen, and other compounds. Natural gas processing consists of separating all of the various hydrocarbons and fluids from the pure natural gas, to produce what is known as ‘pipeline quality’ dry natural gas.	

78	**Ship Emissions** Section 4.1.12.1; Page 4-330, Prevention of Significant Deterioration	The 3rd paragraph below ***Prevention of Significant Deterioration*** does not adequately explain which ship emissions will be considered in the air quality permit application.	Revise 3rd paragraph below ***Prevention of Significant Deterioration*** to read as follows: "The air emissions from LNG marine carriers that directly support terminal operations are included as part of the LNG terminal emissions. The ship emissions that directly support terminal operations are the emissions associated with powering the pumps that pump LNG from the ship to the terminal when LNG is being imported. Other ship emissions, such as hoteling, maneuvering, maintaining readiness, or tugboat emissions, are not included."
79	**PSD** Section 4.1.12.1; Page 4-330, Prevention of Significant Deterioration	The 4th paragraph below ***Prevention of Significant Deterioration*** notes that PSD may potentially apply. ODEQ has determined that PSD does not apply. This should be added for clarity.	Add the following to the end of the 4th paragraph below ***Prevention of Significant Deterioration***: "Oregon DEQ has determined that PSD is not applicable to the proposed terminal."
80	**PSD** Section 4.1.12.1; Page 4-332, Federal Class I Area Protection	The paragraph under ***Federal Class I Area Protection*** does not state that PSD does not apply. This should be added for clarity.	Add the following to the paragraph under ***Federal Class I Area Protection***: "As noted earlier, Oregon DEQ has determined that PSD is not applicable to the proposed terminal."
81	**Emergency Response** Sections 4.1 and 5.1; Pages 4-49, 4-96, 4-186, 4-319, 5-11	While discussing leaks from LNG ships, the DEIS incorrectly states that LNG ships have a double hull which would protect the ship. While all LNG ships do have a double hull protecting the cargo area, most do not have a double hull surrounding the engine room area; so spills of hydraulic fluid, diesel, and other oils and hazardous materials are the same as any other non-double hulled vessel.	Clarify that a double hull on a LNG tanker protects the cargo spaces that store LNG, not the entirety of the ship.

82	**Water Use** Section 5.1.3.1; Page 5-6, Fourth paragraph	The DEIS discussion concerning water use is insufficient, stating only: "About 2.3 billion gallons of water would be needed annually for operations. Most of this water would come from the Columbia River, which would require a Limited Water Use License from OWRD. Given the large size of the Columbia River, significant impacts from water withdrawal are not anticipated." The DEIS should evaluate what type of analysis and inputs were used to make this determination, and what considerations were given to future water availability given that this project might not be complete for several years.	The final EIS must evaluate whether or not water is available from the various (undefined) sources needed for this project.
83	**Hydrostatic Test Water Discharge** Section 5.1.5.1; Page 5-10	The DEIS states that about half of the hydrostatic testing water would be discharged via the City of Warrenton POTW. It is ODEQ's understanding that the applicant is proposing to discharge hydrostatic testing water under their NPDES permit through a shared outfall.	Review and correct if necessary.
84	**LNG Marine Carrier Cooling Water Discharges** Section 5.1.5.1; Page 5-10, Bottom of the page	The DEIS discussion relevant to cooling water discharges is insufficient because impacts of the thermal plume associated with LNG marine carrier cooling water do not appear to take into account the thermal plume from the onshore LNG facility cooling tower discharge.	Review and correct if necessary.

85	**SWPPP** Appendix F, Section 1; Oregon LNG Mitigation and Monitoring Plans	Oregon LNG prepared a Stormwater Pollution Prevention Plan (SWPPP) as part of the DEIS. ODEQ has these questions that are not addressed in the DEIS and should be: • Is this SWPPP part of ODEQ's NPDES 1200-C construction stormwater permit, specifically the required Erosion and Sediment Control Plan (ESCP)? • The operation of a concrete batch plant used to construct the LNG storage tanks would require a 1200-A permit. The 1200-A permit also requires a Stormwater Prevention and Control Plan (SWPCP) to be submitted with the application.	Please include reference to the correct permits and use the correct names for those plans required by ODEQ's permits.
86	**Emergency Response** Appendix F, Section 7, Table 3 of the SPCC plan	The DEIS fails to identify specific notifications and tasks which Oregon LNG, Oregon Pipeline, their contractors and subcontractors will take in the event of a release of oil or hazardous materials to land or waters of the state which exceed the reportable quantities identified in ORS 466.605. The DEIS includes plans for use of heavy machinery, staging of fuel tanks, and other materials which may exceed the reportable quantity if spilled. See ORS 466.635 and OAR 340-142-0040.	While the DEIS includes numerous references to spills, a plan for making immediate notifications to the Oregon Emergency Response System (OERS) needs to be required, as well as a cleanup plan which should include contractors, procedures, and specific cleanup equipment.

Fish and Wildlife, Oregon Department of (ODFW)

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1.0 DEIS General Comments:

The following general deficiencies of the draft Environmental Impact Statement (DEIS) have been identified below.

1.1 ODFW Advisory Biologist/Liaison

Given the broad extent of required actions yet-to-be completed by the applicant, including further planning, permitting, potential implementation, monitoring, and maintenance, among other items, which are being relied upon by the applicant and FERC to reduce the Project's environmental effects to less than significant levels, ODFW recommends that the applicant develop and implement an agreement with ODFW to fund a limited duration biologist (Natural Resource Specialist 3) to serve as a project liaison. This position would be in place through the entire construction process and for at least 3-years following completion of construction of the terminal and pipeline and to the conclusion of required mitigation actions. The biologist/liaison would work across ODFW District boundaries and with ODFW field and headquarters staff to coordinate agency responses and recommendations to fish, wildlife, and habitat, mitigation, fish passage related issues and the myriad of yet-to-be completed project plans (*i.e.* Post Construction Monitoring Plan, Post Construction Landslide Monitoring Plan, Traffic Mitigation Plan, Terminal Construction Traffic Management Plan, HDD Noise Mitigation Plan, Wildfire Suppression Plan, Final Mitigation Plan, Shoreline Erosion Control Plan, etc.). This individual would also work on behalf of ODFW with the Interagency Adaptive Management Team (IAMT) – see below, to determine data needs, provide the on-the-ground technical assistance, including assistance with micrositing at stream crossings, and coordinating with other State and Federal natural resource agencies and tribal staff.

1.2 Proposed Interagency Adaptive Management Team

The applicant proposes to establish an Interagency Adaptive Management Team (IAMT) that would review and advise on mitigation actions but would also be available to provide recommendations in the event of a significant project modification, emergency, or unanticipated effects. The IAMT would comprise representatives from the U.S. Army Corps of Engineers (USACE), Department of State Lands (DSL), Oregon Department of Fish and Wildlife (ODFW), Oregon Department of Forestry, Oregon Department of Environmental Quality, USFWS, National Marine Fisheries Service, USEPA, Washington Department of Fish and Wildlife, and U.S. Coast Guard.

ODFW recommends that FERC direct the applicant to establish the IAMT to provide guidance on the following *additional* project areas of interest:

- Characterization of direct and indirect construction impacts of the project.
- Oversight of construction-related monitoring studies and report development.
- Post-study ecological assessment.
- Characterization of post-construction legacy impacts to fish and wildlife production on the site.
- Mitigation effectiveness monitoring and reporting.

- Development of mitigation strategies and goals.
- Mitigation implementation and monitoring guidance.

ODFW recommends that the structure and function of IAMT should be developed and operate as follows:

- Scheduling and leadership of the regular function of the IAMT be the duty of the Applicant or affiliate.
- The IAMT should be formed and convened no less than six months prior to initiation of construction at either the terminal or pipeline site to meet thereafter at regular quarterly intervals or more often as needed. However, the team can agree to meet less often if it is considered that quarterly frequency is unnecessary.
- The IAMT should remain functioning for a minimum of three years post-construction.
- The IAMT should collaboratively come to agreement on the number and type(s) of monitoring/study(s) required for determining the degree of impact related to the project.
- The IAMT should also come to consensus on unanticipated construction and post-construction impacts, and final adaptive management mitigation actions necessary to compensate for those impacts.
- The IAMT goals should focus on technical guidance and review of study and management actions subject to adaptive management. As such, the team should be comprised of individuals who are natural resource professionals or highly knowledgeable in one or all of the following:
    1. Ecological sciences related to fish and wildlife resources or marine resources
    2. Cultural resources
    3. Recreational resources
    4. Mitigation/Restoration sciences
    5. Water quality sciences
    6. Hydrological sciences

1.3 Impacts to Fishing and Shellfishing Not Adequately Identified and Discussed in DEIS

The Skipanon Marina and Warrenton Deep Sea facilities are an important harbor and marina complex for recreational and commercial vessels. Together, the Skipanon Marina and Warrenton Deep Sea facilities provides slips for over 500 recreational and commercial vessels, and provides boat launching facilities that serves hundreds of additional vessels daily during peak periods. As a result, many commercial and recreational fishing vessels transit through the area identified for the proposed marine terminal berthing area during their exit and return to the Skipanon Marina. The Applicant acknowledges the extremely popular recreational fishery for Chinook and coho salmon that occurs near the mouth of the Skipanon River (Buoy 10 Fishery), and that the proposed OLNG terminal is located in the mid-region of this popular fishing area. However, the application does not adequately characterize the potential for substantial disruption of this culturally and economically important fishery during construction and operation of the marine terminal complex. (Note: This fishery experienced 107,700 angler trips in 2014 with a combined catch of nearly 84,500 salmon).

The Department is currently evaluating the area at the mouth of Young's Bay for potential expansion of the Young's Bay terminal commercial fishery. The expected east boundary for the expanded fishing area would be adjacent to the proposed OLNG terminal, and therefore, commercial fishing activity in this area could be impacted by security zones around docked and marine carriers in transit and maneuvering in the turning basin. The DEIS specifies that a permanent safety closure of about 100 ac would be designated that will prohibit recreational vessels from entering the area 200 m around the marine terminal. In addition, recreational vessels will be periodically prohibited (about 250 times each year) from movement in and out of the Skipanon River during the times that the LNG marine carriers travel between the berth and the federal navigation channel. These safety closures will permanently prohibit recreational fishing and crabbing from a 100 ac area at the marine terminal, and will prohibit transit through the turning basin area over a period of about 125 hours each year.

Given the potential impacts to recreational and commercial fisheries listed above, the Department requests that the Applicant provide more detail characterizing the local importance of the commercial and recreational fisheries and how those fisheries will (or may) be affected during construction and operation of the OLNG terminal, berthing dock, and other facilities. The Applicant should also include a detailed description of proposed mitigation actions designed to offset any losses of recreational and commercial boating and fishing opportunities that result from adherence to the proposed Oregon LNG safety/security zones.

Recreational crabbing is also a popular activity within the Lower Columbia River (LCR) (see ODFW website: https://nrimp.dfw.state.or.us/CRL/Reports/Info/2012-04.pdf), and sport crabbers make a total of 1,500 to 2,200 trips into the estuary each month during the peak season of September, October, and November. Between 12,000 and 28,000 Dungeness crab are harvested from the LCR by sport crabbers each month during the period from September to November. Although most of the sport crabbing activities are focused in the marine-dominated waters outside of the Hammond Marina (about 4 km downstream from the proposed OLNG marine terminal), some sport crabbing occurs in the estuarine waters in the vicinity of the proposed OLNG berthing terminal and in the area located outside the mouth of Young's Bay. The applicant should be required to complete an economic analysis of recreational crabbing activities in the LCR estuary and the impacts to these activities as a result of the Applicant's operations. The DEIS should identify the steps and actions that will be taken to offset the disruption and loss of these recreational crabbing opportunities due to periodic closures of the vessel transit area, due to construction and operation of the terminal, and due to dredging of the turning basin. The DEIS discussion is currently deficient absent identification and discussion of this important and potential significant environmental impact.

The DEIS indicates that all of the dispersion distances for toxic substances are outside of areas containing residences, parks, hospitals, churches or other sensitive areas, and that "siting of the proposed project would not have a significant impact on public safety" (4.1.13 Reliability and Safety; pg. 4-402). However, the Draft EIS (4.1.13 Reliability and Safety) also indicates that accidental release of Natural Gas Liquids or a cloud of toxic gas from the Oregon LNG facility will pose a threat and safety concern for vessels that transit through the Skipanon River (i.e., Figure 4.1.13-9; pg. 4-408 / H2S dispersion resulting from an acid gas design spill; and Figure 4.1.13-10; pg. 4-409 / dispersal of benzene resulting from NGL design spills). Safety of boaters is a concern because many commercial and sport vessels transit through the hazard area near the mouth of the Skipanon River during their exit and return to the Skipanon and Warrenton marinas. The DEIS does not provide detailed information or plans to describe how Oregon LNG will provide warnings and alerts to vessels in transit along the

Skipanon River in the event of an accidental release of LNG or a cloud of toxic gas. Creating this plan should be a condition of project approval.

1.4 Hunting Impacts Not Adequately Identified and Discussed in DEIS

Waterfowl hunting occurs in the tidal waters surrounding the proposed terminal site and near several of the waterways crossed by the pipeline in Young's Bay. Development and operation of the terminal will result in a permanent loss of hunting opportunity in an area that is one of only a few areas open to waterfowl hunting within the Warrenton City limits. While dispersed hunting occurs along the pipeline route, it is not clear to what extent hunting opportunity might be impacted. The Department suggests that the Corps include as a condition of the permit, a provision that OLNG will provide a plan to mitigate for any loss of hunting opportunity stemming from the implementation of the project.

1.5 Fish Screening Requirements as Condition of Authorization

Fish screening and bypass devices prevent or reduce the loss of game fish, food fish, and fish that are listed as Threatened or Endangered under the federal or state Endangered Species Act. Fish screens or bypass devices are necessary at gravity and pumped water diversions and are often required as a condition for a Water Use Permit or Transfer. The Applicant proposes both construction-related and ongoing permanent operational use of State of Oregon's water resources in the project area. In the Department's review of any applicable water use requests from the Oregon Water Resources Department (OWRD) for this project, we will request use of fish screening systems at all surface water point(s) of diversion (POD).

To maintain consistency, we also request that the FERC include as conditions of authorization the following requirements: (1) The Applicant screen all applicable water intakes in accordance with NOAA Fisheries screening guidance as found in NOAA Fisheries Fish Passage Design Criteria Report (http://www.habitat.noaa.gov/pdf/salmon_passage_facility_design.pdf), and (2) that all water intake screens be inspected and approved by the Department prior to the withdrawal of any water. All of the surface water intakes should have approved screening, including but not limited to the following uses: ballast and cooling water, terminal fire system, re-deluge fire pumps, reverse osmosis, hydrostatic testing, concrete mixing, road construction and soil maintenance.

The Department has reviewed the paper *Oregon LNG: Probabilistic Analysis of ESA-Listed Salmonid Entrainment at Ballast and Cooling Water Intakes* located in Appendix D of Volume 2 Appendix F. The Department comments are as follows:

> **General Comments:** The entrainment modeling technical paper only deals with impacts to ESA listed salmonids. The DEIS omits discussion regarding impacts to non-ESA listed species. The Department is concerned about impacts to non-salmonid species at risk of entrainment and entrapment at these intakes. Hatchery fish should also be included in the assessment as the Department has concerns with impacts to returning fisheries. The paper's conclusion is largely based on many assumptions that lack sufficient support, including the model utilized. The following assumptions should be substantiated in the final EIS to justify these conclusions: lamprey data, assuming only juvenile salmonids will be entrained at an approach velocity of 2.2 ft/s (5.5 times the criteria approach velocity), assuming the number of sea chests, their depths and intake size is the same for all boats, the time in port and pumping, assuming that fish will pass the seachest only once in a estuarine tidal system, assuming the majority of fish occur in less than 20 feet of water and are vertically and horizontally uniformly distributed, assuming Chum salmon only use the Washington shore and would not be entrained, assuming that no diel

movement patterns were present and assuming fish behavior at the seachests. The repeated uncertainty in the analysis suggests that the impacts cannot be considered insignificant based on the analysis. Given the many assumptions and the variability that they present, the Department determines that it would be prudent to test actual sea chests in the proposed location to determine what entrainment will actually occur and to which species. The paper was written in 2009 and many management changes and restoration projects have occurred since then, therefore, population numbers and impacts for this area should be reassessed, especially in Young's Bay where many changes to SAFE fisheries have been made, which this paper largely dismisses. The Department continues to request that fish screens meeting ODFW criteria be used on all intakes at the proposed facility to prevent the loss of fish due to water withdrawals, and that this be a condition of authorization.

Specific Comments Pertaining to *Oregon LNG: Probabilistic Analysis of ESA-Listed Salmonid Entrainment at Ballast and Cooling Water Intakes*

Page 1: The paper only considers impacts to ESA listed juvenile salmonids. Consider take of all native fish including native, pelagic and other non-salmonid ESA listed species that are present. Impacts to all life stages present should be considered. ODFW uses NMFS fish screening criteria. (http://www.dfw.state.or.us/fish/passage/docs/fish_passage_design_criteria.pdf). Other non-salmonid ESA listed species are present that should be considered also.

Page 4: The sea chest grates (trash rack) described have much larger openings than allowed in criteria for a fish screen and cannot be used as a substitute for a fish screen.

Page 9: The sea chest opening is described as 12.74 ft^2. At 85 cfs, criteria fish screening would require an area of 212.5 ft^2 at a minimum to achieve an approach velocity of 0.4 ft/s.

Page 11 and 12: While approach velocity is determined by the intake rate, tidal influenced sweeping velocity could make escaping entrainment more difficult as fish are "pushed" towards the screen, increasing the speed and energy needed to avoid it.

Page 12: According to ODFW fish screening criteria, approach velocities need to be 0.4 ft/s or less adjacent to the face of the screen. Given that intake velocities at the face of the sea chest reach 2.2 ft/s, entrainment of all life stages should be considered.

Page 12: Given that sea chests may have different dimensions, fish screens should have sufficient screen area to meet criteria approach velocities.

Page 15: It should not be assumed that fish will pass the sea chest only once in a tidal system.

Page 15: Entrainment should be assessed for all native species at all depths.

Page 16: Peak tidally influenced cross flow velocities (worst case scenario) should be used when assessing entrainment probabilities.

Page 16: The Paper does not address impacts to fish below Tongue Point because of lack of data and the lack of ESA listed salmonids. Impacts to native fish and hatchery salmonids should be addressed.

Page 17: Regardless of outmigrant salmonid population numbers, entrainment will occur.

Page 17: Assumptions regarding salmonids in Young's Bay, especially the population numbers, should be reassessed given the paper was written six years ago. ODFW has concerns with entrainment of hatchery fish which could cause a depletion of returns to the fishery.

Page 18: The horizontal and vertical distribution of fish at this location should be researched, especially with an obstacle (such as the marine carrier) in the water.

Page 18: The paper describes 200 Coho spawners in Young's Bay and then compares the potential entrained numbers in Young's Bay to the entire LCR Coho population of 18 million Coho (it does not state the age group, so it is unclear if the paper is referring to fry, juveniles or adults). Losses to the Young's Bay coho spawning group would be substantially greater compared to individual fish in the entire LCR Coho ESU. There is a large investment of effort and capital to support harvest opportunity, and potential effects to these fisheries needs to be reviewed.

Page 29: Tidal sweeping velocities need to be considered when assessing fish swimming abilities to avoid entrainment.

Page 36: Again the results only look at ESA listed salmonids. Hatchery fish and other native species should be considered.

Entrainment of Eulachon: The Applicants estimate of take (1,225,920 larvae) is a very small fraction of recent estimates of larvae outmigration. The Department estimate of larval out-migrant abundance has ranged from 500 billion to 3 trillion (2010-2014). 1,225,920 larvae is >0.00022% of these recent estimates. The Department estimates that that the 1,837 eulachon adults is ~0.002% (2013) to ~0.104% (2010) of recent adult run abundance estimates. One inherent assumption in the Applicant's analysis is that distribution and occupancy timing of larval eulachon throughout different areas of the estuary is equal. This assumption is not justified. If larvae rear for any period of time in the area of water withdrawals the impact could be much larger than estimated. This is a topic of considerable scientific uncertainty and casts some doubt on the Applicants analysis. Given this uncertainty, and the fact that the applicant has proposed no mitigation for potential effects on eulachon, the Department suggests that the Applicant provide funding that would support an investigation of seasonal larval densities over time in the area of OLNG water withdrawals.

1.6 Future Habitat Restoration and Conservation

The Department remains concerned that the proposed permanent footprint of the OLNG terminal and pipeline will interfere with planned and future fish and wildlife habitat restoration activities in the project area and that this issue is not adequately discussed in the DEIS. In the Department's view, the Applicant should provide assurances that presence of the pipeline in particular, will not unreasonably hinder future habitat restoration actions in the project area. For example, OLNG should ensure that the pipeline is sufficiently deep along the entirety of the route so that it does not interfere with stream restoration/enhancement activities such as restoration of hydrologic processes, placement of large woody debris, restoration of tidal processes and floodplain connectivity.

1.7 ODFW In-Water Blasting Permits

Note: The applicant has not identified a need for an In-water blasting permit for Oregon waters; however, some stream crossings have yet to be surveyed so we find that conclusion is unwarranted at this time. We are providing comments for inclusion in the final EIS to address this potential likelihood.

In-water blasting has the potential to injure aquatic fish and wildlife due to percussion shock waves produced by the energy associated with the explosion. This percussion can cause direct injury and stressors including bursting of the swim bladder, hemorrhaging, damage to sensory organs, and triggering of displacement behavior in fish species. All of these impacts should be identified and discussed in the DEIS.

As required by Oregon Administrative Rule 635-425-0000 through 0050 (In-water Blasting Permits) projects shall apply for in-water blasting permits at any [stream crossing locations where] the use of explosives is desired in the course of removing any obstruction in any waters of this state, in constructing any foundations for dams, bridges, or other structures, or in carrying on any trade or business (OAR-635-425-0005). Further, it is the policy of the Oregon Fish and Wildlife Commission to discourage in-water blasting unless it is the only practicable method to accomplish project goals. The Department may issue in-water blasting permits only if they contain conditions for preventing injury to fish and wildlife and their habitat (OAR 635-00015). FERC should require as a condition of its authorization that any in-water blasting activities be approved by ODFW.

ODFW anticipates that frequent coordination with the Applicant will occur should the Applicant identify sites where in-water blasting may be needed. The applicant should only submit an in-water blasting permit application to ODFW after a thorough site analysis and after less impactful techniques are excluded from consideration.

2.0 Terminal and Marine Facilities DEIS General Comments:

2.1 Terminal Siting

The Department remains concerned that the Applicant first identified the preferred location of the terminal and then identified a suitable corresponding pipeline alignment, which unduly restricted the selection of reasonable alternatives for proposed routes and terminal locations. As such, the cumulative environmental impacts of reasonable alternatives for combined terminal/pipeline scenarios were never sufficiently evaluated. The Department recommends that the alternatives analysis be completed for joint terminal/pipeline scenarios with discussion of how environmental impacts compare among the sites considered.

2.2 Fish and Wildlife Habitat Mitigation Policy and Proposed Terminal Impacts and Compensatory Mitigation Information

The Fish and Wildlife Habitat Mitigation Rule (OAR 635-415-0000 through 0025) governs the Department's provision of biological advice and recommendations concerning mitigation for losses of fish and wildlife habitat caused by development actions. Based on standards in the rule, the Department determines the appropriate category to apply to land or water where a development action is proposed. If The Department determines that such habitat is Category 1, the Department must recommend that impacts to the habitat be avoided. If impacts cannot be avoided, the Department must recommend against the development action. If the Department determines that such habitat is Category 2, the Department must recommend that impacts to the habitat be avoided. If impacts cannot be avoided, the Department must recommend a high level of mitigation (as specified in more detail in

the rule). If such mitigation is not required, the Department must recommend against the development action. Specific mitigation goals for habitats determined to be Category 3, 4, 5 and 6, and for which impacts cannot be avoided, are also provided for in (OAR 635-415-0000 through 0025).

The proposed wetland impacts at the terminal and ancillary facilities consist of 3.15 acres of temporary impacts and approximately 34.92 acres of permanent impacts. The Department's understanding is that DSL has reviewed and approved the OLNG terminal wetland delineation report. The proposed wetland impacts at the terminal occur primarily in estuarine intertidal emergent marsh habitat (29.35 ac.) which in this area the Department considers to be Category 3 Habitat. This shallow-water habitat is critical rearing habitat for several ESA-listed salmonids and is also used by a variety of other estuarine-dependent species. For this habitat category, ODFW recommends (1) no net loss of either habitat quantity or quality; (2) avoidance of impacts through alternatives to the proposed development action; or (3) mitigation of impacts, if unavoidable, through reliable in-kind, in-proximity habitat mitigation to achieve no net loss in either pre-development habitat quantity or quality. For the purposes of the Habitat Mitigation Policy, "in proximity" means within the same home range, or watershed (depending on the species or population being considered) whichever will have the highest likelihood of benefiting fish and wildlife populations directly affected by the development.

The information provided in the application regarding the proposed 120-acre mitigation site at the mouth of the Young's River is not sufficient for the Department to assess its merits. However, what information is provided demonstrates that the mitigation does not meet the "reliable in-kind, in-proximity" standard identified in the mitigation policy for Category 3 Habitat. The mitigation approach proposed by the Applicant seeks to re-establish native freshwater tidal marsh as compensation for the loss and destruction of predominantly estuarine emergent tidal wetlands. This is insufficient because the proposed wetland mitigation site near the mouth of Young's River is located several miles upriver from the wetland impact site near the mouth of the Skipanon River. Thus, the assemblage of species, particularly Columbia River Basin ESA-listed salmonids, occupying the proposed Young's River Mitigation Site likely provides habitat for a different assemblage of species than is present at the proposed terminal site. It is not clear to what extent effort was expended by the applicant to identify opportunities for sites that would re-establish similar native estuarine plants and wetland habitats impacted by the proposed Oregon LNG construction and operation activities, but the Department suggests that this be completed in order to meet our habitat mitigation standards.

As the Applicant seeks to identify a suitable mitigation site, the Department recommends that FERC require the applicant to identify a suitable mitigation site in its final EIS, and to discuss the associated environmental impacts. To reduce the Project's environmental impacts to less than significant levels, FERC should require the applicant to include in the Wetland Mitigation Plan a detailed monitoring plan to evaluate the efficacy of the actions taken to meet the goals and objectives for the mitigation. This condition should include required iterative monitoring conducted over a period of 8-10 years by a qualified wetlands ecologist is required to ensure that the flooded wetlands are sufficiently inundated during a significant proportion of the high tides, that intertidal areas and uplands are relatively free from opportunistic invasive species and noxious weeds, that the emergent plant communities are composed primarily of native species, that the restorative actions return sufficient ecological structure and function to side channels and tidal sloughs, and that restored areas actually provides new rearing habitat for juvenile salmon. Moreover, the technical approach and design for a Wetland Mitigation Plan should include an appropriate undisturbed reference area (or multiple reference areas) to serve as a target and baseline for the evaluation of mitigation success. For example, in the case of a dike breaching project, the Wetland Mitigation Plan should include a nearby undiked tidal wetland reference area that

already has hydrodynamic connections to the LCR estuary and provides high ecological values for communities of emergent plants, fish, and wildlife. The monitoring program should be designed to periodically determine the extent to which ecological conditions within the mitigation area emulate ecological conditions within the nearby reference area. The monitoring work should include permanent transects, archival photos and measurements of several parameters that are important to the assessment of wetland ecological performance (i.e., species composition and density of emergent wetland plants, above and below-ground biomass, productivity, pore-water salinity and nutrient concentrations, organic content of soils, etc.) in reference area(s) and mitigation site. A detailed monitoring plan to evaluate changes within the wetland mitigation area and to assess the recovery of wetland ecological functions and processes should be a requirement of any future authorization.

In summary, the Department believes that the final EIS should identify that the proposed estuarine mitigation is neither in-kind nor in-proximity habitat mitigation per the ODFW Habitat Mitigation Policy, and that FERC should require compliance as a condition of its authorization.

2.3 Terminal Lighting

OLNG indicates that the terminal would be lit to provide an average of 5-footcandles of lighting at each unloading arm, 5 foot-candles at each active access point, and an average of 1 foot-candle throughout the remainder of the Terminal. Lighting along the waterside of the terminal and on the pier would be located or shielded to avoid confusing or interfering with navigation on the adjacent waterways. The Department finds the DEIS does not adequately analyze the potential biological effects of the proposed terminal lighting system and that this deficiency should be corrected in the final EIS to ensure such potential significant impacts have been thoroughly evaluated. There is much data regarding fish behavior in shadows and predation interactions under different lighting regimes. Artificial lighting that is often present on over-water structures may disorient migrating juvenile salmonids, compromise their ability to avoid nocturnal predators, and affect the photosynthesis of aquatic vegetation. There is also evidence that artificial lighting affects birds, mammals, reptiles and amphibians. Artificial lighting can disrupt foraging behavior, influence the timing of breeding behavior, increase risk of predation, and movement patterns of wildlife. Migrating and nocturnal birds in particular can be negatively affected by artificial lighting. Lighted towers have been known to attract, confuse and kill birds. Some species may at times benefit from artificial lighting (e.g., foraging opportunity for bats). As such, the Department requests that the final EIS provide a thorough analysis of these and other potential biological effects of all proposed project lighting (terminal and associated facilities) on fish and wildlife resources, during project construction as well as project operation phases. The Department also requests that the final EIS include measures to avoid and minimize potential harmful effects of project lighting on fish and wildlife (e.g., light intensity, light color, directional lighting, timing of artificial lighting, etc.), and that FERC require these measures be taken as a condition of its authorization.

2.4 Dredging Impacts to Aquatic Resources, Sub-tidal Habitat, Fish, and Shellfish

Table 2.1.3-1 (Volume 1) of the DEIS indicates that dredging of aquatic areas associated with the Oregon LNG terminal facilities (turning basin; pier and berth) will impact about 152 acres during construction and about 148 acres during routine operations. The DEIS also indicates that the spatial footprint for the proposed dredge area (berthing area and turning basin; Figure 2.1.1-2) is about 83 acres and the dredging activity (about 300 barge trips) will remove about 1.2 million yd^3 of sub-tidal sediment. Dredging of the vessel berth will occur to a depth of -48 ft MLLW, the turning basin will be dredged to a depth of -43 ft MLLW, and 2 additional feet will be allowed for over-dredging. Maintenance dredging will be required every 3 years with excavation of 300,000 yd^3 of sub-tidal sediment per dredging event.

The proposed area to be dredged (Figures 2.1.1-2; 2.13-2) is composed of sand and soft unconsolidated sediment located in the shallow sub-tidal zone of the Lower Columbia River estuary at a depth of about -20 to 30 ft below MLLW. This area contains ecologically valuable sub-tidal aquatic habitat that is used by diverse communities of estuarine fish, juvenile and adult Dungeness crab, polychaete worms, amphipods, bivalves, and many other types of aquatic organisms. The DEIS fails to accurately and adequately describe the current use of the sub-tidal habitats. In addition, the DEIS fails to adequately describe the proposed actions designed to offset the substantial disruption, perturbation, and losses of ecological functions and processes that are expected to occur during dredging and excavation of the Oregon LNG berthing area and turning basin. For instance, dredging of the berthing area and turning basin to depths of -43 to -48 ft MLLW will negatively impact these communities and habitats by direct removal, disturbance and restructuring of the benthic substrata. In addition, dredging activities associated with construction and maintenance of the berth and turning basin will result in initial and intermittent disturbance (every three years) to the estuarine water column by increasing turbidity and increasing the load of suspended sediments. The primary ecological impacts associated with dredging, siltation and unnatural loadings of suspended sediment in estuaries include: (a) reduced survival and growth of estuarine phytoplankton and zooplankton; (b) decreased feeding capacity and subsequent reduction in planktivorous organisms; (c) direct disturbance and entrainment of bottom fish and benthic epifaunal and infaunal invertebrate communities; (d) smothering and burial of clams, oysters, crab, shrimp, and other shellfish; and (e) decreased survival and growth of submerged aquatic vegetation and macrobenthic algae.

Dredging and disturbance of non-cohesive and unconsolidated soft sediments is widely recognized to cause periods of increased turbidity and increased loads of suspended sediment in the water column. Elevated turbidity results in reduced penetration of light which suppresses primary production by phytoplankton and submerged aquatic vegetation in shallow benthic habitats. Elevated turbidity also contributes to higher water temperatures and decreased concentrations of dissolved oxygen in the water column. Dredging activities are typically associated with disturbance and redistribution of bottom materials and unnatural loadings of fine sediment to the recently excavated areas of the benthos, which affects numerous ecological communities and processes.

The DEIS (Water Resources; pg. 4-46) states that a hopper dredge will be used to excavate sandy sediments in the berth area and turning basin, and that the amount of turbidity generated will be small. However, ODFW disagrees with this conclusion because hopper dredges are known to generate two distinct types of turbidity plumes: (1) a near-bottom plume produced by cutting through the sediment and turbulence generated by dragging the dredge head through the sediments; and (2) an upper plume in the near-surface and mid-water generated by discharge of the hopper overflow slurries. It is expected that the extensive dredging activities carried out to excavate the berth area and turning basin will result in considerable suspended sediment loads where turbidity levels are elevated well above ambient levels both near bottom and throughout the water column. The elevated turbidity and increase in suspended sediment loads that result from dredging of 1.2 million yd^3 of sub-tidal sediment (300 barge trips) is expected to be substantial.

Sub-tidal soft-sediment habitats provide a series of diverse, productive, and dynamic ecological functions and values in the LCR estuary. These ecological functions include (among others) nutrient processing and production of detritus as well as the provision of prey and habitat for foraging by invertebrates, fish, birds, and marine mammals. Soft-sediments play an important role in the microbial and biogeochemical transformations of organic materials/compounds for nutrient cycling, and they typically serve as a sink or reservoir for the deposition of water-borne particles. In some benthic zones

large quantities of nutrients (i.e. phosphorus) and organic material are stored and subsequently released in pulses along with changes in seasonal currents and shifts in thermal regimes. Deposition of organic matter and microbial activity associated with the fine-grained sediments support a complex food web that includes benthic deposit feeders, omnivores and scavengers as well as resident (infaunal, epifaunal, motile) and transitory (seasonal, migratory) species.

Diverse communities of motile, epifaunal, and infaunal invertebrates inhabit the shallow sub-tidal soft-sediments in Young's Bay and the mouth of the Skipanon River, and the communities of arthropods, annelids, cnidarians, mollusks, and other invertebrates are specifically adapted to survive, feed, grow, and reproduce themselves in the unconsolidated sediments. Ambient environmental conditions such as the sediment grain size, organic content, salinity range, depth, water temperature, depth of the aerobic layer, sedimentation rate, and degree of disturbance are often critical factors that determine the specific locations where these organisms occur. The mixed communities of living bivalves and the beds of their non-living shells (e.g., shell rubble or shell hash) function to help stabilize unconsolidated sediments and provide heterogeneous habitat for numerous species of adult and juvenile fishes, crabs, shrimp, amphipods, worms, and other estuarine organisms. In some cases, filter-feeding populations of bivalves play an important role in the removal of phytoplankton and smaller particulate materials, thereby decreasing turbidity and increasing light penetration throughout the water column.

It is expected that dredging of the spatial footprint of 83 acres and excavation of 1.2 million yd^3 of sub-tidal sediment will result in extensive disturbance of processes that occur both at the interface of the water column/sediments and within the upper layer of the soft-sediments. These include shifts in nutrient cycling, disruption of benthic microbial processes, alteration of the deposition and utilization of detritus, direct mortality of benthic organisms, and changes in the composition of benthic communities and ecological functioning of the food webs that support the benthic and epibenthic invertebrates. The Draft EIS (Aquatic Resources; pg. 4-76) acknowledges that diverse communities of benthic and epibenthic invertebrates are found in the shallow soft-sediment habitats in the proposed terminal area and in the adjacent sub-tidal habitats in Columbia River shipping channel. However, the Draft EIS does not include any discussion of impacts to the benthic detritus-based food webs that are expected to result from dredging of the berth area and turning basin. The final EIS should identify and discuss all of these above-described likely impacts associated with dredging.

The Draft EIS also states that "dredging would convert estuarine slope habitat to deepwater channel, bottom-type habitat with little or no slope. The greatest changes would occur nearest the shoreline, where existing depths around 20 feet below MLLW would be deepened to 45 to 50 feet below MLLW." The Draft EIS (Aquatic Resources 5.1.5; pg. 5-10) reaches the conclusion that "the changes in bathymetry could cause minor localized changes in distribution and number of epibenthic and benthic invertebrates but the fundamental processes that support the existing food web would not be affected. In particular, we expect that the dredged area would be rapidly recolonized by Dungeness crab from surrounding habitat." This broad supposition is not supported by any technical information about similarities or differences in the functioning of benthic food webs in shallow (i.e., -20 ft MLLW) and deeper water habitats (i.e., - 45 ft MLLW) in the LCR estuary, nor any specific technical information about rates of re-colonization by Dungeness crab in the estuary. This inaccuracy should be corrected in the final EIS. Previous studies have shown that the effects of dredging on benthic invertebrates are difficult to predict and can vary considerably depending on the spatial extent and temporal frequency of the dredging activities and the physical characteristics of the habitat. In most cases the ecological effects of dredging on assemblages of benthic invertebrates persist over several years, and in some cases the effects persist

over decades. Sites that have a high proportion of short-lived, motile and opportunistic species are expected to recover relatively quickly in comparison with sites with longer-lived sessile species.

Mixed communities of estuarine invertebrates including cnidarians, oligochaetes, polychaetes, crab, shrimp, amphipods, bivalves, snails, and many other types of invertebrates occur in the subtidal areas of Oregon estuaries, and many of these organisms inhabit the proposed Oregon LNG dredge impact area in Young's Bay. Some of these invertebrates are motile (e.g., crab, shrimp, snails, etc.) and may migrate through different regions and depth zones of the sub-tidal area, while others are sessile (e.g., cnidarians, bivalves, etc.) and remain within a specific habitat over the duration of their adult lives. In addition, the species composition of invertebrate communities is not identical between the undisturbed soft-sediment slope habitats in shallow-water (-20 ft MLLW) and the disturbed soft-sediment flat-area habitats in deeper water (-45 ft MLLW) that are subject to periodic and routine disturbance due to maintenance dredging. Observations made in other Oregon estuaries indicate that the undisturbed shallow-water areas are typically characterized by relatively high habitat heterogeneity and a high diversity of invertebrates and fishes while the dredged deep-water areas are typically characterized by low habitat heterogeneity and a lower diversity of invertebrates and fishes.

The LCR estuary is used extensively by juvenile salmonids (primarily Chinook, coho, and chum salmon) for rearing, foraging, and outmigration, and by adult salmon as they return upriver. The juvenile life stages of salmon frequently occur in shallow-water estuarine habitat where they undergo physiological transitions and prey upon epibenthic invertebrates. It is expected that dredging and disruption of the shallow-water benthic habitat and invertebrate communities within the proposed Oregon LNG 83 ac dredge impact area will have negative impacts on survival and growth of the juvenile salmonids. Several species of demersal fishes also inhabit the LCR estuary, and many of these (e.g., Starry flounder, English sole, sand sole, staghorn sculpins, sturgeon) are benthic feeders that utilize sub-tidal habitat to locate their prey, as well as for spawning and rearing. Sub-tidal habitat is also used by many species of migratory fishes such as fall Chinook salmon, coho salmon, steelhead, chum salmon, coastal cutthroat trout, eulachon, topsmelt, Pacific herring, longfin smelt, surf smelt, northern anchovy, etc., and other species (e.g., lingcod, greenling, rockfishes, gobies, sand lance, surfperches, threespine stickleback, Pacific tomcod, and sturgeon).

The LCR estuary supports 16 species of threatened or endangered fish including salmon, steelhead, sturgeon, and eulachon. The Draft EIS acknowledges that construction and operation of the Oregon LNG terminal could potentially impact salmonid rearing and migration habitat, lamprey migration habitat, eulachon rearing, spawning and migration habitat, and green sturgeon feeding habitat within the LCR estuary. However, the Draft EIS is largely dismissive of any lasting ecological impacts to the shallow sub-tidal habitats, and trivializes the disruption, disturbance and permanent alteration of the habitats and the associated communities of invertebrates and fishes. As estuarine fish grow they typically move into deeper sub-tidal areas (often as their ability to avoid predation increases) to meet their survival needs. Species such as sole, sand lance, and sculpin create burrows in sub-tidal soft-sediments to escape predation and to forage for benthic food resources. Salmonids and other fish species also rear and migrate through subtidal soft-sediment habitats to access high energy, primary, or alternate food sources such as burrowing amphipods and other epibenthic or benthic invertebrates. Soft-sediment habitat is also utilized by numerous shallow-water fish (i.e., sculpins) during periods of low tide when they seek refuge in the deeper subtidal areas that are continuously under water. The sub-tidal habitat zone provides a critically important food source (e.g., epibenthic and infaunal invertebrates) for these species during low tides.

In sum, the DEIS is deficient because it does not provide an adequate description of the current use of the sub-tidal habitats, nor the proposed actions designed to offset the substantial disruption, perturbation, and losses of ecological functions and processes that are expected to occur during dredging and excavation of the Oregon LNG berthing area and turning basin.

Dredging Work Outside the ODFW In-Water Work Window: The DEIS (pg. 2-32, Volume 1) states that "Oregon LNG proposes to dredge the turning basin and berth in one 4-month window between June 1 and September 30. Oregon LNG has requested permission to work outside of the ODFW in-water work window of November 1 to February 28 to allow for safe dredge vessel passage across the Columbia River Bar." The proposed dredging activities are well outside the established ODFW In-Water Work Window for the LCR estuary, and the request for a variance to allow for safe vessel operation and navigation is not supported by analysis of data or technical information about the frequency of bar restrictions or wind/swell/discharge conditions at the Columbia River Bar that pose a risk to safe operations of the dredge vessel.

The Draft EIS does not provide a compelling rationale regarding safety concerns for conducting the dredging work outside the ODFW In-water Work Window. The department's In-Water Work Windows are specifically designed to consider the life-history characteristics and presence (or lack thereof) for species of fish and wildlife that inhabit estuaries, bays, streams, and waterbodies that are considered as critical for production. For fishes, the periods of egg incubation until hatching, juvenile residence in natal areas, and early juvenile rearing are the times when the potential for negative impacts from human disturbance are greatest. However, special consideration may be given to situations when large numbers of adult fishes are present at a particular location where In-Water Work will occur that makes use of equipment and methods that are likely to be highly lethal to adults. For shellfish and other invertebrates, the periods of spawning, embryonic and larval development, settlement, recruitment, and early juvenile growth in estuarine habitats are considered as particularly sensitive stages in the life-histories. The final EIS should address these concerns and FERC should not allow the applicant to operate outside the ODFW In-Water Work Window absent sufficient mitigation to reduce the likely significant environmental impacts associated with such an action.

3.0 Pipeline DEIS General Comments:

<u>Oregon Fish Passage Law Compliance and Consistency</u>

As required by Oregon Revised Statute 509.585 (Oregon Fish Passage Law) the Oregon LNG Project (Project) shall address fish passage at all project components that cross waters of the state and where native migratory fish species are or were historically present. The Project proposes numerous components that will cross Waters of the State (as defined in Oregon Administrative Rule 635-412-0005(46)). These waterway crossing components and corresponding construction methods include LNG pipeline construction techniques (horizontal directional drilling, conventional boring, dry or wet open cut trenching) and new or temporary access roads. The extensive road network necessary to access, construct, and maintain the Project will cross multiple streams or waterways and may use a variety of road-stream crossing construction techniques and methods (culverts and bridges). FERC should require that these Project components, which were not mentioned in the DEIS, be designed, constructed, and maintained consistent with Oregon fish passage policy along with the LNG Pipeline and waterway crossings.

The Oregon Department of Fish and Wildlife administers fish passage rules and regulations. To fulfill this statutory requirement and to ensure the project is designed and constructed consistent with Oregon's

fish passage policy, the Project applicant is required to submit specific stream crossing design details at each project component that will cross waters of the state of Oregon. The expectation and goal of these design details are to site specifically identify and depict how each waterway crossing and will meet fish passage rules and regulations. The DEIS does not identify that to date the Project has not submitted the site specific fish passage design details adequate for the Department's review and fish passage permit approval.

Addressing fish passage at all stream crossings is a requirement of Oregon's fish passage rules and regulations (described in Oregon fish passage statutes and rules) and are necessary actions to reduce adverse environmental impacts to less than significant levels. Individual stream crossings at Project sites where native migratory fish are present shall provide passage during construction. FERC should require that the applicant submit site specific plans that describe how fish passage will be provided.

All Project related stream crossings associated with the proposed LNG pipeline installation or Project site access (including any new or upgraded road-stream crossings) will require site specific fish passage plans for Department review and approval. To date this information has not been submitted by the Applicant and the final EIS should address that deficiency. Further, FERC should require compliance with the requirements discussed above as a condition of its authorization.

3.2 Stream Crossings: Trenching at Bedrock Stream Crossings

The DEIS's discussion of trenching at bedrock stream crossings is deficient as it is unclear how bedrock streams would be trenched or how the stream would be restored following trenching. The Department recommends that the final EIS provide additional information regarding this methodology describing how the trench will be cut, how it will be filled to restore channel function, and how it will be monitored to ensure that the trench fill does not scour or result in diversion of flow, and to identify associated environmental impacts of such actions.

3.3 Cathodic Protection Systems

The Department has concerns regarding the use of the proposed impressed-current cathodic protection system. The Department suggests that clarification be provided in the following areas in the final EIS and prior to approval of the system:

A) What will be the operational range of the voltage and amperage of the system?
B) Is there a protective coating on the outside of the pipeline to prevent fish from contacting the exterior of the pipe, specifically lamprey?
C) How deep will the pipe be placed underneath the stream beds?
D) Is it possible to stop the electrical current transmission at each stream crossing?
E) Electrical fields being transmitted into the substrate of a stream or the water in a stream may have detrimental effects on native fish. Has this system ever been used under fish bearing streams? If so, was a study or monitoring plan implemented for the project?
F) What is the repair method if the pipeline coating becomes exposed to stream flow and is damaged?

3.4 Riparian Management Area (RMA Tree Removal)

The Applicant states that vegetation clearing for the pipeline on state and private forest lands will generate merchantable timber that will be cleared in accordance the specifications of the Oregon Forest Practices Act. The Department recommends that the Applicant follow existing OFPA notifications procedures for any harvest proposed, particularly for any area where harvest is proposed within an Oregon Department of Forestry (ODF) designated RMA. If retention trees are proposed for removal in

the pipeline right-of-way (*i.e.* permanent easements, TWS, and ATWS), the trees should be salvaged for subsequent placement on upland wood-deficient soil surfaces or in stream channels in accordance with ODF and ODFW wood placement guidelines. ODFW recommends that the Applicant develop an alternative harvest plan (via ODF) that shows how these trees will be used for habitat enhancement either as instream LWD or downed wood. This should apply as well for any riparian trees not used for commercial purposes.

Specific Comments on the Draft EIS

	Citation	Issue Identification	ODFW Recommended Resolution
1	Volume 1, Page ES-3	**Action Plan Development:** Catastrophic events caused by a significant and active geology underlying the entire route of the project impose a potential threat to fish and wildlife resources adjacent to pipeline, the access and service infrastructure – including roads and staging areas, and the terminal. A well-articulated Action Plan(s) that is activated pursuant to any catastrophic incident is needed to minimize those impacts.	**Action Plan Development:** Correct deficiency by requiring development of an Action Plan that identifies the probability of an impact event, natural or human related, on a section by section basis or at key sensitive locations on the route, and provides a step by step approach to remediating the effects of the incident on fish and wildlife resources. This Action Plan should be evaluated in the final EIS.
2	Volume 1, Page ES-11	**Compressor Station: Noise Mitigation** Noise mitigation may be necessary for Compressor Station near Deer Island due to bald eagle nest within .25 miles of proposed site.	**Compressor Station: Noise Mitigation** The final EIS must confirm distances between active Bald Eagle nest and Compressor Station and FERC should require the applicant coordinate with ODFW and USFWS to mitigate these likely impacts.
3	Volume 1, Page ES-15 and 16 *Major Conclusions*	**Major Conclusions: General** The Major Conclusions section is deficient, especially given the scope of the proposed project and the scale of the potential impacts.	**Major Conclusions: General** Revise to provide a complete summary of the issues, concerns and probable impacts of the project.
4	Volume 1, Section 1.5.2, Page 1-18 *Oregon Laws and Regulations* *See also,* Volume 1 Page *ii Table of*	**Regulations: Fish Passage** This section fails to identify ODFW's Fish Passage Laws as defined by Oregon Revised Statutes 509.580 through 509.910 and corresponding Oregon Administrative Rules (OAR 635-412-0005 through 0040) which requires fish passage plan review and approval to ensure any Project or project components do	**Regulations: Fish Passage** Correct error in final EIS to include fish passage law in this section. FERC should require as a condition of its authorization the development of a fish passage plan for every stream crossing to support its conclusion that environmental impacts have been reduced to less than significant levels.

	Contents	not impede native migratory fish migration.	
5	Volume 1, Section 1.5.2, Page 1-18 *Oregon Laws and Regulations*	**Regulations: Wildlife** This section fails to mention wildlife regulation that protects certain species of nongame fish and wildlife (OAR 635-044-0130). This is the regulation that makes it unlawful to kill, capture, and be in possession of T&E species, migratory birds, and species on Oregon's State Sensitive Species List.	**Regulations: Wildlife** Correct error in final EIS to include regulation in this section and address as basis for conducting pre-construction surveys and fish salvage and wildlife salvage efforts to avoid direct mortality.
6	Volume 1, Section 1.5.4.1, Page 1-24, Table 1.5.4-1	**Agency ODFW: Fish Passage** The Table recognizes Oregon Fish Passage Law but does not cite the ORS & OAR.	**Agency ODFW: Fish Passage** Include reference to Oregon Revised Statutes 509.580 through 509.910 and corresponding Oregon Administrative Rules (OAR 635-412-0005 through 0040).
7	Volume 1, Section 1.5.4.1, Page 1-24, Table 1.5.4-1	**Agency ODFW: Water Use** Section under ODFW identifies Limited Water Use License process that is OWRD's responsibility – not ODFW's. ODFW's role is advisory to OWRD.	**Agency ODFW: Water Use** Correct error by removing ODFW and list under OWRD's authority.
8	Volume 1, Section 1.5.4.1, Page 1-24, Table 1.5.4-1	**Agency ODFW: Wildlife** The name of the wildlife authorization intended to facilitate wildlife salvage/rescue is incorrect.	**Agency ODFW: Water Use** Correct error in Final EIS by changing to "Wildlife Capture, Holding, Transport and Relocation Permit". Require that an application for a Wildlife CHTR Permit would be submitted by Oregon LNG before start of construction.
9	Volume 1, Section 1.5.4.1, Page 1-24, Table 1.5.4-1 *See also,* Volume 1, Section 4.1.1.2, Page 4-17 Paragraph 4	**Agency ODFW: Authority Blasting** Section under ODFW does not identify citation to in-water blasting permit issued by ODFW (OAR 635-425-0000 to -0050)	**Agency ODFW: Authority** Cite in-water blasting rules (OAR 635-425-0000 to -0050).
10	Volume 1, Section 1.5.4.1, Page 1-24, Table 1.5.4-1	**Agency ODFW: Authority STP** As stated, the purpose of the Fish Scientific Take Permit (STP) is unclear.	**Agency ODFW: Authority** Clarify in final EIS that a Fish STP must be issued to facilitate salvage rescue of protected fish before and during project construction. Require as a condition of authorization that an application for a Fish STP must be submitted from Oregon LNG before start of construction.

11	Volume 1, Section 2.1.1.1, Page 2-5, Table 2.1.1-1	**Compensatory Mitigation: Marine Facilities - Pilings** The total fill area for piling placement amounts to 2,124 square feet or .05 acres of subtidal habitat. The DEIS discussion relevant to mitigation for this impact is deficient as it is not clear if this impact is mitigated for.	**Compensatory Mitigation: Marine Facilities - Pilings** The Final EIS needs to identify and characterize impact from piling placement and identify appropriate compensatory mitigation information.
12	Volume 1, Section 2.1.1.1, Page 2-17, Paragraph 3	**Compensatory Mitigation: General** The applicant states that "proposed compensatory mitigation is conceptual" "for undefined mitigation actions, such as removal of fish passage barrier removal… an Adaptive Management Team…. would review specific mitigation projects prior to implementation to ensure their consistency with the mitigation commitments described in this EIS."	**Compensatory Mitigation: General** The Department has expressed our concerns regarding operation and functions of the AIMT in the text at the beginning of this response (Page 1). The final EIS should incorporate our recommendations and require such actions as a condition of its authorization.
13	Volume 1, Section 2.1.1.3, Page 2-17, Paragraph 2, first bullet and Paragraph 4, first sentence *Also,* Volume 1, Section 4.1.5.2, Page 4-110 *Young's Bay Estuarine Enhancement*	**Compensatory Mitigation: Young's Bay Site – Size of Area** The Applicant identifies two different sizes of the proposed Young's Bay mitigation site, 120 acres and 140 acres.	**Compensatory Mitigation: Young's Bay Site – Size of Area** Correct error in final EIS to provide corrected total acreage for Young's Bay mitigation site.
14	Volume 1, Section 4.1.5.2, Page 4-110 *Young's Bay Estuarine Enhancement* *See also* Volume 2 App F	**Compensatory Mitigation: Young's Bay Site (YBMS) – General** Proposed mitigation re: YBMS for ballast water fish entrainment is not adequate absent a demonstration that the applicant is offering acres in excess for what is needed to offset habitat-only impacts.	**Compensatory Mitigation: Young's Bay Site – General** The final EIS must clarify in a more complete discussion the proposed mitigation and how that mitigation provides the same kind of habitat for the same suite of species impacted by its proposed action. FERC must also require the Applicant to provide approved screening or propose financial mitigation to adequately offset impacts to fisheries such as Young's Bay

	PageES-5 Table ES-1 Rows 2-6; Volume 2 App F PageES-5 Table ES-1 Row 2; Volume 2 App F PageES-5 Table ES-1 Rows 2-6	Note: ODFW's position is the YBMS does not offer the same kind of habitat for the same suite of species that is present at the terminal (see Agency Response Section 2.2).	Select Area fish production. See also Agency Response Section 2.2 for additional concerns about the YBMS.
15	Volume 1, Section 2.1.2.2, Page 2-23	**Facility Impacts: New Powerline** The new 230-kV powerline transects areas of substantial habitat value including a new estuarine wetland restoration site adjacent to Lewis and Clark State Park (Fort Clatsop) at Otter Point. The DEIS fails to address this impact in sufficient detail as there is very little reference to habitat quality or quantity along this right-of-way or how the impacts will be mitigated. See also Table 2.1.2-1 *Mitigation*	**Facility Impacts: New Powerline** The final EIS needs to provide much more detail on habitat characterization, quality, quantity and proposed mitigation for impacts to warrant its conclusion that impacts have been appropriately and adequately mitigated. ODFW recommends against allowing any negative impacts to the Otter Point restoration site located on the Lewis and Clark River adjacent to Fort Clatsop, and alternatives should be developed and analyzed in the final EIS that avoid such impacts.
16	Volume 1, Section 2.1.2.3, Page 2-29	**Facility Impacts: Skipanon HDD Crossing** The alternatives analysis for the HDD crossings location for water/wastewater line across Skipanon River is deficient. Rationale for not reducing wetland impact from 1.6 acres to 0.5 acres is weak and relies primarily on the presence and avoidance on impacts to private property rather than avoidance of wetland impacts. Given that the majority of the project overall will be implemented on private land, it is not clear why this is now being used as rationale for not reducing wetland impacts.	**Facility Impacts: Skipanon HDD Crossing** Final EIS must provide further detail on location and habitat typing for alternative HDD crossing locations and critically evaluate the reasonable alternatives. The Final EIS must justify its conclusion, or otherwise, explain why avoidance of impacts on private property prohibits selection of new route for this element of the project.

17	Volume 1, Section 5.1.5, Page 5-10 *See also,* Vol. 2, App_F Section 5.2.1 Page 5-19; Vol. 2, App_F, Section 5.2.2.3, Page 5-23	**Screening: Ballast Water** The Applicant has proposed that ballast and cooling water intakes not be screened. Further, the Applicant maintains that entrainment of eulachon larvae and other species will not be significant at the population level. The Department's comments are provided in Agency Response Section 1.5 (above).	**Screening: Ballast Water** See comments in Agency Response Section 1.5 (above). The final EIS should correct the identified errors and omissions, and FERC should require that ballast and cooling water intakes be screened as a condition of its authorization.
18	Volume 1, Section 2.1.3.2, Page 2-30 Paragraph 1	**Pipeline Impacts:** This paragraph states that 665.1 acres of disturbed land remaining after pipeline construction would be allowed to "revert" to its former use. This suggests that restoration of the disturbed area would be passive and therefore subject to colonization by invasive plant species.	**Pipeline Impacts:** Clarify statement perhaps by including reference to SWPPP.
19	Volume 1, Page 2-32, Section 2.1.4.1 Paragraph 1	**Dredging Impacts:** This section states that OLNG proposes to dredge turning basin between June 1 and September 30. This action will cause significant environmental impacts that are not identified nor discussed sufficiently in this DEIS, because such actions will conflict with fisheries in August and September and could adversely impact fish and shellfish resources.	**Dredging Impacts:** Correct omission/deficiency in final EIS. There is substantial potential for interruption to fisheries during the requested time period. This action is not supported by ODFW because of the adverse resulting impacts. FERC should require dredging to occur within in-water work periods prescribed by ODFW as a condition of its authorization to mitigate such impacts to less than significant levels.
20	Volume 1, Page 2-36, Section 2.1.4.2, Table 2.1.4-1	**Construction Spreads:** Construction spreads 2 and 3 reference Highway 6. Highway 6 is no longer in the project area.	**Construction Spreads:** Revise as necessary.
21	Volume 1, Page 2-38, Section 2.1.4.2 *Pipeline Corrosion Protection and Induced Alternating current Mitigation*	**Cathodic Protection:** The DEIS discussion does not sufficiently discuss how the cathodic protection system will affect animal behavior at stream and wetland crossings.	**Cathodic Protection:** See Agency Response 3.3 (above). The final EIS should be modified to correct this deficiency and FERC should require our recommended actions prior to approval of the system.

22	Volume 1, Section 2.1.4.2, Page 2-39 *Hydrostatic Testing*	**Hydrostatic Testing** The DEIS fails to explain sufficiently why the applicant will backfill the pipeline prior to hydrostatic testing. If leaks are discovered during hydrostatic testing, additional soils disturbance and construction-related impacts on terrestrial and aquatic ecosystems could occur.	**Hydrostatic Testing** Explain rationale and how additional disturbance would be minimized.
23	Volume 1, Section 2.1.4.2, Page 2-39 *Hydrostatic Testing*	**Hydrostatic Testing** This section states that hydrostatic test water would be analyzed prior to discharge back into the Columbia. However, the DEIS does not discuss the relevant water quality parameters being evaluated and the plan if standards are not met.	**Hydrostatic Testing** Correct deficiency by explaining process for analyzing and treating (as needed) hydrostatic test water.
24	Volume 1, Section 2.1.4.2, Page 2-40 *Pipeline and Associated Aboveground Facilities, Special Pipeline Construction Techniques, Wetland Crossings*	**Pipeline: Wildlife Impacts** This section does not address potential for wildlife presence or techniques that would be employed to avoid / minimize direct mortality to wildlife.	**Pipeline: Wildlife Impacts** Correct deficiency by describing how wildlife presence in wetland crossings would affect construction techniques(s).
25	Volume 1, Section 2.1.4.2, Page 2-41 *Waterbody Crossings*	**Waterbody Crossings: Fisheries** The "fisheries data" referenced in the first paragraph was largely provided from ODFW.	**Waterbody Crossings: Fisheries** Cite or reference ODFW as applicable
26	Volume 1, Page 2-41, Section 2.1.4.2 *Pipeline and Associated Aboveground Facilities, Special Pipeline Construction Techniques, Waterbody Crossings*	**Waterbody Crossings: Wildlife** This section fails to consider wildlife presence data in addition to fisheries data. There are species of protected wildlife and/or their life forms (e.g., amphibian egg masses, frog tadpoles) that could be present even if fish are not that should affect crossing method employed.	**Waterbody Crossings: Wildlife** Correct deficiency by describing how wildlife presence in waterbody crossings would affect construction technique(s).

27	Volume 1, Page 2-41 to 44 Section 2.1.4.2 *Flume and Open Cut Trenching*	**Waterbody Crossing: Fish salvage and Flow Protection** There is no discussion in this section regarding dewatering and fish salvage prior to construction.	**Waterbody Crossing: Fish salvage and Flow Protection** The final EIS should discuss and FERC shuld require that during construction at a stream crossing location, normal flows must be retained in the channel below the action area over the duration of the crossing project to prevent the creek from drying up downstream. Reference needed for fish removal/salvage at all stream crossings where salvage is necessary, and techniques or methods used to ensure the stream below a stream crossing does not lose surface flow and/or dry up.
28	Volume 1, Section 2.1.4.2, Page 2-41-43 *Open-Cut Trench* *See also,* Volume 2, App_F, Section 2.3.1.2, Paragraph 1 Volume 2, App F, Section 5.1.1, Page 5-5, Paragraph 1	**Waterbody Crossings: Open Cut Trench** The DEIS fails to adequately address environmental impacts that would result from such actions. This technique should only be employed in waterbodies that are dry at the time of construction. As stated elsewhere in the document, this method is applicable to intermittent and ephemeral streams that are not fish-bearing, fish-bearing intermittent or ephemeral streams that are dry at the time of construction, and perennial streams that are minor, non-fish-bearing but are not directly tributary to a fish-bearing stream.	**Waterbody Crossings: Open Cut Trench** ODFW recommends that FERC require water diversion equipment be installed at all perennial stream crossings, or that it is immediately available at intermittent or ephemeral stream crossings (in the event of precipitation), so that regardless of the hydrologic characteristic of the stream, flowing water is always bypassed around the work area consistent with Oregon fish passage law. ODFW recommends that construction activities not occur in actively flowing water. The description in 2.1.4.2 does not make this clear and is necessary to avoid significant environmental impacts.
29	Volume 1, Section 2.1.4.2, Page 2-47 *Conventional Boring*	**Conventional Boring: Locations** DEIS discussion is vague and insufficient. Section does not state specifically where conventional boring will be used or if there are any additional habitat impacts.	**Conventional Boring: Locations** Final EIS should identify locations for conventional boring and adjacent habitat types that could be impacted.
30	Volume 1, Section 2.1.8, Page 2-51 *Future Plans and Abandonment*	**Abandonment: Bond Requirements.** The DEIS includes no clear reference to bond requirements to fund clean-up in the event the pipeline is abandoned. This is a significant concern for ODFW particularly at stream and wetland crossings.	**Abandonment: Bond Requirements** Clarify or include bond requirement for terminal and pipeline clean-up in the event of abandonment.

31	Volume 1, Section 3.2.2.2, Page 3-8, *System Alternatives*	**Alternatives: Existing Facilities** The DEIS fails to sufficiently analyze and compare environmental consequences of a reasonable range of alternatives. For example, an alternative was rejected based on the distance LNG carriers would have to go to reach it, but there is no comparative analysis of how environmental impacts compared between the existing NW Natural Gas peak shaving plant on the Willamette River and the proposed Skipanon site. In Section 3.0 on Page 3-1 FERC states that the EIS is to compare the environmental impacts of the proposed action against a range of alternatives, this was not done.	**Alternatives: Existing Facilities** DEIS must be amended to adequately compare environmental and other consequences pertaining to the use of existing facilities or other terminal location alternatives as reasonable alternatives to proposed action.
32	Volume 1, Section 3.3.2.1, Page 3-12, 2nd to last Paragraph	**Alternatives: Marine Carrier Transit .** Many of the alternative Columbia River sites were rejected from consideration because of "long transit times upstream" or for other reasons that are not sufficiently discussed. There is no explanation given why the stated reason for rejection was important and there is no compare/contrast of alternatives with the proposed action.	**Alternatives: Marine Carrier Transit** Correct deficient alternatives analysis by comparing and contrasting these reasonable alternative sites against proposed action. (*e.g.* Address why is an additional 50+ miles of Columbia River transit time an important or relevant criteria justifying rejection of that alternative?) The DEIS must evaluate how potential environmental impacts associated with the proposed terminal site and pipeline compare to the alternative sites.
33	Volume 1, Section 3.3.2.2, Page 3-16 *Safety and Suitability…* (Bullet c)	**Alternatives: Marine Carrier Transit** The statement "In addition, the lower Columbia River is designated critical habitat and Essential Fish Habitat for salmon. Thus, LNG marine carriers have a greater likelihood of impacting this habitat and subsequently the salmon when traveling longer distances upriver" is not supported with a citation or any evidence that this statement is true when compared to impacts from the proposed action.	**Alternatives: Marine Carrier Transit** Correct error/deficiency: Provide rationale preferably using cited literature to support assumptions.

34	Volume 1, Section 3, Page 3-17, *Environmental Criteria, 1(a)*	**Terminal: Fish Density** The DEIS discussion on fish density assumes that the density of fish would be less in wider portions of the river. This assumption is fundamentally flawed given the many physical, chemical, and biological variables that contribute to migration rate, habitat occupancy, and density. The DEIS fails to discuss or evaluate that the terminal location at the west end of Young's Bay may expose Young's Bay Select Area smolt releases to increased impact from dredging water intake entrainment.	**Terminal: Fish Density** ODFW recommends that the final EIS explain its assumption and hypothesis that fish density is lower in wide sections of the river. Also, the final EIS should provide some discussion recognizing that the number of juvenile fish emigrating or adult fish immigrating past a site is higher in lower river sections than it is in sites located further upstream. The final EIS must also sufficiently discuss the influence of Young's Bay Select Area smolt outmigrants on dredging and entrainment impacts.
35	Volume 1, Section 3, Page 3-17, *Environmental Criteria, 1(a)*	**Terminal: Fish Use** The DEIS does not address potential impacts to salmonid smolt releases from the adjacent Young's Bay Select Area net pens and tributary hatcheries that are approximately 5.9 million annually. The potential exists that these smolts may emigrate from Young's Bay in close proximity to the proposed OLNG site and could be exposed to water withdrawals/entrainment. Due to the expected requirement of 2.6 (page 2-10) billion gallons of water annually, NOAA-compliant screening is important to mitigate against adverse impacts.	**Terminal: Fish Use** The final EIS needs to analyze how hatchery releases from Young's Bay (SAFE Areas) will be affected by presence of the terminal, marine structures and water intakes.
36	Volume 1, Section 3.0, *Alternatives for Terminal and Pipeline locations*	**Terminal Site Selection:** In their alternatives analyses, OLNG first identified the preferred location of the terminal and then identified a suitable corresponding pipeline alignment. As such, the cumulative environmental impacts associated with various combined terminal/pipeline scenarios were never evaluated against the other alternative terminal/pipeline scenarios. For example, it would	**Terminal Site Selection:** The final EIS must correct the deficient alternatives analysis. ODFW recommends that the alternatives analysis be completed for joint terminal/pipeline scenarios with discussion of how environmental impacts compare among the sites considered. See also Agency Response section 2.1 (above).

		be important to evaluate the net environmental impacts of a lower river terminal w/long pipeline vs. upper river terminal w/ short pipeline. (Note: This is also discussed in Agency Response Section 2.1 (above).	
37	Volume 1, Section 3.4.1.4, Page 3-50 Table 3.4.1-2	**Pipeline: Route Variation** Variation Name is Nehalem River but the description given is for pipeline crossing at 33.4, Lewis and Clark River. This needs to be corrected.	**Pipeline: Route Variation** Correct discrepancy.
38	Volume 1, Section 4.1.1.1, Page 4-9 Paragraph 1	**Terminal: Earthen Berm** The proposed earthen berm represents a permanent loss of riparian vegetation recruitment and should be accounted for specifically in the mitigation plan. It is not clear if this is the case.	**Terminal: Earthen Berm** Clarify and indicate level of riparian mitigation associated with construction of the earthen berm.
39	Volume 1, Section 4.1.1.2, Page 4-23	**Natural Hazards: Fire Risk** Forest Fires are not described in this section. Given the potential changes in climate and fire patterns, particularly relevant in summer 2015, the potential effects on fish and wildlife resources in the presence of natural gas facilities should be discussed.	**Natural Hazards: Fire Risk** Correct omission by providing additional discussion as indicated.
40	Volume 1, Section 4.1.2.2, Page 4-37, Last Paragraph	**Monitoring: Vegetation** The DEIS proposes two years monitoring for revegetation success, which is not adequate to ensure free-to-grow stage particularly in areas where soil disturbance will lead to high risk of colonization by invasive plants.	**Monitoring: Vegetation** FERC should require as a condition of its authorization at least 5 years of revegetation monitoring.
41	Volume 1, Section 4.1.2.2, Page 4-43, Last Paragraph *Groundwater Impacts*	**Ground Blasting Impacts:** DEIS is vague and does not include or evaluate impacts of blasting to fish and wildlife.	**Ground Blasting Impacts:** Blasting, if used on the project, needs to be better defined in the final EIS in the context of sound traveled and potential impacts to certain species of fish and wildlife. FERC should require that any blasting in any water body will require a permit condition set by ODFW.

42	Volume 1, Section 4.1.3.2, Page 4-48, 49 *Accidental Spills*	**LNG Spill:** DEIS fails to identify and discuss a potentially significant environmental impact of the proposed action. There is no mention of what Liquid Natural Gas will do once vaporized, and if in large quantity will it travel with the wind and in concentrations that could affect wildlife or humans.	**LNG Spill:** Additional explanation is needed in final EIS. Specifically as related to potential impact to wildlife due to accidental spills.
43	Volume 1, Section 4.1.3.2, Page 4-49	**Propeller Wash:** is the DEIS makes no assessment of the proportion of the shoreline area near the terminal that could suffer erosion from propeller wash. Therefore the magnitude of the "potential" of the problem is not known. This needs to be assessed to be prepared in the event erosion does become an issue.	**Propeller Wash:** Correct deficiency by providing an assessment of the shoreline near the terminal to determine what the proportion of the area could suffer propeller wash induced erosion, and have in place a prescribed approach to remediating this impact on a site by site basis.
44	Volume 1, Section 4.1.3.2, Page 4-54, Paragraph 4	**Pipeline: Crossing Method** The statement that "Flowing waterbodies would be crossed [with the pipeline] using the most practical techniques identified based on the condition of the waterbody…" needs to be rephrased to indicate that work will not occur in actively flowing water.	**Pipeline: Crossing Method** Rephrase to indicate that work will not occur in actively flowing water. We recommend that due to potentially significant environmental impacts associated with working in actively flowing water that as a condition of FERC's authorization no such work may occur.
45	Volume 1, Section 4.1.3.2, Page 4-55, Table 4.1.3-7	**Pipeline: Crossing Method** There are several waterbody pipeline crossings (MP 70.7, 71.8, 73.0, 75.4) where Open Cut crossing method is identified. These are fish bearing streams with actively flowing water.	**Pipeline: Crossing Method** The final EIS should indicate that ODFW recommends against work in actively flowing water. We recommend that FERC require the applicant to select an alternative method at these locations and revise section to reflect alternative methodologies
46	Volume 1, Section 4.1.3.2, Page 4-55, Paragraph 2	**Pipeline: Vertical Scour -General** The Section describes the geomorphic risk of channel scour response and addresses this by burying the pipeline at least 5 feet below the predicted vertical scour elevation at each site where ESA fish species are present. The Department believes that this	**Pipeline: Vertical Scour - General** FERC should require as a condition of its authorization that the pipeline be buried at least 5 feet below the predicted vertical scour elevation at all streams in Oregon that presently have or historically had native migratory fish and not just streams presently occupied by ESA species. The final EIS should be revised to reflect this requirement as

		performance standard should also be applied to all streams in Oregon that presently have or historically had native migratory fish and not just streams presently occupied by ESA species.	necessary to reduce potential environmental impacts to less than significant levels.
47	Volume 1, Section 4.1.3.2, Page 4-55, Table 4.1.3-7	**Pipeline: Vertical Scour – Site Plans** As described in Table 4.1.3-7 for stream crossings on Little Clatskanie, Milton, Merrill and Deer Island Slough only a vague mention of the potential for vertical scour is made. More information on the adjacent stream profile and possible grade controls, natural or human caused, in the vicinity of the crossing is needed before the projects can be approved to ensure the best prescribed depth for the pipe crossings. For instance both the culvert that conveys the Little Clatskanie on Apiary Road, and the tide gates at the head of Deer Island Slough, are targeted for replacement. Should the pipe be set at the wrong depth, it is possible that once these other structures are removed that head cutting could advance to the stream location where the pipe crosses the water body.	**Pipeline: Vertical Scour – Site Plans** Correct deficient analysis. Stream crossings need to be better defined in the text with specific on-site information, if available, prior to construction so the pipe crossing is completed at the appropriate depth.
48	Volume 1, Section 4.1.3.2, Page 4-56, Paragraph 4	**ODFW In-water Work Period** The ODFW recommended in-water work period is incorrectly stated as June 1 through September 30. The actual in-water period varies considerably among crossing locations.	**ODFW In-water Work Period** The final EIS should refer to ODFW In-water guidelines for each waterbody. http://www.dfw.state.or.us/lands/inwater/oregon_guidelines_for_timing_of_%20InWater_work2008.pdf
49	Volume 1, Section 4.1.3.2, Page 4-56 *Surface Waters Impacts and Mitigation*	**Waterbody Crossings: Wildlife** This section does not address how presence of protected wildlife may affect crossing methods.	**Waterbody Crossings: Wildlife** Revise to indicate that the Applicant must also coordinate with the Department regarding presence of special status wildlife in waterbodies and waterbody crossing methods.

50	Volume 1, Section 4.1.3.2, Page 4-61, Table 4.1.3-9	**Water Withdrawal:** ODFW does not support withdrawal of water from the Nehalem River or Rock Creek during the period June-October. The DEIS fails to discuss the adverse environmental effects associated with withdrawal outside November through May.	**Water Withdrawal:** ODFW recommends that if water is needed from the Nehalem River or Rock Creek, that it is only withdrawn during the period November through May.
51	Volume 1, Section 4.1.4.2, Page 4-67 and 4-71	**Vegetation Monitoring:** Three years monitoring (earlier stated as 2 years on Page (4-37) for revegetation success is not adequate to ensure free to grow stage particularly in areas where soil disturbance will lead to high risk of colonization by invasive plants.	**Vegetation Monitoring:** Use 5 years minimum as goal for revegetation monitoring. Reference Revegetation Plan where success criteria are defined.
52	Volume 1, Section 4.1.5.1, Page 4-73, Paragraph 2 *Terminal and Marine Transit Route*	**Habitat Utilization:** The statement "Deep subtidal/open water habitat plays several important ecological roles in the estuarine ecosystem as juvenile salmonids use the deep subtidal/open water habitat for feeding and movement" is not universally true as suggested. Juveniles may use these deepwater areas but are often associated with shallow-water estuarine margins.	**Habitat Utilization:** The final EIS needs a citation to support or justify the conclusion made, or it must modify assumptions and correctly discuss associated impacts.
53	Volume 1, Section 4.1.5.1, Page 4-78, Table 4.1.5-3	**Crossing Methods/Locations:** The listed crossing methods and MP locations for stream crossing in the table are not consistent with those previously referred to in Table 4.1.3-7.	**Crossing Methods/Locations:** Revise MP listing and crossing method as needed.
54	Volume 1, Section 4.1.5.1, Page 4-78, Table 4.1.5-3 *See also* Volume 1, Section 2.1.4.2, Pg 2-43,Para 1 *Open-Cut Trench*	**Open Cut Trench: Location** ODFW recommends against open-cut trench at MP 25.9 and MP 44.8 or in any area with active flowing water.	**Open Cut Trench: Location** Revise to indicate use of flume crossing at these locations, which should be required as a condition of authorization.

55	Volume 1, Section 4.1.5.1, Page 4-78, Table 4.1.5-3	**Stream Crossings: Fish presence** The table of stream crossings with salmonids present is incomplete as it doesn't reference many of the fish crossings identified by ODFW and submitted to OLNG (Email from Chris Knutsen, ODFW North Coast District Fish Biologist Callaway and Lorenz (CH2MHill) on 3/23/15 available on request).	**Stream Crossings: Fish presence** Revise table to include all crossings with salmonids present as identified by ODFW.
56	Volume 1, Section 4.1.5.2, Page 4-81, *Other Benthic and Epibenthic Invertebrates*	**Compensatory Mitigation: Loss of Dungeness Crab** The Applicant estimates the loss of Dungeness crab due to initial dredging at 600 --1200 crabs, but does not mention how the loss will be compensated or mitigated for.	**Compensatory Mitigation: Loss of Dungeness Crab** Describe how loss of Dungeness crab will be mitigated for and require such mitigation as a condition of authorization.
57	Volume 1, Section 4.1.5.2, Page 4-85 *Construction of Pier, Dolphins, and Access Trestles*	**Compensatory Mitigation: Pole Placement** The 0.02 and 0.04 acres of shallow and deep water habitat (respectively) impacted by pile placement, though small, still needs to be accounted for in the compensatory mitigation plan.	**Compensatory Mitigation: Pole Placement** Revise and address mitigation concern as indicated.
58	Volume 1, Section 4.1.5.2, Page 4-90 *Aquatic Resources Impacts and Mitigation, Spills*	**Spills: Wildlife** This section does not address the fact that spills can affect wildlife.	**Spills: Wildlife** Correct deficiency/error by addressing wildlife impacts and response.
59	Volume 1, Section 4.1.5.2, Page 4-100 *Aquatic Resources Impacts and Mitigation, Pipeline Construction and Operation*	**Impacts and Mitigation: Wildlife** This section fails to acknowledge the need and opportunity to minimize impacts to wildlife during waterbody crossings.	**Impacts and Mitigation: Wildlife** Address wildlife impacts and require adequate mitigation.

60	Volume 1, Section 4.1.5.2, Page 4-100 *Aquatic Resources Impacts and Mitigation, Direct Mortality*	**Impacts and Mitigation: Wildlife** This section fails to mention mortality of wildlife, in particular aquatic species or life forms thereof present during construction. ODFW's Wildlife Capture, Holding, Transport, Relocation Permit is intended to facilitate wildlife salvage/rescue efforts.	**Impacts and Mitigation: Wildlife** Correct error: Address wildlife mortality as a potential environmental impact. Indicate that the Applicant must obtain a Wildlife CHTR Permit and conduct wildlife salvage/rescue operations to avoid/minimize direct mortality of wildlife, in particular protected nongame species, and require such permits as a condition of authorization.
61	Volume 1, Section 4.1.5.2, Page 4-101 Aquatic Resources Impacts and Mitigation, Sedimentation and Turbidity	**Impacts and Mitigation: Wildlife:** This section fails to address potential impacts to wildlife. Sedimentation and turbidity can negatively affect amphibians (smothering of eggs and gills of larval forms, changes to food web, disruption of foraging).	**Impacts and Mitigation: Wildlife** Correct deficiency by addressing potential impacts to wildlife as indicated.
62	Volume 1, Section 4.1.5.2, Page 4-102 *Aquatic Resources Impacts and Mitigation, Fish Passage*	**Wildlife Passage:** ODFW recommends that the final EIS acknowledge and address potential impacts to wildlife passage. Note: Efforts to protect and provide fish passage would be expected to also benefit many aquatic wildlife species.	**Wildlife Passage:** Address impacts to wildlife related to impediments to movement and passage of wildlife at stream and other crossings resulting from proposed action and how such impacts may be mitigated.
63	Volume 1, Section 4.1.5.2, Page 4-102 *Aquatic Resources Impacts and Mitigation, Fish Passage*	**Fish Passage: ODFW Approval** The DEIS states that "Prior to Construction, Oregon LNG would prepare a Fish Passage Plan to meet Oregon's statutes and rules governing fish passage". Oregon law requires these plans are submitted prior to construction as indicated. However, these plans also require Department review and approval prior to construction (per ORS 509.585).	**Fish Passage: ODFW Approval** Revise to indicate the need for ODFW approval of fish passage plans prior to construction.
64	Volume 1, Section 4.1.5.2, Page 4-103 *Aquatic Resources Impacts and Mitigation, Riparian Vegetation*	**Riparian Vegetation: Wildlife** This section does not address the value of riparian vegetation to wildlife. ODFW recommends retention of riparian vegetation regardless of fish presence due to benefits related to water quality, quantity and wildlife resources, including micro-habitat	**Riparian Vegetation: Wildlife** The final EIS should discuss the important relationship between wildlife and riparian habitat. Clarify meaning of or define "significant wildlife snags".

		conditions. Several status species of wildlife are associated with small non-fish bearing streams (e.g., Coastal tailed frog, torrent salamander). Clarify what are "significant wildlife snags"?	
65	Volume 1, Section 4.1.5.2, Page 4-104 *Aquatic Resources Impacts and Mitigation, Large Woody Debris*	**Large Woody Debris (LWD): Wildlife** The value of LWD to wildlife is not acknowledged. Oregon LNG's planned installation of LWD will also benefit wildlife.	**Large Woody Debris: Wildlife** Correct omission by discussing value of LWD to wildlife. Consider wildlife impacts when installing LWD.
66	Volume 1, Section 4.1.5.2, Pages 4-105 to 4-108 *Aquatic Resources Impacts and Mitigation, Landslides and Mass Failures /Water Withdrawals and Discharges /Blasting /Spills*	**Wildlife Impacts: General** These sections fail to address impacts to wildlife.	**Wildlife Impacts: General** Correct omission/deficiency by addressing wildlife Impacts.
67	Volume 1, Section 4.1.5.2, Page 4-108 *Aquatic Resources Impacts and Mitigation, Landslides and Mass Failures /Water Withdrawals and Discharges /Blasting /Spills*	**Spills:** The only reference to equipment or construction related spills and leaks is made by quoting that fueling stations will be sited 150 feet from a water body and spill kits will be available. More protective spill prevention measures should be listed in this section .	**Spills:** Correct deficiency by revising to list other common techniques that should be applied to reduce the chance fluids and construction equipment related fuels will enter a water way. i.e.; 1. Check hydraulic lines on heavy equipment on a daily basis. 2. All heavy equipment that crosses a dry or flowing stream shall have an adequate "diaper" placed to capture fuels and drips. 3. All pumps used in conveying water to isolate a work area shall be operated in a small pool or enclosure Any standard protective list used by ODOT etc. should suffice.

68	Volume 1, Section 4.1.5.2, Page 4-108 *Aquatic Resources Impacts and Mitigation, Disturbance Due to Pipeline O&M Activities*	**Maintenance: Wildlife Impacts** The DEIS fails to consider impacts to wildlife caused by periodic mowing near streams and other waterbodies can result in direct mortality to certain wildlife (e.g., red-legged frog, western painted turtle).	**Maintenance: Wildlife Impacts** The final EIS must address impacts to wildlife and describe how O&M would occur in a manner that avoids/minimizes direct mortality to wildlife.
69	Volume 1, Section 4.1.5.2, Page 4-109 *Aquatic Resources Impacts and Mitigation, Compensatory Mitigation*	**Wildlife: General** The Young's Bay Estuarine Enhancement, Fish Barrier Removal, and Other Compensatory Mitigation sections should describe benefits to wildlife. ODFW recommends designing fish passage projects to maximize benefits to wildlife. Implement fish and wildlife salvage/rescue at mitigation site during construction (e.g., removal of culverts).	**Wildlife: General** Describe benefits of proposed compensatory mitigation projects to wildlife. Incorporate wildlife-friendly passage designs. Discuss how Fish STP and Wildlife CHTR Permit will avoid/minimize direct mortality during mitigation.
70	Volume 1, Section 4.1.5.2, Page 4-109 *Aquatic Resources Impacts and Mitigation, Compensatory Mitigation*	**Compensatory Mitigation: Fish Passage Approval** The proposed Compensatory Mitigation Plan describes two primary actions to mitigate for impacts associated with the proposed Project. These mitigation actions will require State of Oregon Fish Passage Approval prior to these actions, as required by ORS 509.585, as they trigger the state's passage authority. These two actions include the Young's Bay Estuary Mitigation (n=1 project) and the removal of 8 fish passage barriers (n=8 projects) will require the State of Oregon's approval.	**Compensatory Mitigation: Fish Passage Approval** Each of these individual actions (n=9) requires the applicant to submit Project specific plans for ODFW's review and approval prior to construction. The final EIS should so state and FERC should require such action as a condition of its authorization.
71	Volume 1, Section 4.1.6.1, Page 4-120 Paragraph 4 *Impacts and Mitigation*	**Replanting: General** DEIS insufficiently justifies the rationale for planting non-disturbed wetland areas with a wetland seed mix following construction.	**Replanting: General** Provide rationale.

72	Volume 1, Section 4.1.6.1, Page 4-120 *Vegetation, Terminal, Impacts and Mitigation*	**Revegetation: Monitoring** Current plan is for Oregon LNG to "monitor the success of revegetation at the terminal site for at least the first two growing seasons according to its Plan."	**Revegetation: Monitoring** The Department recommends a 5-year minimum monitoring period.
73	Volume 1, Section 4.1.6.2, Page 4-124, Paragraph 4 *Impacts and Mitigation*	**Upland Vegetation: Temporary Impacts** The document states "Specific mitigation proposals for upland vegetation (habitat) replacement or substitution arising from the FWS and ODFW Habitat Mitigation Policy (which define the upland vegetation types) would be limited to the permanent impact areas. Further information on this policy is provided in section 4.1.7.3." It is not clear what is defined as a 'temporary upland vegetation impact'. As such, it is not possible to determine if mitigation is necessary.	**Upland Vegetation: Temporary Impacts** The applicant should further define 'temporary upland vegetation impact'.
74	Volume 1, Section 4.1.6.2, Page 4-124, Paragraph 6 *Impacts and Mitigation*	**Noxious/Invasive Weeds:** Noxious and Invasive weed prevention plans should be described in the EIS.	**Noxious/Invasive Weeds:** Include plans in final EIS and require such plans as a condition of authorization.
75	Volume 1, Section 4.1.6.2, Page 4-124(125) *Impacts and Mitigation*	**Herbicide Use:** "Herbicides would be applied if necessary to control noxious weeds but would not be used within 100 feet of waterbodies or wetlands unless approved by appropriate state and federal agencies."	**Herbicide Use:** ODFW recommends that the IAMT be consulted prior to any application of herbicide within 100 feet of water bodies or wetlands.
76	Volume 1, Section 4.1.6.2, Page 4-127 *Forestry*	**Riparian FPA Rules:** The OLNG states that vegetation clearing for the pipeline on state and private forest lands will generate merchantable timber that will be cleared in accordance the specifications of the Oregon Forest Practices Act (FPA). Oregon FPA requires retention of	**Riparian FPA Rules:** ODFW recommends that the Applicant consult ODF stewardship foresters for assistance with FPA requirements including notification procedures for any harvest proposed. ODFW recommends avoidance and minimization of riparian impacts to the extent practical. If retention trees are proposed for removal in the pipeline right-of-way (*i.e.*

		certain trees in riparian buffers on perennial fish bearing streams, which may not be possible when clearing a linear right of way perpendicular to a fish bearing stream.	permanent easements, TWS, and ATWS), the trees should be salvaged for subsequent placement on upland wood-deficient soil surfaces or in stream channels in accordance with ODF and ODFW wood placement guidelines. ODFW recommends that OLNG develop a harvest plan (via ODF) that shows how these trees will be used for habitat enhancement either as instream LWD or downed wood.
77	Volume 1, Section 4.1.7 , Page 4-131 *Terrestrial Wildlife*	**Habitat: General** The DEIS fails to identify that ODFW is in the process of revising the 2006 Oregon Conservation Strategy (OCS). The 2015 OCS will include updated habitat descriptions for a few habitat types. These are available and ODFW recommends using them in the Final EIS.	**Habitat: General** Utilize revised Oregon Conservation Strategy habitat descriptions and habitat typing in the final EIS. 2015 OCS can be found at http://www.dfw.state.or.us/conservationstrategy/read_the_strategy.asp
78	Volume 1, Section 4.1.7.1, Page 4-132 *Terminal, Existing Environment*	**Wildlife Surveys:** Wildlife surveys, bald eagle nesting, wildlife observation datasets. The DEIS relies upon outdated wildlife survey information collected in 2007, eight years ago. ODFW recommends new wildlife surveys be conducted. Update wildlife occurrence info based on current ORBIC and ODFW wildlife observation datasets.	**Wildlife Surveys:** FERC should require applicant to update wildlife use and habitat value info based on new surveys and new wildlife datasets. This information should be incorporated into the final EIS.
79	Volume 1, Section 4.1.7.1, Page 4-133, Table 4.1.7-3 *Terminal Wildlife Impacts* *See also,* Volume 1, Table 4.1.7-4, Page 4-139 *Pipeline, Impacts and Mitigation*	**Habitat Categories:** For each habitat type and category it is not clear how many acres are permanent impact vs. temporary impact.	**Habitat Categories:** The final EIS should split temporary and permanent impacts by habitat type and category.

80	Volume 1, Section 4.1.7.1, Page 4-134 *Terminal, Impacts and Mitigation, Construction*	**Wildlife Impacts: Construction** In addition to small rodents, snakes and insects, project construction and construction equipment may result in direct mortality of amphibians, native turtles and ground nesting birds (e.g., killdeer) if they are in the work area. This section does not state how mortality of wildlife in particular of protected wildlife species will be avoided and minimized.	**Wildlife Impacts: Construction** Revise to include impacts to protected wildlife species that could suffer mortality. Describe how direct mortality will be avoided/minimized e.g., exclusion fence, pre-construction wildlife surveys, and implementation of Wildlife CHTR to facilitate capture and relocation of wildlife out of harm's way, and require such actions be taken as a condition of authorization.
81	Volume 1, Section 4.1.7.1, Page 4-137 *Terminal, Impacts and Mitigation Operations, Fencing*	**Wildlife Impacts: Fencing** It is not clear if the perimeter fence would be designed and/or installed such that some species of wildlife would be able to pass under it.	**Wildlife Impacts: Fencing** Clarify permeability of perimeter fence to small and medium sized wildlife species (e.g., reptiles, amphibians, birds, etc...).
82	Volume 1, Section 4.1.7.2, Page 4-140 *Pipeline Facilities, impacts and Mitigation, Construction*	**Wildlife Impacts: Open Trench** The open trench may also entrap and cause injury or even mortality of wildlife depending on species and duration of entrapment. Wildlife presence is often not evident depending on species behavior and ecology, time of day/season, environmental conditions, etc. ODFW recommends minimizing the length of open trench and duration of opening along the entire pipeline route. It is not clear how temporary crossings would be provided and how frequently they would be installed. Other measures can be taken to address potential for entrapment – exclusion fence, sediment berms, daily checks and removal of any trapped wildlife.	**Wildlife Impacts: Open Trench** The final EIS should discuss impacts to wildlife associated with entrapment. The analysis should not rely on evidence of high wildlife activity to measure entrapment potential. FERC should require applicant to employ minimization measures along entire pipeline route.

83	Volume 1, Section 4.1.7.2, Pages 4-139 to 4-141 *Pipeline Facilities, Impacts and Mitigation, Construction*	**Wildlife Impacts: Vegetation Clearing** This section does not address the possibility that clearing of vegetation and use of construction equipment could result in direct mortality to wildlife other than migratory birds especially those that are unable to readily move out of harm's way (reptiles, amphibians). It is unclear how "important specimen trees" and "significant wildlife snags" are defined.	**Wildlife Impacts: Vegetation Clearing** The final EIS must address deficient analysis of direct mortality of wildlife from vegetation clearing and construction equipment. Discuss Wildlife CHTR Permit as part of mitigation measures. Define "important specimen tree" and "significant wildlife snag".
84	Volume 1, Section 4.1.7.2, Page 4-142 *Pipeline Facilities, impacts and Mitigation, Construction, Operations*	**Wildlife Impacts: General** This section inaccurately claims that "along much of the right-of-way, the pipeline would not be noticed by wildlife". This statement minimizes potential impacts to wildlife and underestimates impacts of such a large project. There will be both negative and positive effects of the pipeline on wildlife. Many wildlife species take advantage of right-of way corridors (both cleared and un-cleared) for daily and seasonal activities including movement and foraging.	**Wildlife Impacts: General** Remove/revise statement to accurately describe impacts to wildlife due to pipeline.
85	Volume 1, Section 4.1.7.3, Page 4-144 *Habitat Mitigation Policy, Category 1 – Habitats*	**Wildlife Impacts: General** It is not clear why the raptor nesting season and raptor nest sites are highlighted in this section. Is this supposed to address northern spotted owl nest site?	**Wildlife Impacts: General** Provide clarification and/or consider removing/revising.
86	Volume 1, Section 4.1.7.3, Table 4.1.7-5, Page 4-144	**Protection Measures** All measures in this table generally should be implemented regardless of habitat category. E.g., Avoiding removal of vegetation where present and if possible should be implemented in Habitat Cat 6 habitats.	**Protection Measures** Provide clarification on implementation of measures and terms used.

		It is not clear what "specimen trees" are and why they would not be retained in Category 4, 5 and 6 Habitats.	
87	Volume 1, Section 4.1.7.4, Page 4-145, *Big Game Habitat*	**Wildlife: Big Game** The DEIS does not clearly indicate that the Department is in the process of reviewing and updating big game habitat, winter range designations and maps. Effects of revegetation and changes in vegetation are not addressed. Seeding with seed mix may benefit elk species.	**Wildlife: Big Game** Clarify as indicated, and otherwise supplement as necessary to correct deficiencies.
88	Volume 1, Section 4.1.7.5, Page 4-146 *Migratory Bird*	**Wildlife: Migratory Birds** Overall ODFW considers this section to be inadequate in addressing impacts to migratory birds. This section does not recognize that ODFW also regulates and co-manages migratory birds. It is not clear if database searches also considered migratory birds of conservation concern by ODFW, including State Sensitive Species and OCS priorities. It is not clear if migratory bird presence (data and surveys) was considered beyond the pipeline ROW. Bird presence data is out of date. It is highly unlikely that the only birds of conservation concern observed were bald eagles and Caspian terns were observed during field surveys in 2007 and 2012. What methods were being used and what time of year were surveys conducted?	**Wildlife: Migratory Birds** The final EIS should discuss all of the indicated omissions; clarify issues and revise as indicated.

		Q – were bird surveys conducted only within the pipeline ROW or a certain feet beyond to What about Migratory Bird issues for the terminal? In sentence re: 2007 and 2012 field surveys there are two Spelling errors (caspin tern and amoug). This section does not address streaked horned lark.	
89	Volume 1, Section 4.1.7.5, Page 4-147 *Migratory Birds, Construction Impacts*	**Wildlife Impacts: Migratory Birds** This section does not adequately address impacts to migratory birds from the loss of early to mid-seral stage vegetation. Early seral stage vegetation in particular is considered highly productive habitats for a variety of migratory birds. Some impacts would be temporary and others permanent. Previously disturbed or currently disturbed (e.g., active aglands) can provide suitable habitat for streaked horn lark.	**Wildlife Impacts: Migratory Birds** Correct deficiency. Revise as indicated.
90	Volume 1, Section 4.1.7.5, Page 4-148 *Migratory Birds, Operation Impacts*	**Wildlife Impacts: Terminal** The DEIS fails to indicate that the terminal may provide surfaces suitable for osprey nest building.	**Wildlife Impacts: Terminal** The final EIS should describe how osprey nesting will be managed at the terminal site. ODFW recommends that some areas of the terminal be managed to accommodate osprey nesting.
91	Volume 1, Section 4.1.7.5, Page 4-149 to 151 *Migratory Birds, Mitigation Measures*	**Migratory Birds: General** Development of the Migratory Bird Conservation Plan should be done in coordination with ODFW. Sandy dredge spoils with sparse vegetation can provide suitable nesting habitat for streaked horned lark. Birds may attempt to use pilings,	**Migratory Birds: General** Revise as indicated. The final EIS should also require consultation and coordination with ODFW on development of this Plan as a condition of authorization.

		lighting structures and other facility features for nesting. Include in the monitoring, reporting, and adaptive management plan. Some migratory birds (species or individuals) may nest before March 15 and after August 15. Therefore nest searches and bird activity should occur before and after these dates, not just during this timeframe. It is unclear where the list of "indicator species" for riparian habitat came from.	
92	Volume 1, Section 4.1.8.1 Page 4-154 Table 4.1.8-1 *Federally and State Listed Species Potentially Occurring in the Vicinity of the Oregon LNG Project*	**Species Information:** DEIS contains inaccurate species status and habitat descriptions.	**Species Information:** Make corrections as follows: Columbian white-tailed deer: This section contains errors in Federal and State status. The Columbia River DPS is currently listed as Endangered under the Federal ESA. Down-listing to T has been proposed, but not finalized. The species classified as "Vulnerable" on Oregon's State Sensitive Species list (not T). Preferred habitat also includes scrub/shrub, pasture and other agricultural lands, and islands within the floodplain of the lower Columbia River. Streaked horned lark – Status in Oregon is "Critical" on Sensitive Species List. Preferred habitat also includes roadsides, agricultural fields, airfields, dredge spoils, and other areas with low stature vegetation and bare ground. The Red Tree Vole (North Oregon Coast DPS) should be included in the table and evaluated in EIS. It is a Candidate for listing under the Federal ESA. Is classified as "Vulnerable" on Oregon's State Sensitive Species list. If delisted species are to be included in this table and section (as implied in species status key), then bald eagle and peregrine falcon should be included in table and addressed in the next section.

93	Volume 1, Section 4.1.8.1 Page 4-168 *Federally Listed T and E Species, Mammal – Columbian White-tailed Deer*	**Columbian White-Tailed Deer** This section lacks current CWTD location and breeding data.	**Columbian White-Tailed Deer** Update as indicated.
94	Volume 1, Section 4.1.8.1, Page 4-170 *Federally Listed Threatened and Endangered Species, Birds – Marbled Murrelet*	**Marbled Murrelet** Marbled murrelet occurrence data is outdated.	**Marbled Murrelet** Update with current ORBIC / USFWS data.
95	Volume 1, Section 4.1.8.1 Page 4-176 *Federally Listed T and E Species, Birds – Northern Spotted Owl*	**Northern Spotted Owl:** Update spotted owl survey data.	**Northern Spotted Owl:** ODFW recommends avoiding impacts to Critical Habitat.
96	Volume 1, Section 4.1.8.1 Page 4-180 *Federally Listed T and E Species, Birds – Streaked Horned Lark*	**Streaked Horned Lark** This section lacks current data on occurrence and breeding. Based on description of terminal site there is suitable habitat present. Has the site been assessed by a qualified wildlife biologist?	**Streaked Horned Lark** The Department recommends that habitat suitability at terminal be re-assessed and included in the final EIS. ODFW recommends that FERC require pre-construction surveys to be conducted at the terminal site. Update final EIS with 2015 nesting / occurrence data. Re-evaluate suitability of terminal site for streaked horned lark.
97	Volume 1, Section 4.1.8.1, Page 4-201, Paragraph 2, *Salmonids*	**Dredging: Fish Impacts** The DEIS states "Although adult salmonids would be present during summer and fall dredging, they are strong swimmers that generally migrate mid-column, above the depths where dredging would occur and would not be susceptible either to entrainment during dredging or to burial during	**Dredging: Fish Impacts:** Revise as indicated.

		dredged material discharge (NMFS, 2012)." While this is largely true, ODFW's experience is that adults commonly orient near the bottom during ebb tide.	
98	Volume 1 Section 4.1.8.1, Page 4-201 Paragraph 3 *Salmonids*	**Dredging: Timing:** The DEIS states: "Dredging from June through September would likely have the potential to affect more juvenile salmonids than dredging during the WDFW and ODFW approved November 1 through February 28 work window."	**Dredging: Timing:** The Department recommends an in-water work period of September through November to avoid out-migrating salmonids and reduce impacts on eulachon. This is consistent with NOAA Fisheries proposed changes to the lower Columbia River in-water work period.
99	Volume 1, Section 4.1.8.1, Page 4-208, *Entrainment/Impingement* *also* Volume 1, Page 4-82,94	**Entrainment Model: Eulachon** The Department has identified some uncertainty in the assumptions used in the eulachon entrainment model.	**Entrainment Model: Eulachon** See Agency Response Section 1.5 (above). Correct error/deficiency as indicated therein.
100	Volume 1, Page 4-208, *Entrainment/Impingement* *also* Volume 1, Page 4-82,94	**Entrainment Model: Salmonids** DEIS fails to identify and discuss that large releases of hatchery salmonids for the Young's Bay Select Area Fisheries project could be exposed to increased effects of unscreened sea chest and cooling water intakes.	**Entrainment Model: Salmonids** Although effective screening is the preferred option to minimize entrainment potential, financial mitigation to enhance Young's Bay Select Area fish production should also be a consideration to offset hatchery production impacts that is discussed and evaluated in the final EIS.
101	Volume 1, Section 4.1.6.2, Page 4-211, Table 4.1.8-7	**Waterbody Listing:** The DEIS lists Deep Island Slough.	**Waterbody Listing:** Change to Deer Island Slough
102	Volume 1, Section 4.1.6.2, Page 4-212, Last Paragraph	**In-Water Work Period: Fish Presence** The DEIS states that a few adult coho salmon may be in the tributaries during the ODFW in-water work period. ODFW believes that it is highly unlikely that any adult coho will be encountered during the in-water work period.	**In-Water Work Period: Fish Presence** Revise as indicated.

103	Volume 1, Section 4.1.8.2, Page 4-223 *State Listed Threatened and Endangered Species*	**Misc. Wildlife: Corrections** Table 4.1.8-11 There are inconsistencies and errors in species status for Aleutian Canada goose and purple martin. Status acronyms in table are confusing (i.e., "SC"). Preferred habitat descriptions are incomplete for several species (e.g., pond turtle upland habitat requirements for aestivation and over-wintering are not adequately reflected; open water and nesting cavities for purple martin; oak savannah habitat for vesper sparrow) Updated occurrence data is lacking for multiple species. Pre-construction surveys for pond turtles are lacking at terminal and along pipeline. ODFW's Turtle BMPs and Wildlife CHTR Permit can be used to avoid / minimize negative impacts.	**Misc. Wildlife: Corrections** Correct / Update / Address in final EIS.
104	Volume 1, Section 4.1.8.1, Page 4-237 *See also*, Volume 1, Section 3.3.2.2, Page 3-16 Bullet B	**Impacts to Fisheries: Recreational River Users** The DEIS states "Recreational fishing occurs most frequently during the summer months (averaging about 300 private fishing boats in the waters of the Columbia River estuary per day between June and August)." The DEIS fails to identify that the Buoy 10 fishery effort can exceed 2,000 recreational vessels per day. The Draft EIS does not provide data to support the statement that impacts to recreational boaters due to periodic closures will be minor. In particular, the Draft EIS does not identify the total number of recreational vessel trips that will be disrupted and/or delayed due to construction and operation of the	**Impacts to Fisheries: Recreational River Users** Correct error by revising as indicated, and provide economic analysis as suggested. See also Agency Response Section 1.3 (above).

		marine terminal complex nor during the processes of transport of the LNG vessels in and out of the LCR estuary. The final EIS should include an economic analysis of the recreational and boating uses of the LCR and the impacts the Oregon LNG operations likely will have to these boat-based activities. The Draft EIS should also identify the steps and actions that will be taken to offset the loss of these recreational opportunities.	
105	Volume 1, Section 4.1.8.1, Page 4-239	**Impacts to Fisheries: Commercial River Users** The document states the Young's Bay commercial fishing area "does not include the proposed terminal location, but instead encompasses an area to the east, including those waters of Young's Bay." This statement is in error. The Department has been evaluating the area at the mouth of Young's Bay since 2011 for potential expansion of the Young's Bay terminal fishery. The expected east boundary for the expanded fishing area would be adjacent to the proposed OLNG site; therefore commercial fishing activity in this area could be impacted by security zones around docked and marine carriers in transit and maneuvering in the turning basin.	**Impacts to Fisheries: Commercial River Users** Financial mitigation to enhance Young's Bay Select Area fish production should also be a consideration as a means of mitigating for potential impacts to the proposed fishing area. See also Agency Response Section 1.3 (above). The final EIS should be modified to indicate the potential impact described here.
106	Volume 1, Section 4.1.8.3, *Other Special Status Species*	**Special Status Species:** This section incorrectly describes Oregon's State Sensitive Species list species designations. There are only two – Critical and Vulnerable (ODFW 2008). The Oregon Conservation Strategy is in the process of being revised. An updated Strategy Species list	**Special Status Species:** Refer to 2008 SSL with correct designations. Obtain 2015 OCS species list and update this section (and Appendix H) as applicable.

		can be made available for the Oregon LNG project.	
107	Volume 1, Section 4.1.9.1, Page 4-239 Paragraph 1	**Impacts to Fisheries: Marine Carriers:** The Applicant states that LNG marine carriers would be scheduled to travel at night or when the number of anglers has decreased during the Buoy 10 fishery.	**Impacts to Fisheries: Marine Carriers:** The Department recommends that from August 1 to Labor Day, OLNG should only schedule night transit both into and out of the terminal to ensure that disruptions to the Buoy 10 fishery are minimized . (Note: The Department maintains that any impacts to fisheries be mitigated for as discussed in Response 1.3 (above).
108	Volume 1, Section 4.1.9.2, Page4- 292 *Commercial and Recreational Fishing*	**Security Zones:** The DEIS does not address that security zones have the potential to impact commercial and recreation fishing and other outdoor opportunities including hunting.	**Security Zones:** Correct deficiency. This subject is addressed in Response 1.3 (above).
109	Volume 1, Section 4.3.1.5, Page 4-669 *Cumulative Effects on Resources - Aquatic*	**Wildlife: General** This section does not adequately address wildlife species associated with aquatic resources.	**Wildlife: General** Correct deficiency by addressing impacts as indicated.
110	Volume 1, Section 4.3.1.5, Page 4-669, Paragraph 5 *Cumulative Effects: Aquatic Resources*	**Cumulative Effects: General** The statement *"In context with these historical and ongoing challenges, the potential impacts of the Oregon LNG Project and the WEP are minor."* While true, this statement would also apply to virtually any project being contemplated within the assessment area given the quantity of aquatic resource impacts over the last 150+ years.	**Cumulative Effects: General** The statement does not inform the discussion on cumulative effects to aquatic resources and therefore should be deleted.
111	Volume 1, Section 4.3.1.7 Page 4-671 *Cumulative Effects on Resources – Terrestrial Wildlife*	**Cumulative Effects: General** The DEIS inaccurately represents that the cumulative effects of the project will be negligible. Given the size and scope of the proposed project, the cumulative effects on special status species (taking into account proposed off-site and out-of-kind mitigation) is not negligible.	**Cumulative Effects: General** Correct this mischaracterization.

112	Volume 1, Section 4.3.1.7 Page 4-671 *Cumulative Effects on Resources – Threatened, Endangered, and Other Special Status Species*	**Effects on T and E Species** Given the information provided, the DEIS has failed to demonstrate with certainty that the proposed actions will not adversely affect T&E species, in particular due to uncertainty related to northern spotted owl and marbled murrelet proposed mitigation and its success as there is no evidence that the type of forest habitat needed (for mitigation) is available in the area.	**Effects on T and E Species** Final EIS should include adequate mitigation to address impacts as described in these comments.
113	Volume 2, App F, Section 7.7.1 *Spill Response: Wetlands and Waterways*	**Emergency Notification:** There is no reference to notifying Oregon Emergency Response System (OERS) in the event of a spill into waterways or wetlands	**Emergency Notification:** Revise to indicate appropriate notification to OERS in the event of a spill.
114	Volume 2, App F, Section 8.1.4 *Frac-Out notification*	**Emergency Notification: ODFW Contact:** Contact phone extension for Chris Knutsen is incorrect.	**Emergency Notification: ODFW Contact:** Change phone extension for Knutsen, ODFW from x231 to x233.
115	Volume 2, App F, *Section 3.1 Erosion Prevention and Sediment Controls*	**Permanent and Temporary Seeding and Planting:** The section references seeding and planting but does not specifically refer to use of native stocks.	**Permanent and Temporary seeding and Planting:** The final EIS should state that native seed and planting stock will be used.
116	Volume 2, App F, Page ES-3 *Executive Summary*	**Interagency Adaptive Management Team: ODFW Staff Time** Oregon LNG proposes the organization of a formal interagency Adaptive Management Team (Team) to be operative during preconstruction of the Terminal and Pipeline and to continue several years post-construction. The Team would comprise representatives from the USACE, DSL, Oregon Department of Fish and Wildlife (ODFW).	**Interagency Adaptive Management Team: ODFW Staff Time** There is no existing funding for staff time to work on this; therefore, reliance upon this measure is unwarranted as a means of reducing environmental impacts to less than significant levels. The Department recommends that the applicant find a Limited duration ODFW position as outlined in Response 1.1 (above) to correct this error.

117	Volume 2, App F, Section 1.2.3.2, Page 1-3 *Adaptive Management*	**Interagency Adaptive Management Team:** The responsibility of the proposed Interagency Adaptive Management Team is broad and the duration is long. However there are no funding resources being offered to cover agency staff time on this project.	**Interagency Adaptive Management Team:** This is addressed in Response 1.2 (above). FERC should require applicant follow our recommendations as a condition of authorization.
118	Volume 2, App F, Section 5.1.1, Page 1-5 Paragraph 4 Volume 2, App F, Section 5.1.1.5, Page 5-8 Paragraph 1	**Shade loss at Stream Crossings:** Applicant indicates that shade loss will not result in increased stream temperatures but has not addressed loss of shade's contribution to cumulative effects of proposed action.	**Shade loss at Stream Crossings:** The final EIS should discuss and analyzehow shade loss due to temporary and permanent removal of trees contributes to stream temperature issues in the context of cumulative effects from contemporary and historical land use practices.
119	Volume 2, App F, Section 5.1.1.2, Page 5-5, Bullet 4	**Use of downed large wood in stream rehabilitation:** DEIS fails to refer to 'A guide to placing large wood in streams (ODF and ODFW, 1995)	**Use of downed large wood in stream rehabilitation:** Revise final EIS as indicated.
120	Volume 2, App F, Section 5.2.2.2, Page 5-22	**Compensatory Mitigation: Replace 7 culverts:** There is very little information provided in this section.	**Compensatory Mitigation: Replace 7 culverts:** Correct deficiency by providing more detail or indicate that specifics will be developed through the proposed IAMT process. The final EIS needs to state more clearly that the mitigation goal is to restore fish passage at 7 fish passage barriers per state and federal fish passage guidelines. Final EIS needs to discuss limits imposed on this mitigation.
121	Volume 2, App F, Section 5.2.2.2, Page 5-22,	**Compensatory Mitigation: Conservation Easement Riparian Stands.** DEIS proposes 100 foot easements for riparian mitigation corridors. The DEIS fails to point out that existing land use rules (ODF FPA, County, etc.) typically require 50-foot management areas or no touch buffers. Also, mitigating at 1:1 ratio doesn't take into consideration age, species composition, density	**Compensatory Mitigation: Conservation Easement Riparian Stands.** Correct errors/deficiencies by address these points.

		at time of impacts. There is also no information on what type/condition of riparian corridor will be conserved for mitigation.	
122	Volume 2, App F, Section 5.2.3, Page 5-23 and, Section 5.2.3.8, Page 5-26	**Compensatory Mitigation:** The DEIS proposes no compensatory mitigation for Artificial light and shading, turbidity, Passage impediments, and food web effects.	**Compensatory Mitigation:** The Departments concerns regarding artificial light are addressed in Agency Response Section 2.3 (above). The final EIS should be amended as indicated therein.
123	Volume 2 App F Section 5.3.1.2 Page 5-29 *Ongoing Vegetation Removal*	**Maintenance Herbicide Application:** The statement "to preclude herbicide drift into sensitive streams or waterbodies, no herbicides would be applied unless absolutely necessary" needs to be clarified.	**Maintenance Herbicide Application:** Correct deficiency: Need to describe what constitutes "absolutely necessary."
124	Volume 2 App F Section 6.1.3.1 Page 6-3	**Riparian Revegetation:** The DEIS proposes permanent loss of riparian site potential within the 10-foot mow strip and the additional 15-foot wide (from centerline) area where riparian height is restricted. The DEIS fails to account for permanent loss of site potential in the mitigation analysis.	**Riparian Revegetation:** The Department recommends that the final EIS, in its consideration of mitigation for riparian impacts, consider not only the quality of the habitat at the time of construction, but also the potential of the site if it were to remain undisturbed or under the existing land management regime. This is a more accurate measure of the habitat impact given the propensity for change in riparian habitat over relatively short time scales and the fact the proposed loss will be permanent. The final EIS should be revised accordingly.
125	Volume 2 App F Section 6.2.1 Page 6-5 Bullet 6	**Riparian: General** Riparian areas that require compensatory mitigation are determined as those streams with at least x ['x'- added] percent existing cover of woody vegetation immediately adjacent to a stream.	**Riparian: General** The bullet is incomplete and should be revised. It is also unclear how the Applicant proposes to use woody vegetation cover as a metric for mitigation quantity. This needs to be sufficiently explained.
126	Volume 2 App F Section 6.2.1 Page 6-5	M**itigation: HDD Crossing** The DEIS incorrectly states that "Mitigation is not needed for HDD crossings". Activities associated with HDD crossings such as use of	M**itigation: HDD Crossing** The final EIS needs to analyze the impacts resulting from HDD sites and assess potential mitigation to offset such impacts. In addition, FERC should require the applicant to

		designated temporary work space may result in habitat impacts that require mitigation. Also, environmental impacts resulting from frac-outs need to be mitigated for.	coordinate with natural resource agencies to develop a plan that clearly articulates how environmental damage resulting from frac outs will be mitigated for.
127	Volume 2 App F Section 6.3.2 Page 6-7 *Performance Standards*	**Revegetation of Pipeline Right-of-way:** DEIS states that corrective actions may include invasive species control (typically spring/early summer); protective sleeves to minimize browsing damage by herbivores; etc…	**Revegetation of Pipeline Right-of-way:** Most of the corrective actions listed are measures that need to be implemented as a primary component of the project, i.e., these are part of BMPs. The Department suggests that these be included as primary actions in the final EIS.
128	Volume 2 App F Section 7.2.4 Page 7-9;10 ES-2,3; 5-14, 24- 29 *See also* Volume 1 Page 490	**Mitigation: Young's River Mitigation Site** Fish benefitted from the proposed mitigation are primarily those emigrating from Young's Bay, specifically Young's River, Klaskanine River, and a few tributaries. While it is likely that a small number of out-of-population juvenile immigrants will find their way to the Young's River site, there is no information presented to suggest the numbers will be substantial or biologically significant. There is no explanation of why selective breaching was chosen over complete removal. This proposal is difficult to evaluate without a plan and results from hydrologic modeling. Freshwater marsh site is lower habitat value than estuarine wetland (high and low marsh). Proposal is not consistent with ODFW Habitat Mitigation Policy.	**Mitigation: Young's River Mitigation Site** The Department has provided considerable discussion on this topic in Response 2.2 (above). In addition, the Applicant needs to better characterize the expected use of the site by salmonids, particularly with regards to population origin. The applicant should recognize that source populations within the Young's River area consist of primary hatchery-origin fish, with very few natural origin spawners. This needs to be compared and evaluated against those impacted estuarine habitats at the proposed terminal site. This needs to be done in addition to addressing the Department's primary concern regarding consistency with ODFW's Habitat Mitigation Policy. A plan and hydrologic modeling should be included in the final EIS to allow the public and decision makers to appropriately evaluate the potential significant environmental impacts of the proposed action.
129	Volume 2 App F Section 8.1.1.1 Page 8-3	**Pipeline Crossing Methods Vertical scour** The stream scour assessment was lacking specific information on substrate type and it is not clear how this was handled in the	**Pipeline Crossing Methods Vertical scour** Clarify as indicated and use following technical reference as applicable: Castro J.M., A. McDonald, E. Lynch, and C.R. Thorne. 2014 A risk-based approach to

		analysis. Further use of Castro et al. 2014 would be helpful in the final analysis.	designing and reviewing pipeline stream crossing to minimize impacts to aquatic habitats and species. River Research and Applications
130	Volume 2 App F Section 8.3.2 Page 8-11 *Monitoring Reporting*	**Monitoring Reporting:** DEIS states that monitoring reports will go to DSL.	**Monitoring Reporting:** In addition to DSL, monitoring reports should be distributed in a timely manner to the IAMT and ODFW Liaison staff person.
131	Volume 2, App E, Figure 3	**Conflict with Astoria Marine Construction Company Clean-up:** The proposed HDD alignment between Stations 135 and 170 (Pipeline Milepost 3.0 approx.) may conflict with ongoing remedial site investigations and future contaminant clean-up at the Astoria Marine Construction Company (AMCC) on the Lewis and Clark River. This site was recently deferred from the Environmental Protection Agency's National Priorities List and is currently under the purview of Oregon Department of Environmental Quality's, Environmental Clean-up Program.	**Conflict with Astoria Marine Construction Company Clean-up:** ODFW recommends that the Applicant coordinate directly with ODEQ regarding HDD alignment in this area.
132	Volume 2, App E3, Figure 3, maps 1-27	**Pipeline: Alternative Routes** The DEIS does not indicate that crossings and fish passage designs need Department approval, nor that the proposed alternative pipeline routes have not been vetted through the Department.	**Pipeline: Alternative Routes** Prior to issuing the final EIS, OLNG should provide design for alternative stream crossings for ODFW to evaluate and provide comment for inclusion in that document to inform consideration of alternatives, cumulative effects analysis, and impacts analysis.

Forestry, Oregon Department of (ODF)

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The ODF's comments are primarily related to the potential for construction, operation, and maintenance of project components that would be located across state and privately owned forest lands. In these instances project operators are responsible for review and compliance with applicable requirements found in statute and code. In addition, there is ongoing concern where proposed projects introduce the threat and or potential for creation of risk where wildfire is a concern. These issues are not adequately identified and discussed in the DEIS.

With respect to wildfire risk, efforts should be sought to mitigate hazards through all phases of the proposed action. Phases include planning, construction, maintenance, completion, and removal. Risk mitigation expectations and measures are unique to each project and can be further detailed in conjunction with the ODF.

Additionally, depending on the location of any proposed project activity, operator requirements and considerations may include but are not limited to the following conditions, which we recommend FERC requires compliance as a condition of its authorization:

State and Private Forest Lands - Project activities involving commercial forest activity on state and private forest lands are governed by the Oregon Forest Practices Act, Oregon Revised Statute (ORS) 527, and Oregon Administrative Rules (OAR) chapter 629 divisions 605 through 665. These apply even though the forest activity is a peripheral component of the project(s). The forest practice rules are intended to provide resource protection and to set standards for planning forestry practices including harvesting, road construction and maintenance, protecting water quality in waters of the state, limiting effects on specified resource sites, providing for public safety down slope of high landslide hazards, and determining reforestation or land conversion requirements. Requirements include but are not limited to:

- **Operation Notification –** Notification to the State Forester is required for each operation on forestland under ORS 527.670. A separate notification should be filed for each county affected by the project. All notifications require a 15 day waiting period before activity may begin unless a waiver is requested. Notifications are shared with the Department of Revenue for tax filing purposes (ORS 321.550). A notification is required for each owner involved in the project.

- **Compliance with the Forest Practices Act** – The clearing or harvest of forests must comply with the Forest Practices Act. The project contractor(s) must plan for harvesting techniques that comply with the harvesting rules, particularly around streams, wetlands, and specified resource sites such as sensitive habitat. The presence of certain resources in or near an operation will trigger requirements to submit written plans in conjunction with notification. Activities necessitating statutory written plans are listed in OAR 629-605-0170. Additionally plans for alternate practices may be required for any activity which proposes modification of a rule requirement such as normally retained riparian management area trees, conversion to a land use incompatible with tree cover or other situations listed in OAR 629-605-0173. Where other agencies' regulations will be applicable, written approval from those agencies must be

submitted as part of the plan for alternate practice. Additionally, non-statutory written plans may be required for any situation encountered that is listed in OAR 629-605-0170. These requirements may be waived if a request is submitted to the local ODF Stewardship Forester and said request is deemed reasonable.

- **Fire Protection** – The Oregon Department of Forestry is responsible for wildfire protection on private, state and some federal lands (BLM west of Cascades). Individuals and corporations conducting forest operations are subject to wildfire prevention and suppression requirements under Oregon Revised Statute chapter 477 and the associated administrative rules within chapter 629. Additional information regarding these requirements is available at the Department's website, http://www.oregon.gov/odf/Pages/fire/fire.aspx.

    - **Power Driven Machinery (PDM)** – Every person conducting an operation within a forest protection district that uses fire in any form or power driven machinery shall first obtain from the forester a written permit (ORS 477.625). By obtaining a PDM, which is included in the Notification of Operation, operators are required to follow certain fire prevention, readiness and suppression guidelines during fire season.
    - **Fire Season** – When fire season is declared those conducting an operation within a forest protection district must have fire tools and a water supply and also provide a watchman service. As fire danger increases through the course of the season, time restrictions may be imposed in an effort to prevent fires from starting during the most critical times of the day.
    - **Liability** – Under Oregon law, a landowner/operator must make every reasonable effort to suppress a wildfire resulting from an operation. Part of this requirement stems from meeting the above requirements and following fire prevention laws and rules. Rules violations may result in the billing of the landowner for the costs required to put the fire out by ODF. Limited liability, with a cap of $300,000 in fire suppression costs, still occurs if the operator follows all of the rules.

- **Road Construction and Reconstruction –** Project operators must ensure that road construction, reconstruction, and maintenance comply with the Forest Practices Act rules and associated best management practices (Rule Division 625).

- **Conversion of Forestlands** – While nothing in the Forest Practices Act shall prevent the conversion of forestland to any other use (ORS 527.730), many of the implementing administrative rules address the conversion to non-forest use to ensure the conversion process is coordinated with other relevant federal, state, and local agencies.

- **High Landslide Hazard Locations** – Operations that include areas classified as high landslide hazard locations require planning and geotechnical assessment to provide for public safety (Rule Division 623).

State Forest Lands – The final EIS should identify and consider the following additional considerations beyond those noted above for project activities, which could or will affect portions of state forests. The Northwest Oregon Forest Management Plan (FMP) directs and guides management activities on State Forest lands. The ODF concerns with respect to the referenced project(s) lie with the potential for hindrance in strategies employed to achieve FMP goals and objectives. Specific concerns and considerations include but are not necessarily limited to:

- **Loss of Timber Production** – Oregon law requires that state forest lands generate revenue for trust-land counties via timber sales. Loss of forest productivity is a concern particularly where land is converted to a non-forest status. To minimize the loss of productivity and conversion to a non-forest status, the ODF request that FERC consider as a condition of its authorization:
    - Keeping construction corridors to a minimum width and clear only what is necessary
    - Co-locate the pipeline in existing utility and road right-of-ways where possible
    - Provide for reforestation of the portion that will not be used as a permanent right of way
    - Consider alternative routes that avoid state forestland as much as possible.

- **Conflicts with Planned Operations –** If and where appropriate, ODF requests that construction activity consider the timing of logging operations and mitigation that will minimize conflicts between road use, road construction, heavy equipment, log haul, and harvest activities. Additional activities such as tree planting, site preparation, and road maintenance should be considered as well.

- **Terrain and Operational Constraints –**Where planned project activity could or will challenge state forestland management interests such as general access, logging feasibility, timber sale design, slope stability, or resource inventory, coordination and consultation with ODF for project route selection are recommended and should be considered.

- **Other Considerations** – If and where appropriate considerations should be made where the proposed project(s) could or will affect FMP interests and or other applicable statute or rule as they relate to:
    - Protection of Forestland from wildfire
    - Aquatic and Riparian Resources
    - Threatened and Endangered Species
    - Land Management Classification System
    - Landscape Design
    - Recreation
    - Invasive Species
    - Cultural Resources

The aforementioned points of consideration serve to underline several elements of the Oregon Forest Practices Act as well as general issues of concern as they relate to the project under consideration, but do not represent the breadth of responsibility required of the proposer. There is an implicit expectation that the project proposer will be familiar with and fulfill all obligations entailed in the Oregon Forest Practices Act, as well as all relating statutes and rules (federal, state, and local) where the proposed project intersects with Oregon forest land and necessitates forest operations. Complete understanding and observance of these requirements as they relate to forestland in the course of the proposed is the responsibility of the proposer.

Specific comments are provided below:

Citation	Issue Identification	Recommended Resolution
4.1.6.2 Pipeline and	ODF identified as contract administrator	ODF administers contracts on lands

Associated Facilities, Forest Practices (Page 4-127)	("Logging contracts from the clearing of the pipeline corridor in state and private forest lands would be administrated by ODF.")	owned or managed by ODF. ODF does not manage contracts on private forestlands. ODF only administers the Forest Practices Act on private forestlands. Please strike the language identifying ODF as a contract manager on private forestlands.
1.5.4.1 Oregon LNG Project	These sections speak about submissions to meet regulations. This section fails to mention the need for or uses incorrect terminology to refer to ODF Notifications/Permits for the Use of Fire or Power Driven Machinery, Written Plans and Plans for Alternate Practice.	The final EIS must be modified to disclose the importance and need for Notifications, written plans, and plans for alternate practice. The Notification serves three purposes: notification of a forest operation (ORS 527.670), a request for a Permit to Use Fire or Power Driven Machinery (PDM, ORS Chapter 477), and notice to the Department of Revenue of timber harvest (ORS 321.550). Notifications are to be submitted via the online E-Notification system (www.ferns.odf.state.or.us/E-Notification). A separate notification should be filed for each county and timber owner affected by the project. All notifications require a 15-day waiting period before activity may begin unless a waiver is requested. This project will also result in the conversion of forestland to other land uses (ORS 527.730) or practices not in statute or rule. This would require the submission of a Plan for Alternate Practice and written approval from the State Forester.
Section 6.1.3.1. Revegetation Along the Pipeline	The DEIS notes that "After construction, the construction corridor would be revegetated and returned to the discretionary land use of the landowner, consistent with easement restrictions." Unless a land use conversion occurs, previously forested areas would need to be replanted in accordance with Oregon reforestation rules (OAR 629-610-0000 through 629-610-0090).	The final EIS should recommend that where land use conversions do not occur, reforestation of private forestlands will need to occur.
Appendix G, NS-10 & 12, Spill Prevention and Control Procedures,	DEIS fails to identify that Forest Practices Act Chemical Rules standards may be applicable.	The final EIS should include applicable standards under Forest Practices Act Rule Division 620 or reference to appropriate sections of the final EIS with equal or greater protection

Hazardous Materials and Waste Management. 6.1.4 Invasive Vegetation		standards related to spills of hazardous materials or applications of chemicals.
8.1.1.2. Implement Erosion Control Best Management Practices, 8.1.1.3. Avoid or Minimize Landslide Hazards	DEIS fails to identify that Forest Practices Act landslide hazard assessment and standards may be applicable.	It is anticipated that most or all landslide public safety hazards associated with the project will fall under other jurisdictions due to land use conversion. Where clearings are not permanent and forest land use is maintained or proposed roads have a combined pipeline and forest use, provisions for public safety under Forest Practices Act Rule Division 623, road location and construction (Division 625) and harvesting practices (Division 630) may be necessary to appropriately reduce potential public safety issues and significant environmental impacts to forest resources and should be identified in this EIS. Reference to appropriate sections of the final EIS with equal or greater protection standards may also meet requirements.
Appendix F4, Wetland Mitigation Plan	DEIS fails to identify and discuss the Forest Practices Act and wetland, lake linkage	The final EIS should be modified to reflect that through the Notification process, provisions for wetlands under the Forest Practices Act (FPA) and rules will be addressed (Divisions 645, 650, 655), if applicable. Details would be submitted in either a Written Plan or Alternate Plan. Details may include specific provisions for meeting the FPA or reference appropriate sections of the final EIS with equal or greater protection standards or where land use conversion places water protection under other jurisdictions.
4.1.6.2 Pipeline and Associated Facilities, Forest Practices, APPENDIX F1 STORMWATER POLLUTION PREVENTION PLAN	DEIS fails to identify and discuss the Forest Practices Act and water quality linkage	The final EIS should be modified to reflect that through the Notification process, provisions for surface water quality under the Forest Practices Act (FPA) and rules will be addressed, if applicable. Details would be submitted in either a Written Plan or Alternate Plan. Details may include specific provisions for meeting the FPA or

FOR CONSTRUCTION OF THE OREGON LNG TERMINAL AND PIPELINE, INCLUDING EROSION PREVENTION AND SEDIMENT CONTROL PLAN; SPILL PREVENTION, CONTROL, AND COUNTERMEASURES PLAN; AND FRACOUT CONTINGENCY PLAN		reference appropriate sections of the final EIS with equal or greater protection standards or where land use conversion places water protection under other jurisdictions.
Section 4.1.8.3 (Other Special Status Species), Appendix H	This section speaks about additional wildlife species that have special status or consideration by other federal or state agencies, beyond those listed as Threatened or Endangered under the federal ESA. The Oregon Forest Practices Act requires protections for certain wildlife species under Oregon Administrative Rule 629, Division 665. This is informational and the presence/absence of these species in proximity to the proposed activity has not been assessed. The FPA has specific rules for Northern Spotted Owl nest sites (OAR-629-665-0210); Bald Eagle nest sites (OAR 629-665-0220), winter roost sites (OAR 629-665-0230), and foraging perch sites (OAR 629-665-0240); Osprey nest sites (OAR 629-665-0110), and Great Blue Heron rookeries (OAR 629-665-0120). Written plans which describe how forest operations will be conducted to avoid a conflict may also be required for operations near known sites of marbled murrelets under OAR-629-0170(5)(d) or OAR-629-0190(2). Similarly, written plans may be required for operations near certain band-tailed pigeon mineral springs or golden eagle nest sites under	This Department recommends that the final EIS address protections afforded to wildlife under the Oregon Forest Practices Act. Of particular note is the great-blue heron. Although this species is protected by law through the FPA, in association with forest operations, it is not addressed as a special status species in the EIS. It is included in the general bird section for wading birds (e.g., page 4-501), but because it is a special status bird in Oregon on forested lands, it should be addressed with the Special Status species. Furthermore, these protection standards need to be addressed throughout the EIS. Activities such as timber harvest operations that occur near a known site of one of these species may require a written plan to address how the operation will be conducted to avoid a conflict with the wildlife site. Exceptions to the FPA rules for spotted owls, marbled murrelets, or bald eagles may apply if the applicant has a

	OAR-629-0170(5)(a) or OAR-629-0190(1).	valid Incidental Take Permit from the USFWS (or equivalent permit type for bald eagles under the Bald and Golden Eagle Act). Other exceptions would need to be addressed through a Plan for Alternate Practice that must indicate how the operation will be conducted to result in a net equal or greater outcome for the species in question.
4.2.7.2 Unique or Sensitive Habitats	This section indicates that the project will go through or near known nest patches of spotted owls. Forest operations on non-federal lands near a known nest site of a spotted owl may require a Written plan or Plan for Alternate Practice. This may include a requirement to designate a 70 acre core area of suitable spotted owl habitat, as described in rule in OAR 629-665-0210(1)(a).	Designate a 70-acre core area of suitable spotted owl habitat, as described in rule in OAR 629-665-0210(1)(a) or indicate how the purpose of the rule is otherwise met.

Geology and Mineral Industries, Department of (DOGAMI)

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The Oregon Department of Geology and Mineral Industries (DOGAMI) did not have resources to perform a detailed review of the Draft Environmental Impact Statement (DEIS) for the proposed Oregon LNG Project dated August 2015. However, we have completed a preliminary review of portions of several sections of the DEIS including: 1.5 Permits; 2.1.5 Construction Schedule; 4.0 Environmental Analysis; 5.0 Conclusions and Recommendations; Appendix G2 and G6; and Attachment 4A (landslide inventory) and provide comments based on that review (see below). Additionally, we have listed our primary concerns for the Oregon LNG and Pipeline project based on our general knowledge of the geologic hazards in these areas.

Our primary concerns at the Oregon LNG and Pipeline project include:

1. The proposed facility and portions of the pipeline would be located in the state's highest seismic hazard region and within the tsunami inundation zone, thus, exercising caution to safeguard people, the environment, and the economy is strongly advised.

2. The Oregon LNG site is located within the tsunami regulatory map zone. We did not see the following Oregon Law and Regulation in the DEIS. We recommend including in the final EIS and requiring compliance with the requirements in the following document http://www.oregongeology.org/pubs/ofr/O-03-05.pdf and the current Oregon Structural Specialty Code section 1803 and ORS 455.446 and 455.447 as a condition of authorization. We also recommend that any mitigation should include life safety level design, which may include, but not be limited to items such as structural and/or geotechnical design, evacuation planning, and education.

3. The American Society of Civil Engineers (ASCE) is developing its first design standards for tsunami loads in a new chapter (6) of the ASCE-7 Minimum Design Loads for Buildings and other Structures (http://www.asce.org/structural-engineering/asce-7-and-sei-standards/). These standards are still in the review and balloting stage, and have not yet been adopted. We recommend that FERC and Oregon LNG closely track the standards development process and consider the proposed or final standards in the design of the Oregon LNG project.

4. We recommend a technical peer review of the existing and proposed detailed geotechnical and seismic reports to ensure technical competency and that work performed meets state of the practice or other acceptable methods. An independent (non-government agency) technical peer review should be performed on the detailed geotechnical and seismic reports to safeguard the public and environment. We did not see this recommendation in the DEIS. Review should be done by qualified and licensed geologists and engineers. All technical peer review comments should be recorded and addressed by the applicant as part of the FERC review process.

5. Co-seismic hazards at the Oregon LNG site may be substantial and could include: co-seismic subsidence, tsunami inundation, scouring and erosion, tsunami debris impact, settlement, liquefaction, and lateral spreading. Since most of the proposed hazard mitigation (e.g. tsunami

berms, etc.) are proposed to be built on the ground subject to all of these co-seismic hazards, the evaluation and mitigation of these hazards well beyond the tank foundations are critical so that the site does not have cascading failures. Co-seismic hazards along the pipeline may also be substantial and could include: landslides, co-seismic subsidence, tsunami inundation, scouring and /erosion, tsunami debris impact, settlement, liquefaction, and lateral spreading. The existing large deep landslides in the coast range can be tens to hundreds of feet deep. Recent studies of existing large deep landslide movements triggered by future large subduction zone earthquakes, suggest that the landslides may be displaced by tens of feet. It does not appear that the DEIS addresses all of these concerns adequately.

6. Since construction may last years, we recommend evaluation of the geologic hazards which could affect the safety of construction personnel during the construction period. For example, how will the applicant provide life safety from tsunami during the construction period, prior to the implementation of the final long-term tsunami mitigation?

7. We anticipate many landslides and earthquake fault crossings along the proposed pipeline route. Our statewide landslide information database (SLIDO 3.2) indicate potentially hundreds of landslides along the generalize pipeline route. However, this should be considered a minimum because most existing mapping in SLIDO 3.2 along the route is not based on lidar, and recent lidar studies in the Coast Range have identified thousands of previously unmapped landslides. Therefore we recommend the applicant use lidar to map the landslides along the pipeline route.

NO.	Citation	Issue Identification	Recommended Resolution
1	2.1.2.2	Upgraded electric transmission line	Even though this is an existing transmission line, it should still be evaluated for geologic hazards. Correct deficiency in final EIS.
2	2.1.5 Construction Schedule	48 month construction	Tsunami evacuation should be addressed in final EIS since the construction workers will be in the tsunami zone for a long time.
3	4.1.1.1, p 4-7, Earthquakes	USGS, 2008	The final EIS analysis should use the latest published seismic data. For example, the USGS, 2014 national seismic hazard maps.
4	4.1.1.1, p 4-9, Tsunami	“there would be little effect of such a wave on a tugboat assistant LNG carrier”	The final EIS analysis should also include discussion of the effects of the water draining away from the coast just prior to the tsunami inundation because the LNG carriers are so big and so close to the bottom of the channel.
5	4.1.1.1, p 4-9, Tsunami	“at least 1 foot above the predicted tsunami”	We recommend that any mitigation should include life safety level design, which may include, but not be limited to items such as structural and/or geotechnical design, evacuation

			planning, and education. Mitigation should also include expected scouring, erosion, debris impact and co-seismic subsidence.
6	4.1.1.1, p 4-14, Landslide	"we do not consider landslides to be a hazards at the terminal"	Underwater landslides along the dredge channel banks should be analyzed, especially considering the dredge depth. Liquefaction induced lateral spread landslides should also be analyzed.
7	4.1.1.1, p 4-14, Flooding and Coastal Storms	The December 2007 storm caused many landslides. For example, one landslide undermined the natural gas main pipeline going to the City of Astoria and the pipeline needed rerouting.	Consider landslides in the coastal storms analysis in the final EIS.
8	4.1.1.1, p 4-22, Soil Liquefaction	"Liquefaction hazard mapping is available only for the area…"	DOGAMI OFR 13-06 has liquefaction hazard maps for all of western Oregon.
9	4.1.1.1, p 4-23, Landslide Susceptibility	The DEIS incorrectly states that "The risk from slow-moving landslides is lower than…"	The final EIS should correct this error, because this is not true, especially during an earthquake.
10	Appendix G2, Landslide Hazard Areas Crossed…	SLIDO 2	The latest version of SLIDO, 3.2 should be used in the final EIS.
11	Appendix G2, Landslide Hazard Areas Crossed…	The use of lidar dramatically improves our understanding of the landslide hazard.	See example in Figure 1 below.
12	Appendix G6, Landslide and Debris Flow…	The DEIS inappropriately focuses on shallow rapid landslides as landslide hazard areas.	The analysis in the final EIS should be focused on the landslide types that are most likely to impact the pipeline.

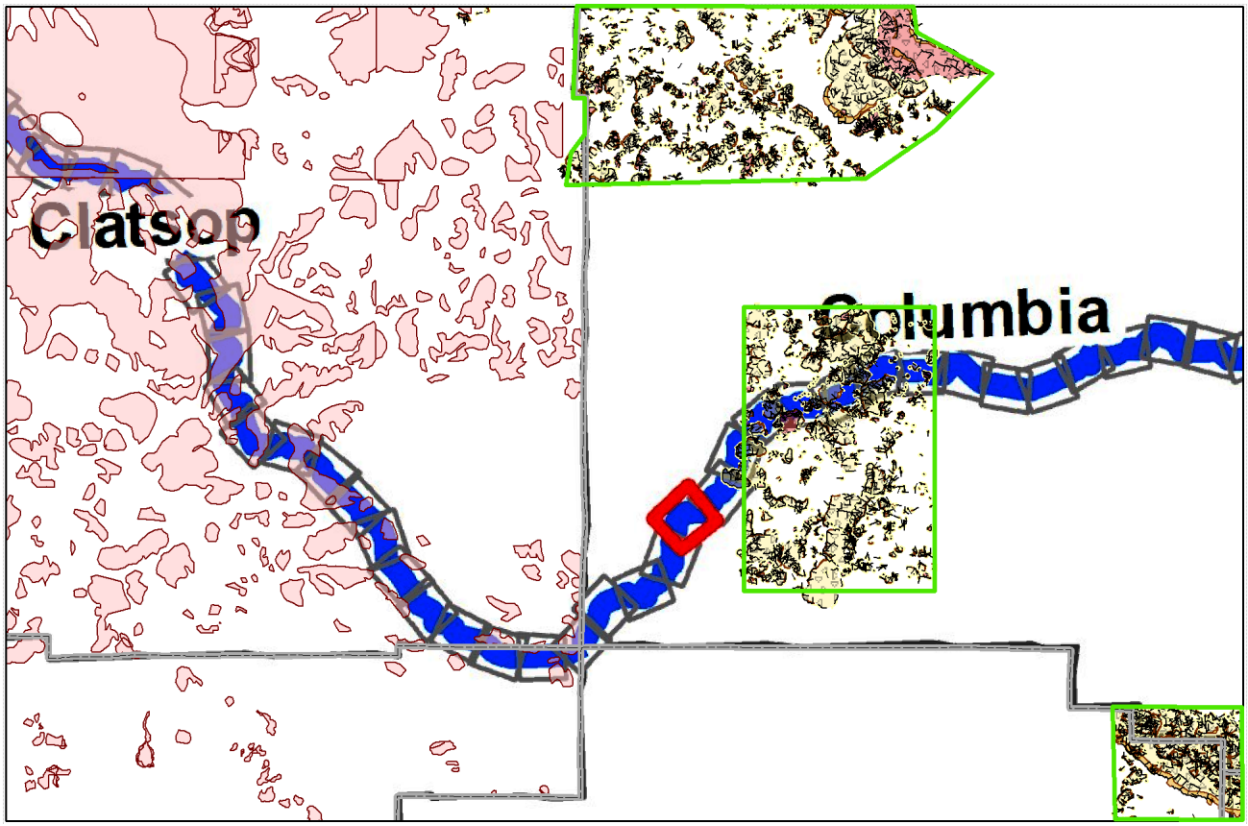

Figure 1. Map of the central portion of the pipeline in Oregon, overlaid with SLIDO 3.2 data. The pink polygons in Clatsop County were mapped prior to lidar. We have found that the use of the LIDAR data resulted in the identification of between 3 to 200 times the number of landslides found (Burns, 2007). The areas outlined in green were mapped with lidar. The City of Vernonia area (central portion of Columbia County) changed from zero mapped landslides to 627.

References

DOGAMI, 2013, Local source (Cascadia Subduction Zone) tsunami inundation map for Warrenton North [Plate 1]: Oregon Department of Geology and Mineral Industries, Tsunami Inundation Map TIM-Clat-02, 2 pl. Web: http://www.oregongeology.org/pubs/tim/Clat02_WarrentonNorth_Plate1_onscreen.pdf.

Burns, W.J., 2014, Statewide Landslide Information Database for Oregon, release 3.2: Oregon Department of Geology and Mineral Industries, Web: http://www.oregongeology.org/sub/slido/

Burns, W. J., 2007, Comparison of remote sensing datasets for the establishment of a landslide mapping protocol in Oregon. AEG Special Publication 23: Vail, Colo., Conference Presentations, 1st North American Landslide Conference.

Madin, I.P. and Burns, W.J., 2013. Ground motion, ground deformation, tsunami inundation, coseismic subsidence, and damage potential maps for the 2012 Oregon Resilience Plan for Cascadia Subduction Zone Earthquakes: Oregon Department of Geology and Mineral Industries, Open-File Report O-13-06.

Land Conservation and Development, Oregon Department of (DLCD)-CZMA

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The DLCD is Oregon's designated coastal management agency responsible for acting on the required certification of consistency with the Oregon Coastal Management Program (OCMP) pursuant to Section 307 (c)(3)(A) of the Coastal Zone Management Act (CZMA). Our comments are therefore specifically directed to the analysis provided in the DEIS of the CZMA required certification of consistency. While the DEIS addresses many important issues related to other state agency authorities that are part of the OCMP, we defer to these partner agencies for review of specific issues related to their interests and regulatory authority.

The DEIS provides a general discussion of the required CZMA consistency certification at section 1.5.1.9, and a brief analysis and proposed condition for the certification at section 4.1.9.1 and 5.1.9.1. Specifically, there are recommended conditions at 4.1.9.1 and 5.1.9.1 that state:

> "Prior to construction of the Oregon LNG Project, Oregon LNG should file with the Secretary documentation of concurrence from the ODLCD that the Oregon LNG Project is consistent with the CZMA." Page 4-233
>
> And
>
> "We are recommending that prior to construction, Oregon LNG file with FERC documentation of concurrence from the ODLCD that the Oregon LNG Project is consistent with the CZMA." Page 5-19

It is unclear whether, or in what manner, this condition could or would be enforced. In particular, the use of the words "should" and "recommending" in directing the applicants to not begin construction prior to filing the required DLCD concurrence with the applicant's consistency certification makes this condition advisory in nature. Most importantly, though not explicitly stated, this language implies that the FERC may issue the requested authorizations for the project prior to (and conditioned upon) a determination of consistency with the OCMP by DLCD. Such an action by the FERC would be contrary to the express language of the CZMA, which requires consistency concurrence prior to the granting of any federal license or permit.

Specifically, the CZMA states, "No license or permit shall be granted by the Federal agency ***until the state or its designated agency has concurred with the applicant's certification*** or until by the state's failure to act, the concurrence is conclusively presumed, unless the Secretary, on his own initiative or upon appeal by the applicant, finds after providing a reasonable opportunity for detailed comments from the Federal agency involved and from the state, that the activity is consistent with the objectives of this chapter or is otherwise necessary in the interest of national security." (CZMA § 307 (c)(3)(A)). (Emphasis added). This requirement of the act is implemented by 15 CFR §930.53(d), which likewise states: "No federal license or permit described on an approved list shall be issued by a Federal agency until the requirements of this subpart have been satisfied. Federal agencies shall inform applicants for listed licenses or permits of the requirements of this subpart."

We believe that this requirement of the CZMA is clear and unambiguous: no decision by the FERC to issue the requested authorizations can be made until DLCD has formally concurred with the applicant's certification of consistency. There is specific purpose for the requirement that federal licenses or permits be issued only *after* concurrence with the state's consistency certification; that purpose is to ensure that state program requirements have been fully considered and incorporated into any final federal decision. The implementing regulations of the CZMA clearly anticipate and authorize state imposed conditions to modify a project in order to achieve consistency. Specifically, the provisions of 15 CFR 930.62(d), state: "During the period when the State agency is reviewing the consistency certification, the applicant and the State agency should attempt, if necessary, to agree upon conditions, which, if met by the applicant, would permit State agency concurrence. The parties shall also consult with the Federal agency responsible for approving the federal license or permit to ensure that the proposed conditions satisfy federal as well as management program requirements (see also § 930.4)." 15 CFR § 930.4 further states: "Federal agencies, applicants, persons and applicant agencies should cooperate with State agencies to develop conditions that, if agreed to during the State agency's consistency review period and included in a Federal agency's final decision under subpart C or in a Federal agency's approval under subparts D, E, F or I of this part, would allow the State agency to concur with the federal action."

Given that the federal consistency review could result in state imposed conditions to modify the project, it is essential that the FERC know the outcome of this review before issuing a decision. To make a conditional decision in advance of the completion of the consistency review creates the risk of inconsistent federal and state decisions in the event that state and federal conditions conflict. Such an outcome would be contrary to the purpose of the CZMA.

Based on these requirements of the CZMA, DLCD requests that the recommended conditions at sections 4.1.9.1 and 5.1.9.1 be eliminated. The DEIS should instead state in clear language at sections 4.1.9.1 and at 5.1.9.1 that, pursuant to CZMA § 307 (c)(3)(A), the FERC cannot and will not issue the requested authorizations until DLCD has concurred with the applicant's consistency certification.

State Lands, Oregon Department of (DSL)

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The Oregon Department of State Lands (DSL) has provided below a table that includes the status of permits submitted to-date, references to permits that were made in DEIS that DSL does not have any record of, as well as listing of permits that will be required for actions described in the DEIS. Below this table is DSL's comments on the DEIS for FERC's consideration and incorporation into the final EIS and/or as conditions of its authorization.

	DSL Authority	Agency Action for Oregon LNG	Status
1	Easements OAR 141-122 Trust and Non-Trust Lands	Oregon LNG - Pipeline Waterbody Crossings (submerged and submersible lands)	Draft EIS states Oregon LNG applied in July 2013 for easements; no record of any such application has been found. Each waterbody crossing in jurisdictional waters will require an easement authorization.
2	Sand & Gravel Lease/Licenses OAR 141-014	Oregon LNG – Access Channel and Marine Slip	Sand & Gravel License/Lease required if state-owned material is placed anywhere besides the inflow channel. If so, royalties may be required.
3	Lease and Registrations OAR 141-082	Oregon LNG – Wharf registration	Loading and unloading tanker activities. Applied for wharf registration on October 2007. Administratively closed; will need to re-apply.
4		Oregon LNG – LNG Facility (filled lands)	Current sublease with Port of Astoria
5		Oregon LNG – Trestle Terminal (submerged and submersible lands)	Received application July 2013; incomplete application. Lease authorization required.
6		Oregon LNG – Turning Basin (submersible lands)	Lease authorization required.
7	Removal Fill Law ORS 196.795-990 OAR 141-85 OAR 141-90	Approve removal and fill of material in waters of the state for impacts related to the Terminal and entrance road (LNG Development Co. LLC) and the pipeline (Oregon Pipeline Co. LLC).	Terminal 54374-RF and Pipeline 54375-RF- Applications submitted July 5, 2013. Both determined to be incomplete August 1, 2013. Terminal 54374-RF and Pipeline 54375-RF- Applications resubmitted June 22, 2015. Both determined to be incomplete July 28, 2015. Applicant must resubmit new applications that are complete. Wetland delineations for properties with permitted access within the terminal (WD2013-0217) and pipeline (WD2014-0235) were reviewed and

			concurred with (4/10/2014 and 6/30/2015). An updated wetland delineation report is required after access to all properties is obtained before a modified fill and removal permit can authorize impacts to all wetlands on the project. Wetland delineations for the mitigation sites reviewed and concurred with: Young's River, WD2015-195 (8/27/2015) and Nehalem, WD2014-467.

DSL Comments on Oregon LNG DEIS

	Citation	Issue Identification	Recommended Resolution
1	Executive Summary Page 37 (ES-5) and Page 295 (4-65)	Reference to DSL's "Section 401" permit conditions	Correct error to replace "401" with the appropriate reference to Removal Fill.
2	Executive Summary Page 38 (ES-6)	The DEIS incorrectly states that impacts to wetland resources are effectively minimized or mitigated by proposed measures.	Temporary fill and removal areas for pipelines within the terminal are not calculated correctly. Fill and removal volumes are correct but the area does not take into account the entire impact area for spoils piles and work area. The OLNG application permit must account for the entire temporary impacted wetland area. The final EIS should correct this error. The final EIS should also indicate that the Young's River mitigation (140 or 120 acres?) is out of kind. The DEIS provides an insufficient discussion of an effort to provide alternative mitigation that is in-kind. The mitigation plan is conceptual only and incomplete. Functional assessment is flawed and should be corrected in the final EIS.
3	Executive Summary Page 39 (ES-7)	DEIS includes a deficient analysis of impacts to forested wetland habitat.	Mitigation offered does not address conversion of forested wetland to emergent or scrub shrub. Correct deficiency.
4	Executive Summary Page 89 (2-3)	Berthing area to dredge has a typo on depth of water. It is described as 20 to 30 feet MLLW.	Place "-" signs in front of "20" and "30" to indicate below MLLW not above MLLW.
5	Page 103 (2-17)	The DEIS includes a Conceptual Compensatory Wetland Mitigation	The Final EIS should include a Final Compensatory Wetland Mitigation Plan

		Plan that is insufficient to offset potential significant environmental impacts.	that mitigates for the proposed impacts including cumulative effects. Clarify whether the Young's Bay mitigation site 140 acres or 120 acres.
6	Page 105 (2-19) and Page 341 (4-111)	The DEIS proposes removal of 8 culverts as compensatory mitigation for non-wetland impacts (fish habitat impacts). The DEIS indicates that a plan will be developed sometime in the future before construction. The DEIS analysis of Nehalem mitigation is insufficient: design is faulty and doesn't meet ODSL rules and functional assessment analysis done improperly. Wetland mitigation for impacts in the Lower Columbia – Clatskanie River Basin is proposed as purchase of In-Lieu Fee (ILF) Mitigation credits.	A Final Compensatory Non-Wetland (fish habitat) Mitigation Plan is required as part of the Removal Fill application to DSL. The final EIS should include that requirement. For Nehalem mitigation: Mitigation for functional loss of conversion from PFO to PSS or PEM is not well documented. The final EIS should provide enhancement that meets ODSL definition and provide proper functional analysis. The final EIS should identify that there are no ILF credits available in the Lower Columbia – Clatskanie River Basin. FERC should require as a condition of authorization that Oregon LNG provide appropriate mitigation for that basin.
7	Page 110 (2-24)	The DEIS states that a new substation and electrical lines in Warrenton will be permitted later by others. As proposed in the DEIS the new substation and electrical transmission line and transmission line upgrades are necessary for the ONLG project and do not have independent utility from the OLNG project. Wetlands are known to be present and are not identified in the area of the proposed Warrenton substation and new transmission line and upgrades. The substation is proposed in North Coast Business Park.	The Final EIS must account for all impacts as a result of the OLNG project including a new substation and new electrical transmission lines and upgrades and provide compensatory mitigation. FERC should require coordination with Clatsop County regarding the North Coast Business Park Master Plan to determine that the substation is compatible with the Master Plan.
8	Page 276 (4-46)	Dredged materials sampled in 2007 and 2008 are outdated and should not be relied upon in the final EIS.	New samples needed, reviewed and approved before proposal of in-water disposal on state lands for inclusion in the final EIS.
9	Page 304 (4-74)	The DEIS incorrectly states that no eel grass beds are observed near the terminal.	Correct error: Small areas of eel grass are located east of the terminal in saline waters. Reassess salinity of the

			habitat.
10	Page 309 (4-79)	DEIS indicates that dredging proposes in-water work of June 1 to September 30 but does not indicate that such actions require authorization by ODFW before DSL can authorize that work.	Final EIS should indicate that an alternative in-water work window outside of the recommended in-water work window of November 1 to February 28 must be approved by ODFW before DSL can authorize it.
11	Page 340 (4-110)	The DEIS indicated that the Compensatory Wetland Mitigation Plan was conceptual. The DEIS proposed that a Final Compensatory Wetland Mitigation Plan would be produced before construction.	DSL recommends that a Final Compensatory Wetland Mitigation Plan be included in the final EIS. A Final Compensatory Wetland Mitigation Plan is required by DSL upon submittal of an application for a Removal Fill Permit before an application will be reviewed.

Transportation, Oregon Department of (ODOT)

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The Oregon Department of Transportation (ODOT) has the responsibility to preserve the operational safety, integrity, and function of the state's highway facilities. ODOT must also ensure that improvements to the highway system can be accomplished without undue impacts or damage to utilities within the highway right-of-way. It is ODOT's understanding that the proposed Oregon LNG (liquefied natural gas terminal facilities) and the associated pipeline projects in Oregon and Washington, and associated activities, could or will interface with state highways by crossing the highway, running parallel to the highway within the right-of-way, or running parallel to the highway just outside of the right-of-way. It is also ODOT's understanding that additional access may be needed to ODOT's facilities, and that traffic on ODOT's facilities may increase due to the terminal and associated pipeline projects (both during construction and upon project completion during regular operations and project maintenance).

General Requirements

Construction that may impact the state right-of-way is subject to Oregon Revised Statute (ORS) 374.305 under which no person, firm, or corporation may place, build, or construct on any state highway right-of-way, any approach road, structure, pipeline, ditch, cable or wire, or any other facility, thing, or appurtenance without first obtaining written permission from ODOT. The Applicant, Oregon LNG, therefore, must obtain permits from each ODOT District Office where project work will occur prior to commencing construction within the highway right-of-way or usage of access connections to the right-of-way. The Applicant must also meet the requirements in Oregon Administrative Rule (OAR) Chapter 734 Division 51 for approach permitting and Division 55 for utility permitting through special provisions and should review rule requirements before completing plan sets and construction plans to understand stipulations related to the construction phase and future project operations and maintenance. ODOT Districts have some discretion in the issuance of a permit in order to address site specific situations such as weather/season, traffic volume, terrain, etc.

The following conditions must be fulfilled before a permit to work in the ODOT right-of -way will be issued:

- Applicants must notify and work directly with ODOT where the proposed location of the pipeline facilities and associated activities are shown to be within the Potential Impact Radius (PIR) of any state highway. The PIR is based on minimum federal safety standards found in 49 CFR Part 192.
- Applicants shall provide ODOT with a set of plans that include, but are not limited to, detailed construction staging plans for the terminal facility and associated LNG transfer facilities (e.g., Wharf, LNG storage tanks), expansion of upland industrial lands and access road improvements as well as pipeline route maps and construction staging plans. Applicants will work with ODOT to develop design standards for all pipes and related structures within the PIR of a state highway. Design requirements include the following:

    - Minimum of 10 feet of cover from the top of the pipe will be the norm unless special acceptance of a lesser amount is authorized for a specific reason. A minimum of 10 feet of

cover should be used as the standard within ODOT right-of-way (more specific details can be found further in these comments).

- All pipe crossings of the highway shall be properly cased or for uncased pipeline crossings, a substantial increase in the pipeline design standards will be required.
- In no instance shall the pipeline be installed in an open trench across a state highway (more details follow).
- In no instance shall the pipeline attach to or be suspended within highway bridge structures.
- Highway access to all pipeline surface structures and assemblies, such as but not limited to gate valves and monitoring equipment, shall comply with OAR 734 Division 051. A preferred location for pipeline surface structures and assemblies is to be placed outside state highway right-of-way.
- Temporary access locations, used for construction activities, shall also comply with OAR 734-051. Modifications appropriate to provide safe operation shall be constructed at all temporary access locations, prior to construction usage. Safety modifications must be removed; and the highway and access points shall be returned to their original condition upon completion of construction activities.
- Applicant must address specific site concerns associated with their terminal and pipeline route and associated project facilities. These concerns shall be addressed to the satisfaction of the appropriate Oregon Department of Transportation District offices prior to issuance of a permit to perform work within the state's right-of-way.
- Annually, or as changes dictate, updated emergency contact information (names and phone numbers) shall be delivered to each ODOT District Manager in which the terminal and pipeline and associated project facilities may affect state highway operations and maintenance activities.

The Applicant has the sole responsibility to ensure that all required environmental statutes and codes are completely met. The Applicant is responsible to secure all state, federal, and local permits and clearances as required under federal, state, and local statutes or codes for all areas within ODOT right-of-way that are impacted by the development.

All impacts to the traveling public on state highways will be approved by the ODOT local District office(s). Utility coordination will be the responsibility of the Applicant. The terminal and pipeline projects will need to provide traffic mitigation for all state highways affected, and the mitigation approved by ODOT prior to and for the duration of the impact. Specific comments follow.

Specific Comments on the DEIS

In addition to the standards and specifications outlined above and in the ODOT letter dated October 24, 2012 to the Secretary of the Federal Energy Regulatory Commission, the following comments and recommendations should also apply to the project.

The data presented in the DEIS concerning the Traffic Impact Study (TIS) is outdated and does not reflect the current proposals of the Updated February 2015 TIS. The 2015 TIS proposed mitigation **substantially** changes the proposals of the 2013 TIS used in this draft.

ODOT requests the Updated February 2015 TIS be used and the DEIS reflect the new traffic findings under the following sections, along with ODOT's recommendations, as follows.

4.1.10.1 Socioeconomics – Terminal – Transportation and Traffic – Road Traffic

We recommend this section include the following changes:

Delete Paragraphs 7 & 8 and the stated recommendation as follows: "Construction of the Oregon LNG terminal would affect roadway transportation and traffic in the project area by increasing the number of vehicle trips per day on area roads as a result of worker commuting and construction vehicle traffic. The increase in traffic would cause short-term localized delays in traffic movement, resulting in potential short-term economic losses due to delays caused by the increase in traffic volumes."

"Prior to construction, Oregon LNG must obtain site plan approval for construction of the terminal and must obtain an Access Permit from ODOT to cross state funded roadways. Additionally, due to the currently high volume to capacity ratios, poor levels of service at traffic intersections near the terminal facility, and to minimize the potential for construction traffic to further impact traffic, **we recommend that:"**

"Prior to terminal construction, Oregon LNG should file with the Secretary, for review and written approval by the Director of OEP, a Terminal Construction Traffic Management Plan prepared in consultation with the City of Warrenton and ODOT. The plan should address total vehicular traffic at the construction site, volume of traffic from other employees and schedule of shift changes, and describe potential restrictions of construction traffic if necessary."

And Replace With the following: "Construction of the Oregon LNG terminal would affect roadway transportation and traffic in the project area by increasing the number of vehicle trips per day on area roads as a result of worker commuting and construction vehicle traffic. Traffic volumes on the existing roadway network will increase and adverse effects will be experienced. Impacts will include reduced capacity, higher delay times, increased turning movements at intersections, and slower-moving traffic. The increase in traffic would cause short-term localized delays in traffic movement, resulting in potential short-term economic losses due to delays caused by the increase in traffic volumes."
"Prior to construction, Oregon LNG must obtain site plan approval for construction of the terminal from the City of Warrenton. Additionally, due to the currently high volume to capacity ratios, poor levels of service at traffic intersections near the terminal facility, and to minimize the potential for construction traffic to further impact traffic, **we recommend that:"**

- **"Prior to terminal construction,** Oregon LNG shall implement the mitigation measures described in Section 6 of the Updated February 2015 TIS, per ODOT approval. OLNG has not obtained ODOT approval of the mitigation measures so OLNG must work with ODOT to finalize and approve the appropriate mitigation measures. ODOT, or the City of Warrenton may modify the means by which a mitigation measure will be implemented, as long as the alternative means ensure compliance with performance measures.

- The Applicant, Oregon LNG, shall implement additional temporary mitigation measures as described in Section 7.1 of the 2015 TIS, and listed below, as needed and/or required by ODOT or the City at any time during construction of the facility. All mitigation measures listed below will require ODOT approval prior to implementation.

- Establish temporary increases in lane capacity (by widening existing shoulders for bypass traffic).
- Institute time-of-day restrictions for large, oversized construction vehicles.
- Use flaggers, as necessary, to direct traffic when large equipment is exiting or entering public roads to minimize risk of accidents.
- Provide advance warning and proper roadway signage along US 101, US 101 Bus, and US 30 to warn motorists of potential vehicles entering and exiting the roadway. Signage would include "Equipment on Road," "Truck Access," or "Road Crossings."
- Use pilot vehicles when slow or oversized wide loads are being hauled.
- Place appropriate detour plans and warning signage in advance of any planned traffic disturbances.
- Maintain one travel lane on all roadways at all times, if possible.
- If lane closures must occur, post adequate signage for potential detours or possible delays.

- The Applicant shall pay all costs required to fully implement all the mitigation measures stated above to the standards and approval of ODOT.

- Applicant, Oregon LNG, shall implement and pay all costs for any and all additional mitigation measures required by ODOT for impacts not fully identified or stated in the 2015 TIS, such as, but not limited to the following:

    - Park and ride facilities outside the analysis area with direct state highway access.**"**

5.1.10.1 Conclusion and Recommendations – Oregon LNG Project

We recommend this section include the following changes:

Delete Paragraph 8 as follows: "Construction of the Oregon LNG terminal would affect roadway transportation and traffic in the project area by increasing the number of vehicle trips per day on area roads as a result of worker commuting and construction vehicle traffic. We are recommending that Oregon LNG work with the City of Warrenton and ODOT to prepare a Terminal Construction Traffic Management Plan. Operations would not contribute a large amount of traffic to the terminal area; however, intersections with already low levels of service could worsen during the first year of operations.

And Replace with the following: "Construction of the Oregon LNG terminal would affect roadway transportation and traffic in the project area by increasing the number of vehicle trips per day on area roads as a result of worker commuting and construction vehicle traffic. Oregon LNG shall implement the mitigation measures described in Section 6 of the Updated February 2015 TIS, per ODOT approval. OLNG has not obtained ODOT approval of the mitigation measures so OLNG must work with ODOT to finalize and approve the appropriate mitigation measures. ODOT, or the City of Warrenton, may modify the means by which a mitigation measure will be implemented, as long as the alternative means ensure compliance with performance measures.

- The Applicant, Oregon LNG, shall implement additional temporary mitigation measures as described in Section 7.1 of the 2015 TIS, and listed below, as needed and/or required by ODOT or the City at any time during construction of the facility. All mitigation measures listed below will require ODOT approval prior to implementation.

    - Establish temporary increases in lane capacity (by widening existing shoulders for bypass traffic).
    - Institute time-of-day restrictions for large, oversized construction vehicles.
    - Use flaggers, as necessary, to direct traffic when large equipment is exiting or entering public roads to minimize risk of accidents.
    - Provide advance warning and proper roadway signage along US 101, US 101 Bus, and US 30 to warn motorists of potential vehicles entering and exiting the roadway. Signage would include “Equipment on Road,” “Truck Access,” or “Road Crossings.”
    - Use pilot vehicles when slow or oversized wide loads are being hauled.
    - Place appropriate detour plans and warning signage in advance of any planned traffic disturbances.
    - Maintain one travel lane on all roadways at all times, if possible.
    - If lane closures must occur, post adequate signage for potential detours or possible delays.

- The Applicant shall pay all costs required to fully implement all the mitigation measures stated above to the standards and approval of ODOT.

- Applicant, Oregon LNG, shall implement and pay all costs for any and all additional mitigation measures required by ODOT for impacts not fully identified or stated in the 2015 TIS, such as, but not limited to the following:

    - Park and ride facilities outside the analysis area with direct state highway access.”

We also recommend the following ODOT statutes and administrative rules be added to Table 1.5.4-1:

1.5.4.1 Permit Summary Tables – Oregon LNG Project

Agency: ODOT

Authority/Regulation/Permit: ORS 364.305 & OAR 734-055, ORS 818, OAR 734-82

Agency Action: Issue utility permits to locate pipeline within state highway right-of-way; Issue approach road permits to access state highways; Over-dimension Trucks

Status: Prior to start of construction

Water Resources, Oregon Department of (WRD)

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NO.	Citation	Issue Identification	Recommended Resolution
1	1.5.2 Pages 1-18 through 1-20, Oregon Laws and Regulations.	No Reference to Oregon Water Law. This section fails to acknowledge that there are laws and rules that must be considered and complied with when using waters of the state.	Correct this deficiency in the final EIS and require compliance with Oregon Water Law as a condition of authorization: Failure to comply with Oregon Water Law will adversely affect existing users, cause significant damage to the resource, and result in expensive delays to comply with Oregon Water Law.

Appendix A

MEMORANDUM OF UNDERSTANDING AND AGREEMENT No. 15-018 BY AND BETWEEN OREGON LNG PROJECT AND THE STATE OF OREGON FOR CO2 AND FINANCIAL ASSURANCE FOR FACILITIES RETIREMENT

I. RECITALS

WHEREAS, in August 2005, President Bush signed into law the Energy Policy Act of 2005 giving the Federal Energy Regulatory Commission (FERC) exclusive authority to approve or deny the siting, construction, expansion or operation of a Liquefied Natural Gas (LNG) terminal located onshore or in state waters. Prior to the 2005 Energy Policy Act, the Oregon Department of Energy (ODOE) and the Energy Facility Siting Council (EFSC) had siting authority over proposed LNG facilities in Oregon.

WHEREAS, the Energy Policy Act of 2005 requires LNG terminal applicants to develop an Emergency Response Plan for terminal operations, subject to consultation with the United States Coast Guard and state and local agencies, and subject to FERC approval.

WHEREAS, recognizing the importance of participating in the federal review process, the Governor in January 2006 designated ODOE as the lead state agency for ensuring that Oregon's interests are addressed in the federal FERC siting process.

WHEREAS, ODOE has been delegated the responsibilities for emergency preparedness for LNG facilities (ORS 469). This includes working with LNG developers to develop and maintain an emergency response plan to protect citizens from LNG leaks and fires should a terminal be built and to provide oversight throughout the life of the project.

WHEREAS, Oregon LNG (OLNG) agreed to maintain state standards for C02 and facility financial assurance not otherwise covered by federal authority.

WHEREAS, OLNG has applied to FERC for authorization to construct and operate a LNG peak-shaving, liquefaction, and bi-directional facility located on the Skipanon Peninsula in Warrenton, Oregon. The approximately 96 acre site is eight miles west of Astoria and is less than 10 miles from the point where the Columbia River empties into the Pacific Ocean.

WHEREAS, OLNG and ODOE entered into Memorandum of Understanding and Agreement No. 09-100 by and Between Oregon LNG and the State of Oregon for Emergency Preparedness, CO2, and Retirement and Financial Assurance on June 8, 2009 (2009 MOU);

WHEREAS OLNG and ODOE desire for convenience to separate the 2009 MOU into two agreements: this Memorandum of Understanding and Agreement No. 15-018 by and between Oregon LNG and the State of Oregon for CO2 and Financial Assurance for Facilities Retirement ("MOU") and the separate Memorandum of Understanding and Agreement No. 15-017 by and Between Oregon LNG and the State of Oregon for LNG Emergency Preparedness (Emergency Preparedness MOU).

NOW THEREFORE, the parties hereby agree as follows:

II. Effect on 2009 MOU

The 2009 MOU is superseded in its entirety by this MOU and the Emergency Preparedness MOU, and the 2009 MOU is of no further force or effect.

III. Purposes

This Memorandum of Understanding (MOU) establishes a framework for cooperation and outlines responsibilities for the State of Oregon and OLNG for mitigating CO2 emissions from the operation of the proposed LNG terminal; and 2) providing a retirement cost estimate and funding surety that is consistent with the state requirements for energy facilities.

IV. Objectives

OLNG agrees to cooperate to mitigate carbon dioxide (CO2) emissions from the operation of the proposed LNG terminal pursuant to Section V, which establishes that CO2 mitigation terms shall be consistent with the existing requirements that apply to electric generating facilities under EFSC jurisdiction.

OLNG agrees to cooperate to provide a retirement cost estimate and funding surety described in Section VI, which is consistent with the existing requirements for energy facilities under EFSC jurisdiction.

V. CO2 Authorities and Responsibilities

OLNG will commit to mitigate carbon dioxide (CO2) emissions from the operation of the proposed LNG terminal pursuant to the terms of this Section V. Notwithstanding anything to the contrary herein, to the extent OLNG is required to mitigate, offset, or reduce CO2 emissions pursuant to any future state or federal CO2 emissions mitigation, offset, or reduction program, ODOE shall, to the extent allowable under the applicable program, consider the CO2 mitigation performed pursuant to the MOU as being applicable toward the new program. CO2 mitigation terms shall be consistent with the current requirements that apply to electric generating facilities under EFSC jurisdiction. For such facilities, the Energy Facility Siting Council (EFSC) standard for CO2 is written in terms of output CO2 per unit electricity produced.

There is no parallel standard for LNG terminals. However, the basic CO2 standard for EFSC facilities requires that licensees match the best available technology, and then improve on the best available technology by 17%. EFSC jurisdictional facilities that improve on the best available technology by 17% or more are deemed to meet the CO2 standard outright. Any emissions in excess of 17% below the emissions produced using best available technology must be offset, either directly or by providing offset funds to a "qualified organization" as described in ORS 469.503. The EFSC has found that the Oregon Climate Trust is a qualified organization.

Therefore, for the proposed LNG terminal, ODOE and OLNG agree that a CO2 offset method consistent with the one used by EFSC shall be followed. The proposed LNG terminal would emit CO2 by the use of natural gas fuel in combustion vaporizers and fired heaters. OLNG has

committed to using the most efficient commercially available vaporizer and heater design. Therefore, to be consistent with the EFSC standard for generating facilities, OLNG shall be required to offset 17% of those emissions. Provided The Climate Trust agrees to the terms and conditions of the applicable provisions of this MOU, ODOE and OLNG will adopt the following terms and conditions:

(1) Before beginning construction of the facility, OLNG shall make payment to The Climate Trust in the amount of the monetary path payment requirement (in 2009 dollars) as determined by the calculations set forth in Section V(4). The offset fund rate for the monetary path payment requirement shall be the rate in dollars per short ton of CO2 that EFSC has set forth in Oregon Administrative Rules at OAR Chapter 345-024-0580 as in effect at the time of payment. The calculation of 2009 dollars shall be made using the Gross Domestic Product Implicit Price Deflator as published by the Oregon Department of Administrative Services (Index).

(a) In the event of any dispute between OLNG and The Climate Trust with respect to whether the monetary path payment complies with the requirements of this MOU, either OLNG or The Climate Trust may submit the matter to ODOE for its determination as to whether OLNG is in compliance with the requirements of this Section V(1). OLNG shall make its determination within 60 days following receipt of all relevant information regarding the dispute and its decision shall be binding on all parties.

(b) In the event that FERC approves assignment of its authorization to a party other than OLNG for the LNG facility, the new party shall submit to ODOE for ODOE's approval evidence of payment to the Climate Trust in the amount calculated under this MOU for the monetary path payment.

(c) If the full monetary path payment is not paid by the end of the year in which ODOE verifies the calculation required under Section V(4), the amount of the monetary path payment shall increase annually by the percentage increase in the Index and shall be prorated within the year to the date of disbursement to The Climate Trust from the date FERC approved the facility.

(2) OLNG shall submit monetary path payment requirement calculations to ODOE for approval in a timely manner before making the monetary path payment to the Climate Trust. OLNG shall use the contracted design parameters for combustion vaporizer and fired heater rates that it reports pursuant to Section V(3) to calculate the monetary path payment requirement.

(3) OLNG shall include an affidavit certifying the heat rates and capacities reported as follows.

Before beginning construction of the facility, OLNG shall notify ODOE in writing of its final selection of LNG vaporization technology, expected thermal efficiency of combustion vaporizers and fired heaters, the design annual throughput of the facility assuming full time operations for 100% capacity factor, and the expected annual consumption of fuel in vaporizers and fired heaters based on operating 2190 hours (25%) for capacity factor, hours of operation at annual average site temperature and pressure.

(4) OLNG shall calculate the monetary path payment requirement as follows:

(a) For submerged combustion vaporizers ("SCV's") and hot oil heaters, the monetary path payment requirement is

EAC x 30 x 0.17 x 117/2000 x MPR

Where

- EAC = the expected annual consumption of natural gas combusted (in MMBTU's) in SCV's and other heaters, assuming 2190 hours per year, using the initial estimate for capacity factor for the full year at average annual ambient temperature
- 30 is the facility lifetime in years
- 17 is the percentage of emissions for a state of the art facility required to be offset at electric generating facilities under Oregon Statute
- 117/2000 is pounds of CO2 emitted per MMBTU of natural gas combusted, converted to short tons, and
- MPR is the monetary path rate set at OAR 345-024-0580 ($1.27 as of September 2015, but subject to change every two years)

(5) Year Five Test and True Up Provision:

(a) At the end of the fifth full year of commercial operations, OLNG shall report the facility's actual fuel consumption in combustion vaporizers and fired heaters, and the facility's actual throughput of LNG product as a percentage of maximum designed annual throughput that was reported under Section V(3) above for the years of operation one through five. OLNG shall submit this report to ODOE within six months of the end of the fifth full year of operations. OLNG shall normalize the actual fuel consumption to actual facility operating capacity factor as follows:

$$FC_{normalized} = FC_{actual} \times TP_d/TP_{actual}$$

Where
FCactual = the actual fuel consumption over the five full years of operation
TPd = the design LNG throughput reported under Section V(3), and
TPactual = the actual LNG throughput over the five full years of operation.

If the calculated normalized fuel consumption is less than the annual fuel consumption used in the calculations performed under Section V(4), then the facility is considered to be as thermally efficient as was assumed, and no additional payment is required but no refund shall be provided to OLNG.

If the calculated normalized fuel consumption is within 5% of the annual fuel consumption used in the calculations performed under Section V(4) then no additional payment shall be required.

If the calculated normalized fuel consumption is greater than 5% above the annual fuel consumption assumed in the calculations performed under Section V(4), then OLNG shall recalculate the monetary path payment requirement for 30 years using the same method as set forth in Section V(4) using the normalized annual fuel consumption and the MPR in effect at the time, subtract off the amount already disbursed to the Climate Trust under Section V(1), and make a "true up payment" to the Climate Trust, equal to the difference.

VI. Retirement and Financial Assurance Authorities and Responsibilities

OLNG agrees to provide a retirement cost estimate and funding surety that is consistent with the requirements for energy facilities under EFSC jurisdiction. ODOE and OLNG agree to the following terms, which are consistent with the requirements for the EFSC Retirement and Financial Assurance Standard at OAR Chapter 345 Divisions 21 and 22.

(1) Two years before closure of the terminal and following consultation with the City of Warrenton, OLNG shall submit to ODOE a proposed final retirement plan for the facility and site that conforms substantially with the requirements of OAR 345-027-0110, including:

(a) A plan for retirement that provides for completion of retirement within two years of permanent cessation of operation of the facility and that protects the public health and safety and the environment;

(b) A description of actions OLNG proposes to take to restore the site to a useful, nonhazardous condition, including options for postretirement land use, information on how it would minimize impacts to fish, wildlife and the environment during the retirement process; and measures it would take to protect the public against risk or danger resulting from postretirement site conditions; and

(c) A current detailed cost estimate, a comparison of that estimate with the dollar amount contained in the bond or letter of credit, in combination with any funds that OLNG may have irrevocably committed to retirement, and a plan for ensuring the availability of adequate funds for completion of retirement.

(2) OLNG shall retire the facility if OLNG permanently ceases construction or operation of the facility. OLNG shall retire the facility according to a final retirement plan prepared pursuant to Section VI(1) and which shall be approved by ODOE if the plan complies with OAR 345-027-0110.

(3) OLNG shall prevent the development of any conditions on the site that would preclude restoration of the site to a useful, nonhazardous condition to the extent that prevention of such site conditions is within the control of OLNG.

(4) Before beginning any construction of the facility, OLNG shall submit a detailed engineering estimate of the cost to retire the facility and restore the site to a useful and non-hazardous condition. The estimate shall include a discussion and justification of the methods and assumptions used to estimate the retirement and restoration cost. The information provided in the estimate shall substantially conform to the information

requirements of OAR 345-021-0010(w). Both the estimate and the methodology used to develop the estimate are subject to ODOE review and approval.

In estimating the site restoration cost, no credit shall be allowed for scrap value or salvage of equipment, consistent with the EFSC policy for jurisdictional energy facilities.

(5) Before beginning construction of the facility, OLNG shall submit to the State of Oregon through ODOE a bond or letter of credit, naming the State of Oregon, acting by and through ODOE, as beneficiary or payee. The initial bond or letter of credit shall be in the amount of the above estimate (in the quarter/year dollars of the date of ODOE approval of the estimate) and adjusted to the date of issuance.

(a) OLNG shall annually adjust the amount of the bond or letter of credit using the US Gross Domestic Product Implicit Price Deflator, Chain-Weight, as published in the Oregon Department of Administrative Services' "Oregon Economic and Revenue Forecast," or by any successor agency ("the Index"). If, at any time, the Index is no longer published, ODOE shall select a comparable calculation of the quarter/year dollars of the date of ODOE approval of the estimate.

(b) The amount of the bond or letter of credit account shall increase annually by the percentage increase in the Index.

(c) OLNG shall use a form of bond or letter of credit approved by ODOE.

(d) OLNG shall use an issuer of the bond or letter of credit approved by ODOE.

(e) OLNG shall not revoke or reduce the bond or letter of credit before retirement of the facility without approval by ODOE.

(f) OLNG shall provide notice to ODOE within five (5) days if the bond or letter of credit is revoked or reduced by the issuing institution.

(g) The reduction or revocation of the bond or letter of credit before completion of retirement of the facility shall constitute an event of default under this Agreement if not consented to by ODOE or cured by OLNG within thirty (30) days.

(6) OLNG shall ensure the issuer of the bond or letter of credit supplies annual riders and continuation certificates to bonds, or amendments to letters of credit, to ensure annual adjustments.

(7) As required by ORS 466.635, OLNG shall report any release of hazardous substances above reportable quantities, or any amount to waters of the state under state and federal law to the Oregon Department of Environmental Quality (DEQ) immediately via the Oregon Emergency Response System (ERS) by calling 800-452-0311. In addition, OLNG shall inform ODOE by email of any reportable release within one working day after the discovery of such release. This obligation shall be in addition to any other reporting requirements applicable to such a release.

(8) OLNG is responsible for cleaning up the spill or release and disposing of any

contaminated media or other materials according to applicable regulations. OLNG must provide a copy of any spill or release clean-up report required by state or federal agencies to DEQ and ODOE, with required documentation.

(9) If ODOE finds that OLNG has permanently ceased construction or operation of the facility without retiring the facility according to an approved final retirement plan prepared pursuant to Section VI(1), ODOE will notify OLNG and request that OLNG submit a proposed final retirement plan to the ODOE within a reasonable time not to exceed 90 days.

(a) If OLNG does not submit a proposed final retirement plan by the specified date, ODOE may contract with a qualified site restoration contractor at OLNG's expense to prepare a proposed a retirement plan.

(b) ODOE may draw on the bond or letter of credit described in Section VI(5) and shall use the funds to restore the site to a useful, non-hazardous condition according to the final retirement plan.

(c) If the amount of the bond or letter of credit is insufficient to pay the actual cost of retirement, OLNG shall pay any additional cost necessary to restore the site to a useful, non-hazardous condition.

VII. Agreements

OLNG will provide adequate funding through the "Contract for Services with OLNG" (ODOE #15-093) to ODOE to pay the additional costs ODOE incurs as a result of the responsibilities listed in Section V and VI.

ODOE agrees to develop a program for carrying out the responsibilities listed in Section V and VI as they apply to OLNG.

To the extent the terms or conditions of the FERC authorization of the siting, construction, and operation of an LNG terminal by OLNG expressly conflict with the terms or conditions of this MOU, the terms and conditions of the order shall prevail over the terms and conditions of this MOU. To the extent a provision of this MOU imposes a more stringent requirement on OLNG than the FERC authorization imposes on OLNG, this MOU shall not be deemed to be in conflict with the FERC permit unless the permit specifically prohibits the imposition of a more stringent requirement. If this MOU addresses an issue but the FERC permit is silent with respect to that issue, the FERC authorization shall not be deemed to be in conflict with this MOU with respect to that issue. OLNG shall not intentionally take any action that would tend to cause FERC to issue an order (i) in conflict with this MOU or (ii) that would prohibit the imposition of more stringent requirements under the terms of this MOU.

VIII. Liabilities

OLNG will assume liability for all costs incurred by the State of Oregon arising out of an LNG incident at the import terminal and along the transit route except to the extent such incident was caused or exacerbated by the negligence or willful misconduct of the State of Oregon.

IX. Successors and Assigns
This MOU binds and benefits OLNG and ODOE and their respective successors and assigns.

X. Governing Law

This MOU is to be governed by and construed in accordance with the laws of Oregon, without regard to its conflict of law principles.

XI. Severability

If any provision of this MOU is held by a court of competent jurisdiction to be invalid or unenforceable, the Parties shall negotiate an equitable adjustment to the affected provisions of the MOU with a view toward effecting the purpose of the MOU, and the validity and enforceability of the remaining provisions, portions or applications thereof, shall continue in full force and effect.

XII. Notices

Any notice required to be given by either ODOE or OLNG under this MOU shall be in writing and be delivered in person, or sent by first class mail, or transmitted by facsimile or other electronic means to the appropriate addresses of ODOE or OLNG, respectively. The notice shall be effective on the date received if delivered in person, the date of mailing as shown by the postmark if sent by mail, or the date transmitted if sent by facsimile or other electronic means.

XIII. Revisions

OLNG and ODOE agree to review this MOU and update it as necessary. Amendments or modifications may be made to this MOU only upon written notice by both parties.

XIV. Term of Agreement

This MOU shall become effective upon approval, and shall remain in effect until completion of retirement of the facility; provided, that expiration of the term of this MOU will not relieve either party of any claims against it that arise under this MOU prior to such expiration.

XV. Dispute Resolution

The parties shall make a good faith effort among themselves to resolve any disputes arising under this MOU.

XVI. Designation of Forum and Consent to Jurisdiction

(1) Any party bringing a legal action or proceeding against any other party arising out of or relating to this Agreement shall bring the legal action or proceeding in the Circuit Court of the State of Oregon for Marion County. Each party hereby consents to the exclusive jurisdiction of such court, waives any objection to venue, and waives any claim that such forum is an inconvenient forum.

(2) Notwithstanding Section XVI(1), if a claim must be brought in a federal forum, then it must be brought and adjudicated solely and exclusively within the United States District Court for the District of Oregon. This section applies to a claim brought against the State of Oregon only to the extent Congress has appropriately abrogated the State of Oregon's sovereign immunity and is not consent by the State of Oregon to be sued in federal court. This section is also not a waiver by the State of Oregon of any form of immunity, including but not limited to sovereign immunity and immunity based on the Eleventh Amendment to the Constitution of the United States.

The MOU is executed this 10th day of September, 2015.

OREGON DEPARTMENT OF ENERGY

9.11.15
Michael Kaplan Date
Director

OREGON LNG

9/10/2015
Peter Hansen Date
Chief Executive Officer

Janice R Lemke 9/10/15
Jan Lemke
Designated Procurement Officer

10/5-6/2015
Todd Cornett Date
Division Administrator

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MEMORANDUM OF UNDERSTANDING AND AGREEMENT
No. 15-017
BY AND BETWEEN
THE OREGON LNG PROJECT AND
THE STATE OF OREGON FOR
LNG EMERGENCY PREPAREDNESS

This Memorandum of Understanding (MOU) is insufficient on its own to meet the State of Oregon's safety and security standards for siting an LNG terminal. The following documents must be executed by the Oregon Department of Energy (ODOE) and the LNG terminal applicant, or provided to and approved by ODOE, as appropriate, in order for ODOE to reach a determination that the emergency preparedness approach committed to by the LNG terminal applicant meets state safety and security standards: 1) Emergency Response Plan (ERP); 2) Resource List that identifies gaps in personnel, facilities, equipment and systems needed to implement the ERP; and 3) Cost-Share Agreement with state and local agencies for activities and resources identified in the ERP and Resource List.

I. RECITALS

WHEREAS, in August 2005, President Bush signed into law the Energy Policy Act of 2005 giving the Federal Energy Regulatory Commission ("FERC") exclusive authority to approve or deny the siting, construction, expansion or operation of an LNG terminal located onshore or in state waters. Prior to the 2005 Energy Policy Act, the Oregon Department of Energy ("ODOE") and the Energy Facility Siting Council ("EFSC") had siting authority over proposed LNG facilities in Oregon.

WHEREAS, recognizing the importance of participating in the federal review process, the Governor in January 2006 designated ODOE as the lead state agency for ensuring that Oregon's interests are addressed in the federal FERC siting process.

WHEREAS, ODOE has been delegated the responsibilities for emergency preparedness for LNG facilities (ORS 469). This includes working with LNG developers to develop and maintain an emergency response plan to protect citizens from LNG leaks and fires should a terminal be built and to provide oversight throughout the life of the project.

WHEREAS, Oregon LNG (OLNG) has applied to FERC for authorization to construct and operate an LNG bi-directional processing facility located on the Skipanon Peninsula in Warrenton, Oregon. The approximately 96 acre site is eight miles west of Astoria and is less than 10 miles from the point where the Columbia River empties into the Pacific Ocean.

WHEREAS, OLNG and ODOE entered into Memorandum of Understanding and Agreement No. 09-100 by and Between the Oregon LNG Project and the State of Oregon for Emergency Preparedness, CO2, and Retirement and Financial Assurance on June 8, 2009 ("2009 MOU"); WHEREAS OLNG and ODOE desire for convenience to separate the 2009 MOU into two

agreements: this Memorandum of Understanding and Agreement No. 15-017 by and Between the Oregon LNG Project and the State of Oregon for LNG Emergency Preparedness ("MOU") and the separate Memorandum of Understanding and Agreement No. 15-018 by and Between the Oregon LNG Project and the State of Oregon for CO2 and Financial Assurance for Facilities Retirement ("CO2 and Retirement MOU").

NOW THEREFORE, the parties hereby agree as follows:

II. EFFECT ON 2009 MOU

The 2009 MOU is superseded in its entirety by this MOU and the CO2 and Retirement MOU, upon execution of both, and the 2009 MOU is of no further force or effect.

III. PURPOSES

This MOU establishes a framework for cooperation and outlines responsibilities for ODOE and OLNG to: 1) identify risk mitigation measures to reduce vulnerability and prevent incidents; 2) develop and maintain a comprehensive emergency response plan for the terminal, associated facilities, and along the waterway transit route; and 3) train and prepare decision-makers and first responders to implement the plan should an emergency occur to protect public health and safety of Oregonians living, working, or recreating in the region.

Note: This MOU will not address natural gas pipeline emergency preparedness. Interstate gas pipelines are regulated by the U.S. Department of Transportation's Pipeline and Hazardous Material Safety Administration (PHMSA). Intrastate gas pipelines are regulated by the Oregon Public Utility Commission (OPUC) Pipeline Safety Division, All pipeline companies are required to comply with PHMSA and OPUC standards and regulations for gas pipeline construction, operation, maintenance, and emergency response.

IV. OBJECTIVES

ODOE and OLNG agree to cooperate to develop an emergency preparedness program for LNG emergencies as described in this MOU, which establishes and ensures uniform policies and procedures for response at the federal, state, local and industry levels to (1) protect public health, safety and the environment, (2) ensure public awareness of and confidence in the state and OLNG response to an LNG accident, and (3) provide OLNG with certainty as to Oregon emergency preparedness requirements.

V. OLNG COMMITMENT AND RESPONSIBILITIES TO OREGON EMERGENCY PREPAREDNESS AUTHORITIES

The Governor of Oregon is responsible for emergency preparedness and response in Oregon (ORS 401). ODOE has authorities and responsibilities for emergency preparedness and response as delegated by the Governor (ORS 469). Therefore, ODOE is responsible for ensuring that LNG developers operating in Oregon design an emergency response plan (ERP) that meets state and local safety and security standards and requirements as specified in this MOU. OLNG agrees to take the following actions consistent with the development of the ERP:

(1) *PLAN DEVELOPMENT AND COMMITMENT TO EMERGENCY RESPONSE RESOURCES* – Prior to construction, OLNG will work with state and local emergency response organizations to develop and maintain a comprehensive ERP for the terminal, associated facilities, and the LNG carrier waterway transit route. OLNG will provide state and local emergency response organizations adequate funding, personnel, equipment, and other resources as appropriate to implement the ERP. Components of the ERP include:

a) Facility firefighting strategy to meet the National Fire Protection Association (NFPA) standards for a four-minute response to a 1st Alarm Fire at an industrial facility as shown in Table 7.2.1 below. The facility firefighting strategy will include a Resource List which details the location and number of facilities, personnel, equipment, and apparatus provided, and other pertinent information as appropriate.

Table 7.2.1 - Required Resources for a "Medium-Hazard Occupancies" Response. This includes apartments, offices, mercantile and industrial occupancies not normally requiring extensive rescue or fire-fighting forces.

- At least 3 pumpers
- 1 ladder truck (or combination apparatus with equivalent capabilities)
- Other specialized apparatus as may be needed or available
- No fewer than 16 fire fighters, 1 chief officer, 1 safety officer, and a Rapid
- Intervention Team (4 - 5 fire fighters on standby at event scene).

Note: Refer to Volume 1 - NFPA Handbook, 19th Edition, Chapter 2, Section 7, Organizing for Fire and Rescue Services.

Upon state and local approval of the facility firefighting strategy and OLNG issuing a Notice to Proceed to its contractor(s) to commence construction, OLNG will begin acquiring resources listed in Table 7.2.1. All essential personnel, training, facilities, equipment, systems and supplies provided to ensure effective fire and rescue response must be in place 30 days prior to terminal operation and maintained throughout the life of the project by OLNG.

b) Marine firefighting strategy in response to LNG incidents occurring along the waterway transit route. This strategy must be consistent with the Unified Command Structure. Under Unified Command, the fire service with the authority and responsibility for protecting the location of the initial incident will lead the waterway transit route response effort on land. Neighboring fire agency, the Astoria Fire Department will provide support as necessary to the lead fire agency, the Warrenton Fire Department. While fire fighters from both the Warrenton and Astoria Fire Departments will not respond to a shipboard fire on an LNG carrier, the fire agencies are responsible for protecting the population living, working, and recreating along the eight mile waterway transit route.

The proposed marine firefighting strategy will also include a Resource List which details the location and number of personnel, equipment, and apparatus necessary to support a waterway transit route response. The dedicated personnel and assets will be in place,

trained and tested, and operational 30 days prior to terminal operation and maintained throughout the life of the project by OLNG.

To the extent additional resources and support are needed to respond to an incident, they will be obtained as needed through mutual aid in the region.

c) Public warning system strategy for the region to inform people of an LNG emergency. The public warning system strategy must be consistent with the Federal Emergency Management Agency (FEMA) Guidance for public warning systems for all hazard events, the National Response Framework, and the Oregon Department of Geology and Mineral Industries Tsunami Warning Systems and Procedures (ORS 516.030). The public warning system strategy will include the following alert and notifications systems:

- Reverse 911 (24-Port) System for the host county - The system will include the following capabilities: high volume calling; compatible with major mapping systems; E911 data ready; multiple devices (recorded voice messages, text messages to wireless receivers, and pages); geo-dimensional calling; full networking capabilities; off-site back-up notification; remote launching capability; and other capabilities as appropriate.

- Sirens - Outdoor siren system throughout the entire transit route covering all three zones of concern up to the terminal. The system will include the following capabilities: multiple high intensity warning signals; live and digital voice messaging with flat frequency response from 200 - 2000 Hz for clear voice reproduction; 360-degree coverage with no sound variation in the horizontal plane (106 to 125 dBc at 100ft/30m); continued emergency operation regardless of primary power outages, and other capabilities as appropriate. OLNG will include a map of the proposed number and locations of sirens showing the coverage area of each proposed siren for state and local review and approval.

- Reader Boards - Reader boards located along the major highways in Clatsop County to provide event information, direct traffic, and facilitate evacuations. OLNG will include a map of the proposed number and locations of reader boards for state and local approval. Reader board specifications must be consistent with the Oregon Department of Transportation reader boards located throughout the state.

- Other Alert and Notification Systems - OLNG, state, and local emergency response organizations will continue to assess and implement other alert and notification needs as appropriate.

Upon state and local approval of the public warning system strategy, all equipment and systems provided to enhance the host county's public warning system must be in place, tested, and operational 30 days prior to terminal operation and maintained throughout the life of the project by OLNG.

d) Remote gas detection system strategy for detecting offsite releases. The remote gas detection system strategy will include a list with a breakdown of all proposed fixed and

portable gas detectors and designated locations for the equipment including:

- Fixed Gas Detectors – in all high risk and high population areas along the entire transit route in the host county. Fixed gas detector capabilities will include remote wireless operations and the ability to provide readouts in multiple locations.
- Portable Gas Detectors – three layers of portable gas detectors to be provided in: 1) All emergency responder vehicles in the region will be provided a methane gas detector. 2) Methane gas and oxygen meters will be assigned to all fire trucks, and 3) Multi-meters will be provided to hazardous materials responders.
- Other Gas Detection Equipment and Systems – OLNG, state, and local emergency response organizations will continue to assess and implement other gas detection needs as appropriate.

Upon state and local approval of the remote gas detection system strategy, all fixed and portable gas detectors and systems provided must be in place, tested, and operational 30 days prior to terminal operation and maintained throughout the life of the project by OLNG.

e) Interoperable communications strategy for the region to ensure seamless communications among OLNG, federal, state, and local emergency response organizations during routine operations and in response to emergencies. OLNG will consider state of the art communications technology for its primary communications system such as voice over internet protocols or industry equivalent and an independent backup communications system to ensure redundancy. The interoperable communications strategy must be consistent with the FEMA Guidance for interoperable communications systems for all hazard events, the National Response Framework, and the Oregon Statewide Communications Interoperability Plan and Guidelines.

OLNG, state, and local emergency response organizations will continue to assess and implement other communications needs as appropriate. Upon state and local approval of the interoperable communications strategy, all equipment and systems provided to enhance the region's interoperable communications system must be in place, tested, and operational 30 days prior to terminal operation and maintained throughout the life of the project by OLNG.

f) Emergency notification strategy to ensure timely notifications (within 15 minutes of event onset) to state and local agencies in the event of an incident at the terminal, associated facilities, and along the waterway transit route with potential impacts to the health and safety of site workers, the public, or the environment. This includes security threats and any other event that may generate media attention. If primary communications are down, OLNG will notify state and local agencies by an approved independent backup communications system.

OLNG will maintain ongoing communications with and provide event information to state and local decision-makers throughout the duration of an emergency. This includes,

but is not limited to information about the emergency classification, facility conditions, LNG release, mitigation measures taken, vessel information, meteorological data, protective action recommendations, maps, and other pertinent emergency information as appropriate. State and local decision-makers will use the event information to assess the severity of the event, determine impacts to Oregonians, advise the Governor on protective actions for the public, issue emergency information and instructions to the news media and the public, and perform other actions as appropriate.

Upon state and local approval of the emergency notification strategy, all notification equipment and systems provided must be in place, tested, and operational 30 days prior to terminal operation and maintained throughout the life of the project by OLNG.

g) Designate location or build a new centralized EOC for the region to allow for coordination, planning, preparedness, and response to OLNG terminal, associated facilities or LNG waterway transit route emergencies. The designated regional EOC must be located outside of the three zones of concern. The proposed plan will be consistent with the National Response Framework to ensure adequate work space, communications capabilities, hazard specific technology, and other tools, equipment, and systems to allow affected federal, state, and local emergency responders to collaborate on planning, preparedness, or response to LNG emergencies.

   Upon state and local approval of the centralized EOC location and facility design, the facility, equipment and systems must be in place, tested, and operational 30 days prior to terminal operation and maintained throughout the life of the project by OLNG.

h) Designate location or build a new Joint Information Center (JIC) to ensure the coordination of event information among the federal, state, and local agencies responding to the event. The goal is to provide a consistent message to news media and the public. The designated JIC must be located outside of the three zones of concern and should not be collocated with the regional EOC.

   The JIC will be the location for news conferences; coordinating news releases from responding federal, state, and local jurisdictions as well as OLNG; addressing public and media inquiries; and other public information activities as appropriate. Failure to provide a central clearing house to manage the receipt and dissemination of emergency information may result in misinformation, inconsistent information, and unconfirmed information getting out to the public and news media creating public panic, confusion, and mistrust. The proposed JIC plan will be consistent with the National Response Framework guidelines and be located outside of the three zones of concern. The JIC must provide adequate space and equipment for conducting news conferences and work space for public information officers from federal, estate, and local emergency response organizations reporting to the JIC.

   Upon state and local approval of the JIC location and facility design, the facility, equipment and systems must be in place, tested, and operational 30 days prior to terminal operation and maintained throughout the life of the project by OLNG.

i) Designate location or build an LNG training center to prepare state and local emergency responders and decision-makers for an LNG emergency at the terminal, associated facilities, and along the waterway transit route. The LNG training center must be located outside of the three zones of concern. Instructors must be accredited LNG instructors. The type of training to be provided should include, but is not limited to: 1) Incident Command System; 2) facility security; 3) oil & hazmat spill response; 4) LNG for fire fighters, emergency responders, and law enforcement; 6) general LNG training; 7) advanced LNG fire fighting; 8) hospital training; 9) tabletops, drill, and exercises and other training as appropriate.

Upon state and local approval of the LNG training center, the facility, instructors, equipment and systems must be in place, tested, and operational three months prior to the first LNG cargo delivery to or from the dual-use import-export terminal and maintained throughout the life of the project by OLNG.

j) Provide position description and funding mechanism to Clatsop County, City of Warrenton, and the City of Astoria to hire a full-time LNG Planner/Fire Response Coordinator for each jurisdiction. The position description for the LNG Planner/Fire Response Coordinator will include 1) drafting the jurisdiction's LNG emergency response plan; 2) working with first responders to prepare for LNG vessel arrivals and departures; 3) working with first responders, the state, and OLNG to conduct plan review, coordinate training, exercises, public outreach, and 4) performing other LNG emergency preparedness activities as appropriate. Funding of these positions will be maintained throughout the life of the project by OLNG.

Upon state and local approval of the position description and funding mechanism, OLNG will provide funding to hire and train an LNG Planner/Fire Response Coordinator for Clatsop County, City of Warrenton, and City of Astoria at the start of the construction phase.

k) Develop strategy to address burn victims as a result of an LNG emergency at the terminal, associated facilities, or along the waterway transit route. The strategy must be consistent with the capabilities outlined in the Burn Mass Casualty Plan for the Oregon Burn Center at Legacy Emanuel Hospital. Specifically, OLNG will provide area hospital(s) with the personnel and resources necessary to implement the Burn Mass Casualty Plan's 72 Hour Burn Plan - Care of Burn Patients in a Non-Burn Hospital. This includes, but is not limited to:

- Identifying resources and procedures necessary for treating burn victims if immediate transfer to a regional burn center is not feasible. This includes ongoing resuscitation and care.
- Identify medical supplies, pharmaceuticals, and equipment needed to support a triage station capable of treating 5 victims with severe burns. This includes pre-packed medical resources.

- Communications capabilities including 800 mhz trunked radio and web-based client/server applications to coordinate communications between the event scene and Bay Area Hospital and serve as the patient information tracking mechanism in events involving multiple burn victims.
- Staffing requirements for care of burn patients in a non-burn hospital.

Upon state and local approval of the burn victim strategy, all personnel, equipment and systems provided to enhance the hospital's capabilities to address burn victims must be in place, tested, and operational 30 days prior to terminal operation and maintained throughout the life of the project by OLNG.

(2) *LNG TRANSIT MANAGEMENT PLAN DEVELOPMENT AND COMMITMENT TO EMERGENCY RESPONSE RESOURCES* - Prior to construction, OLNG will provide a LNG Transit Management Plan (TMP) to identify operational safety and security measures relating to the transit of LNG carriers. The TMP clarifies roles and responsibilities and describes the interagency coordination procedures and operational framework that is put in place prior to a LNG carrier transit and during operations at the marine terminal. The TMP will be consistent with U.S. Coast Guard (USCG) standards in 33 CFR 105. All personnel, equipment, and resources provided to enhance security for LNG carrier transits will be in place, trained and tested, and operational prior to operation and maintained throughout the life of the project by OLNG.

Upon state and local approval of the TMP, the facility, personnel, equipment and systems must be in place, tested, and operational three months prior to the first LNG cargo delivery to or from the dual-use import-export terminal and maintained throughout the life of the project by OLNG.

(3) *SECURITY PLAN DEVELOPMENT AND COMMITMENT TO EMERGENCY RESPONSE RESOURCES* - Prior to construction, OLNG will provide a comprehensive security plan for the facility, associated facilities, and along the LNG waterway transit route. The security plan must be consistent with the conditions, requirements and standards identified in USCG's Waterway Suitability Assessment. The proposed plan will assess and identify additional local law enforcement personnel and resources needed, if any, as a result of the project. This includes, but is not limited to OLNG expectation of local law enforcement to conduct water-side patrols and enforce LNG vessel and terminal security zones along the channel and at the import terminal. All personnel, equipment, and resources provided to enhance security on the water must be dedicated to LNG response.

Upon state and local approval of the security plan, the facility, personnel, equipment and systems must be in place, tested, and operational three months prior to the first LNG cargo delivery to or from the dual-use import-export terminal and maintained throughout the life of the project by OLNG.

VI. STATE OF OREGON LNG EMERGENCY RESPONSE PLAN (STATE OF OREGON LNG ERP)

ODOE has authorities and responsibilities as delegated by the Governor to develop and maintain the State of Oregon LNG ERP.

(1) OREGON PLAN DEVELOPMENT – The plan will define the state's role and responsibilities to prepare for, respond to, and recover from LNG emergencies that threaten the health and safety of Oregon citizens, the environment, and the region's economy. ODOE will direct and control the State of Oregon's overall response to LNG emergencies impacting the state. This includes:

a) Receive initial notifications from OLNG about an event at the terminal and along the transport route.

b) Notify and/or establish contact with all affected federal, state, and county emergency response organizations to ensure a coordinated response to LNG emergencies in Oregon.

c) Work with OLNG, USCG, and Clatsop County to assess the severity of the event, determine impacts to Oregon, and advise the Governor on protective actions for the public. This includes but is not limited to declaring a state of emergency and requesting federal support.

d) Work with OLNG, USCG, and Clatsop County to recover from an LNG emergency at the terminal, associated facilities, and along the waterway transport route.

(2) ORS 176.810 authorizes ODOE to oversee the development of county government LNG plans. The county LNG plans should meet the needs of first responders in all affected jurisdictions. The county LNG plans must also meet state safety and security requirements and be consistent with the statewide LNG plan as specified in Section V, under number 1) of this MOU.

VII. MAINTAINING STATE OF OREGON LNG EMERGENCY RESPONSE PROGRAM READINESS

OLNG will work with state and local emergency response organizations to ensure that the region's emergency responders and decision-makers are prepared to respond to an LNG crisis at the terminal, associated facilities, and along the waterway transport route. It is recognized that OLNG does not control federal, state, and local agencies and their participation is controlled by management outside of OLNG. This includes:

(1) *PLAN REVIEW AND UPDATE* – OLNG will coordinate the review and update of ERPs with state and local emergency response organizations annually or as needed. Revisions will include improvements identified through training, drills, and exercises.

(2) *DRILLS AND EXERCISES* – OLNG will schedule and coordinate drills and exercises. This includes, but is not limited to:

- Annual Tabletop Drill - To talk through OLNG response as well as federal, state, and local responses to an LNG emergency at the terminal and along the transit route.

- Annual Full Scale Exercise – To evaluate the actual response capabilities OLNG and federal, state, and local emergency response organizations as discussed in the Tabletop Drills.

  For full-scale exercises, OLNG will establish an Exercise Planning Team. This Team will include representatives from OLNG, USCG, ODOE, Clatsop County, local emergency response agencies, and other emergency response organizations as appropriate. The Exercise Planning Team will develop the scenario, exercise objectives, limitations, and the extent-of-play as well as serve as the exercise controllers and evaluators. All information pertaining to drill and exercise scenarios are to be kept under the custody of the trusted agent for each organization and not to be released to participants.

  After each drill and exercise, members of the Exercise Planning Team will identify corrective actions needed and lessons learned. It is the responsibility of each team member to ensure corrective actions are taken within their respective organizations.

- Quarterly Communications Exercises – OLNG will conduct quarterly communications drills to test the initial notification methods with federal, state, and local emergency response agencies. This includes primary and backup communications methods.

- Annual Review of Training and Equipment Needs – OLNG will work with state and local emergency response organizations to evaluate the adequacy and effectiveness of the training and resources available and make appropriate modifications to OLNG's ERP as agreed to by OLNG and ODOE.

(3) *CONFERENCES AND WORKSHOPS* – OLNG will inform state and local emergency response organizations of regional and national LNG conferences and workshops to ensure information sharing on LNG issues and topics of mutual concern. OLNG will provide funding for state and local representatives to participate and attend workshops and conferences as appropriate.

(4) *PUBLIC OUTREACH AND EDUCATION* – OLNG will work with state and local emergency response organizations to ensure LNG public outreach is conducted as required by FERC in host communities and throughout the state as needed. This includes but is not limited to:

a) Public meetings or workshops

b) Presentations to community and business groups, elected officials, schools, and other audiences as appropriate

c) News Media

d) Provide pre-printed materials about OLNG and LNG to libraries, schools, businesses, government offices, and other locations as appropriate. This includes but is not limited to brochures, fact sheets, and calendars.

e) Other public outreach activities as appropriate.

VIII. PROJECT MISSION CHANGE

OLNG will notify state and local agencies of all material project changes and expansions. OLNG will work with state and local emergency response organizations to assess potential impacts to the region's response capabilities, resources, and activities as a result of the proposed material project change or expansion. OLNG will cover all costs incurred by state and local emergency response organizations as a result of the proposed expansion or change. Proposed "material" project changes and expansions include, but are not limited to:

a) Increases to the current shipment schedule
b) Increasing the current carrier vessel size
c) Increases to the current emergency planning zones
d) Constructing additional LNG storage tanks on site
e) Expanding current dockside capabilities
f) Changing liquefying or re-gasification capabilities on site
g) Other

IX. AGREEMENTS

OLNG will provide adequate funding, pursuant to a cost-share agreement titled "Contract for Services with OLNG" (ODOE #14-024) to ODOE to pay the additional costs ODOE incurs as a result of the responsibilities listed in Section V, VI, VII, and VIII.

ODOE agrees to develop a program for carrying out the responsibilities listed in Section V, VI, VII, and VIII as they apply to OLNG. The execution of the responsibilities of the Governor of Oregon under this MOU is hereby assigned and delegated to ODOE.

OLNG agrees to provide ODOE annual support for administration of the State of Oregon's LNG ERP as specified in section V while the MOU is operative. Should this MOU be terminated, the parties mutually agree to negotiate in good faith, a revised MOU or some other agreement to insure continued commitment to provide annual support to the responsibilities of Oregon's LNG ERP as specified in Section V of this MOU.

In exchange, ODOE agrees to maintain the State of Oregon's LNG ERP in a state of readiness. ODOE's responsibility for expenditures for program maintenance as well as for drill and exercise participation is limited to the funding provided by OLNG. Funds provided by OLNG shall be paid directly to ODOE, unless otherwise mutually agreed.

To the extent the terms or conditions of the FERC permit authorizing the siting, construction, and operation of an LNG terminal by OLNG expressly conflict with the terms or conditions of this MOU, the terms and conditions of the FERC permit shall prevail over the terms and conditions of this MOU. To the extent a provision of this MOU imposes a more stringent term or condition on OLNG than the FERC permit imposes on OLNG, this MOU shall not be deemed to be in conflict with the FERC permit unless the permit specifically prohibits the imposition of a

more stringent requirement. If this MOU addresses an issue but the FERC permit is silent with respect to that issue, the FERC permit shall not be deemed to be in conflict with this MOU with respect to that issue. OLNG shall not intentionally take any action that would tend to cause FERC to issue an order (i) in conflict with this MOU or (ii) that would prohibit the imposition of more stringent requirements under the terms of this MOU.

X. LIABILITIES

OLNG will assume liability for all costs incurred by the State of Oregon arising out of an LNG incident at the terminal and along the transit route except to the extent such incident was caused or exacerbated by the negligence or willful misconduct of the State of Oregon.

XI. SUCCESSORS AND ASSIGNS

This MOU binds and benefits OLNG and ODOE and their respective successors and assigns.

XII. GOVERNING LAW

This MOU is to be governed by and construed in accordance with the laws of Oregon, without regard to its conflict of law principles.

XIII. SEVERABILITY

If any provision of this MOU is held by a court of competent jurisdiction to be invalid or unenforceable, the Parties shall negotiate an equitable adjustment to the affected provisions of the MOU with a view toward effecting the purpose of the MOU, and the validity and enforceability of the remaining provisions, portions or applications thereof, shall continue in full force and effect.

XIV NOTICES

Any notice required to be given by either ODOE or OLNG under this MOU shall be in writing and be delivered in person, or sent by first class mail, or transmitted by facsimile or other electronic means to the appropriate addresses of ODOE or OLNG, respectively. The notice shall be effective on the date received if delivered in person, the date of mailing as shown by the postmark if sent by mail, or the date transmitted if sent by facsimile or other electronic means.

XV. REVISIONS

OLNG and ODOE agree to review this MOU and update it as necessary. Amendments or modifications may be made to this MOU only upon written agreement by both parties.

XVI. TERM OF AGREEMENT

This MOU shall become effective upon approval, and shall remain in effect until completion of retirement of the facility; provided, that expiration of the term of this MOU will not relieve either

party of any claims against it that arise under this MOU prior to such expiration.

The MOU is executed this 10th day of September, 2015.

9.11.15

Michael Kaplan, Director
Oregon Department of Energy

Peter Hansen, CEO
LNG Development Co., LLC

Ken Niles, Assistant Director
Nuclear Safety & Energy Emergency
Preparedness Division

Janice R. Lemke 9/11/15

Jan Lemke,
Designated Procurement Officer

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