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Habitat Conservation Division

NOAA Fisheries National Marine Fisheries Service

Memorandum

FOR: Medha Kochhar, Office of Energy Projects, FERC

FROM: Bridgette Lohrman, Oregon State Habitat Office, NMFS
Alison Agness, Protected Resources Division, NMFS

SUBJECT: Review of the 2nd draft of resource reports #1, 2, and 3 for the proposed Oregon LNG terminal and sendout pipeline in Warrenton, Oregon

DATE: July 18, 2008

The National Marine Fisheries Service (NMFS) appreciates the opportunity to review and comment on the second draft of resource reports for the proposed LNG import terminal at Warrenton, Oregon, and associated natural gas sendout pipeline to Molalla, Oregon.

NMFS continues to be engaged with Oregon LNG, their consultants, and the FERC during this pre-filing process in order to address issues relevant to NMFS' trust resources. NMFS provides these comments to assist FERC with the development of their environmental analysis and for the needs of consultation under the Endangered Species Act (ESA) and Magnuson-Stevens Fishery Conservation and Management Act (MSA). NMFS does not consider these comments to be an exhaustive list of issues to be addressed but should be used in conjunction with information shared and discussed throughout the pre-filing process. Thus, NMFS reserves the right to comment at a later date, *e.g.* draft Biological and EFH assessment, on issues not raised herein.

These comments are organized by resource report; some comments may be applicable to other reports than the one referenced.

Resource Report 1 – General Project

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Description

Page 1-72 – *Dredge material*
Please provide the results and analysis from additional sediment characterization of the berth and turning basin conducted in May 2008.

Page 1-76 – *Stormwater*
NMFS recommends that stormwater facilities are sized to allow for infiltration of the 6-month, 24-hour storm.

Page 1-77 – *Cement deep soil mixing*
In the Architectural Institute of Japan study, please confirm that the soil type within the study is similar to the soil at the terminal location, and that the weather conditions under which the study was conducted are applicable to the Warrenton-area during this component of construction. NMFS has concern with cement deep soil mixing from the perspective of altering the pH of a waterbody via surface or subsurface flow.

Page 1-84
All water withdrawals from a fish bearing stream should meet NMFS' fish passage screening criteria (see http://www.nwr.noaa.gov/Publications/Reference-Documents/Passage-Refs.cfm). NMFS would appreciate the opportunity to review and provide feedback on the design of all screened water withdrawals in fish-bearing streams.

Page 1-85
With regards to ESA-listed salmonids, please revise the list as it relates to the Evolutionarily Significant Unit (ESU) or Distinct Population Segment (DPS) which may be affected by the proposed project. During ESA consultation, NMFS will be assessing impacts on an ESU/DPS basis. Thus, NMFS recommends revising the list as follows:

Lewis and Clark: Lower Columbia River (LCR) Chinook salmon ESU, LCR coho salmon ESU, Columbia River Chum ESU (however, they are nearly extirpated on the

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Oregon side of the Columbia River). As for steelhead, the Southwest Washington DPS extends into the Lewis and Clark River but are not considered a threatened or endangered species.

Nehalem: Chinook salmon are not a threatened or endangered species in the Nehalem River nor are steelhead. The Oregon Coast coho salmon ESU is a threatened species.

Yamhill: Upper Willamette River steelhead DPS, Upper Willamette River Chinook DPS.

Willamette: Upper Willamette River Chinook ESU, Upper Willamette River steelhead DPS.

Please refer to NMFS' Northwest Region webpage for the geographic location of these ESU/DPS' and which ones are and are not threatened or endangered under the ESA (http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/Maps/Index.cfm).

Page 1-92 – *Blasting*
Blasting is mentioned as a possibility during the proposed action. If blasting will directly or indirectly affect ESA-listed species or EFH, the location, duration, and magnitude of the event(s) should be described and the effects analyzed. In addition, describe any mitigation measures that would be implemented to avoid, minimize, or offset such impacts.

Page 1-95 – *Stream crossings*
Please provide site specific plans for stream crossings with ESA-listed species or designated critical habitat. When considering the crossing methodology and the resulting impacts, the short-term and long-term impacts of the proposed action should be evaluated as it relates to the crossing itself and riparian disturbance, bank stability, and future scour potential.

Page 1-95 – *BMPs*
At a minimum, NMFS recommends storing any hazardous materials a minimum of 150 feet

from any waterbody.

Page 1-96 – *Riparian buffers*
At a minimum, the riparian buffer should be considered equal to a site-potential tree height. Please consider this as Oregon LNG continues to work through site specific crossing methodologies so that the impacts and mitigation can be accurately assessed.

Page 1-96 – *Stream crossing riparian areas*
Please provide greater detail on a site specific crossing basis for ESA-listed streams and designated critical habitat, as to how the banks will be regraded and stabilized (will the geomorphology of the stream be altered? Any indirect effects upstream or downstream from such actions?) and specific replanting plans for these locations, *i.e.*, species composition of native grasses, shrubs, trees, and their replanting density, and monitoring and maintenance of the replanting. For HDD crossings, include staging locations, any riparian removal, depth of pipe in relation to scour potential, and the location of the channel migration zone.

Page 1-96 – *Stream crossing bridges*
The language used in this paragraph is ambiguous. Will Oregon LNG, or will they not, remove construction bridges?

Page 1-99
Oregon LNG states that the "waterbody will be returned to it pre-construction contours" after it is open-trenched. This goal may or may not be achievable considering pre-construction contours. An example of such is a steep, naturally eroding, outer bend of the river. It is unlikely that Oregon LNG would return the streambank contour to a vertical wall considering this may contribute to exposure of the pipe at the crossing at a later point from natural flows. Thus, a site specific plan is needed to address the effect of the action and appropriate mitigation.

Page 1-105 – *ROW vegetation*
Please include a description and analysis of

effect of the loss or alteration of riparian vegetation within the permanent ROW and maintained ROW. Include a description of the mitigation for the spatial and temporal loss of the habitat functions for the life of the project (56-years).

Page 1-106
NMFS recommends Oregon LNG determine how they will ensure that habitat impacts are fully restored or mitigated in the case of an unplanned event, *i.e.*, bankruptcy or abandonment. NMFS wants assurance that in the event Oregon LNG is unable or unwilling to complete the project as proposed, including full implementation of the mitigation plan in perpetuity, that the habitat lost at the terminal site would be restored (and enhanced to account for temporal inequity) or that mitigation would be fully implemented. Both restoration and mitigation would require significant funds to implement. A bond, for example, would ensure that the applicant would not have the affected environment bear the burden of the unmitigated impacts and the public to potentially bear the financial costs of restoration.

Resource Report 2 – Water Use and Quality

Page 2-19 – *Pipeline and water quality impairments*
Section 2.2.2.1 discusses the water quality limitations of the streams to be crossed by the pipeline. Please carry forward the baseline conditions for those waterbodies in the discussion of how the project may exacerbate any of these limitations. For example, many streams in Oregon are too warm to support proper functioning conditions for fish. The withdrawal of water, removal of riparian habitat, or alteration of bank soil or vegetative state, may contribute to this degraded state.

Page 2-20 – *Geotechnical reports*
Oregon LNG should continue to pursue the geotechnical information needed for each HDD. As stated in the resource report, this information is needed to minimize the risk of a

frac-out and provide greater assurance for a successful installation of the pipeline. Please provide a table with the sites Oregon LNG can and cannot access. For sites which Oregon LNG can access, the geotechnical information should be provided to evaluate the effectiveness of the bore and the risk to NMFS' trust resources. In locations where Oregon LNG does not have access, Oregon LNG should provide all other available information which will be used to determine the relative risk of the bore. In both instances, the risk of the activity and any adverse effect should be provided.

Page 2-30 – *Hydrostatic test water*
For the discharge of hydrostatic test water, please provide a discussion of the potential for, based on the proposed action, erosion, temperature change, or contaminants (*e.g.*, biocides) to enter the receiving waterway and the resultant effect upon ESA-listed species, critical habitat, or EFH.
Please note that NMFS standard distance for maintaining, storing, or fueling construction equipment from a waterbody is 150 feet.

The translocation of invasive species and disease is an issue of concern for many watersheds in Oregon. All water removed for hydrostatic testing should be discharged to the same reach in which it was removed.

Page 2-34 - *Construction impacts*
In the discussion regarding the waterbody impacts from construction easements, please note that not only should direct impacts to waterways be avoided, but also indirect impacts such as spoils eroding into the waterbody from rainfall, disturbance or removal of riparian vegetation, leaching of chemicals into the stream from overland runoff. The riparian buffer is considered equal to the a site-potential tree height, thus, in almost all cases, a construction easement within a 15-feet of undisturbed vegetation next to a waterbody is insufficient in providing riparian function. Please describe the effects of the proposed action and mitigation.

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Resource Report 3 – Fish, Wildlife, and Vegetation

Page 3-1
2nd paragraph: The first sentence is a bit misleading as stated, "The proposed project will be constructed entirely in Oregon." Given that dredge material placement locations in Washington are under consideration and the disposal of material effects fish and wildlife, the sentence should be reworded to be more inclusive or provide greater clarity of its intent.

Page 3-7
Please note that NMFS has been petitioned to list Eulachon (*Thaleichthys pacificus*) as a threatened or endangered species. The status review of the species is currently underway (see NMFS' web site http://www.nwr.noaa.gov/Other-Marine-Species/Smelt.cfm).

Page 3-16
Hydrodynamic modeling of the effects of dredging the turning basin and berth area is ongoing. This modeling effort is an intricate part of other aspects of the project including maintenance dredging volume and timing, morphological changes to the channel upstream and downstream, movement of sediment within the action area, recolonization rates of benthic invertebrates at the project site, and dredge material placement decisions. Thus, the modeling should be incorporated into the environmental analysis conducted by the FERC as well as in the BA and EFH assessment.

Oregon LNG is continuing to explore disposal locations for the 1.3 million cubic yards of dredge material. NMFS will continue to track this issue closely and would appreciate being involved in future conversations as this issue develops. The effects of removal and placement of this material need to be addressed considering the lower Columbia River is a sediment deficient system.

Page 3-18

As discussed, sampling of the benthic invertebrate community occurred after the resource report was written. The sampling has been completed and results shared with resource agencies on a July 10, 2008 conference call. Thus, those results and the further analysis of project impacts using those data are a component of the project which should be discussed and analyzed in FERC's environmental analysis, as well as the BA and EFH assessment.

Page 3-22; Table 3.1-1
In addition to using relevant literature to determine where salmonids are "confirmed" to be found, Oregon LNG should also talk to local experts who are in the field including state and tribal biologists to refine their discussion of where salmonids are within the action area.

Page 3-29; Table 3.1-5
In addition to noting federally managed groundfish species, please note that Northern anchovy and Pacific sardine are federally managed coastal pelagic species (see Pacific Fishery Management Council http://www.pcouncil.org/).

Compensatory mitigation plan
A compensatory mitigation plan should be completed for FERC's environmental review and for meeting the needs of the ESA and MSA consultation requirements. Appendix 2J discusses the possibilities of off-site mitigation but it is clear that the details are still being determined. Avoidance and minimization measures should be used before off-site compensatory mitigation is undertaken. In addition, the compensatory mitigation plan will need to take into account the spatial and temporal aspects of the impact it is mitigating, the life stage of the species it is affecting, the habitat type and quality being impacted and mitigated, and discuss the mitigation, for ESA purposes, in the context of the viability parameters (abundance, productivity, spatial structure, and diversity) for the ESU's affected. The discussion of offsetting impacts to NMFS'

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trust resources should address EFH as well.

Page 3-66
The effects of the artificial illumination from construction and operation of the LNG terminal should be accounted for and discussed with regards to its environmental impacts and specifically its effects on ESA-listed species and EFH.

Page 3-67
Please include NMFS in the distribution list of the avian predator reports.

Page 3-68; 3-69
The conclusory statement regarding the impact of the wharf to juvenile salmonids is dismissive of the effect of such an action at the level of the individual. The impacts of a wharf, (*i.e.*, habitat loss, shading, predator attraction), and the effect of displacing inviduals, (*i.e.*, increased predation, reduced food source, competition for rearing habitat), should focus on the localized impact to the habitat of the fish and then analyzed on a broader population scale.

This logic path was also used in the discussion of the impact of potential LNG spills on the environment. The resource report states that fish would not be affected by the extreme cold water and combustion because the Columbia River has so much water in it that they will be able to move away. Please provide a reference as to this flee response to an LNG spill. In addition, the impact should be analyzed at the individual and local habitat level.

Page 3-72
The discussion regarding susceptibility of juvenile salmonids to entrainment or impingement from ballast water and engine cooling water uptake is still a concern for NMFS' trust resources. The discussion states that studies documenting entrainment or impingement of fish in ship ballast and cooling water are limited; thus, NMFS recommends pursuing mitigation and monitoring for ballast water and engine cooling water withdrawal.

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For such an effect on ESA-listed species, the magnitude of the impact, by species, should be included.

Page 3-77
The analysis of entrainment/impingement effects of fry and larger subyearling juvenile salmonids states that the effect will be low because they use shallow-water habitat. Please include a discussion about how far from the ship the zone of influence extends and into which depths of water. An estimate is made that the impacts would be very low and no significant impacts at the population level are anticipated; again, this statement appears unsupported from the literature presented.

Page 3-77
Avoidance behavior of ballast water and engine cooling water intakes is inferred from the studies, however, greater analysis of work with salmonids in the lower Columbia River should be considered.

Page 3-78
Avoidance and minimization measures for the entrainment or impingement of salmonids, other fishes, and ichthyoplankton from ballast and engine cooling water uptake should be included as part of the proposed action in FERC's environmental analysis in addition to being included in the BA and EFH assessment.

Page 3-79
Please discuss the overlap of when water temperatures would be outside the preferred range for salmonids and when individuals would be present in the area. In addition, please clarify whether the warm water plume would extend 16 meters toward the shore or away?

Page 3-82
Please describe all point-source discharges, what will be discharged, frequency of discharge, and impacts to ESA-listed species and habitats with regards to the effluent itself and the placement and armoring of the discharge pipe.

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Page 3-84
Please address the impact of tug operations on the slope of the turning basin, *e.g.*, erosion of the slope.

Page 3-84
Please include a monitoring and adaptive management plan for shoreline erosion at the terminal.

Page 3-90
Reference is made to a potential change in the alignment of the pier. Please be cognizant of the fact that changing the alignment of the pier may alter the proposed action which may affect the effects analysis for NMFS' trust resources.

Page 3-94
To determine direct take from fish salvage activities during construction, please consult with local Oregon Department of Fish and Wildlife (ODFW) and tribal biologists for information on estimates of abundance for those particular areas.

Page 3-95
Please note that a frac-out from horizontal directional drilling will cause bentonite, a very fine clay, to be released into the water column that has the potential, if fish are present, to clog their gills, causing them to suffocate. Whether it is a toxic compound or not, the particle size of the clay is of concern for fish.

Page 3-97
Please analyze the spatial and temporal effect of removing riparian vegetation and discuss proposed mitigation. Mitigation which includes replanting of the lost riparian habitat functions should take into consideration the time it will take for the replanted area to provide the ecosystem functions which were lost.

Page 3-102
Please include the conservation measures which will be implemented to avoid the spread of non-native species or pathogens between

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streams during pipeline construction.

Page 3-104
Please consider and discuss any indirect effects to NMFS' trust resources and their habitat with regards to the creation or maintenance of access roads or pipeline corridors that may lead to unintended use by the public and cause an adverse effect on fish and their habitat. Please discuss how Oregon LNG will address this issue through monitoring and maintenance of these areas for the life of the project. In addition, Oregon LNG should consider any use and upgrade of access roads and their impact on ESA-listed species or designated critical habitat, *i.e.*, consideration of floodplain impacts, translating sediment from the road to the stream, slope instability etc.

Page 3-157; Table 3.4-3
Please ensure the federal status column matches the status codes. If considering species, the Lower Columbia River Chinook salmon is one species, *i.e.*, ESU. The Lower Columbia River Chinook ESU is not split between spring run and fall-run life history characteristics.

Page 3-158
Please include the analysis of the field data collected December 2007 and January 2008. In addition, please identify which stream crossings Oregon LNG does and does not have access to.

Page 3-194
When considering impacts to designated critical habitat, please address the primary constituent elements affected by the proposed action (see http://www.nwr.noaa.gov/Salmon-Habitat/Critical-Habitat/NWR-CH-Designation-FRN.cfmdesignations).

Page 3-196
Please consider the impacts to prey for species that have designated EFH in the action area.

Page 3-197
Pacific sardines are found in the lower

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Columbia River and should be included in the analysis of effects to designated EFH for coastal pelagic species.

General Comment

In several locations in the resource reports, the analysis of effect is based upon comparing the proposed activity to existing activities and operations (page 3-87; page 3-84; page 3-91; page 3-97), however, please keep in mind that the effects to NMFS' trust resources should be considered in light of the environmental baseline or existing conditions on the landscape. Thus, the discussion should include whether the action will improve, degrade, or maintain existing conditions.

Marine Mammals

Page 3-154
Eastern DPS Steller sea lions are listed as threatened under the ESA.

Page 3-183 – *Mammals*
Section 3.4.5.2 references Appendix 3E (later referenced as Appendix 3G on page 3-194), however, the Appendix is not appended to resource report #3, and was not available on-line for comment. In the absence of this appendix, it is not clear how the potential for whale strikes by LNG ships are expected to be immeasurable, as concluded for blue, fin, humpback, Sei, and sperm whales (pages 3-183 to 3-185, and page 3-194). Please provide NMFS with the aforementioned appendix for review and comment. Related to this comment, please contact NMFS for the updated ship strike information for the Northwest Region (06/19/2008).

Page 3-184 – *Mammals*
The description of Southern Resident killer whale (SR killer whale) should be revised to reflect current science. The final Recovery Plan for SR killer whales, published this year, contains the most recent scientific information and a substantial reference list. The Recovery Plan is available on line at www.nwr.noaa.gov

. For example, the recovery plan contains current information for the sighting history of Southern Resident pods in coastal waters and seasonal occurrence in inland waters of Washington State and B.C.

Page 3-185 – *Mammals*
We recommend updating the description for gray whales using the most recent Stock Assessment Report, revised 03/31/07. The stock assessment report is available on line at (www.nmfs.noaa.gov/pr/). No information is presented on whales that do not make the full migration from Mexico to Alaska. The Draft Environmental Impact Statement for the Proposed Authorization of the Makah Whale Hunt, released this year for public comment, contains a comprehensive description of the Pacific Coast Feeding Aggregation of gray whales that could be encountered off Oregon and Washington outside of the migratory periods. The draft statement is available online at www.nwr.noaa.gov .

Page 3-185 to 3-186 – *Mammals*
We recommend updating the descriptions of Steller sea lions and California sea lions to include movement of sea lions in the Columbia River. Review movement information in the final environmental assessment entitled, Authority for States to Remove Sea Lions under Marine Mammal Protection Act (MMPA) Section 120, which is the most up to date source of information (http://www.nwr.noaa.gov/Marine-Mammals/Seals-and-Sea-Lions/upload/Sec-120-Final-EA.pdf). The Revised Recovery Plan for the Steller Sea Lion, published this year contains comprehensive data on the status and trends of the Eastern DPS. The recovery plan is available online at http://www.fakr.noaa.gov/ .

Page 3-193 – *Terminal and marine transit*
The description of sound disturbance and characterization of thresholds should be revised. Example language provided: NMFS is currently developing comprehensive guidance on sound exposure levels likely to

cause injury and behavioral disruption in the context of the MMPA. Until formal guidance is available, NMFS uses conservative thresholds of sound exposure levels from broad band impulse sounds that cause behavioral disturbance (in-water for cetaceans and pinnipeds: 160dB$_{RMS}$ re: 1µPa) and injury (in-water for cetaceans: 180dB$_{RMS}$ re: 1µPa; in-water for pinnipeds: 190dB$_{RMS}$ re: 1µPa).

Additionally, NMFS recommends using the noise disturbance threshold for pinnipeds in air, 100dB$_{RMS}$. For physical presence and human activity the marine mammal viewing guidelines recommend a 100 yard buffer to avoid disturbance on land. If pinipeds are likely to be found hauled out at the work site, we recommend including potential disturbance of pinipeds on land as part of a request for take authorization under MMPA Section 101(a)(5)(D).

The Underwater Noise Propagation and Mitigation Technical Memorandum is referenced as Appendix 3G, however, was not appended to resource report #3 and was not available on-line. Please provide for review and comment.

The description of vibratory pile driving states, "Noise generated by vibratory pile driving would be below 160 dB, the harassment threshold." More information should be provided to support this statement, such as the size and type of piles that would be driven by vibratory hammer. For larger diameter or steel piles the threshold is likely to be exceeded.

Page 3-194 – *Terminal and marine transit*
The report states that, "Oregon LNG proposes to apply adaptive management using some combination of hammer cushions (pile caps), stacked or confined bubble curtains, coffer dams, or other sound barriers. The choice of technique will depend on water depth and the degree to which a technique reduces noise." The details of the adaptive approach described, in combination with a safety zone and sound monitoring, should be further refined in

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consultation with NMFS.

The report states that, “Even with mitigation, underwater noise likely will exceed the 190-dB injury threshold in close proximity.” And further states that Oregon LNG will measure underwater noise with a hydrophone and set a safety zone in consultation with NMFS. It is not clear if the applicant intends to set a safety zone out to the disturbance or to the injury threshold. If pile driving is anticipated to result in exposures above the threshold for disturbance, the applicant should apply for an IHA and additional steps may be required to minimize take.

The report states that, “A conservative approach to estimating the number of seals and sea lions that could be affected by noise during construction is to use estimates of animals at haulouts between November and the end of February.” It is unclear whether the applicant intends to use this method to estimate exposure to noise sources in-air, in-water or both. Because of the proximate location of haulouts to construction noise, NMFS recommends the applicant estimate animal exposure to both in-air and in-water noise. The analysis should consider the number of animals affected both in-air and in-water as well as the number of days the animals would be exposed in order to estimate the number of exposures. Animals are likely concentrated in proximity to haulout sites and access and egress may be affected by construction noise. When inundated, Desdemona sands is an underwater resting site for harbor seals as well as a low tide haulout when exposed. We recommend contacting Washington Department of Fish and Wildlife (Steve Jeffries) or ODFW (Robin Brown) for additional detail on usage patterns.

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