

February 20, 2019

Mr. Christopher Stine
Water Quality Engineer
Oregon Department of Environmental Quality
165 East 7th Ave., Suite 100
Eugene, OR 97401

Re: Jordan Cove Energy Project L.P. and Pacific Connector Gas Pipeline, L.P. Section 401 Water Quality Certification - Response to ODEQ Supplemental Information Request received December 20, 2018.

Dear Mr. Stine:

On September 21, 2017, Jordan Cove Energy Project L.P. ("JCEP") filed an application pursuant to Section 3(a) of the Natural Gas Act, as amended,¹ and Parts 153 and 380 of the regulations of the Federal Energy Regulatory Commission ("Commission"),² for authorization to site, construct, and operate certain liquefied natural gas facilities ("LNG Terminal"). On the same day, Pacific Connector Gas Pipeline, LP ("PCGP", and together with JCEP, "Jordan Cove") filed an application pursuant to Section 7(c) of the NGA,³ and Parts 157 and 284 of the Commission's regulations,⁴ for a certificate of public convenience and necessity authorizing PCGP to construct, install, own, and operate a new natural gas pipeline ("Pipeline", and together with the LNG Terminal, "the Project").

Section 401(a) of the Clean Water Act, 33 U.S.C. § 1341(a), requires an applicant for "a Federal license or permit to conduct any activity which may result in a discharge into the navigable waters" to provide the federal licensing or permitting agency a certification from the relevant state that the discharge will comply with applicable state water quality standards. Accordingly, on October 22, 2017, Jordan Cove submitted an application for a Section 401 Water Quality Certification for the Project to the Oregon Department of Environmental Quality ("ODEQ") for review. Jordan Cove's request for certification under Section 401 of the Clean Water Act provides a description of the proposed activities subject to federal permitting that may result in discharges into waters of the U.S. The application does not address activities and/or potential discharges outside of the scope of these federally-authorized proposed activities. Supplemental application materials were also provided to ODEQ on February 6, 2018, May 21, 2018, and November 21, 2018.

¹ 15 U.S.C. § 717b(a) (2012).

² 18 C.F.R. Pts. 153 and 380 (2017).

³ 15 U.S.C. § 717f (2012).

⁴ 18 C.F.R. Pts. 157 and 284.

In a letter dated September 7, 2018, ODEQ identified additional information necessary to complete ODEQ's review ("Sept. 7th Information Request"). Jordan Cove submitted a response to the September 7th Information Request on October 8, 2018.

On December 20, 2018, Jordan Cove received a request from ODEQ seeking clarification regarding responses submitted by Jordan Cove to the September 7th Information Request. On January 22, 2019, Jordan Cove filed a brief response to ODEQ noting that Jordan Cove and ODEQ had set up a technical meeting for January 31st, 2019 to review questions Jordan Cove had regarding some of ODEQ's requests. In addition, Jordan Cove expressed concern regarding the scope of the request and sought a meeting with ODEQ senior management and legal representatives to seek a resolution to these issues.

During our meeting on January 31st, we discussed many of the technical issues such as construction stormwater BMPs, trench dewatering, vehicle wash water, post-construction stormwater, sedimentation from roads, geohazards, TMDLs, and thermal assessment for waterways. Jordan Cove and ODEQ agreed that most, if not all, of the technical issues will be resolved by providing additional information to ODEQ either in the form of permits that are currently being drafted or technical documents. Jordan Cove has committed to providing the following information over the next two months to address these technical concerns:

- 1200-C Construction Stormwater Permit Applications (LNG Terminal, Kentucky, APCO 2, Trans-Pacific Parkway/101 Widening, North Spit Utilities)
- Post-Construction Stormwater Management information for PCGP and LNG Terminal
- Additional PCGP Best Management Practices("BMPs") Information
- Source-Specific Water Quality Protection Plan
- List of 303(d) streams that may be affected by use of existing roads
- Geotechnical memorandum related to slope stability and sedimentation
- Updated Thermal Impact Assessment
- Updated Transportation Plan for Non-Federal Land
- Dredging Pollution Prevention Plan

In addition, we would like to further discuss the following information requests with ODEQ Senior Management and legal counsel prior to completing responses: 4, 5, 6, 7, 14, 16, 17, 18, 22, 23, 24, 25, and 44. In the context of these requests, we look forward to a discussion whereby Jordan Cove can describe the nature and extent of information relevant to the protection of water quality and when that information becomes available, and how impacts to water quality are managed on projects of this nature with respect to BMPs, certificate conditions and real time inspection.

However, in an effort to provide relevant information that is available at this time, we have included partial response to some of these requests. In addition, to the extent an issue has been previously resolved, it has been removed from the table. For example, no further action or comment is required for information requests 1, 2, 3, 9 and 12. Finally, to facilitate ODEQ's review, responses have been grouped and maintained in the table format from December.

Jordan Cove looks forward to working with ODEQ on the Section 401 water quality certification. Should you have any questions, please contact Derik Vowels at dvowels@pembina.com or 971-940-7800.

Sincerely,



Natalie Eades,
Manager, Environment & Regulatory
Jordan Cove Energy Project L.P.
Pacific Connector Gas Pipeline, LP

Comment No.	September 7, 2018 Information Request	October 8, 2018 Jordan Cove Response	December 20, 2018 DEQ's Review and Response to Jordan Cove's Response	February 20, 2019 Jordan Cove Response to December 20, 2018 ODEQ comments
4, 5	<p><u>Comment 4:</u> Water Quality Standards Oregon's water quality standards consist of beneficial uses, numeric and narrative criteria developed to support these uses, and an antidegradation policy that prohibits an activity from further degrading water quality. Applicants for water quality certification must provide sufficient information to demonstrate the activity will comply with Oregon water quality standards (OAR 340-048-0020(g)).</p> <p><u>Comment 5:</u> Provide information to demonstrate how the Project will comply with the water quality standards found in OAR 340 Division 041. For project activities that do not affect State waters, note how the Project will not violate applicable standards. For project activities that impact State waters, note how Jordan Cove is proposing to mitigate, reduce, or prevent impacts so as to ensure the Project, as proposed, does not violate applicable water quality standards. Project impacts should be assessed in terms of direct, indirect, and cumulative effects of the activity on state water quality.</p>	<p>The JCEP 401 Water Quality Memorandum (Part 1) and PCGP 401 Water Quality Summary Table (Part 2, Appendix A) in the application specifically address the Project's compliance with Oregon water quality standards.</p>	<p>Summary Statement: Jordan Cove references previously submitted material that describes Best Management Practices to reduce project effects on water quality. Citing potential BMPs by themselves is insufficient. DEQ recognizes BMPs as one part of a broader strategy that must also consider existing water quality, local environmental conditions, the anticipated magnitude of project-related effects, and appropriate engineering controls to mitigate negative effects on water quality. Proposed BMPs must be well-supported using quantitative analyses such as modeling, manufacturer's technical specifications, results of pilot tests, or other quantitative data to support their site-specific use to effectively achieve water quality objectives. Please provide a plan that demonstrates how proposed BMPs or other engineering controls will protect water quality at each location where project actions may directly or indirectly affect waters of the state. The plan should provide a site-specific analysis of each proposed activity and technical justification for each proposed remedy as discussed more fully in the following section.</p> <p>Jordan Cove's responses must provide a comprehensive analysis of potential project-related water quality impacts or the quantitative data necessary to evaluate proposed remedies. Jordan Cove's responses frequently refer to plans that rely on qualitative descriptions of BMPs with no site-specific reference to individual waterbodies, water quality conditions, or a discussion of proposed activities. Applications that propose BMPs to mitigate water quality impairment must identify the location, design details including engineering technical data, and a maintenance schedules to ensure adequate protection during use. In developing its response, Jordan Cove should refer to the information below.</p> <p>Jordan Cove must include quantitative and/or engineering support for the proposed controls or best management practices. For example, DEQ suggests using models such as <u>Geomorphic Road Analysis and Inventory Package (GRAIP)</u> and <u>X-DRAIN</u> to provide DEQ with the requested evaluation of potential water quality impacts from PCGP's proposal to use existing roads and to build new roads. Adequate quantitative analysis is necessary to demonstrate that current and future erosion control planning will not "cause or contribute to a violation of in-stream water quality standards" as required in Schedule A.10.a of the NPDES 1200-C General Permit and OAR 340-048-0042(2)(a).</p> <p>Jordan Cove's response does not include estimates of sediment discharge from the construction and post-construction right-of-way. Models such as the <u>Revised Universal Soil Loss Equation Version 2 (RULSE2)</u>, <u>Watershed Assessment Tool for Environmental Risk (WATER)</u>, and/or <u>Soil and Water Assessment Tool (SWAT)</u> may be used to quantitatively estimate sediment control practices. PCGP can use GRAIP noted above to evaluate the need for BMPs on existing access roads for pipeline construction and operation.^{i, ii, iii}</p> <p>Qualitative descriptions of proposed erosion and sediment control practices do not adequately demonstrate that measures will sufficiently mitigate risks to water quality. Jordan Cove must provide well-supported quantitative analyses of proposed engineering remedies based on site-specific understanding of water quality conditions. DEQ's comments on PCGP's response to Comment 15 provide additional examples of information required to demonstrate compliance with Oregon water quality standards</p>	<p>As noted in the cover letter, the following constitutes a partial response to this request. Additional information will be provided, as necessary, following the senior management/legal meeting.</p> <p>As discussed during the January 31, 2019 technical meeting with DEQ, the following items related to construction stormwater, where discharge may impact receiving waters of the U.S., are currently being prepared and will be provided to ODEQ as stated below:</p> <ul style="list-style-type: none"> • Kentuck 1200-C Application (March 2019) • APCO 2 1200-C Application (March 2019) • Trans Pacific Parkway / 101 Intersection 1200-C Application (March 2019) • LNG Terminal 1200-C Application (March 2019) • North Spit Utilities 1200-C Application (April 2019) • PCGP Post-Construction ("Operational Easement") Stormwater Management - PCGP will submit results of hydrologic modeling comparing pre-construction runoff based on existing contours/vegetation to post-construction runoff based on restored contours and revegetation to ODEQ in April 2019. <p>In addition, a progress version of the stormwater detention pond design at the Klamath Compressor Station site will be submitted in April 2019. The final design for the stormwater pond is scheduled for Q4 2019.</p> <p>Note that "post-construction" referenced is DEQ's definition after restoration activities are complete. Whereas PCGP's Erosion Control and Revegetation Plan (ECRP) refer to post-construction as after backfill of the trench.</p> <p>In January 4, 2019, PCGP submitted the pipeline 1200-C application to ODEQ which includes a detailed site map and drawings for constructing the entire length of the pipeline and all associated components. The PCGP application was revised to incorporate reroutes in the pipeline alignment and to address ODEQ's 2016 review comments of the previous 1200-C application. The PCGP application meets the following requirements:</p>

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				<ul style="list-style-type: none"> • NPDES 1200-C General Permit Conditions (Schedule A.1,10, and 12 in particular) • OAR 340-041-0007(1) and (7) • OAR 340-048-0042(2) • It identifies the locations of the proposed BMPs on detailed 1":200' scale aerial photo-based Environmental Alignment Sheets. <p>As discussed during the January 31, 2019 technical meeting with DEQ, design details of the proposed BMPs are included in Attachment C to the ECRP in the 1200-C application as well as the Notes Pages of the Environmental Alignment Sheets.</p> <p>PCGP used GIS software to accurately locate BMPs to minimize/ control potential offsite sedimentation by reviewing the following data coverages:</p> <ul style="list-style-type: none"> • LiDAR • Contours • Aerial photography • Resource data (i.e., soils wetlands) <p>Further supporting details regarding BMP evaluation (including LiDAR information), site selection, and compliance management during construction will be provided to DEQ in March 2019.</p>
8	Please provide a NPDES 1200-A Permit Application demonstrating that the proposed 20 sites to obtain rock for Pacific Connector's gas pipeline construction and maintenance. DEQ will need to determine if these land disturbing activities will comply with the technology-based effluent limits of this permit.	PCGP will obtain rock commercially.	PCGP will not need coverage under NPDES 1200-A for rock material that is obtained commercially. PCGP will need to update the information in the 401 Water Quality submittal package to reflect this revision to its proposal.	<p>PCGP will obtain rock from existing commercial sources and will therefore not require coverage under the 1200A.</p> <p>PCGP will update language in both Appendix E-8 (TMP) to Part 2 of the ODEQ JPA and to Appendix E-5 (Overburden) to Part 2 of the ODEQ JPA to clarify this approach. As both the TMP and Overburden Plans are under review by BLM at this time, PCGP will revise the plans once this review is complete.</p>
10, 11, 13	Comment 10: Please provide a NPDES Individual Permit Application for the LNG Terminal's two domestic wastewater facilities discharging to	JCEP is preparing an application for submittal in Q4 2018 to modify existing Permit No. 101499. JCEP provided a	DEQ anticipates a response to this request in Q4 2018. The information provided in JCEP's Discharge Characterization Memo is insufficient for DEQ to draft a NPDES Individual Permit for the LNG Terminal's domestic wastewater discharge.	Jordan Cove submitted the NPDES Permit application to ODEQ in January 2019 and the mixing zone study will be submitted by March 2019. The information provided in these documents will contain all of the requisite information to allow ODEQ to draft an NPDES Individual Permit for the LNG Terminal's domestic wastewater discharge.

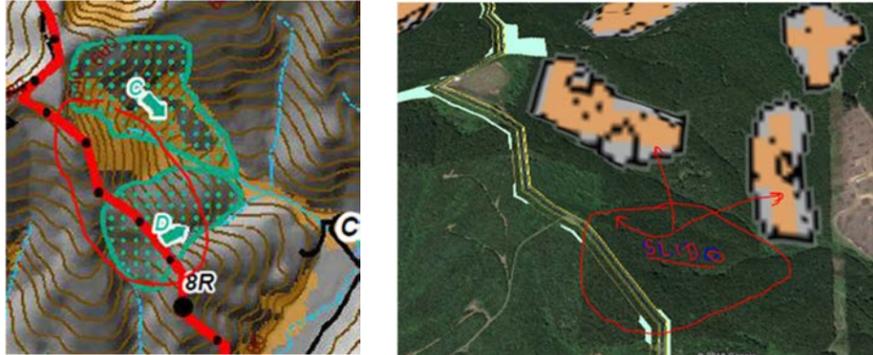
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	<p>surface water. DEQ will use the information in this permit application to develop a discharge permit containing technology-based and water quality-based effluent limits associated with this permit.</p> <p><u>Comment 11:</u> Please provide a NPDES Individual Permit Application for discharges of non-contact cooling wastewater discharged from Liquefied Natural Gas carriers using the Marine Slip at the LNG Terminal. DEQ will use this permit application to develop a discharge permit containing technology-based and water quality-based effluent limits.</p> <p><u>Comment 13:</u> Please provide an application for a NPDES Individual Permit for the discharge of vehicle and equipment washwater to surface water during the operation of the LNG Terminal. DEQ will use this permit application to develop technology-based and water quality-based effluent limits for this permit if the operations.</p>	<p>Discharge Characterization Memo to DEQ on May 25, 2018.</p>		
15	<p>In compliance with OAR 340-041-0007(8), please provide an assessment of Pacific Connector Gas Pipeline's</p>	<p>PCGP provided DEQ Appendix A of Part 2 of the 401 Water Quality Package to DEQ demonstrating compliance with</p>	<p>Summary Statement: PCGP's response does not fully address the requirements described in Comment 15. DEQ requires a comprehensive analysis using appropriate quantitative support to demonstrate compliance with water quality objectives, including TMDLs. As requested in Comment 15 and more fully described below, please describe how PCGP will comply with the Federal, State, and County plans/programs for complying with TMDLs. Please include or identify relevant supporting documents (e.g., design manuals, standards, and</p>	<p>During the January 31, 2019 technical meeting with ODEQ, approaches were discussed by PCGP to address TMDLs, 303(d) waterways, geohazards, and roads. PCGP and ODEQ agreed the information to be included with the following</p>

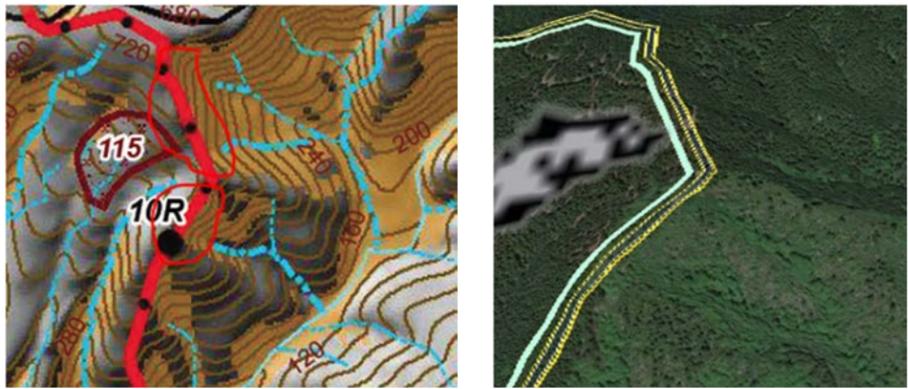
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	<p>compliance with all applicable DEQ-approved Total Maximum Daily Load Implementation Plans or compliance programs for the following:</p> <ul style="list-style-type: none"> • United States Department of Agricultural Forest Service Water Quality Restoration Plans and the USDA National Best Management Practices for Water Quality Management on National Forest System Lands (Volume 1: National Core BMP Technical Guide) noted in DEQ's Memorandum of Understanding with the Forest Service. • US Department of Interior Bureau of Land Management's Water Quality Restoration Plans. • Oregon Department of Forestry's Forest Practices Act Program. • Oregon Department of Agriculture's Water Quality Plans. • Coos County Total Maximum Daily Load Implementation Plan. • Douglas County Total Maximum Daily Load Implementation Plan. • Jackson County TMDL Implementation Plan. • Klamath County TMDL Implementation Plan. 	<p>water quality standards and the plans used to meet water quality standards. The conditions in the Federal ROW grants will ensure compliance with applicable water quality plans.</p>	<p>specifications) that each Designated Management Agency uses to implement their TMDL compliance programs. DEQ will need to review the conditions in all Federal access or right-of-way grants to ensure these conditions comply with OAR 340-048-0042(2).</p> <p>Plans referenced by Jordan Cove provide a qualitative analysis of proposed BMPs. As discussed previously, DEQ requires BMPs to be supported by an evaluation of existing water quality, the impact of the proposed activity on water resources, and a quantitative assessment of mitigation provided by the proposed BMPs. For example, PCGP briefly describes BMPs in a table in Part 2 Attachment G that PCGP asserts will comply with water quality standards. In making this assertion, PCGP lists various plans developed to comply water quality standards. PCGP includes no analysis to demonstrate these BMPs will prevent a water quality violation for all pollutant discharges.</p> <p>Certain portions of the project that occur on state and federal lands are governed by existing TMDLs. PCGP has not demonstrated to DEQ that proposed activities such as right-of-way construction, road maintenance, and road construction will comply with USDA Forest Service, U.S. Department of Interior BLM, Bureau of Reclamation, Oregon Department of Forestry, and County Total Maximum Daily Load compliance plans and programs. DEQ developed these TMDL to achieve compliance with water quality standard in water bodies impaired by specific pollutants. For an example of this deficiency in PCGP's response to AIR-1, please refer to DEQ's review of PCGP's response to Comment 24 demonstrating that some of PCGP's proposed activities will not comply with Forest Service, BLM, ODF, and County TMDL compliance programs without the submittal of additional information. Under state rules, TMDL compliance plans are enforceable when Designated Management Agencies such as the Forest Service, BLM, and ODF, for instance, fail to implement these plans.</p> <p>Right-of-way permits are not the only mechanism these Federal agencies will use to ensure compliance with their Water Quality Restoration Plans.^{iv, v, vi} WQRPs can and do address road impacts on water quality. Federal agencies address these impacts in their efforts to comply with Clean Water Act requirements such as Section 303. DEQ provides PCGP an example of how federal agencies use WQRPs to address road impact on water quality in DEQ's review of PCGP's response to Comments 26 and 27 below. For this reason, DEQ will review all proposed road permits to cover all access roads Jordan Cove will use to construct and operate the terminal and gas pipeline. If acceptable, DEQ will use the conditions provided in Federal road permits when developing its Certification Decision.</p> <p>In Appendix A of Part 2 of the 401 Water Quality Package cited in PCGP's response to Comment 15, PCGP lists in a table the following:</p> <ul style="list-style-type: none"> • Potential impairment parameters. • Sources and activities associated with these potential impairment parameters. • PCGP's proposed plans/BMPs developed to comply with water quality standards. <p>In many of these plans and reports, PCGP provides only a qualitative description of actions or BMPs PCGP will use to avoid violations of water quality standards. DEQ highlights specific examples below.</p>	<p>submittals will address ODEQ's outstanding concerns. All of these will be submitted in March 2019:</p> <ul style="list-style-type: none"> • A Source-Specific Implementation and Water Quality Protection Plan will be prepared and will include a narrative on how BMPs interact with the TMDLs. • A geotechnical memorandum will be prepared and will include an analysis of the following: <ul style="list-style-type: none"> ○ Permanent controls for cut/fill slopes ○ Slope stability (i.e., storage in TEWAs, stormwater discharge), ○ New or reconstructed roads in geohazard areas ○ Road drainage water discharge into headwalls, slide areas, high landslide hazard locations, or steep erodible fill slopes ○ Typical geotechnical designs ○ Decision criteria for final geotechnical BMP placement • Updated Thermal Impacts Assessment – as detailed in response to Comment 21b below. • Updated Transportation Management Plan for Non-Federal Lands – as detailed in response to Comment 22 below. • Although we do not believe such information is required for purposes of ODEQ's 401 evaluation, as discussed with ODEQ on January 31, 2019, the Transportation Management Plan for Non-Federal Lands (TMPNFL) will be provided to ODEQ in March 2019. • The Transportation Management Plan for federal roads is being updated as part of the federal Right-of-Way Grant process. The updated plan will include attachments (detailed maps and tables). A previous version of these attachments was informally provided to ODEQ on February 1, 2019 as an example of the measures that will be required to protect water quality during use and maintenance of the roads. • As indicated in Appendix E.3 to Part 2 of the JPA (Klamath Project Facilities Crossing Plan), all BOR water conveyance facilities (e.g., canals, laterals,

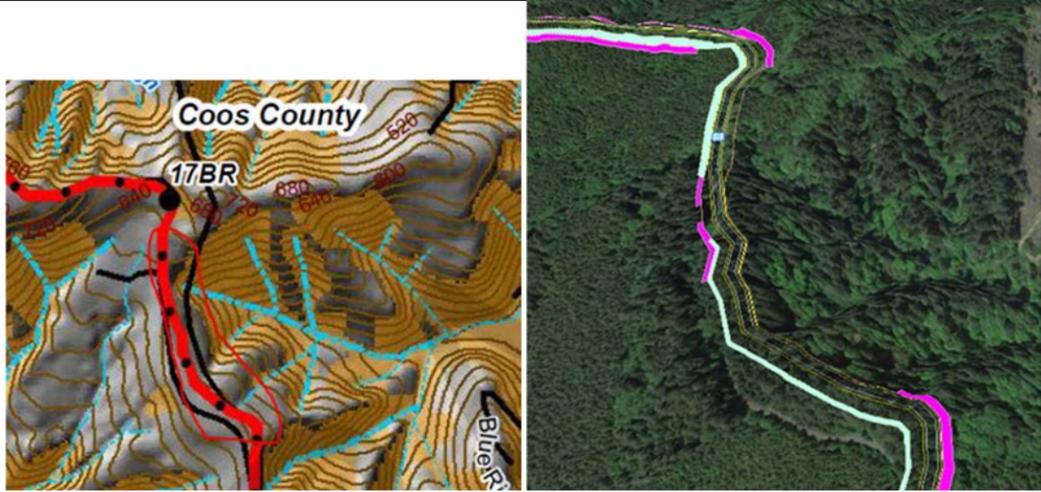
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	<p>In this compliance assessment, please also note all the support documents such as design manuals, guidance documents, road permits etc. that PCGP will follow when complying with these Implementation Plans.</p>		<p>For example, PCGP provides no quantitative analysis or engineering designs with technical support demonstrating that the construction of the pipeline and operation of the pipeline right-of-way will prevent water quality impairments from landslides and sediment discharge resulting from the following:</p> <ul style="list-style-type: none"> • Design and maintenance of roads. • Design of both the construction and permanent pipeline right-of-way. <p>PCGP's qualitative analysis of compliance with water quality standards does not even list the more than 660 miles of access roads as a source of sediment. The scientific literatures clearly shows roads as a major source of sediment and soil erosion in forested watersheds. The scientific literature identifies road maintenance practices, road construction decisions, road construction and maintenance standards, road improvements, and decommissioning standards as key elements in protecting soil and water quality.^{vii}</p> <p>Among the proposed pollution control plans and reports in Appendix A of Part 2 that PCGP presents to avoid or minimize potential water quality impairments are:</p> <ul style="list-style-type: none"> • Resource Report 6 (Geologic Resources) • Erosion Control and Revegetation Plan • Transportation Management Plan <p>The information below demonstrates how these two plans and this report – with their current information – do not address how PCGP's proposed activities will comply with water quality standards. These two plans and this report lack either the quantitative analysis or engineering analysis and technical support to give DEQ reasonable assurance that PCGP's actions will not contribute to or cause a violation of water quality standards.</p> <p><u>Examples of Inadequate Engineering Analysis and Support</u></p> <p>1. Unclear Drainage Management and Storage Activities Adjacent to Potentially Unstable Slopes</p> <p>In areas where there is a potential for rapidly moving landslides such as the Tyee Core Area, PCGP should avoid certain activities. As recommended by authorities regulating forest management on unstable slopes, PCGP should avoid placing additional weight from (1) construction debris and logging and (2) water onto the upper or mid-scarp areas of unstable slopes such as those associated with:</p> <ul style="list-style-type: none"> • Convergent headwalls/concave-shaped slopes • Bedrock hollows • Inner gorges with steep slopes.^{viii, ix, x, xi, xii, xiii, xiv} <p>In fact, the Oregon Department of Forestry issued rules under the Forest Practice Act that ODF uses to comply with the Clean Water Act requirements such as Total Maximum Daily Loads and to achieve Oregon's water quality standards.^{xv} Among these FPA rules is a rule OAR 629-625-0330 to ensure forest operations provide a stable forest roads that protect water quality when in use. As discussed in DEQ's</p>	<p>and drains) in the Klamath Basin will be crossed by trenchless conventional boring methods, which will avoid/ minimize effects to these facilities and avoid water quality impacts.</p>

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			<p>review of PCGP's response to Comment 34, PCGP's pipeline right-of-way is functioning as a primitive road. Specifically, this forest road drainage rule for the FPA states:</p> <p><i>(1) The purpose of this rule is to provide a drainage system on new and reconstructed roads that minimizes alteration of stream channels and the risk of sediment delivery to waters of the state. Drainage structures should be located based on the priority listed below. When there is a conflict between the requirements of sections (2) through (6) of this rule, the lowest numbered section takes precedence, and the later-numbered and conflicting section shall not be implemented.</i></p> <p><i>(2) Operators shall not concentrate road drainage water into headwalls, slide areas, high landslide hazard locations, or steep erodible fillslopes.</i></p> <p><i>(3) Operators shall not divert water from stream channels into roadside ditches.</i></p> <p><i>(4) Operators shall install dips, water bars, or cross drainage culverts above and away from stream crossings so that road drainage water may be filtered before entering waters of the state.</i></p> <p><i>(5) Operators shall provide drainage when roads cross or expose springs, seeps, or wet areas.</i></p> <p><i>(6) Operators shall provide a drainage system using grade reversals, surface sloping, ditches, culverts and/or waterbars as necessary to minimize development of gully erosion of the road prism or slopes below the road.</i></p> <p>PCGP has not demonstrated in the Erosion Control and Revegetation Plan or Transportation Management Plan that PCGP will avoid discharging road drainage water into headwalls, slide areas, high landslide hazard locations, or steep erodible fill slopes. Moreover, PCGP has not addressed any of the ODF requirements noted below regarding forest road maintenance. ODF established FPA rule OAR 629-625-0600 to comply with water quality standards by timely maintenance of all active and inactive roads.</p> <p>DEQ excerpted the following sketches and photographs from technical manuals designed to prevent landslides during forest operations. DEQ used these technical manuals during its desktop analysis of PCGP's proposed actions to identify potential unstable slopes that could initiate debris flows into water bodies.</p>	

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			<p>The examples depict convergent headwalls (i.e., concave-shaped slopes) and bedrock hollows. These landscape features can be found adjacent to the proposed PCGP pipeline alignment in numerous locations:</p> <div data-bbox="1121 431 1874 778" data-label="Image"> <p><i>Figure 8. Typical hillslope relationships between bedrock hollows, convergent headwalls, and inner gorges (drawing by Jack Powell, DNR 2003).</i></p> </div> <p><u>Source:</u> Text to Accompany the Hazard Map of Potential Rapidly Moving Landslides in Western Oregon (Hofmeister et al. 2002)</p> <div data-bbox="972 953 1631 1346" data-label="Image"> <p><i>Figure 9. Common hillslope relationship: bedrock hollows in convergent headwalls draining to inner gorges (photo and drawing by Jack Powell, DNR 2003).</i></p> </div> <div data-bbox="972 1352 1656 1628" data-label="Image"> <p><i>Figure 14a. Stereo pair of a clearcut convergent headwall in Pistol Creek basin, North Fork Calawah River, Washington.</i></p> </div> <p><u>Source:</u> State of Washington Forest Practices Board Manual</p> <p>These three examples are among many that PCGP can identify when reviewing its Geologic Hazards Map in combination with aerial photos showing the pipeline's right-of-way and other components such as the</p>	

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			<p>Temporary Extra Work Areas relative to Areas of Rapidly Moving Landslide Hazard, convergent headwalls, and bedrock hollows. The light brown areas in the excerpt of PCGP's Geologic Hazards Maps are Potential Rapidly Moving Landslide Hazards. The accompanying excerpt of aerial photos show unstable slope features from the Statewide Landslide Information Database for Oregon (SLIDO). These excerpts from the aerial photos also show the pipeline right-of-way (in yellow) and Temporary Extra Work Areas (in light blue).</p> <p><i>Figure 2 of 47 from PCGP's Geologic Hazards Maps (Northwest of Milepost 8R):</i></p>  <p>PCGP's Erosion Control and Revegetation Plan does not indicate if the Temporary Work Area above the unstable slope feature will be used to store spoils (soil, boulders, root wads) and logs from forest clearing. However, PCGP's Resource Report 1 indicates that PCGP may use these work areas for these purposes. The ECRP does not detail how PCGP will manage construction stormwater above this unstable feature. Stormwater discharge at the top of convergent headwalls and bedrock hollow adds load to the top of this unstable slope. This stormwater discharge may create a positive soil pore pressure leading to a landslide. PCGP has not provided DEQ with an engineered post-construction stormwater management plan for the permanent pipeline right-of-way for this area and others indicating how PCGP will manage drainage above unstable slope features.</p> <p>On page 35 of Resource Report 6, PCGP discusses two primary ways in which pipeline construction has the potential to adversely impact slope stability. PCGP notes in Report 6 that routing drainage to potentially unstable slopes has the potential to adversely impact slope stability. However, PCGP does not provide DEQ with an analysis using the slope stability models to identify unstable slopes noted in DEQ's review of PCGP's response to Comments 6 and 7. Additionally, PCGP does not provide DEQ with a construction and post-construction stormwater management plan demonstrating how specifically PCGP will manage stormwater along these unstable landscape features.</p> <p>PCGP only identifies slope breakers along the construction and permanent right-of-way as the only technique to manage construction and post-construction stormwater. PCGP does not discuss, for example, or demonstrate the application of cutoff trenches presented in technical manuals on stabilizing slopes. PCGP does not detail the grade and placement of slope breakers on the ground in engineering plans for the construction and permanent right-of-way. Without this information as well as the drainage pattern, DEQ is</p>	

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			<p>unable to determine if the proposed use of slope breakers alone is sufficient to prevent the addition of weight from stormwater and an increase in soil pore pressure on an unstable slope.</p> <p>With the current submittal, DEQ cannot determine if the proposed slope breakers highlighted in the Erosion Control and Revegetation Plan will prevent landslides due to pipeline construction and operation. Additionally, in Resource Report 6 and the proposed ECRP, PCGP does not address site-specific constraints (i.e., roads, unstable landforms on each side of the right-of-way etc.) that may limit the application of slope breakers to route drainage away from unstable slopes. PCGP is proposing to remove trees and shrubs to install this gas pipeline. This loss of tree interception will increase the volume of runoff generated along pipeline's construction and permanent right-of-way. The discharge of this additional runoff among these unstable slope features has the potential to impact water quality.</p> <p>The following are two more examples highlighting similar concerns discussed in DEQ's review immediately above.</p> <p><i>Figure 2 of 47 (Northwest and South of Milepost 10R) – Area No. 115 delineated in red is an identified landslide from the Department of Geology and Mineral Industries:</i></p>  <p>PCGP's ECRP does not show the engineering analysis and its technical support for how PCGP will manage the construction and post-construction stormwater above the Area of a Rapidly Moving Landslide Hazard and convergent headwall as well as the mapped landslide 115 identified by the Oregon Department of Geology and Mineral Industries..</p> <p><i>Figure 4 of 47 (Southeast of Milepost 17 BR) – Blue square is a hydrostatic test location while the magenta polygon is an uncleared storage area:</i></p>	

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			 <p data-bbox="966 822 2163 919">PCGP's ECRP does not show the engineering analysis and its technical support for how PCGP will manage the construction and post-construction stormwater above the Area of a Rapidly Moving Landslide Hazard and convergent headwall.</p> <p data-bbox="1013 959 2107 1020">2. No Engineering Designs for Fill Slopes on Steep, Unstable Slopes and/or Steep Slopes with Erosive Soils</p> <p data-bbox="966 1060 2188 1225">In Resource Report 6 (Geologic Resources), PCGP provides few specifics regarding controls to stabilize slopes to prevent landslides. Moreover, as noted in DEQ's review of PCGP's response to Comment 35 below, PCGP provides no engineering designs and the technical support for these designs for stabilizing fill slopes on steep, unstable slopes greater than 30% including slopes with highly erosive soils. PCGP identifies this deficiency on page 35 of Section 4.6.2 of Resource Report 6 by stating the following:</p> <p data-bbox="1044 1266 2038 1362"><i>Steep side slope Pipeline construction segments will be identified during the final design phase of the Pipeline project. Fill slope construction details and specifications will be designed for the identified steep side slope Pipeline segments.</i></p> <p data-bbox="966 1403 2188 1669">In Section 11.0 (Steep and Rugged Terrain), PCGP provides only a qualitative description of how it may approach fill slopes on steep, unstable slopes starting at the bottom of page 47. However, this mostly qualitative discussion does not consider terracing on erosive soils nor does it thoroughly address the management of stormwater on a terraced fill slope. The management of drainage on these steep slopes, the use of geotextiles or other engineering techniques to support terracing, and the need to reinforce the toe of slope are also not addressed in PCGP's submittal. These are issues typically addressed in technical references developed to construct linear infrastructure such as roads on steep slopes. However, PCGP does not discuss or address these issues in PCGP's submittal.</p> <p data-bbox="1013 1709 2122 1770">3. Unclear Design Standards/Specifications for Needed Road Improvements and Maintenance Standards/Specifications for Existing Access Roads</p>	

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			<p>PCGP is proposing to use more than 660 miles of roads to construct this gas pipeline and its associated components. PCGP lists the Transportation Management Plan in Appendix A part 2 of the Water Quality Package as PCGP's approach to comply with water quality standards. As highlighted below, PCGP has not provided DEQ with specific road maintenance standards for access roads PCGP will use to construct and operate the pipeline. As highlighted below, PCGP has not provided DEQ with designs and specifications for any identified improvement to these existing access roads nor has PCGP demonstrated it conducted an inventory of the current condition of all access roads to determine their capacity to support the proposed level of use while minimizing the impact of these access roads on water quality.</p> <p>The scientific literature is replete with research documenting the importance of non-paved road design for protecting water quality. There are a number of references providing information on designing stable roads, including improving existing roads, and maintaining non-paved roads to protect water quality.^{xvi, xvii, xviii, xix, xx} PCGP has not provided DEQ with engineering design details and their technical support for site-specific cut and fill slopes. PCGP has provided no information in the Transportation Management Plan on the improvements to protect water quality that PCGP proposes for existing access roads nor has PCGP presented for DEQ approval the methodology it will use to evaluate the potential water quality impact when using existing access roads given their current condition and design. Requesting that PCGP provide the engineering designs and specifications used to improve roads for pipeline construction and operation is essential for protecting water quality and, at minimum, assuring compliance with water quality standards and, in particular, OAR 340-041-0007(7).</p> <p>As noted in DEQ's review of PCGP's response to Comment 15, the scientific literature is replete with research documenting the importance of routine road maintenance for protecting water quality. For example, routine road maintenance for water quality is important to maintaining water quality necessary for the recovery of salmonids listed under the Endangered Species Act and found in streams receiving runoff from PCGP's proposed access roads. The National Marine Fisheries Service issued the Limit 10 Section 4(d) rule concerning routine road maintenance to protect water quality for ESA-listed salmon. For decades, the scientific community has established the harmful effects of roads on streams.^{xxi} DEQ is requesting that PCGP provide the specific maintenance standards PCGP will apply to access roads while in use for pipeline construction. As discussed above, this is essential for protecting water quality and, at minimum, assuring compliance with water quality standards and, in particular, OAR 340-041-0007(7).</p> <p>Additionally, the Oregon Department of Forestry has rules for road maintenance and road building on private forest roads. ODF developed these rules to address public safety and water quality given the risk of landslides, road failure, and sediment discharge from road use and construction.^{xxii, xxiii, xxiv, xxv} ODF uses road maintenance and building requirements associated with the Forest Practices Act to comply with Clean Water Act requirements such as those associated with Total Maximum Daily Loads and water quality standards. However, PCGP does not provide DEQ with information on how specifically PCGP will address OAR 629-625-0700 (Wet Weather Road Use). ODF's Wet Weather Road Use rule requires the following:</p> <p><i>...durable surfacing or other effective measures to resist deep rutting or the development of a layer of mud on top of the road surface on road segments that drain directly to streams that will be used for log hauling and moving construction equipment during wet periods.</i></p>	

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			<p>In its Forest Practices Technical Note 9, ODF provides a discussion of aggregate surfacing, road use, and turbidity in streams. DEQ can find no information in any of the plans included in PCGP's analysis of its compliance with water quality standards that addresses the issues raised in this ODF technical note and in Forest Practices Act rules.</p> <p>Moreover, for public safety, under OAR 629-623-0000 – 0800, a forest harvesting operator must submit to ODF a detailed road design for all new or reconstructed roads crossing high landslide hazard locations. For water quality protection and compliance with OAR 340-041-0007(7), DEQ is requesting in Comment 31 that PCGP provide detailed road designs for new or reconstructed roads in landslide hazard areas and other locations where these roads are hydrologically connected to waters of the state. PCGP must demonstrate in its plans and supporting documents where and when exactly PCGP is applying these designs on the proposed access roads for pipeline construction and operation.</p> <p>As with ODF's requirements for private forest roads, Counties have authority to establish road construction designs and specifications for County roads.^{xxvi} At minimum, these county requirements will ensure that an unpaved county road will support PCGP's proposed level of use while protecting the stability of the road surface and, consequently, water quality for roads hydrologically connected to waters of the state. In its proposed Transportation Management Plan, PCGP has not identified any maintenance standards as well as design and specifications for reconstructed County roads used as access roads. Additionally, PCGP has not provided DEQ with Forest Service, Bureau of Land Management, and Bureau of Reclamation road permits roads containing maintenance standards and design and specifications for reconstructed federal roads proposed by PCGP for use as access roads. These road permits must provide PCGP with clear and enforceable standards and specifications.</p> <p>The following is an example of the maintenance standards PCGP has proposed in its Transportation Management Plan in Section 2.2.2:</p> <p><i>PCGP will perform or make commensurate share payment(s) for maintenance on existing Agency roads used during construction and any subsequent non-casual use in accordance with USDA-FS Manual Chapter 7730, the USDA-FS Handbook section 7709.59, Chapter 60, BLM Manual 9100 Series and the various BLM District Resource Management Plans and as shown in TMP Appendices C1, C2, C3, D, and D1.</i></p> <p><i>Existing Agency-jurisdiction Roads will be maintained to ensure compliance with any applicable Road Use Permit, Reclamation standards for "Engineering and O&M Guidelines for Crossings" (Exhibit H of the Grant and TUP), the Grant and TUP, this TMP and in consultation with the Agencies regarding current standards for the maintenance level identified for the Road(s). Roads constructed by PCGP on Agency lands will be maintained to standards approved by the Agency.</i></p> <p><i>To facilitate consistency across the Pipeline Project, Agencies have agreed to utilize the most current USDA-FS, Pacific Northwest Region (Region 6), standard timber sale road maintenance specifications ("T-specs") and Pipeline Project specific supplemental specifications as appropriate. Agency Roads requiring PCGP maintenance and associated specifications are shown on maps in TMP Appendices B and B1 and in tables in TMP Appendices C, C1, C2, C3,</i></p>	

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			<p><i>D, and D1. Copies of the specifications are available from the Supervisor's Office of any National Forest in Region 6.</i></p> <p><i>Paved Roads will be kept free of mud and other debris that may be deposited by construction equipment. Track-driven equipment would cross paved Roads on tires or equipment pads to minimize Road damage. Any paved, gravel, or dirt roadways damaged by construction activities will be repaired to a condition equal to or better than the condition prior to damage. Agencies may require PCGP to provide selected pre-use Road and/or sign condition surveys, including photos or video, to aid in assessing use-induced changes.</i></p> <p>Similarly, in Section 2.2.3, PCGP proposes road improvements to accommodate equipment for pipeline construction and roads slated for improvements are described in:</p> <p><i>TMP Appendices B and B1 maps</i></p> <p><i>TMP Appendices C, C1, C2, C3, and D1 tables</i></p> <p>However, PCGP has provided no information in Appendices B, B1, C1, C2, C3, D, and D1 as PCGP has left these pages in the Transportation Management Plan blank. PCGP indicates in the excerpt above that PCGP will maintain existing "Agency-jurisdiction Roads" to ensure compliance with any applicable road use permit and other standards. However, PCGP provides no road permits for DEQ to review nor any applicable road maintenance standards and specifications for all the access roads. In DEQ's Comment 15, DEQ requests that PCGP provide supporting documents such as design standards and road permits that PCGP will use when complying with TMDL Implementation Plans such as Federal Water Quality Restoration Plans. However, in PCGP's response to DEQ's Comment 15, PCGP indicates that Right-of-Way Grants will ensure compliance with water quality plans. DEQ disagrees with this assertion and provides the rationale for this disagreement in DEQ's review of PCGP's response to Comment 15. Moreover, the statement below from PCGP's Transportation Management Plan undermines this assertion regarding right-of-way grants. In the TMP, PCGP states that roads "will be maintained to ensure compliance with any applicable Road Use Permit." Although PCGP intends to use compliance with applicable road use permits to comply with water quality standards and, therefore, obtain a 401 Water Quality Certification, PCGP does not consider road use permits essential for demonstrating compliance with a Total Maximum Daily Load.</p> <p>Additionally, in the excerpts from PCGP's Transportation Management Plan above, PCGP does not provide the actions it will take to maintain Coos, Douglas, Jackson, and Klamath County and private forest roads that PCGP will use to access pipeline right-of-way for construction and operation. What are the County road maintenance standards that PCGP will follow? For private forest roads used to haul harvested trees, Oregon Department of Forestry has issued a road drainage rule to implement the Forest Practices Act.^{xxvii} As noted above, ODF uses the FPA and its administrative rules to regulate road maintenance for water quality and compliance with the Clean Water Act and, in particular, water quality standards. ODF requires the operator of private forest roads used for forest harvesting to install additional drainage such as cross drains where needed to filter stormwater from roads to protect water quality. In ODF's Technical Note Number 8 referenced above, ODF provides technical guidance to address ditch erosion and the sediment it produces. Specifically, ODF presents typical minimum culvert spacing for erosion control in a roadside</p>	

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			<p>ditch. As the grade of a road increases, this drainage becomes increasingly important. In OAR 629-625-600(9), ODF requires the following:</p> <p style="text-align: center;"><i>Where needed to protect water quality, as directed by the State Forester, operators shall place additional cross drainage structures on existing active roads within their ownership prior to hauling to meet the requirements of OAR 629-625-0330.</i></p> <p>PCGP must determine in collaboration with ODF the need for additional cross drainage structures prior to using access roads for pipeline construction and operation. As discussed above, PCGP must include this determination as well as the evaluation of the current condition and design of existing access roads in its submittal for Water Quality Certification. DEQ will review this information when developing the Certification Decision.</p> <p>Additionally, in its Transportation Management Plan excerpted above, PCGP does not indicate specifically how PCGP will keep paved roads free of mud and other debris PCGP may deposit with its construction equipment. How specifically will PCGP keep paved roads free of mud and other debris? What BMPs will PCGP use to implement this stated goal? Will PCGP operate a wheel wash station at access road crossings with the construction right-of-way? DEQ cannot fully evaluate the efficacy of the proposed Transportation Management Plan on general statements unless PCGP follows these statements with specific practices applied to specific locations with a schedule identifying when PCGP will implement these practices.</p> <p>In PCGP's Transportation Management Plan excerpted above, PCGP has not provided road permits showing maintenance standards that DEQ can review. PCGP has not provided DEQ with proposed "T-specs" to review nor demonstrated that these "T-specs" will comply with County and ODF Forest Practice Act requirements developed to comply with Clean Water Act requirements. As requested in Comment 23 and 24, PCGP has not identified access requiring maintenance and improvements to protect water quality nor standards and specifications noted in the Transportation Management Plan excerpt above. Additionally, PCGP has not provided maintenance specifications for Forest Service roads. As noted in DEQ's Comment 15 and Comment 29, DEQ must ensure compliance with Section 303 of the CWA and other appropriate requirements of state law in developing its Certification Decision. To protect water quality and to comply with water quality standards such as OAR 340-041-007(7), PCGP must design needed access road improvements to ensure these improvements do not cause landslides. Moreover, PCGP must maintain access roads to prevent water quality impacts during logging truck and heavy equipment traffic.</p> <p>Regarding any proposed improvements to proposed access roads, PCGP provides few details that DEQ can use to evaluate the efficacy of proposed controls to prevent erosion and sedimentation. For DEQ's concerns regarding slope stability and the construction and operation of the pipeline, DEQ can find only the following information in Section 3.5 of the Transportation Management Plan:</p> <p style="text-align: center;"><i>Refer to Slope Stability Stipulation D.20 of the Grant and TUP.</i></p> <p>PCGP has not provided the Grant (Right-of-Way Grant, Serial No. OR 63542-01) and the TUP (Temporary Use Permit, Serial No. OR 63542) for DEQ to review to determine if the grant and permit contain enforceable details regarding road maintenance and improvements. Our review of the "Grant and TUP" is</p>	

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			<p>essential for the development of the Certification Decision and determining PCGP's compliance rules for developing this decision as stated in OAR 340-048-0042. Given the above, DEQ is unable to determine what this "Slope Stability Stipulation" entails and how PCGP will respond to it.</p> <p>PCGP's Introduction in Section 1.0 of the Transportation Management Plan states that this plan:</p> <p><i>...includes details regarding timber removal and construction access Road improvements, Road maintenance and management of use before, during, and after construction. A final TMP will be submitted by PCGP to the Agencies for approval prior to issuance of the TUP and Grant. This TMP applies to Agency-jurisdiction Roads located on Agency and privately-owned land.</i></p> <p>To date, PCGP's Transportation Management Plan does not contain and PCGP has not provided DEQ with any detailed information in engineering plans on how and where exactly PCGP will perform road improvements to prepare the proposed access roads for their proposed use and to protect water quality. In the Transportation Management Plan, PCGP also states the following:</p> <p><i>...where construction schedules require Road use outside the normal operating season, more substantial work such as surfacing or resurfacing of may be necessary.</i></p> <p>The season of rainfall is typically from mid-October to mid-July. Timber and ridgetop removal as well as heavy equipment access for pipeline construction are levels of use that have the potential to generate sediment discharge to receiving waters if the non-paved roads are not reconstructed and maintained to support this proposed use during the season of rainfall.</p> <p>To date, PCGP has not provided DEQ with a road maintenance plan for all access roads to ensure that during the season of rainfall road use will not impact water quality. PCGP states in its Transportation Management Plan that:</p> <p><i>All maintenance and improvements will be completed in accordance with Pipeline Project requirements and Agency, state, county and private landowner standards.</i></p> <p>PCGP has not provided DEQ with any information on road maintenance standards and road improvement design standards in this Transportation Management Plan or any other document PCGP included in its 401 Water Quality Certification Submittal.</p> <p>In Section 2.2.1 of PCGP's Transportation Management Plan, DEQ states the following:</p> <p><i>PCGP will be responsible for performing Road maintenance on all newly constructed Roads on Federal Lands and decommissioning of temporary Roads as specified in this plan.</i></p> <p>PCGP has not presented in this plan any road decommissioning standards. Rather, PCGP only provides the following information and references to documents that are currently unavailable to DEQ:</p>	

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			<p><i>TARs and previously decommissioned Roads that are constructed or reconstructed for use during the Pipeline Project will be reclaimed or decommissioned as specified by the Agency. In addition, as mitigation for impacts to various late-successional and riparian-dependent species as well as soil productivity losses, PCGP proposes to decommission off-site Roads in cooperation with the Agency in accordance with Agency specifications and the Compensatory Mitigation Plan (Exhibit G, Appendix CC to the Grant and TUP).</i></p> <p>As noted in the USDA Forest Service's review of the science regarding road construction and maintenance, unmaintained roads are a substantial source of sediment delivery to streams in forest watersheds.^{xxviii} Given this and other research on water quality impacts from road design and maintenance, DEQ requested information in AIR-1 on road decommissioning to develop its Certification Decision. Although PCGP provides a definition of decommissioning in Appendix E of the Transportation Management Plan, PCGP does not indicate in this plan what roads PCGP will decommission nor provide detailed management practices and design standards that PCGP will employ at each decommissioned road segment. DEQ requested this information in Comment 28 of AIR-1.</p> <p>The definition of decommissioning used in PCGP's Transportation Management Plan indicates that treatments may include stabilizing slopes, pulling back road shoulder, removing unstable road fills, or installing water bars. How will PCGP carry out these treatments at each site to ensure roads on landslide prone, steep slopes are not destabilized further? Does stabilizing slopes refer to unstable cut slopes if the road prism is left in place? If so, what are PCGP's proposed designs for stabilizing unstable cut slopes? If PCGP uses slope breakers or water bars to manage stormwater on a decommissioned road surface, who will maintain this system for managing stormwater and are there financial resources to maintain this system for the operational life of this pipeline? PCGP has not demonstrated to DEQ that it has thought through the details of decommissioning road segments to protect water quality.</p>	
19	<p>This compliance assessment must also include a summary of the steps taken to first avoid and then minimize impacts to the Designated Management Agency's riparian buffer protection areas prior to:</p> <ul style="list-style-type: none"> • Siting Temporary Extra Work Areas for the pipeline construction • Siting of the construction and the permanent right-of-way for the pipeline. 	<p>PCGP will provide a response to DEQ in Q4 of 2018.</p>	<p>DEQ anticipates PCGP's response in Q4 2018.</p>	<p>Refer to response to Comment 21b.</p>

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	<p>DEQ is requesting this information in response to Pacific Connector Gas Pipeline's proposal to locate TEWAs 50 feet from a waterbody and wetland boundary (see page 25 of Resource Report 1 for the gas pipeline). For example, this setback will not comply with the Forest Service's and Bureau of Land Management's riparian buffer protection requirements as presented in their Water Quality Restoration Plans which serve as their TMDL Implementation Plans.</p> <p>In Resource Report 1 noted above, PCGP notes that there are 922.64 acres of TEWAs. Please identify the location of each TEWA that PCGP will locate within one and two potential tree heights away to 50 feet from waters of the state.</p> <p>For streams, please indicate the distance of each TEWA from the ordinary high water mark of the stream or riverine wetland. Additionally, please note the land ownership where each TEWA is located.</p> <p>In addition, on page 58 of Resource Report 1 for the gas pipeline, PCGP indicates that the pipeline – in some places – will impact riparian</p>			

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	<p>vegetation while paralleling streams. Specifically, this report notes that the "proposed route will avoid paralleling a waterbody within 15 feet or less, where feasible." In this report, PCGP notes that this placement is consistent with the Section V.B.2.a of FERC's Wetland and Waterbody Procedures. However, 15 feet of riparian buffer would violate DMA riparian buffer protection requirements. Moreover, based on the literature, a 15-foot riparian buffer for thermal regulation of streams may result in thermal gain to the adjacent water body. As result, please identify each segment of the pipeline's construction right-of-way and permanent right-of-way that is parallel to waters of the state and within two site potential tree heights from waters of the state.</p> <p>Please provide the location and a detailed rationale for siting TEWAs closer to streams than authorized by a DMA's riparian buffer protection requirements and when siting sections of the construction and permanent right-of-way. For example, the PCGP's rationale in Resource Report 1 (page 58) for not proposing setbacks larger than 50 feet in Riparian</p>			

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	<p>Reserves is that larger setbacks "would render the TEWA useless for the stream crossing." PCGP should justify its proposal for non-standard riparian buffer protections by providing the following information:</p> <ul style="list-style-type: none"> • A description of the specific constraints at each site preventing the use of a TEWA in an area. • The specific rationale why the TEWA must be closer to the stream crossing. <p>Without this specific information, DEQ cannot determine that Pacific Connector Gas Pipeline attempted to first avoid and minimize riparian impacts to the maximum extent practicable before seeking to mitigate these impacts.</p>			
20	<p>This compliance assessment must also identify other locations where PCGP will not comply with Designated Management Agencies' riparian protection areas when siting the following:</p> <ul style="list-style-type: none"> • Temporary and Permanent Access Roads, • Staging areas, • Material storage areas, and • Other components (e.g., compressor stations, 	<p>PCGP will provide a response to DEQ in Q4 of 2018.</p>	<p>DEQ anticipates PCGP's response in Q4 2018.</p>	<p>Refer to response to Comment 21b.</p>

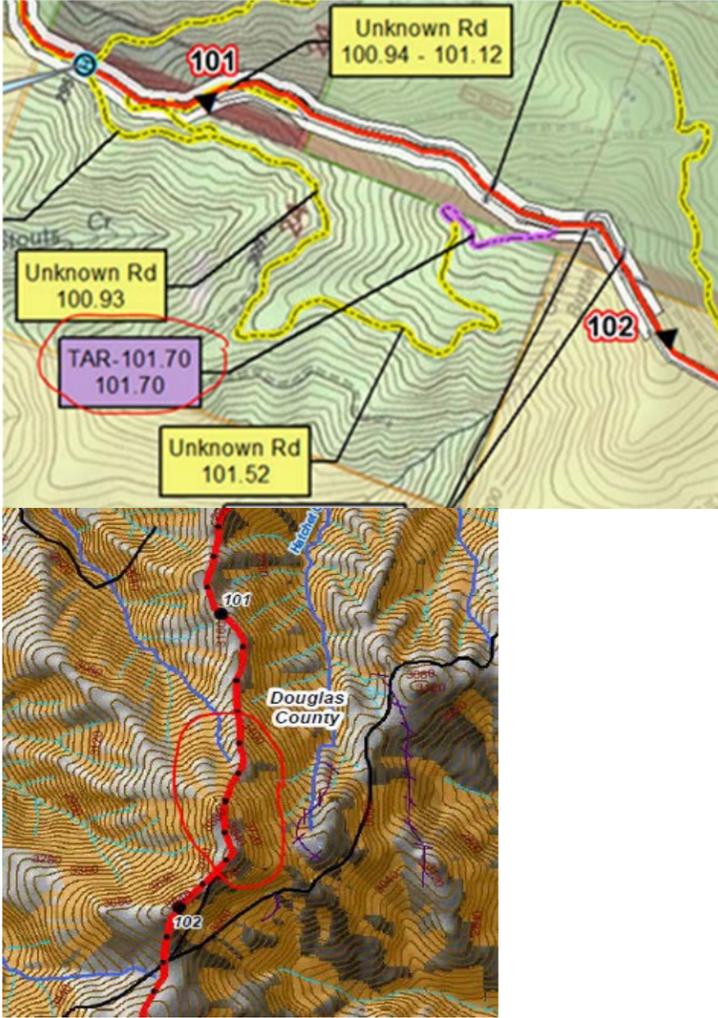
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	metering stations) of the pipeline.			
21a	Please include a detailed justification for seeking alternative riparian buffer protection requirements when siting these facilities within riparian areas.	PCGP will provide a response to DEQ in Q4 of 2018.	DEQ anticipates PCGP's response in Q4 2018.	<p>As detailed in response to Comment 15, the Thermal Impact Assessment is being updated to include riparian impacts associated with areas where the alignment is parallel to streams and within one-site potential tree height. Justification for the parallel routing will be included. This will be submitted in March 2019.</p> <p>Additionally, the site-specific justifications for the modification requests are detailed in Table A.1-1 (see Appendix B to Part 2 of the JPA, pdf page 399). These justifications follow FERC's guidance found in its Wetland and Waterbody Construction and Mitigation Procedures (see Section II.A.1. in Attachment B to the ECRP).</p> <p>Jordan Cove anticipates approval by FERC of this routine request.</p>
21b	<p>Pacific Connector Gas Pipeline must evaluate the thermal impacts from all noncompliance with DMA riparian protection requirements requested above where PCGP has provided and DEQ has approved the following information:</p> <ul style="list-style-type: none"> • Detailed information demonstrating it considered all actions to first avoid or then minimize impacts to riparian areas to the maximum extent practicable. • Detail rationale for proposing nonstandard widths for riparian buffer protections. <p>This evaluation must be included in PCGP's Thermal</p>	PCGP will provide a response to DEQ in Q4 of 2018.	DEQ anticipates PCGP's response in Q4 2018.	<p>The Thermal Impact Assessment is being updated to ensure that all areas of the construction right-of-way which parallel a waterbody and are within a site potential tree height of a stream have been assessed for thermal loading impacts using ODEQ's Shade-A-Lator tool. The update will be submitted in March 2019 and is based on the same methods that were used in GeoEngineers August 31, 2017 Thermal Assessment.</p> <p>Because the Pipeline project is linear and cannot avoid Riparian Management Areas (RMAs), in compliance with ODF's Forest Practice Act, PCGP will prepare Written and Alternate plans to address crossing RMAs in areas where tree harvest is generally restricted. These plans will be submitted during ODF's NOAP process according to the construction schedule for the pipeline.</p> <p>To address the potential effects associated with crossing RMAs (e.g., sedimentation, thermal), PCGP has prepared the ECRP to ensure the potential for erosion and sedimentation is avoided and/or minimized, and disturbed RMAs are restored and replanted with appropriate riparian species.</p> <p>PCGP has also completed a Thermal Impact Assessment (Appendix Q.2 to Attachment C to Attachment B to Part 2 of the JPA on pdf page 2137) for the Pipeline (which is being updated), according to ODEQ methods, and has committed to mitigate for temporary (1:1 ratio) and permanent (2:1</p>

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	Impacts Assessment noted in the comments below on compliance with state water quality standards.			ratio) impacts within riparian areas. Many of the parallel alignment areas occur in herbaceous pastures/fields where the existing riparian vegetation (that will be temporary affected by construction) does not provide shade to the adjacent stream reaches.
22	<p>There is no information presented in Pacific Connector Gas Pipeline's Appendices for Timber Removal and Construction in the Transportation Management Plan (Part 2, Appendix E-8). Please provide the location of the approximately 660 miles of existing public and private roads that PCGP proposes to use to construct the gas pipeline and/or support its operation. In this updated plan, please delineate these existing public and private roads by ownership as follows:</p> <ul style="list-style-type: none"> • Private road on land zoned for forest use • Private road on land zoned for agricultural use • Private road on land zoned residential, commercial, and industrial use by Coos, Douglas, Jackson, and Klamath County • Public road owned and operated by Coos, Douglas, Jackson, Klamath County • Public road on the Umpqua, Rogue- 	<p>Maps of access roads proposed for use for construction of the pipeline are included in Appendix B to Part 2 of the JPA (see pdf page 183 and 661 – please note that the same set of maps are provided twice, as their own attachment and as an appendix to the overall Project Description). A list of the roads is included in Table A.8-1 on pdf page 143.</p> <p>Table A.2-6 is in Appendix A.2 to Resource Report 2 (Attachment C of the PCGP JPA package) lists waterbodies crossed by or within 100 feet of temporary and permanent access roads or existing access roads where improvements will be required prior to use. PCGP will provide a revised table A.2-6 is</p>	<p>Statement Summary: PCGP's response to Comment 22 did not identify the ownership of all the access roads PCGP proposes to use. In the section below, DEQ provides specific examples where ownership is unknown. DEQ requires site-specific, detailed information on road maintenance and road improvement actions PCGP will need to perform to protect water quality when using the more than 660 miles of access roads. DEQ provides the rationale for this information request in the section below as well as examples of the level of required detail. In particular, DEQ refers PCGP to a tool to identify roads that are hydrologically connected to water bodies. Please provide responses to Comment 22 using the examples and guidance provided below.</p> <p>Information in submittal documents do not include all the information requested in Comment 22 of AIR-1. For example, on Sheet 1 of 55 of Drawing No. 3430.31-Y-Map 1, the specific ownership of the following roads as well as others is not identified:</p> <ul style="list-style-type: none"> • Logging Spur 6.64R – 7.34R • Carlson Heights Road 7.34R – 7.44R • Willanch Slough 8.44R • Logging Spur 8.17R <p>These are just a few examples among many on PCGP's drawings. Without information on the specific ownership of each road, DEQ cannot evaluate compliance with TMDL allocations as required in OAR 340-048-0042(2). As requested in AIR-1, please delineate these public and private roads by ownership where ownership is unclear.</p> <p>Additionally, PCGP provides only limited information in Table A.8-1 regarding the improvements needed for PCGP to use various access roads for pipeline construction and/or operation. For example, PCGP provides only the following information: requires pothole filling, blading/grading, brush limbing, widening and/or turnouts. As explained using an example in DEQ's review of PCGP's response to Comment 23 below, this information does not tell DEQ that PCGP evaluated these roads for their potential impact to water quality. DEQ is most interested in an assessment of the roads with dirt, gravel, bituminous, and rock surfaces for their potential impact to water quality under different levels of use noted in Table A.8-1. Moreover, given the information provided in PCGP's submittal, many of these road these access roads will experience loads from the following activities:</p> <ul style="list-style-type: none"> • Haul heavy equipment for road building and improvements to support forest harvesting. • Provide access to the approximately 300 miles of pipeline alignment for logging trucks and logging equipment to clear the construction right-of-way of vegetation. • Haul logs from the construction right-of-way. • Provide access for truck traffic for reforestation of the construction ROW. 	<p>See responses to Comments 4/5 and 15 above.</p> <p>Further response pending outcome of ODEQ senior management/legal meeting.</p> <p>On non-federal lands, PCGP will follow Oregon Department of Forestry (ODF) Division 625 Forest Road Construction and Maintenance requirements for the proposed use and maintenance of existing roads and the improvement of any road (approximately 15.21 miles) or construction of any new temporary (1.48 miles) or permanent access roads (0.72 mile).</p> <p>On federally-managed lands, PCGP will follow the requirements of the BLM and Forest Service, as stipulated in the Transportation Management Plan (see Appendix E.8 to Part 2 of the JPA).</p> <p>PCGP will implement ODF Forest Road Construction and Maintenance requirements, which have been adopted by ODEQ as BMPs to achieve state water quality standards to reduce potential water quality impacts associated with use, construction, and maintenance of roads for forest operations (and will also apply to road use during pipeline construction).</p> <p>PCGP will update the Transportation Management Plan for Non-Federal Lands (TMPNFL) and submit to ODEQ in late March 2019. This plan will address ODF Division 625 Forest Road Construction and Maintenance requirements for the proposed use and maintenance of existing roads and road improvements. Design specifications will be included to address improvements of existing roads or construction of new roads (temporary or permanent) and will address maintenance of existing roads to protect water quality.</p> <p>The potential for sediment delivery to streams following construction of roads (temporary or permanent), improvement of existing roads, or the use of existing roads will be evaluated by applying sediment and drainage assessment components of the Washington Road Surface</p>

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	<p>Siskiyou, and Winema-Fremont National Forest</p> <ul style="list-style-type: none"> Public road on land in the Bureau of Land Management Coos Bay District, Roseburg District, Medford District, Klamath Resource Area Public road on Bureau of Reclamation land <p>DEQ will use this information to evaluate compliance with the Section 303 of the Clean Water Act as noted above.</p>	<p>in Appendix A.2 to Resource Report 2 (Attachment C of the PCGP JPA package) that will identify best management practices for waterbodies crossed by or within 100 feet of temporary and permanent access roads.</p> <p>PCGP anticipates submitting the revised table to ODEQ in Q4 2018.</p>	<ul style="list-style-type: none"> Haul stumps as well as a portion of the slash that will not be left in the 30-foot swath of the 50-foot permanent right-of-way as this right-of-way needs to be clear for periodic vegetation management and future pipeline repairs. Haul heavy equipment to construct a construction right-of-way that will require the removal of mountain ridgetops in the Coastal and Cascade Mountain Ranges. Haul rock and soil to disposal sites that PCGP removed from ridgetops to create the permanent right-of-way. Haul heavy equipment for laying the pipeline. Haul heavy equipment to rip/subsoil or scarify compacted soil during the restoration of the construction right-of-way. <p>To develop its Certification Decision, DEQ requested and must receive in response to Comment 22 the following:</p> <ul style="list-style-type: none"> An evaluation of each access road segment's current condition relative to applicable standards and specifications. An evaluation of needed improvements to protect water quality as requested in Comment 23 below. <p>This information is critical for DEQ to evaluate PCGP's compliance with Total Maximum Daily Load Implementation Plans of Designated Management Agencies as requested in Comments 15 and 16 noted above. In fact, the Oregon Department of Forestry – a Designated Management Agency – developed a Technical Note 8 to guide the implementation of Forest Practices Act rule that states:</p> <p><i>Road drainage must be improved when there is the likelihood of substantial sediment delivery if the drainage system is not upgraded. Inspection of the road drainage on inactive roads prior to active road use is essential. Evidence of potential sediment delivery include the following conditions:</i></p> <p>ROAD USE CHANGING - LIKELY SEDIMENT DELIVERY</p> <ul style="list-style-type: none"> No cross drain structure (for filtering) within 200 feet of a stream crossing Streams running in roadside ditches <p>ROAD USE NOT CHANGING - LIKELY SEDIMENT DELIVERY ON ANY ROAD</p> <ul style="list-style-type: none"> When gullies (over 100 feet in length) exist in a ditch, or below a cross drain Surface drainage waters flow into cracks on the outside edge of the road When more than 30 percent of the road system draining directly to streams or into gullies (a goal for a superior road is 15 percent) <p>REPAIRS FOR OLDER ROADS</p> <p><i>When repairing older roads, streams running down ditches need to be put back into the original channel. Other common repairs are adding cross drains for filtering above stream crossings, and installing new cross-drains where gullies have formed in the ditch or at culvert outlets. In general, the information on drainage of new roads as described earlier in this Technical Note</i></p>	<p>Erosion Model or WARSEM (Dube et al. 2004). This evaluation will provide a risk assessment of the roads that have No, Moderate or High-risk potential of sediment delivery to streams. Note that this evaluation was used in the Applicant-Prepared Draft Biological Assessment to determine the roads that could have a risk of sediment delivery to streams with ESA listed coho. (Reference: Dube, K., W. Megahan, M. McCalmon. 2004. Washington Road Surface Erosion Model. Prepared for State of Washington Department of Natural Resources. Olympia, WA.)</p> <p>The TMPNFL will also reference the federal Transportation Management Plan (TMP), included in the Plan of Development as Appendix Y, describing how access roads on federally-managed lands will be used and maintained. (Note: Appendices A, B, C and D to the TMP were not provided in the JPA because these appendices are being updated by the BLM for the current pipeline route and proposed use of existing access roads. The previous version of these appendices were provided informally to ODEQ on February 1, 2019 as examples.) The TMP provides the detailed requirements for new permanent and temporary road construction, maintenance standards, improvements, including reconstruction resurfacing, and decommissioning; all road activities must comply with applicable agency's BMPs. To minimize the potential for both road-related and off-road resource damage, PCGP will perform road surfacing structural capacity assessments and place additional road surfacing (aggregate or bituminous) as appropriate or needed for the planned use.</p> <p>The BOR roads called out in Comment 27 are short road segments on existing roads where BOR holds easements to facilitate access to their facilities. There would be no timber harvesting or removal of commercial forest products on BOR easement roads.</p> <p>Table 1.2-2 (pdf page 329 in Appendix B to Part 2 of the JPA) lists the proposed TARs and PARs and provides their purposes.</p>

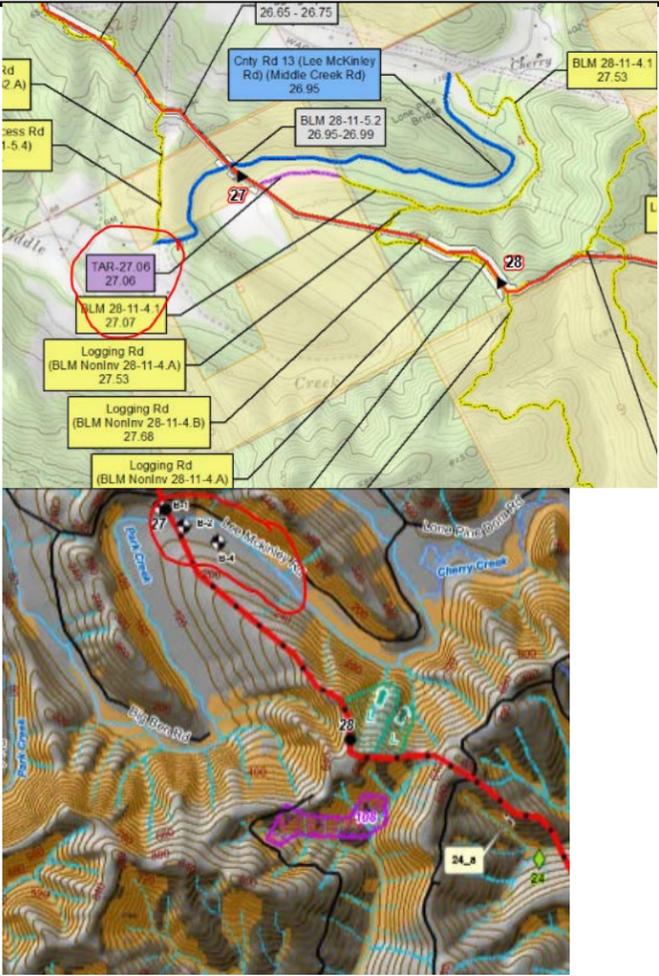
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			<p><i>are also appropriate for maintenance of older roads. Use any technique that efficiently fixes the problem.</i></p> <p>As discussed in more detail in the review of PCGP's response to Comment 15, this information is necessary to ensure compliance Oregon Administrative Rule 629-625-0600. Oregon Department of Forestry uses this Forest Practices Act rule regarding road maintenance to protect water quality by requiring the timely maintenance of all active and inactive roads. ODF uses this rule to comply with Total Maximum Daily Loads and water quality standards as noted elsewhere in DEQ's review.</p> <p>The information request in Comment 22 is essential for evaluating PCGP's practices to protect water quality on PCGP's proposed private access roads as well as proposed public access roads. In Section 2.1.1 of the Transportation Management Plan, PCGP states only the following:</p> <p><i>PCGP will obtain landowner agreements for any use of private roads. All conditions agreed to with the landowner must be met by the Contactor for continued use of the road. Where access is not available to Agency lands or Roads, and in cases of private roads of mutual interest, PCGP will coordinate with the appropriate Agency(ies) in the identification and acquisition of access rights related to the right-of-way locations for the Grant and TUP.</i></p> <p>At minimum, to formulate a Certification Decision, DEQ must receive and review all private landowner agreements for use of private roads to ensure compliance with Forest Practices Act rules administered to comply with water quality standards as noted above and in DEQ's review of PCGP's response to Comment 15. To protect water quality, these private agreements must include:</p> <ul style="list-style-type: none"> • PCGP's evaluation of the current conditions of these roads to protect water quality. • PCGP's reconstruction plan – if needed to protect water quality/comply with the Forest Practices Act – to prepare these private forest roads for their proposed use. • PCGP's maintenance plan for these roads once PCGP makes needed improvements to protect water quality. <p>To develop the Certification Decision, DEQ requires PCGP to provide specific information on where PCGP will apply specific maintenance actions and when PCGP will apply these actions. This information is required for all the private and public access roads.</p> <p>In preparing AIR-1, DEQ reviewed Table A.2-6 in Appendix A.2 of Resource Report 2. The information in this table does not provide DEQ with a detailed maintenance and improvement plan for the approximately 660 miles of access roads to construct and/or operate this pipeline requested in Comment 24. As noted in the University of Nebraska's/USDA Forest Service's review of forest roads entitled <u>Protecting Soil and Water in Forest Management</u>, road maintenance is critical to protecting water quality. Given the research on roads and water quality, DEQ is most concerned with the dirt, gravel, bituminous, and rock surfaced access roads given their high potential to discharge sediment to waters of the state when under use for forest clearing and pipeline construction as documented elsewhere in DEQ's review of PCGP's response.</p>	

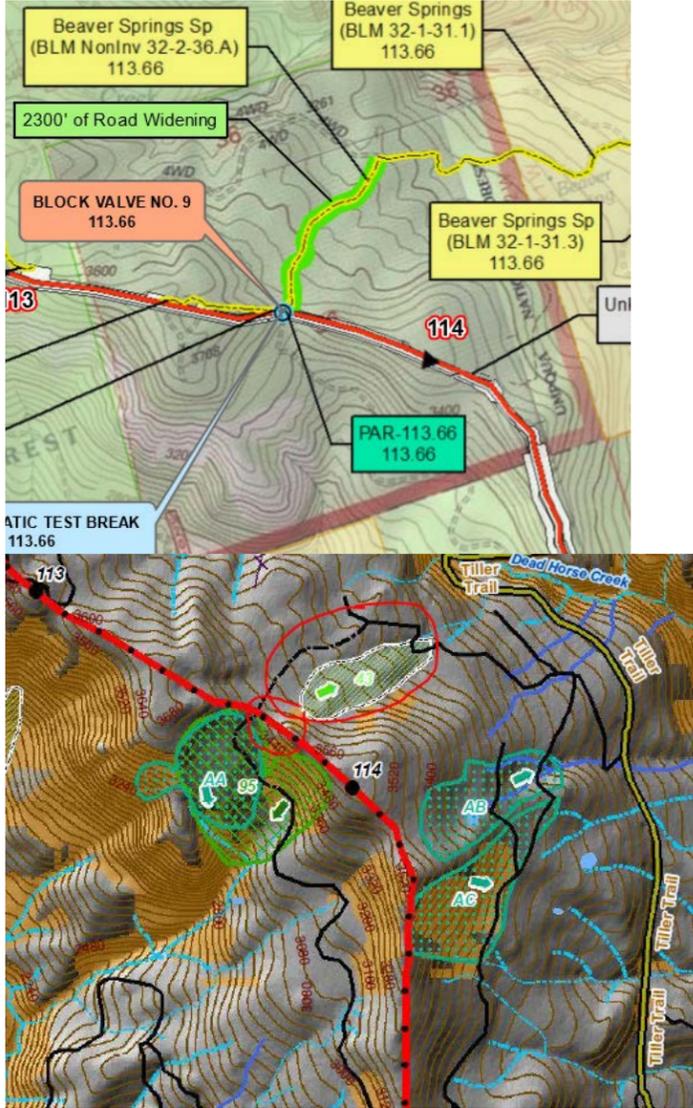
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			<p>Additionally, PCGP's table referenced in its response only identifies access road segments within 100 feet of waterbodies. Road conditions and their use beyond 100 feet of waterbodies can affect these waterbodies. PCGP must address all roads hydrologically connected to waterbodies in its pursuit of a Section 401 Water Quality Certification for its proposed activities. To identify objectively these hydrologically connected roads, PCGP may use Geomorphic Road Assessment and Inventory Package (GRAIP) or a comparable analytical tool approved by DEQ. DEQ is very skeptical that PCGP will provide the level of detail DEQ is requesting in AIR-1 in PCGP's update to the information presented in Table A.2-6. For an example of the detail that DEQ is expecting, please see DEQ's review of PCGP's response to Comments 23 and 24 below. This review provides examples of the level of detail DEQ is requesting and expecting to receive from PCGP to develop the Certification Decision.</p>	
26, 27	<p><u>Comment 26:</u> Please provide the location of the proposed 25 miles of new Temporary and Permanent Access Roads and the selection criteria used to site these new roads to avoid minimize impacts to water quality.</p> <p>Please delineate these new roads by land ownership (e.g., private ownership on land zoned for forest use) so DEQ can evaluate compliance with Section 303 of the Clean Water Act.</p> <p><u>Comment 27:</u> To ensure these roads will not serve as a source of sediment to and hydromodification of waters of the state and as a source of debris flows into streams from road-related landslides, please include the design standards and specifications for constructing these roads including their drainage systems, cut-slopes, and fill-slopes. Please identify the proposed designs to</p>	<p>Appendix B in Part 2 (Table 1.2-2 on pdf page 329) provides a table of the ten (10) temporary and 15 permanent access roads by milepost and landownership. There are not 25 miles of Temporary and Permanent access roads; the roads total approximately 2.2 miles (and 5.96 acres), not 25 miles as stated in the comment. They are shown on the maps included in the PCGP JPA (beginning on pdf page 660). Table 2.2-5 (pdf page 1104) lists those temporary and permanent access roads within 100 feet of waterbodies, all of which are located on private lands. Four waterbodies will be crossed by permanent access roads, and three of</p>	<p>Summary Statement: DEQ requests that PCGP provide the selection criteria used to evaluate and choose road segments proposed in their application. In particular, DEQ wishes to review the decision-making criteria used to ensure road development would avoid conflicts with streams, wetlands, and waterbodies to the maximum extent practicable. DEQ further requests PCGP conduct an analysis to determine hydraulic connectivity of road surfaces and waters of the state using the analytical tools and the design standards addressed in the following section.</p> <p>DEQ located the 25 (10 temporary and 15 permanent) segments of new road building proposed for the construction and operation of the pipeline in the maps included in PCGP's Joint Permit Application on pdf page 660.</p> <p>As discussed elsewhere in DEQ's review of PCGP's response to AIR-1, DEQ is requesting the level of detail provided in the examples below to evaluate the impacts of PCGP's proposed new roads to build and operate the pipeline. As noted elsewhere in DEQ's review of PCGP's response, new roads or existing roads do not have to be within 100 feet of a water body to have a potential impact on water quality. PCGP refers DEQ to Table A.2-6 in Appendix A.2 of Resource Report 2 for temporary and permanent access roads crossed by or within 100 feet waterbodies. This scope of analysis and the limited information provided in Table 2.2-5 is inadequate for DEQ to evaluate the potential impacts to water quality. PCGP must evaluate all Temporary and Permanent Access Roads hydrologically connected to water bodies. To evaluate objectively evaluate the impact of these Temporary and Permanent Access Roads on water quality, PCGP may use X-DRAIN or a comparable analytical tool approved by DEQ.</p> <p>Without design details and their technical support, DEQ is unable to determine if PCGP is designing new permanent and temporary roads hydrologically disconnected to water bodies by the design of their drainage system. The Oregon Department of Forestry established rules to address drainage from forest roads as highlighted in DEQ's review of PCGP's response to Comment 15 above. ODF developed these rules to comply with water quality standards. The design of a road drainage system and a non-paved road surface, for example, influences the level of sediment delivery into water bodies as discussed elsewhere in DEQ's review of PCGP's response to AIR-1. Moreover, the location of cut and fill slopes and their design can destabilize slopes and lead to the failure of unstable, landslide prone slopes. As noted elsewhere in DEQ's review of PCGP's response, the literature is replete with information demonstrating that linear infrastructure such as roads can cause slope failures leading to landslides and sending debris flows into stream channels. Human-caused debris torrents impact water quality by changing the natural cycles of sediment delivery to stream systems.^{xxix}</p>	<p>Refer to response to Comment 22 above.</p>

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	<p>stabilize fill slopes and cut slopes and manage stormwater on new temporary and permanent roads located on the steep slopes (i.e., slopes greater than 30%) and engineering support for these designs. This information is necessary for DEQ to evaluate compliance with the statewide water quality criteria for road building and maintenance (OAR 340-041-0007)(7) and for ensuring that PCGP uses the highest and best practicable treatment control (OAR 340-041-0007(1).</p>	<p>those waterbodies are ditches. Appendix A in Part 2 of the 401 Water Quality Package issued to DEQ on February 6, 2018 outlines PCGP's compliance with all applicable water quality standards and where plans have been developed for the Pipeline to ensure compliance with those standards, including compliance with requirement for TMDLs on federal and non-federal lands.</p> <p>Table A.2-6 is in Appendix A.2 to Resource Report 2 (Attachment C of the PCGP JPA package) lists waterbodies crossed by or within 100 feet of temporary and permanent access roads.</p> <p>PCGP will revise table A.2-6 (Appendix A.2 to Resource 2 – Attachment C of the PCGP JPA package) to identify best management practices for waterbodies crossed</p>	<p>PCGP has not provided DEQ with the selection criteria PCGP will use to site proposed new roads to avoid impacts to water quality. For example, PCGP directed DEQ to Table 1.2-2 (Temporary and Permanent Access Roads for the Pipeline). In this table, the Temporary Access Road labeled as TAR 101.70 appears to be on both Private and National Forest Land (Umpqua National Forest). This TAR provides an example of DEQ's concerns regarding the siting of these new roads. As shown in the following map excerpts below, PCGP has located TAR 101.70 in a Potential Rapidly Moving Landslide Hazard Area when DEQ compares PCGP's USGS Quad-Based General Location Maps with PCGP's Geologic Hazards Maps:</p>  <p>Location of TAR 101.70 near Milepost 102 in Part 2 JPA Appendix B, General Location Maps, Drawing No. 340.31-Y-Map 14, Sheet 27, 55</p> <p>Area where TAR 101.70 will be located in Resource Report 6, Appendix F, Figure 22 of 47. Note: the light brown areas are Potential Rapidly Moving Landslide Hazard</p> <p>As noted in DEQ's review of PCGP's response to Comment 15, the Oregon Department of Forestry uses rules developed under the Oregon Forest Practices Act to comply with Total Maximum Daily Loads and</p>	

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		<p>by or within 100 feet of temporary and permanent access roads. PCGP anticipates submitting the revised table to ODEQ in Q4 2018.</p>	<p>with water quality standards. In ODF's memorandum of understanding with DEQ referenced in DEQ's review above, ODF states that it has adopted water protection rules in the form of BMPs for forest operations "including, but not limited to, OAR Chapter 629, Divisions 635-660." With the limited information that PCGP provides, DEQ is unable to determine if PCGP is complying with the following Forest Practices Act rule (OAR 629-625-0200):</p> <p>Road Location</p> <p>(1) <i>The purpose of this rule is to ensure roads are located where potential impacts to waters of the state are minimized.</i></p> <p>(2) <i>When locating roads, operators shall designate road locations which minimize the risk of materials entering waters of the state and minimize disturbance to channels, lakes, wetlands and floodplains.</i></p> <p>(3) <i>Operators shall avoid locating roads on steep slopes, slide areas, high landslide hazard locations, and in wetlands, riparian management areas, channels or floodplains where viable alternatives exist.</i></p> <p>(4) <i>Operators shall minimize the number of stream crossings.</i></p> <p>(5) <i>To reduce the duplication of road systems and associated ground disturbance, operators shall make use of existing roads where practical. Where roads traverse land in another ownership and will adequately serve the operation, investigate options for using those roads before constructing new roads.</i></p> <p>Moreover, PCGP has not provided DEQ with any information indicating that it has investigated the constraints associated with the proposed site for TAR 101.70. PCGP has not developed engineering solutions – with associated technical support – to avoid debris flows into East Fork Stouts Creek or the intermittent streams below the fill slope of this proposed road sited in an area identified as hazard for Rapidly Moving Landslides. Hearn 2011 provides techniques for planning new road construction on steep mountainous terrain and include the following as stated in his book:</p> <p>B1.2.1 New Road Construction</p> <p><i>The techniques listed in Table B1.3 are variously applicable to all project phases, but they offer the greatest application to new road construction projects as an aid to route corridor selection and the development of the engineering design. The order in which the techniques are listed in the table, and described in Section B2-F5, is the approximate order in which they should be applied.</i></p> <p>B1.2.4 Road Operation and Maintenance</p> <p><i>During road operation and maintenance, the focus of attention will be directed towards existing cut and fill slopes and the management of drainage. Systematic routine observation, slope monitoring and condition surveys will form the basis of the records necessary for ongoing assessment of slope stability. Field mapping, cross-section survey and ground investigation or monitoring at high-risk site may be required for the reinstatement and remedial works for slopes and section of road that have failed (Part D).</i></p>	

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			<p>Hearn's recommendations for road construction, operation, and maintenance serve as one of several reasons for DEQ's request for additional information in Comment 26 and 27. Such recommendations and applicable regulatory requirements also serve as the basis for DEQ's information request in Comment 24. Hearn's recommendations provide examples of the information DEQ expects PCGP to provide DEQ when furnishing information on its maintenance plans for both Permanent Access Roads and existing access roads. Since PCGP needs access roads for PCGP's operation of the pipeline and the controlling authorities for these access roads cannot decommission these roads to avoid their associated water quality risks, these roads present potential impacts to water quality that PCGP must address in its 401 Water Quality Certification submittal. As a result, for access roads on steep and/or unstable slopes necessary for pipeline operation, PCGP must provide a maintenance plan that periodically evaluates the influence of these access roads on slope stability and evaluates the need to adjust the road design to help maintain the stability of the slope below and above the PAR.</p> <p>For another example of the lack of information provided by PCGP for proposed PARs and TARs, PCGP proposes to build Temporary Access Road labeled TAR 27.06. This TAR parallels the stream Park Creek and would extend a BLM road (BLM 29.11-4.1 27.53) when County Road 13 is also available to reach the temporary extra work area near Milepost 27. PCGP does not provide information detailing how PCGP will manage drainage from this proposed new access road and the extent, condition, or existence of a vegetated buffer between TAR 27.06 and Park Creek. PCGP does not provide information on the design of the cut slope for this TAR nor indicate with designs and technical support how PCGP will stabilize this cut slope to prevent small slides into the roadside stormwater conveyance system or perhaps prevent larger slides conveying debris flows into Park Creek directly. PCGP does not provide a discussion of the other alternatives to reach this TEWA. PCGP does not provide the rationale for building this new access road nor does PCGP provide the design details for DEQ to evaluate if this design has the potential to protect water quality.</p>	

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			 <p data-bbox="969 1298 1597 1352">Location of TAR 27.06 near Milepost 27 on the General Location Maps. Drawing No. 3430.31-Y-Map 5, Sheet 6 of 55</p> <p data-bbox="1672 1298 2203 1378">Location of TAR 27.06 near Milepost 27 on the Geologic Hazards Maps. Figure 8 of 47. Note: the light brown areas are Potential Rapidly Moving Landslide Hazard</p> <p data-bbox="969 1435 2203 1768">PCGP is proposing to site another proposed new road labeled as PAR-132.66 and shown in the map excerpt below. PCGP proposes to locate this PAR in a Potential Rapidly Moving Landslide Hazard Area. This proposed PAR is also near landslides identified from Aerial Photos and from LiDAR. Moreover, PCGP is proposing to reconstruct BLM's Beaver Springs road (BLM Noninv 32-2-36.A) by widening it. According to PCGP's Geologic Hazard Map, this BLM road identified for widening is located above a landslide area that drains to intermittent stream discharging into Dead Horse Creek. PCGP has not provided DEQ with design information regarding the need for the creation of fill slopes for this proposed new road in an area with unstable slopes. PCGP has not provided DEQ with design information for the reconstruction of the BLM road above unstable slopes. Has PCGP conducted a geotechnical investigation of this road-widening project? If performed, does this geotechnical investigation indicate the need for reinforced fill for this</p>	

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			<p>road-widening project? Where will PCGP discharge the post-construction stormwater for this PAR? Given the lack of design details, these questions surface for DEQ while reviewing PCGP's submittal.</p>  <p>Location of PAR-113.66 and the reconstruction of BLM Noninv 32-2-36.A. Drawing No. 340.31-Y-Map 14, Sheet 32, 55</p> <p>Location of PAR-113.66 and Proposed Road Reconstruction relative to landslide features. Figure 25 of 47. Note: the light brown areas are Potential Rapidly Moving Landslide Hazard</p> <p>As discussed in DEQ's review of PCGP's response to Comment 15, the management of stormwater discharge and the design of cut and fill slopes are important engineering considerations when constructing roads on steep and unstable slopes. The intent of DEQ's request for information on PCGP's selection criteria is to evaluate PCGP's efforts to minimize impacts to water quality from debris flows during new</p>	

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			<p>road construction. As noted below, PCGP should analyze the various options for accessing sections of the pipeline alignment for construction and operation as part of its efforts to address the National Environmental Protection Act requirements and, based on this analysis required by NEPA, determine the need to build new roads such as TAR 101.70 discussed above. To evaluate PCGP's efforts to avoid and minimize impacts to water quality, DEQ is requesting that PCGP provide its selection criteria for determining the need and location of TARs and PARs that PCGP used in its alternative analyses to comply with NEPA.</p> <p>DEQ is highlighting the information below to provide PCGP with an example of the level of detail DEQ is anticipating in PCGP's revision of Table A.2-6. DEQ requests this detailed information to evaluate PCGP's compliance with Clean Water Act requirements such as Total Maximum Daily Loads. For example, as noted above, the Forest Service and Bureau of Land Management use Water Quality Restoration Plans to comply with Clean Water Act requirements concerning nonpoint source pollution and Total Maximum Daily Loads. The BLM's Water Quality Restoration Plan for the Elk Creek Watershed applies to a portion of the pipeline where PCGP is proposing to place the pipeline alignment. Forest Service and BLM Roads are within the Elk Creek Watershed. In its WQRP, BLM identifies sediment input from roads as the primary human-caused sediment source from BLM-administered lands in the plan area and an influence on channel morphology with effects on stream temperature. BLM's restoration goals in this plan include:</p> <ul style="list-style-type: none"> • Reduce road densities. • Maintain and improve road surfacing. • Minimize future slope failures through stability review and land reallocation if necessary. <p>To achieve their restoration goals when roads are an element, BLM and the Forest Service have manuals and handbooks for locating new roads, engineering road construction/reconstruction, and conducting road maintenance. These technical manuals and references are the tools and strategies the Forest Service and BLM use to implement their WQRPs and, consequently, comply with TMDLs issued by DEQ. As noted elsewhere in this review, TMDLs are DEQ's plan to ensure a water body impaired by pollutant discharge ultimately achieves water quality standards. For example, the Forest Service Manual states:</p> <p style="padding-left: 40px;"><i>Perform route or site selection, location, geotechnical investigation, survey, and design to a technical level sufficient for the intended use of the facility, the investment to be incurred, and the affected resource values.</i></p> <p style="padding-left: 40px;"><i>Ensure that road preconstruction activities receive peer reviews, and that the adequacy of road designs and cost estimates is attested to in writing by qualified engineers.^{xxx}</i></p> <p>In the Forest Service Handbook 7709.56 on Section 22.2 (Location Marking), the Forest Service provides the following directive for determining the location of a proposed road:</p> <p style="padding-left: 40px;"><i>22.1 - Initial Field Examination</i></p> <p style="padding-left: 40px;"><i>Make an on-the-ground examination of the corridor in which the road is to be located.</i></p>	

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			<p><i>Verify the control points, critical areas, and resource and management direction identified in the applicable environmental, logging system, travel analysis, and transportation analysis documents and during the office location studies. Identify and document features within or adjacent to the corridor that would affect previous and subsequent decisions.</i></p> <p><i>If possible, document these features on maps and photos. Consult with appropriate specialists and land managers to resolve conflicts or address specific problems.</i></p> <p>22.2 - Location Marking</p> <p><i>Using information from the office location studies and the initial field examination, mark road locations on the ground that conform to those identified on the maps and photos that are compatible with the design criteria and other management direction. It may be necessary to mark more than one location of a road or road segment, especially in the vicinity of critical areas such as topographic features affecting logging systems, landing locations, riparian areas, intersections, switchbacks, and private land. If a new NEPA document is being produced, these alternative locations will be analyzed for effects, according to FSH 1909.15, section 15.xxxi</i></p> <p>As noted in this reference, the National Environmental Policy Act influences the selection of the road location and this influence by NEPA is detailed in the Forest Service Handbook as follows:</p> <p>15 - ESTIMATE EFFECTS OF EACH ALTERNATIVE <i>Effects and impacts as used in these regulations are synonymous. Effects includes ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial. (40 CFR 1508.8(b))</i></p> <p><i>For each alternative considered in detail, analyze and document the environmental effects, including the effectiveness of the mitigation measures that would result from implementing each alternative, including the no-action alternative.^{xxxii}</i></p> <p>This required analysis for locating a new road on National Forest Land would provide DEQ with specific BMPs and the level of detail DEQ is seeking to evaluate PCGP's selection a location for a TAR and PAR. DEQ is seeking this information to evaluate PCGP's efforts to protect water quality and comply with TMDL and other Clean Water Act requirements. This represents the level of detail DEQ is expecting from PCGP as they respond to Comment 26 and 27. DEQ's request for more detail on the practices PCGP will employ and engineering PCGP will use to protect water quality is consistent with and supportive of the NEPA process. PCGP should be supporting this NEPA process during its application to Federal Energy Regulatory Commission to construct and operate this gas pipeline. Given this NEPA requirement, PCGP should have developed selection criteria for choosing both the need for and the location of new access roads for</p>	

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			<p>pipeline construction and operation to minimize impacts to water quality among other concerns as discussed above in DEQ's review of PCGP's response to Comment 26.</p>	
28	<p>Additionally, please provide detailed best management practices and design standards for decommissioning the Temporary Access Roads.</p>	<p>Best management practices for construction of temporary and permanent access roads are contained in the Erosion Control and Revegetation Plan in Attachment A, Appendix B.1 of the PCGP JPA package.</p>	<p>Summary Statement: The Erosion Control and Revegetation Plan does not provide site-specific plans describing how PCGP will decommission temporary roads. PCGP should also address how road closures will comply with applicable TMDL Implementation Plans. Please provide site-specific plans for achieving these objectives as described more fully in the following section.</p> <p>Unused and unmaintained roads are a source of sediment and debris flows into waterways.^{xxxiii, xxxiv, xxxv} For this reason, DEQ is requesting that PCGP provide DEQ with the specific road decommissioning treatments for each Temporary Access Road. DEQ reviewed PCGP's Erosion Control and Revegetation Plan and can find no design details and technical support these details in this plan. PCGP has not clearly detailed how PCGP will specifically decommission the 10 segments of Temporary Access Roads. Moreover, DEQ can find no discussion of how PCGP will treat closed Forest Service, BLM, Bureau of Reclamation, Private, and/or County roads that PCGP's project activated for the sole purpose of constructing the pipeline.</p> <p>The Forest Service, BLM, and ODF's Forest Practices Act Program have specific requirements concerning road decommissioning developed, in part, to address water quality impairments from nonpoint source pollution and comply with Total Maximum Daily Loads. In reviewing their requirements along with PCGP's Erosion Control and Revegetation Plan, PCGP has not clearly addressed the decommissioning or closing requirements of these TMDL Designated Management Agencies. To develop its Certification Decision, PCGP must provide DEQ the site-specific details for how it will decommission all Temporary Access Roads as well as close access roads that PCGP's project opened to build this pipeline. Evaluating compliance with Section 303 of the Clean Water Act is a requirement for developing DEQ's Certification Decision. PCGP must demonstrate that a road no longer in use for pipeline construction and/or operation will not become a source of sediment and debris flows into water bodies.</p> <p>As noted above in DEQ's review of PCGP's response to Comment 24, 26, and 27, road closures are often a goal of an agency Total Maximum Daily Load Implementation Plan. The Forest Service defines road decommissioning as "activities that result in the stabilization and restoration of unneeded roads to a more natural state."^{xxxvi} As noted in DEQ's review above, the Forest Service uses the Forest Service Manual and Handbook to implement Water Quality Restoration Plans in its efforts to comply with TMDLs. According to this manual, the only road management option for temporary roads is decommissioning. The Forest Service Manual identifies the following five road decommissioning treatments that may be used in combination depending on the particular site:</p> <ul style="list-style-type: none"> • Blocking entrance • Revegetation and water barring • Removing fills and culverts • Establish drainage ways and remove unstable road shoulders • Full obliteration by recontouring and restoring natural slopes^{xxxvii} 	<p>Refer to response to Comment 22 above.</p>

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			<p>For private forest roads regulated under Forest Practices Act rules, the requirements for vacating these roads are as follows:</p> <p>Vacating Forest Roads</p> <p>(1) The purpose of this rule is to ensure that when landowners choose to vacate roads under their control, the roads are left in a condition where road related damage to waters of the state is unlikely.</p> <p>(2) To vacate a forest road, landowners shall effectively block the road to prevent continued use by vehicular traffic, and shall take all reasonable actions to leave the road in a condition where road related damage to waters of the state is unlikely.</p> <p>(3) Reasonable actions to vacate a forest road may include removal of stream crossing fills, pullback of fills on steep slopes, frequent cross ditching, and/or vegetative stabilization.</p> <p>(4) Damage which may occur from a vacated road, consistent with Sections (2) and (3) of the rule, will not be subject to remedy under the provisions of the Oregon Forest Practices Act.^{xxxviii}</p> <p>As noted elsewhere in this DEQ review, the Oregon Department of Forestry uses the Forest Practices Act rules to comply with Total Maximum Daily Loads and water quality standards. Jordan Cove must provide DEQ with the site-specific designs and specification for each segment of road that Jordan Cove will decommission after terminal and pipeline construction.</p>	
29	<p>DEQ has not completed this review at this time but will consult in the future with other DEQ programs and other state agencies concerning compliance with other state statutory requirements such as:</p> <ul style="list-style-type: none"> Oregon Revised Statute 468B.035 and 105 (Enabling Legislation for Implementing the Coastal Zone Amendments and Reauthorization Act) ORS 783.620 through 640 and 783.990 through 992 (Ballast Water Management Law) 	<p>JCEP and PCGP are actively working with the respective agencies to obtain approvals outlined to the extent required by law. There are no landfills associated with the PCGP, therefore, ORS 459.005 is not applicable.</p>	<p>Summary Statement: PCGP's Resource Report 1 describes excess material generated during development as "construction debris", which meets the definition of "demolition and construction materials" found in ORS 459.005(24).</p> <p>PCGP's submittal for a Section 401 Water Quality Certification references in several locations PCGP's plan to identify several disposal sites along the pipeline right-of-way. DEQ is providing PCGP excerpts below of these references to disposal sites. Please review your submittal and revise it to reflect PCGP's most current intent on managing the solid waste from the pipeline construction and operation. Without these revisions, DEQ will assume PCGP will develop and use disposal sites for construction debris. References to proposal sites in PCGP's submittal will require a Construction and Demolition Landfill Permit during the development of DEQ's Certification decision.</p> <p>1. Overburden and Excess Material Disposal Plan, page 2 and Attachment A, Table 1</p> <div data-bbox="1050 1459 2029 1725" style="border: 1px solid black; padding: 5px;"> <p>2.3 PERMANENT DISPOSAL LOCATIONS</p> <p>At permanent disposal sites, excess material will be deposited and treated in a manner that will be agreed upon with the corresponding federal land-managing agencies. PCGP will provide a Site Development and Reclamation Plan that will include surveyed drawings of the permanent disposal sites that identify the storage location of material based on material type and material size for agency approval. The disposal drawings will also show any temporary and/or permanent erosion control measures that may be required. Attachment B – Typical 1 shows the information that would be included in the sample quarry drawing for permanent disposal sites.</p> </div>	<p>PCGP has identified existing upland quarries to use as potential disposal sites along the alignment are where excess rock or overburden (i.e., excavated material) may be disposed of, if necessary. There are no anticipated impacts to waterbodies or wetlands related to the use of these disposal sites. All trash, litter, and debris generated during construction will be collected and disposed of in an approved solid waste disposal facility. Under no circumstances will refuse be discarded in trenches or along the construction right-of-way and associated work areas. PCGP will ensure that all drilling mud is disposed of in a state and/or local approved landfill.</p> <p>PCGP will follow Sections 629-625-0400 through 629-625-0440 of ODF Forest Practice Rules, which provide standards for the disposal of waste materials, drainage, stream protection, and stabilization to protect water quality during and after road construction.</p> <p>If the existing quarry sites are used for permanent disposal, the existing footprint of these quarries would not be expanded. PCGP would ensure that appropriate environmental controls are installed to ensure potential sedimentation of area drainage does not occur from the material storage. Appropriate environmental controls may</p>

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	<ul style="list-style-type: none"> • ORS 466.020, 075, 105, and 195 (Hazardous Waste Management Law) • ORS 196.795 through 990 (Removal-Fill Law) • ORS 496.172 – 496.192 (Oregon Threatened and Endangered Species Act) • ORS 496.012, 496.138, and ORS 506.109 <ul style="list-style-type: none"> ○ Fish and Wildlife Habitat Mitigation Policy ○ In-water Timing and In-water Blasting Permits ○ ORS 509.585 (Fish Passage Requirements) ○ ORS 498 (Fish Screening) ○ ORS 497.298 (Scientific Taking Permit) • ORS 537 (Water Rights Law) • ORS 197 (Oregon Land Use Planning Law) • ORS 390.235 (Permits for Removal of Archaeological or Historical Material) • ORS 569 (Weed Control Law) • ORS 527 (Forest Practices Act) <p>At this time, please provide applications for Construction and Demolition Landfill Permits required under Oregon</p>		<p style="text-align: center;">Attachment A</p> <p style="text-align: center;">Table 1 Rock Source and Disposal Sites Identified for Construction of the Pipeline Project on Federal Lands</p> <table border="1" data-bbox="1050 364 1970 878"> <thead> <tr> <th>Rock Source and/or Permanent Disposal Sites</th> <th>Size (acres)</th> <th>Pipeline MP location</th> <th>Purpose</th> <th>Jurisdiction</th> <th>Land Use</th> <th>Permanent/ Temporary Use</th> <th>Vegetation</th> <th>Access</th> </tr> </thead> <tbody> <tr> <td colspan="9" style="text-align: left;">Douglas County</td> </tr> <tr> <td>Signal Tree Road Quarry – Sec. 3 (3430.26-X-0004)</td> <td>1.22</td> <td>45.86</td> <td>Rock source and overburden disposal, spoil storage, staging</td> <td>BLM-Roseburg district</td> <td>Quarries</td> <td>Permanent or Temporary</td> <td>Industrial, Douglas fir-W, Hemlock W., red cedar (regenerating)</td> <td>Upper Signal Tree (BLM 28-9-35) 45.85 - 45.92 (3430-31-Y-008)</td> </tr> <tr> <td>Signal Tree Road Quarry – Sec. 35 (3430.26-X-0002)</td> <td>1.09</td> <td>47</td> <td>Rock source and overburden disposal</td> <td>BLM-Coos Bay district</td> <td>Quarries</td> <td>Permanent or Temporary</td> <td>Industrial, Douglas fir-W, Hemlock W., red cedar (regenerating)</td> <td>Upper Signal Tree (BLM 28-9-35) 45.85 - 45.92 (3430-31-Y-008b)</td> </tr> <tr> <td>Weaver Road Quarry Site 1 (3430.26-X-0003)</td> <td>1.62</td> <td>47</td> <td>Rock source and overburden disposal</td> <td>BLM-Coos Bay district</td> <td>Quarries</td> <td>Permanent or Temporary</td> <td>Industrial, Douglas fir-W, Hemlock W., red cedar</td> <td>Weaver Road (BLM 28-8-18) 42.03 – 42.50 (3430-31-Y-008b)</td> </tr> <tr> <td>Weaver Road Quarry Site 2 (3430.26-X-0003)</td> <td>1.30</td> <td>47</td> <td>Rock source and overburden disposal</td> <td>BLM-Coos Bay district</td> <td>Quarries</td> <td>Permanent or Temporary</td> <td>Industrial, Douglas fir-W, Hemlock W., red cedar</td> <td>Weaver Road (BLM 28-8-18) 42.03 – 42.50 (3430-31-Y-008b)</td> </tr> <tr> <td>Signal Tree Quarry Site – Sec. 15 (3430.26-X-0005)</td> <td>1.75</td> <td>47</td> <td>Rock source and overburden disposal</td> <td>BLM-Roseburg district</td> <td>Quarries</td> <td>Permanent or Temporary</td> <td>Industrial, Douglas fir-W, Hemlock W., red cedar</td> <td>Lower Signal Tree (BLM 29-9-36.0) 46.51 (3430-31-Y-008)</td> </tr> <tr> <td>TEWA 79.85-N (BLM Quarry Site) 1</td> <td>3.61</td> <td>79.85</td> <td>Overburden disposal, PI, spoil storage, log landing, steep slope staging</td> <td>BLM-Roseburg district</td> <td>Transportation, communication, utilities corridors, regenerating evergreen forest land, quarries</td> <td>Permanent or Temporary</td> <td>Roads, corridors, Douglas fir dominant - mixed conifer</td> <td>Pack Saddle Road (BLM 28-4-17) 79.89 - 80.42 & Construction Right-of-Way (3430-31-Y-013)</td> </tr> <tr> <td>Hatchet Quarry MP 102.30 (3430.26-X-0016)</td> <td>2.00</td> <td>102.30</td> <td>Log (mitigation) storage</td> <td>FS-Umpqua</td> <td>Strip mines, quarries, gravel pit and evergreen</td> <td>Permanent</td> <td>Industrial</td> <td>FS 3220000 (3430-31-Y-016c)</td> </tr> </tbody> </table> <p>2. Sanitation and Waste Management Plan, page 4</p> <div style="border: 1px solid black; padding: 5px;"> <p>8.0 ROCK REMOVAL/EXCESS OVERBURDEN</p> <p>FERC's Upland Plan requires the removal of excess rock from the top 12 inches of soil to the extent practicable in all rotated and permanent croplands, hayfields, pastures, residential areas, and other areas as agreed between landowner and PCGP. In these areas, PCGP will clean up excess rock to a condition similar to adjacent portions of the construction right-of-way (e.g., size, density, and distribution of rock) unless the landowner and PCGP negotiate different stipulations. Excess rock and spoil materials will be redistributed along the construction right-of-way in upland areas during restoration regrading in a manner that reflects the original contours and preconstruction drainage patterns. Excess materials will be disposed of in existing quarries and in permanent disposal sites that have been identified along the construction right-of-way. Appendix Q to the POD provides PCGP's Overburden and Excess Material Disposal Plan which describes how these materials will be stored and disposed of on federal lands. (Table A.8-4 in Appendix A.8 to Resource Report 8 of PCGP's Certificate application also identifies the permanent disposal areas that will be located on private lands.) Large rock may be provided to the federal land-managing agencies to be used for instream restoration projects and habitat features. Large rocks and boulders may also be used as OHV barriers along the right-of-way and at road crossings to block access at OHV points to restrict traffic on the right-of-way as described in the Recreation Management Plan (Appendix S to the POD). Additionally, large rocks and boulders may be piled in upland areas along the construction right-of-way to create habitat diversity features where approved by the EI or PCGP's authorized representative and the landowner or land-managing agency. The use of alternate disposal locations will be approved by FERC and, if on federal lands, the respective land-managing agency.</p> </div> <p>3. Resource Report 1, General Project Description, page 61</p>	Rock Source and/or Permanent Disposal Sites	Size (acres)	Pipeline MP location	Purpose	Jurisdiction	Land Use	Permanent/ Temporary Use	Vegetation	Access	Douglas County									Signal Tree Road Quarry – Sec. 3 (3430.26-X-0004)	1.22	45.86	Rock source and overburden disposal, spoil storage, staging	BLM-Roseburg district	Quarries	Permanent or Temporary	Industrial, Douglas fir-W, Hemlock W., red cedar (regenerating)	Upper Signal Tree (BLM 28-9-35) 45.85 - 45.92 (3430-31-Y-008)	Signal Tree Road Quarry – Sec. 35 (3430.26-X-0002)	1.09	47	Rock source and overburden disposal	BLM-Coos Bay district	Quarries	Permanent or Temporary	Industrial, Douglas fir-W, Hemlock W., red cedar (regenerating)	Upper Signal Tree (BLM 28-9-35) 45.85 - 45.92 (3430-31-Y-008b)	Weaver Road Quarry Site 1 (3430.26-X-0003)	1.62	47	Rock source and overburden disposal	BLM-Coos Bay district	Quarries	Permanent or Temporary	Industrial, Douglas fir-W, Hemlock W., red cedar	Weaver Road (BLM 28-8-18) 42.03 – 42.50 (3430-31-Y-008b)	Weaver Road Quarry Site 2 (3430.26-X-0003)	1.30	47	Rock source and overburden disposal	BLM-Coos Bay district	Quarries	Permanent or Temporary	Industrial, Douglas fir-W, Hemlock W., red cedar	Weaver Road (BLM 28-8-18) 42.03 – 42.50 (3430-31-Y-008b)	Signal Tree Quarry Site – Sec. 15 (3430.26-X-0005)	1.75	47	Rock source and overburden disposal	BLM-Roseburg district	Quarries	Permanent or Temporary	Industrial, Douglas fir-W, Hemlock W., red cedar	Lower Signal Tree (BLM 29-9-36.0) 46.51 (3430-31-Y-008)	TEWA 79.85-N (BLM Quarry Site) 1	3.61	79.85	Overburden disposal, PI, spoil storage, log landing, steep slope staging	BLM-Roseburg district	Transportation, communication, utilities corridors, regenerating evergreen forest land, quarries	Permanent or Temporary	Roads, corridors, Douglas fir dominant - mixed conifer	Pack Saddle Road (BLM 28-4-17) 79.89 - 80.42 & Construction Right-of-Way (3430-31-Y-013)	Hatchet Quarry MP 102.30 (3430.26-X-0016)	2.00	102.30	Log (mitigation) storage	FS-Umpqua	Strip mines, quarries, gravel pit and evergreen	Permanent	Industrial	FS 3220000 (3430-31-Y-016c)	<p>include adequate regrading/sloping, mulching, seeding, staking, or fencing, and the use of sediment barriers, berms, or diversion ditches where necessary as outlined in the ECRP. On federally-managed lands, PCGP would prepare a Site Development and Reclamation Plan for agency review and approval (see Attachment B to Appendix E-5 to Part 2 of the JPA).</p>
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	<p>Revised Statute 459.005 through 418 (Solid Waste Management Law) for the several proposed disposal sites associated with the construction or operation of the gas pipeline.</p>		<p>Excess Rock Removal. FERC's Upland Plan (see Section V.A.3) requires the removal of excess rock from the top 12 inches of soil in cultivated or rotated croplands, hayfields, pastures, residential areas, and other areas at the landowner's request. PCGP will comply with FERC's Upland Plan. In these areas, PCGP will clean up excess rock to a condition (size, density, and distribution) similar to adjacent portions of the construction right-of-way. In rangeland, forestlands, or other non-agricultural or residential lands where shallow bedrock is encountered and rock excavation is required, excess rock will be buried in cuts during restoration to reestablish approximate original contours and scattered across the right-of-way and TEWAs according to landowner agreements. Where excess rock requires disposal, PCGP will consider this material construction debris. The disposal sites have been identified in Resource Report 8, and PCGP will obtain the appropriate approvals prior to use. As noted above, excess rock may be incorporated into habitat diversity structures and stacked or piled along the right-of-way to provide wildlife habitat diversity features to benefit mammals, birds, reptiles, amphibians, and the prey base they depend upon. These habitat features would be created within the Pipeline's certificated construction limits where approved by the EI or PCGP's authorized representative and the landowner or land management agency. These features are also included in Section 10.14 of the ERCP (see Appendix B.1).</p>	
31	<p>In compliance with OAR 340-041-0007(8), please provide for DEQ review and approval the resource and land management plans, guidance, design standards, design manuals, access permits or grants, and other programs from the U.S. Bureau of Reclamation that Pacific Connector Gas Pipeline will use to protect water quality during the following:</p> <ul style="list-style-type: none"> • Siting Temporary and Permanent Access Roads and the construction/permanent right-of-way on U.S. Bureau of Reclamation land, over BOR water-bearing infrastructure (e.g., canals), or paralleling this infrastructure. • Maintaining both Temporary and Permanent Access Roads for pipeline 	<p>Please refer to the Response to #17. The Klamath Project Facilities Crossing Plan (Appendix E.3 to Part 2 of JPA), which is specific to BOR facilities, is under review as part of the POD and, once approved, would be implemented as part of the Right-of-Way Grant. PCGP is currently working with BOR to provide the necessary information for the federal agencies to issue right-of-way grants for federal lands. An operations and maintenance plan will be prepared if required by the agencies during that process. Proposed amendments and changes to existing BOR resource and</p>	<p>Summary Statement: Amendments to federal plans that authorize new or modify existing discharge to waters of the state are considered federal authorizations and are, therefore, subject to review by states under Section 301(a) of the Clean Water Act. DEQ requests PCGP identify any proposed amendments and changes to existing BOR resource and land management plans as more fully described in the following section.</p> <p>See also DEQ's response to Comment 18, above, for related responses to Comment 31.</p> <p>The U.S. EPA is currently reviewing DEQ's Upper Klamath and Lost River Total Maximum Daily Load first issued in May 2010. In this TMDL, DEQ address the impairment of a number of creeks segments by sedimentation and impairment of water bodies by nutrients including nutrient discharge via sediment as follows as follows:</p> <p><i>DEQ is not developing a TMDL for a number of creek segments impaired by sedimentation or for biological criteria (Table 1-3). At the time of the writing of this TMDL, DEQ is in the process of developing a sedimentation assessment methodology that could be used for implementing the narrative sedimentation standard and possibly the biological criteria impairment, as well. When the methodology and associated guidance is completed, the agency will establish sedimentation TMDLs for those waterways on the 303(d) list. (page 11)</i></p> <p>Given these pending TMDL actions, DEQ is requesting specific information from PCGP in the form of road design standards and specifications, road maintenance standards and specification, and – if appropriate – the technical support for these engineering designs. DEQ is requesting specific information from PCGP in the form of design standard and specification and engineering designs with their technical support for treating stormwater discharge from the pipeline's permanent right-of-way to BOR operated water conveyance structures connected to waters of the state.</p> <p>DEQ reviewed the Klamath Project Facilities Crossing Plan referenced in PCGP's response to Comment 31 and finds the following information gaps relevant to DEQ's Comment 31:</p>	<p>Please refer to responses to Comments 15 (TMDLs) and 22 (roads) above.</p>

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	<p>construction and operation.</p> <ul style="list-style-type: none"> Siting other components necessary to construct and operate such as staging areas, material storage areas, and other components (e.g., compressor stations, metering stations) of the pipeline. Installing the construction and permanent right-of-way for the gas pipeline. Operating the permanent right-of-way for the pipeline. <p>Please identify any proposed amendments and changes to existing BOR resource and land management plans and other documents noted that are necessary to construct, use, or maintain access roads and the permanent right-of-way on BOR land.</p>	<p>land management plans are not prerequisites for issuing a 401 Water Quality Certification.</p>	<ul style="list-style-type: none"> Information on how PCGP will manage all BOR access roads (including the 25 Permanent and Temporary Access Roads) while in use to construct and operate the pipeline such as the: <ul style="list-style-type: none"> Inventory method PCGP uses to evaluate the current condition of existing BOR roads and current capacity to protect water. Need for maintenance treatments prior to use by PCGP based on the inventory discussed above. Design standards and specifications for reconstruction that PCGP will use to ensure PCGP improves these access roads if the above inventory identifies needed improvements to protect water quality under the proposed use (e.g., durable surfacing for non-paved roads, cross drains etc.). If applicable, design standards and specifications that PCGP will use to ensure PCGP constructs proposed Permanent Access Roads and Temporary Access Roads to protect water quality. Standards and specifications for maintenance that PCGP will use to ensure existing and proposed new BOR. Information on the selection criteria PCGP used to site the proposed PARs and TARs on BOR land if applicable. Information provided to BOR in a Use Authorization Application and the Application for Transportation and Utility Systems and Facilities on Federal Lands as described in the directions for this application and highlighted below in DEQ's review of PCGP's response to Comment 31.^{xxxix, xl, xlii} Information referenced in Section 6.0 (Environmental Considerations) of the Crossing Plan that is relevant to Plans of Development (e.g., Transportation Management Plan, Erosion Control and Revegetation Plan) but lacking sufficient information for DEQ to use in its Certification decision as noted above in DEQ's review of PCGP's response to DEQ's comments in AIR-1 (e.g., Comment 15). Information on the designs standards and specifications as well as engineering designs PCGP will use to construction stormwater treatment controls for the post-construction stormwater discharge to the BOR water conveyance structures connected to waters of the state. <p>DEQ needs to review all easements, agreements, access/right-of-way grants, authorizations, and permits that are established to construct and operate this pipeline on all federal and nonfederal land. DEQ's receipt of this requested information and its evaluation by DEQ is required under OAR 340-048-0042(2) while developing a Certification Decision. DEQ will review and evaluate all final designs as well as standards and specifications – such as those referenced in the Klamath Project Facilities Crossing Plan and associated design package – as part of the required Certification Decision.</p> <p>At minimum, DEQ anticipates receiving the information PCGP provides in response to the application requirements in BOR's use authorization application and the application for transportation and utility systems and facilities. DEQ provides examples below of the minimum level of detail DEQ is seeking from PCGP that BOR initially requires when an entity seeks to use BOR land, resources, and facilities. Depending on the potential level of impact to water quality, this minimum level of information may not be sufficient to develop a Certification Decision. However, the information provided in PCGP's submittal to date lacks the level of detail required for a BOR use authorization application and an application for transportation and utility system and facilities.</p>	

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			<p>For timber harvesting, removal of commercial forest products, and use of BOR roads, the BOR Use Authorization Application requests the following information:</p> <ol style="list-style-type: none"> 4. <i>Location of the proposed use. Submit two copies of all maps or drawings and other information clearly demonstrating the location for the proposed use, including township, range, and section. Under 43 CFR 429.13(a), Reclamation may request additional information needed to process your application, such as legal land descriptions and detailed construction specifications.</i> 5. <i>Description of the proposed use. Examples of additional information to provide, depending upon the use, are as follows:</i> <ul style="list-style-type: none"> • <i>maximum number of anticipated participants/spectators/crew;</i> • <i>number and types of vehicles to be on site;</i> • <i>description of props, tents, tractors, trailers, and other equipment;</i> • <i>description of facilities you intend to provide, such as sanitation facilities, emergency personnel, food services or vendors, or other applicable information (attach plans); and</i> • <i>description of your intended use of Reclamation on-site roads or trails.</i> <p>In its Application for Transportation and Utility System and Facilities on Federal Lands, for example, BOR will require or has required the following from PCGP for its proposed pipeline and roads:</p> <ol style="list-style-type: none"> 7. <i>Project description (describe in detail): (a) Type of system or facility, (e.g., canal, pipeline, road); (b) related structures and facilities; (c) physical specifications (Length, width, grading, etc.); (d) term of years needed; (e) time of year of use or operation; (f) Volume or amount of product to be transported; (g) duration and timing of construction; and (h) temporary work areas needed for construction (Attach additional sheets, if additional space is needed.).</i> 13. <i>a. Describe the reasonable alternative routes and modes considered. b. Why were these alternatives not selected?</i> <p><i>SPECIFIC INSTRUCTIONS (Items not listed are self-explanatory)</i></p> <ol style="list-style-type: none"> 7. <i>Attach preliminary site and facility construction plans. The responsible agency will provide instructions whenever specific plans are required.</i> 13. <i>Providing information on alternate routes and modes in as much detail as possible, discussing why certain routes or modes were rejected and why it is necessary to cross Federal lands will assist the agency(ies) in processing your application and reaching a final decision. Include only reasonable alternate routes and modes as related to current technology and economics.</i> 	

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			<p>Consistent with DEQ's comments in AIR-1 and its review of PCGP's response to AIR-1, DEQ will need to know if PCGP inventoried/investigated the current condition of BOR roads for their proposed use. As noted elsewhere in this review, this inventory is important to evaluate potential impacts to water quality from this proposed use. PCGP can use the Geomorphic Road Inventory and Assessment Package (GRAIP) or a comparable analytical tool if approved by DEQ to perform this inventory. DEQ will also need to know that PCGP uses this inventory/investigation to identify maintenance treatments or road improvements necessary to protect water quality. Finally, DEQ anticipates that BOR will provide PCGP with the design standards and specifications applicable to BOR road maintenance, reconstruction, and construction projects. If DEQ provides these design standards and specifications, DEQ will review and – if needed – make modifications and addition to these during the development of a Certification Decision. If BOR does not provide these standards and specifications, DEQ expects PCGP to propose road maintenance, reconstruction, and construction standards and specification for DEQ review and approval.</p>	
32	<p>The scope of work in Pacific Connector Gas Pipeline's August 31, 2017 Thermal Impacts Assessment suggests that PCGP evaluated only stream crossings for their potential to influence or regulate thermal properties of streams.</p> <ul style="list-style-type: none"> An analysis of the impacts from the 50-foot setbacks from waterbodies in riparian areas currently proposed for the Temporary Extra Work Areas. An analysis of the impacts from siting the pipeline alignment within riparian areas as close as 15 feet from streams as currently proposed when paralleling these waterbodies. An analysis of the impacts from siting Temporary and Permanent Access 	<p>The most recent version of the Draft Thermal Impact Assessment plan was provided to ODEQ as Attachment C / Appendix Q.2 of 404-10 JPA Part 2 provided as Appendix B of 2/6/18 401 WQ Package. PCGP is assessing all areas that may fall within riparian areas (one site potential tree height) that are outside the stream crossings listed in the Thermal Impact Assessment. Following receipt of ODEQ's comments on the Thermal Impacts Assessment, updates or revisions to the assessment will be completed at that time.</p>	<p>Please provide DEQ with an estimated schedule for the revision to the thermal analysis. PCGP should identify all the impacts to riparian vegetation that PCGP did not consider in its August 31, 2017 draft Thermal Impact Assessment. PCGP should also account for the effects of all cleared areas (e.g., TEWA, parallel stream-pipeline alignment, etc.) that were not previously included in the thermal load analysis.</p>	<p>Please refer to response to Comment 21b above.</p>

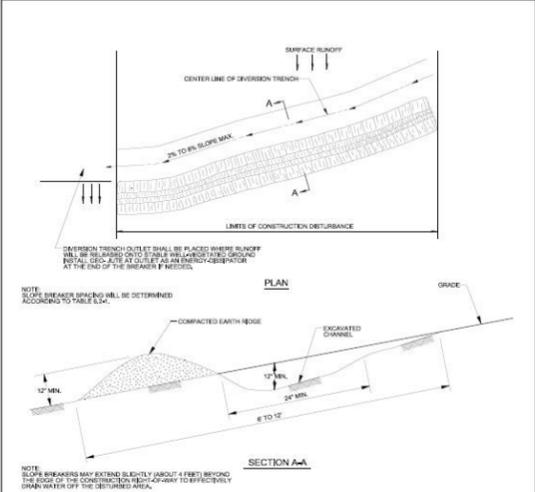
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	<p>Roads, Staging Areas, material storage area, and other pipeline components (e.g., compressor stations, metering stations) within riparian areas.</p> <p>DEQ is requesting this clarification because the scope of work from the Thermal Impacts Assessment suggests that the estimate of solar loading for stream crossings under both the construction (i.e., 75-95 foot wide) corridor and the permanent (i.e., 30-foot wide) corridor using the Shade-A-Lator tool did not consider the impact of these TEWAs.</p> <p>The use of TEWAs during pipeline construction extends the construction corridor beyond 75 and 95 feet. Currently, the Pacific Connector Gas Pipelines proposes to site TEWAs 50 feet from waterbodies as noted in the comment above.</p> <p>In addition, the scope of work in this assessment does not indicate PCGP evaluated the influence on stream thermal properties when the pipeline's construction and permanent corridor closely parallels streams and comes within 15-feet or less of these streams. For a comprehensive analysis of</p>			

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	<p>PCGP's compliance with the temperature standard, PCGP's Thermal Impact Assessment must also evaluate these impacts as well as other impacts (e.g., roads, staging areas etc.) as requested in the comments above on compliance with Section 303 of the Clean Water Act.</p>			
<p>33, 34, 35, 36</p>	<p><u>Comment 33:</u> In compliance with OAR 340-041-0007(1) and (7), please provide a post-construction stormwater management plan addressing DEQ's <i>Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines</i> for all the road stream crossings that Jordan Cove Energy Project and Pacific Connector Gas Pipeline will:</p> <ul style="list-style-type: none"> • Replace or improve to construct and/or operate the gas pipeline and • Result in an increase in impervious surface area during the replacement/improvement process. <p>This information is necessary [see OAR 340-048-0042(2)(a)] to determine whether the stormwater discharge from the pipeline's road stream crossings will contribute to</p>	<p>The JCEP 401 Water Quality Memorandum (Part 1) and PCGP 401 Water Quality Summary Table (Part 2, Appendix A) in the application specifically address project compliance with Oregon water quality standards.</p> <p>Details pertaining to post-construction stormwater management for the pipeline are provided in the PCGP Erosion Control and Revegetation Plan (Part 2 Attachment A / Appendix B.1 of 404-10 JPA Part 2 provided as Appendix B of 2/6/18 401 WQ Package). The general location maps showing proposed access roads are referenced in Appendix G.1</p>	<p>Summary Statement: The responses provided by PCGP do not fully address the information requested by DEQ. Please provide the information requested in Comments 33 through 36 and more fully described in the following section. See also DEQ's Summary Statements related to Comments 4, 5, and 15 for additional guidance.</p> <p>Comment 33 of DEQ's AIR-1 (Road Stream Crossings PCGP Will Improve)</p> <p>In its response to Comment 33, PCGP has not addressed guidance materials found in DEQ's <u>Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines</u>. DEQ requested this information to evaluate fully PCGP's actions to treat the discharge from roads at stream crossings such as culverts and bridges. DEQ is requesting this information since these stream crossings serve as a discharge point for sediment arising from the travel ways, cut slopes, and in-slope ditches of non-paved roads.^{xiii} The information regarding the design of these stormwater treatment systems requested in these submission guidelines enables DEQ to evaluate the efficacy of PCGP's proposed stormwater treatment controls.</p> <p>Given the potential for pollutant discharge at stream crossings, DEQ is requesting the engineering designs and technical support for each water quality BMP proposed for each stream crossing that PCGP proposes to identify in a future update to Table A.2-6 in Q4 2018. DEQ will not accept a qualitative description of a treatment practice in lieu of these engineering designs and their technical support. Even for a simple stormwater treatment control such as a grass swale, several design variables influence the performance of a grass swale. For example, a simple statement that PCGP will use a grass swale to treat the roadside ditch runoff prior to discharge to a stream provides DEQ no information regarding the pollutant removal performance for this swale. As an illustration for PCGP's consideration in preparing to submit information to DEQ, Minton 2005 provides a brief discussion of these design variables for a grass swale in the following excerpt:</p> <p style="padding-left: 40px;"><i>Although grass swales are commonly viewed as filters (biofiltration), they are properly classified as shallow basins or biosettlers. Flow-through grass swales function as treatment devices if vegetation remains erect. Erect grass reduces shear stress in the channel, reducing its capacity to carry sediment. Careful selection of the Manning's n is critical to proper sizing (Chapter 5).</i></p> <p style="padding-left: 40px;"><i>Length was first established at 200 feet (60 m) based on a study of a grass-lined freeway ditch. 60 percent of the TSS was removed in 100 feet and 80 percent in 200</i></p>	<p>Please refer to the respective response to comments above:</p> <ul style="list-style-type: none"> • Post-construction stormwater / BMP (comments 4/5) • Geohazards (comment 15) • Thermal effects (comments 21b) • Roads (comment 22)

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	<p>or cause violations of water quality standards.</p> <p><u>Comment 34:</u> In compliance with OAR 340-041-0007(1) and (7), please provide a post-construction stormwater management plan addressing DEQ's <i>Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines</i> for all stream crossings for the pipeline. The focus of this plan should be the drainage area for the right-of-way approaches that discharge stormwater into the stream crossing.</p> <p>To ensure compliance with OAR 340-048-0042(2)(a), please evaluate if the discharge from the pipeline's permanent 30-foot right-of-way at all stream crossings for the pipeline will contribute to or cause violations of water quality standards.</p> <p>In compliance with OAR 340-048-0042(2)(a), please propose the analytical model(s) (e.g., X-DRAIN) that Pacific Connector Gas Pipeline will use to evaluate if the stormwater discharge from the permanent 30 foot right-of-way with its 10 feet of compacted soil overlying the gas pipeline will</p>	<p>to Resource Report 1 (Part 2 Attachment A of 404-10 JPA provided as Part 2 Appendix B of 2/6/18 401 WQ Package, see pdf pages 183 and 661). The waterbodies within 100 feet of existing roads needing improvement are detailed in Table A.2-6 in Appendix A.2 of Resource Report 2 (Part 2 Attachment C / Appendix A.2 of 404-10 JPA provided as Part 2 Appendix B of 2/6/18 401 WQ Package). Table A.2-6 will be updated to include the water quality BMPs for each crossing and provided to ODEQ in Q4 2018.</p> <p>Further, impacts associated with vegetation removal are detailed in the PCGP Revised Draft Thermal Impact Assessment (Part 2 Attachment C / Appendix Q.2 of 404-10 JPA provided as Part 2 Appendix B of 2/6/18 401 WQ Package).</p>	<p><i>feet. More recently, others have specified a minimum length of 100 feet combined with a minimum hydraulic residence time of 9 minutes. The specified residence time results in lengths considerably greater than 100 feet.</i></p> <p><i>...Swales and strips designed for treatment appear to give reasonable performance, on the order of 70 to 80 percent TSS removal if the hydraulic residence time is on the order of 10 minutes.^{xliii}</i></p> <p>A table of water quality BMPs employed at stream crossing without corresponding engineering analysis and its technical support will not allow DEQ to evaluate the potential water quality impacts from the stormwater discharge at these stream crossings. In developing the Certification Decision, DEQ must evaluate all proposed activities that would either contribute to or cause violations of water quality standards from road drainage discharged at stream crossings [OAR 340-048-0042(2)(a)]. To perform this evaluation, DEQ needs PCGP to submit a quantitative assessment using, for example, models and/or engineering designs and the technical support for these designs.</p> <p><u>Comment 34 of DEQ's AIR-1 (Permanent Right-of-Way Post-construction Discharge at Stream Crossings)</u> In its response to Comment 34, PCGP did not provide DEQ with the information requested in DEQ's <i>Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines</i>. As discussed in DEQ's review of PCGP's response to DEQ's Comment 16 and again emphasized below, the permanent right-of-way for the pipeline will have areas of compacted soil particularly over the gas pipeline. Given this, the permanent right-of-way is essentially functioning as primitive road as the compacted soil above the pipeline is serving as a travel way.</p> <p>Compacted soil will limit stormwater infiltration and promote surface runoff. As a result, PCGP must treat the stormwater at the crossing of each pipeline right-of-way prior to its discharge into streams. As noted elsewhere in DEQ's review of PCGP's response to AIR-1, road stream crossings are a source of pollutant discharge. The proposed slope breakers or water bars noted below are serving as this primitive road system's cross drains for stormwater. Given this fact, DEQ draws upon the numerous studies on the impact of roads on receiving water quality to anticipate the potential water quality impacts from PCGP's proposed right-of-way. One of these studies, referenced elsewhere in DEQ's review of PCGP's proposal, summarizes DEQ's concerns as follows:</p> <p><i>If there is a moderate distance between the road and stream, then mitigation to reduce both road erosion and channel erosion may decrease sediment delivery. Channel treatment options include lining the channel with rock or similar materials, establishing vegetation, or installing control structures. These mitigation techniques are expensive and may be ineffective during severe runoffs.</i> (Elliot 1999).</p> <p>PCGP is proposing the use slope breakers discussed and presented below to manage stormwater on the permanent right-of-way for the gas pipeline. A slope breaker is essentially a stormwater ditch (see drawing below) with a berm to control the direction of stormwater flow. Slope breakers represent a potential hydrological connection between streams and the permanent right-of-way when these slope breakers are located near stream crossings. PCGP must propose to DEQ a defensible approach to treating any pollutants mobilized in the permanent right-of-way, transported in the ditches of slope breakers, and discharged near</p>	

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	<p>contribute to or cause violations of water quality standards.</p> <p>In compliance with OAR 340-041-0002(1), this evaluation must also consider the impact of the change in stormwater volume discharged to receiving waters from the vegetation conversion (i.e., from forest canopy to herbaceous vegetation) during pipeline construction. The evaluation of this impact is necessary to determine if pipeline's permanent right-of-way will cause bed and bank erosion and, therefore, violate Oregon's biocriteria water quality standard (i.e., OAR 340-041-0011).</p> <p><u>Comment 35:</u> In compliance with OAR 340-041-0007(1) and (7), please provide a post-construction stormwater management plan addressing DEQ's Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines for the 30-foot permanent right-of-way for the approximately 117 miles of the proposed pipeline right-of-way traversing steep slopes (i.e., slopes greater than 30%). This information is necessary before Pacific Connector Gas Pipeline, in</p>		<p>stream crossings. Unless PCGP can provide the engineering analysis to demonstrate otherwise, DEQ considers the proposed slope breakers near stream crossings to be stormwater conveyance systems rather than stormwater treatment systems.</p> <p>As noted above, compacted soil will limit the infiltration of stormwater. Raindrop splash erosion on bare soil and stormwater moving downslope will mobilize sediment where soil is exposed and/or compacted and vegetation is limited due to this compaction around the pipeline. Moreover, PCGP's proposed vegetation maintenance for pipeline right-of-way will limit the extent vegetation types allowed in the right-of-way particularly above and adjacent to the gas pipeline. PCGP's response to Comment 34 did not address DEQ's request to evaluate the discharge from this permanent 30-foot right-of-way with its 10-feet, at minimum, of compacted soil overlying the pipeline. During its review of proposed federal resource and land management plans, DEQ confirmed its concern regarding post-construction stormwater discharge from slope breakers at stream crossings carrying sediment from compacted soil. DEQ documents this concern in DEQ's review of PCGP's response to Comment 16 presented above. PCGP will need these amendments to federal soil compaction standards to build the gas pipeline.</p> <p>The application of a model such as X-DRAIN will help PCGP estimate the level of sediment discharge from the proposed permanent right-of-way. In AIR-1, DEQ requested from PCGP this quantitative evaluation to develop DEQ's Certification Decision. However, PCGP has not indicated in its response to AIR-1 that this evaluation is forthcoming. In formulating a Certification Decision, DEQ must determine if the potential alterations to water quality would either contribute to or cause violations of water quality standards [OAR 340-048-0042(2)(a)]. As noted above, a slope breaker installed near stream crossings is a stormwater conveyance component rather than a stormwater treatment component unless PCGP provides the engineering analysis to demonstrate otherwise. Moreover, DEQ does not see how PCGP's updating Table A.2-6 with brief, qualitative descriptions of water quality BMPs will provide the engineering design and its technical support that DEQ is requesting from PCGP.</p> <p>In PCGP's response to Comment 34, PCGP refers DEQ to PCGP's proposed Erosion Control and Revegetation Plan. In this plan, PCGP provides a description of its permanent post-construction stormwater control referred to a "permanent slope breakers (waterbars)." Below, DEQ provides an excerpt of this description as well as design details for slope breakers. This description and design details do not provide the information to answer the following questions:</p> <ul style="list-style-type: none"> • Is PCGP proposing to install slope breakers/water bars in floodplains? <ul style="list-style-type: none"> ○ Will these installations trigger local government floodplain regulations and, if yes, will these installations comply with these land use regulations or prevent the signing of a required Land Use Compatibility Statement. ○ If PCGP does not intend to use slope breakers in floodplains, how is PCGP proposing to manage post-construction stormwater in floodplains. • What is PCGP's proposed setback from the Army Corps of Engineer's and Oregon Department of State Land's ordinary high water mark for permanent slope breakers? <ul style="list-style-type: none"> ○ How will PCGP infiltrate (i.e., treat) the discharge from the slope breaker installed above this setback during periods of rainfall, high groundwater table, saturated soil conditions reducing infiltration of runoff, and a limited vegetation buffer to treat surface runoff? 	

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	<p>compliance with OAR 340-048-0042(2)(a), can determine whether the discharge from the pipeline right-of-way will contribute to or cause violations of water quality standards.</p> <p>The information provided in PCGP's documents (e.g., 401 Application Submittal, drafts of Resource Reports) – made available to DEQ – only provides generic diagrams and erosion controls practices. DEQ can find no information on PCGP's field investigations or remote sensing for these areas to evaluate slope stability when siting the pipeline alignment. DEQ can find no information on the specific designs and practices that PCGP will use on cut slopes and fill slopes located on these steep slopes. In developing this plan in compliance with OAR 340-041-0007(1) and (7), please provide information on the designs and engineering support for these designs for the permanent controls Pacific Connector Gas Pipeline proposes to stabilize cut-slopes and fill slopes for the right-of- way sited along the steep slopes. The purpose of these controls is to prevent sediment discharge in stormwater and debris flows from landslides discharging into streams. Please note</p>		<ul style="list-style-type: none"> ○ How will PCGP manage post-construction stormwater and provide treatment for this stormwater within this setback? <ul style="list-style-type: none"> ▪ Is PCGP proposing to infiltrate (i.e., treat) the runoff within the setback during periods of high rainfall, high groundwater table, and saturated soil conditions or will this runoff discharge into streams untreated as surface runoff into streams? ● If PCGP will setback slope breakers from the ordinary high water mark to comply with Corps and DSL permit requirements, how will the discharge from these slope breakers prevent hydromodification of smaller streams and, therefore, bed and bank erosion in these streams with its effect on Oregon's biocriteria? 	

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	<p>these on the post-construction stormwater plan in the information request above.</p> <p>Additionally, please identify where the 117 miles of proposed pipeline noted above coincide with the 94 miles of the proposed pipeline that would be located in soils that PCGP has identified as having a high or severe erosion potential. Please provide the designs and engineering support for these designs for the permanent controls in these areas of high/severe erosion potential and steep slopes. In compliance with OAR 340-041-0007(1) and (7), the engineering support must indicate that these permanent controls are sufficient to:</p> <ul style="list-style-type: none"> • Manage stormwater to prevent erosion on the permanent right-of-way, its cut-slope, and its fill-slope. • Prevent debris flows into streams from landslides from cut-slope and fill-slope failures. <p>On the post-construction stormwater management plan requested above, please also provide the location for these controls</p>		<p>4.2.2 Permanent Slope Breakers</p> <p>Permanent slope breakers (waterbars) will be installed across the right-of-way on slopes. The purpose of these structures is to minimize erosion by reducing runoff velocities by shortening slope lengths, preventing concentrated flow, and by diverting water off the right-of-way. Slope breakers are also intended to prevent sediment deposition into sensitive resources.</p> <p>Slope breakers will be constructed with a two to eight percent outslope so that water does not pool or erode behind the breaker. Outflow will be diverted to a stable area off the right-of-way consistent with FERC's Upland Plan. Slope breakers may extend slightly (about 4 feet) beyond the edge of the construction right-of-way to effectively drain water off the disturbed area. If a stable area is not present, a temporary energy-dissipating device will be installed at the end of the slope breaker.</p> <p>Slope breakers will be installed along the right-of-way based on slope gradient and soil characteristics (see Table 4.2-2). The frequency of slope breakers will be installed based on a combination of FERC's Upland Plan (see Attachment A) and input from the Forest Service and BLM. Because of the range in variation between agency recommendations and because of the complex landownership pattern, a single slope breaker spacing was developed based on slope gradient and soil type to ensure installation practicality across the various private and federal lands. The permanent slope breakers will be installed in all areas except agricultural fields, hayfields, pastures, and lawns. A typical drawing of a slope breaker is provided in Attachment C as Drawing 3430.34-X-0008.</p> <table border="1" data-bbox="1100 655 1659 782"> <caption>Table 4.2-2 Permanent Slope Breaker Spacing Spacing Based on Soil Characteristics¹</caption> <thead> <tr> <th rowspan="2">Slope Percent</th> <th colspan="2">Spacing Based on Soil Characteristics¹</th> </tr> <tr> <th>Highly Erosive Granitic Soils² (feet)</th> <th>Moderate/Low Erosion Soil Types (feet)</th> </tr> </thead> <tbody> <tr> <td>0-5</td> <td>None Required</td> <td>None Required</td> </tr> <tr> <td>>5-15</td> <td>100</td> <td>200 to 300</td> </tr> <tr> <td>>15-30</td> <td>50 to 75</td> <td>75 to 100</td> </tr> <tr> <td>>30</td> <td>50</td> <td>50</td> </tr> </tbody> </table> <p>¹ Actual spacing will be determined at the time of installation based on site-specific topographic conditions on the right-of-way to ensure proper slope breaker construction and proper drainage to stable off-site areas. On the Umpqua National Forest between about MIPs 109 and 110, where the alignment crosses the historic Thomas cinnabar claim group, waterbars are to be installed at 50-foot intervals as recommended by the Forest Service (see the Contaminated Substances Discovery Plan/Appendix E of the POD).</p> <p>² Granitic formations are crossed by the alignment between about: MPs 79.1 to 80.5; 81.6 to 82.2; 87 to 88.8; 87.0 to 101.2; 103.0 to 105.4; and 114.8 to 115.</p>  <p>TEMPORARY AND PERMANENT SLOPE BREAKERS TEMPORARY & PERMANENT EROSION CONTROL MEASURE</p> <p>DRAWING NO. REFERENCE SHEET: PACIFIC CONNECTOR GAS PIPELINE PROJECT PACIFIC CONNECTOR GAS PIPELINE, LP TEMPORARY AND PERMANENT SLOPE BREAKERS TYPICAL DATE: 1/18/18 SCALE: NOT TO SCALE</p> <p>DESIGNED BY: DATE: DESIGNED FOR USE: DATE: SHEET FOR CONSTRUCTION: DATE: SHEET OF: 01</p> <p>APPROVED BY: DATE: DRAWN BY: DATE: CHECKED BY: DATE: 3430.34-X-0008</p> <p>Section 4.2.2 on Slope Breakers from PCGP's Erosion Control Drawing Number 3430.34-X-0008 of Slope Breakers and Revegetation Plan</p> <p>DEQ is seeking answers to the questions above because PCGP has provided limited information on its proposed post-construction stormwater controls at the stream crossings of the permanent right-of-way. In Comment 34, DEQ requested PCGP use DEQ's Section 401 Water Quality Certification Post-Construction</p>	Slope Percent	Spacing Based on Soil Characteristics ¹		Highly Erosive Granitic Soils ² (feet)	Moderate/Low Erosion Soil Types (feet)	0-5	None Required	None Required	>5-15	100	200 to 300	>15-30	50 to 75	75 to 100	>30	50	50	
Slope Percent	Spacing Based on Soil Characteristics ¹																				
	Highly Erosive Granitic Soils ² (feet)	Moderate/Low Erosion Soil Types (feet)																			
0-5	None Required	None Required																			
>5-15	100	200 to 300																			
>15-30	50 to 75	75 to 100																			
>30	50	50																			

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	<p>along the 117 miles of pipeline on steep slopes (>30%).</p> <p><u>Comment 36:</u> In compliance with OAR 340-041-0007(1) and (7), please provide post-construction stormwater management plans for the proposed 25 miles of new permanent and temporary roads addressing DEQ's Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines. This information is required before Pacific Connector Gas Pipeline can determine whether the discharge from these new roads will contribute to or cause violations of water quality standards.</p> <p>In compliance with OAR 340-048-0042(2)(a), please propose the analytical model(s) (e.g., X-DRAIN) that Pacific Connector Gas Pipeline will use to evaluate if the stormwater discharge from these 25 miles of proposed new roads will contribute to or cause violations of water quality standards.</p>		<p>Stormwater Management Plan Submission Guidelines. Using these guidelines would provide DEQ with information needed to evaluate the efficacy of PCGP's proposed use of slope breakers at stream crossings. For example, PCGP is proposing to discharge stormwater from slope breakers and, presumably, infiltrate this discharge into the surrounding soils for treatment. According to DEQ submission guidelines for a post-construction stormwater management plan, the PCGP should design structural controls for any conditions that warrant special water quality considerations such as:</p> <ul style="list-style-type: none"> • <i>Size infiltration structural stormwater controls such that there is sufficient depth to groundwater to facilitate drainage (e.g., soil pore storage volume ≥ volume of stormwater designed to infiltrate (Table 2, page 19).</i> • <i>The bottom of the structural stormwater control should be sufficiently above the highest anticipated seasonal groundwater to facilitate drainage. Generally, the volume of the post-construction stormwater runoff the structural control is designed to infiltrate should not exceed the storage volume within the soil pores of the subgrade (Section E.7.2.1, page 20).</i> <p>PCGP's references the proposed Erosion Control and Revegetation Plan in its response to Comment 34. However, this plan does not provide any details regarding the natural area or structural controls PCGP intends to install to infiltrate stormwater discharged from slope breakers near stream crossings. PCGP does not provide any infiltration testing for the area receiving the slope breaker discharge as requested in Section E.3 of DEQ's submission guidelines. PCGP does not provide DEQ with any design criteria such as those suggested by Pazwash 2016. For example, Pazwash provides the following example criteria for a filtering system:</p> <p><i>...the entire treatment system (including pretreatment) hold at least 75% of the WQ_v prior to infiltration. Minimum filter bed thickness is typically 18 in (45cm) for infiltration basins and 12 inches (30 cm) for sand filters. e. Swales: Swales are designed to treat the full WQ_v and may be dry swale or wet swale...Dry swale is basically a vegetated open channel, and wet swale has an expanded basin with wetland vegetation and constricted outlet. Figure 5.6 shows a schematic plan view of a wet swale. Design criteria for swales (open channel) area:</i></p> <ol style="list-style-type: none"> 1. <i>Swales shall be designed for the 10-year storm.</i> 2. <i>The peak flow velocity for the 10-year storm shall be nonerosive.</i> 3. <i>Channels will have moderate side slopes (flatter than 3:1) – in no case, steeper than 2:1.</i> 4. <i>A minimum ponding time of 30 minutes is recommended for WQ_v treatment. The maximum allowable ponding time shall be less than 48 hours. An underdrain system shall be provided in dry swales to meet the maximum ponding time requirement.^{xliv}</i> <p>PCGP provides none of the detailed information provided in the example above for how PCGP will manage and treat the stormwater discharge from slope breakers at stream crossings. Without additional information, PCGP is essentially asking DEQ to accept – without any engineering analysis or technical</p>	

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			<p>support – that the soils and vegetation in between the slope breaker's discharge point and the stream will treat this stormwater discharge. Additionally, when the permanent right-of-way is in operation, PCGP does not provide DEQ with the water quality design storm that the proposed slope breaker collection system and/or natural area will treat. Moreover, PCGP does not demonstrate that the natural area (i.e., buffer area) between stream and the slope breaker's discharge point is capable of adequately treating the discharge from the water bar.</p> <p>In the absence of this detailed information, DEQ can only assume that PCGP does not sufficiently treat the runoff from the permanent right-of-way at stream crossings once discharged from the slope breaker to the stream. In Comment 34, DEQ requested that PCGP evaluate the water quality impacts from this discharge by using a model such as <u>X-DRAIN</u>. PCGP has not provided this evaluation in its response nor indicated it will provide this information to DEQ in the near future.</p> <p><u>Comment 35 of AIR-1 (Post-construction Stormwater Discharge from ROW to Steep/Unstable/Erosive Slopes)</u></p> <p>In PCGP's response to DEQ's Comment 35, PCGP refers DEQ to the Erosion Control and Revegetation Plan. As noted in DEQ's Comment 35, PCGP only provides generic diagrams for certain erosion control practices. This information does not provide site-specific information for how PCGP will avoid discharging post-construction stormwater to unstable slopes such as headwalls, Areas of Potential Rapidly Moving Landslide Hazards, and mapped landslides along the entire pipeline alignment. In DEQ's review of PCGP's response to Comment 15 noted above, DEQ provides the regulatory and technical basis for avoiding post-construction discharges to steep, unstable slopes from the pipeline's right-of-way. For example, in its Erosion Control and Revegetation Plan, PCGP indicates that it will use permanent slope breakers (i.e., water bars) across the right-of-way on slopes to:</p> <p style="padding-left: 40px;"><i>...minimize erosion by reducing runoff velocities by shortening slope lengths, preventing concentrated flow, and by diverting water off the right-of-way. Slope breakers are also intended to prevent sediment deposition into sensitive resources.</i></p> <p>DEQ addresses the deficiencies of this plan excerpt from the ECRP in DEQ's review of PCGP's response to Comment 34 above. This represents all the information PCGP provided to DEQ in its submittal. The information that PCGP has provided in its submittal, to date, lacks site-specific information regarding the discharge points for these slope breakers. Also, without additional information, DEQ is unable to determine if these discharge points will:</p> <ul style="list-style-type: none"> • Add additional water to unstable slopes (e.g., headwalls, high Rapidly Moving Landslide Hazard Potential Areas, mapped landslides) • Produce positive soil pore pressures that may cause landslides that impact water quality. <p>As noted PCGP's submittal, slope breakers are specialized drainage ditches to prevent stormwater from eroding the right-of-way and creating rills and gullies in this right-of-way. PCGP's response did not provide DEQ with a post-construction stormwater management plan for the management of stormwater for the approximately 117 miles of the proposed pipeline right-of-way traversing steep slopes (i.e., slopes greater than 30%).</p>	

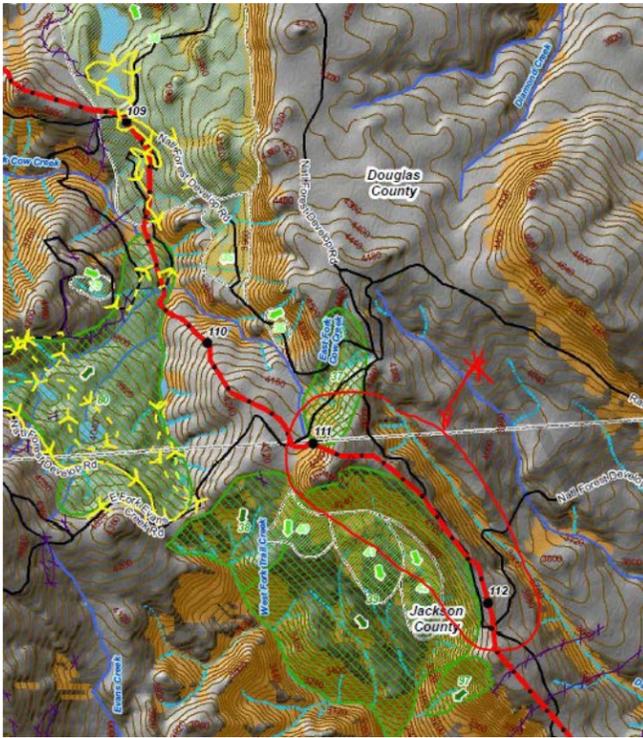
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			<p style="text-align: center;">Technical Basis for DEQ's Information Request</p> <p>In a discussion of slope stability and linear infrastructure such as roads, Benda et al. 2007 notes the following:</p> <p style="padding-left: 40px;"><i>Surface runoff that is concentrated and diverted through ditches onto steep slopes can saturate soils or road fills much more than natural intense precipitation events (Megahan, 1972; Sidle et al., 1985), thus increasing the potential for landsliding and/or gully initiation (e.g., Montgomery, 1994; see Figure 31).</i></p> <p style="padding-left: 40px;"><i>Road drainage that is diverted onto hillslopes is a major factor in landslide initiation (Figure 32 and Table 2). Ditch water that is diverted into naturally landslide-prone bedrock hollows (such as is shown in Figure 1) can trigger shallow landslides and initiate debris flows.</i></p> <p style="padding-left: 40px;"><i>...Figure 34 illustrates how the design of road drainage can lead either to landsliding or reduce the likelihood of landsliding.</i></p> <p>Moreover, drawing on geotechnical experts, research, and references, the USDA Forest Service stresses the role of water in the cause and mitigation of landslides as follows:</p> <p style="padding-left: 40px;"><i>There are two categories of water with which we will be concerned: surface water and ground water. Concentrations of surface water, seeps, springs, and vegetation changes indicate topographic changes that can provide critical clues about what may be happening with the ground water.</i></p> <p style="padding-left: 40px;"><i>Water plays a very important role in the cause and mitigation of most landslides. It is important to learn as much as possible about surface water and ground water because changes in ground water levels and pore water pressures alter effective normal stress and, as a result, modify shear strength.</i></p> <p style="padding-left: 40px;"><i>It is therefore critical that the source of ground water, changes in ground water levels, and the relationships among surface water, ground water, and the local geology be understood if landslide activity is to be managed.^{xiv}</i></p> <p>PCGP is proposing to clear ridgetops of trees and other vegetation in Tye Core Area, other locations with mapped landslide features, steep slopes, and slopes with soil that has a high erosion potential. PCGP is also proposing to level these ridgetops to install a gas pipeline. These activities dramatically alter the interception of rainfall from trees and the movement of stormwater on these ridgetops. These alterations will result in a substantial increase in stormwater generated on these ridgetops relative to their undisturbed condition. However, PCGP has not provided DEQ with specific information for how PCGP will manage the stormwater generated on these ridgetops supporting the permanent right-of-way.</p>	

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			<p>As highlighted in references DEQ presented above, stormwater discharge has the potential to cause landslides. Landslides caused by stormwater discharge from pipeline construction activities and the operation of the permanent pipeline right-of-way have the potential to migrate into stream channels affecting water quality. As discussed in DEQ's review above, the permanent right-of-way for the pipeline is functioning as a primitive road. To ensure compliance with OAR 340-041-0007(1) and (7), DEQ is requesting additional information that PCGP would generate during the development of a post-construction stormwater management plan for its permanent right-of-way. DEQ provides guidelines for the development of a post-construction stormwater management plan. For example, in Section E.2.2 of DEQ's <i>Post-Construction Stormwater Management Plan Submission Guidelines</i>, DEQ requests that applicants seeking a 401 Water Quality Certification perform the following actions:</p> <p style="text-align: center;"><i>Check the topography and Oregon Department of Geology and Mineral Industries' Statewide Landslide Information Database (http://www.oregongeology.org/sub/slido/index.htm). Consult with an Oregon-registered geotechnical engineer or engineering geologist in areas with steep slopes or landslide risk to see if excavation and/or infiltration should be avoided.</i></p> <p>Since stormwater discharge may cause a landslide as noted above, DEQ provides the above post-construction stormwater plan guidelines to project proponents in DEQ's effort to administer statewide narrative criteria OAR 340-041-0001(1). PCGP has not demonstrated to DEQ that it has selected appropriate discharge points for its slope breakers/water bars to avoid stormwater discharge to unstable slopes. In the limited field investigations for landslides that PCGP has performed (i.e., PCGP's Submittal, Part 2, Appendix C) and discussed in DEQ's review below, PCGP's focus was primarily on the potential risk to the pipeline and did not include a comprehensive evaluation of the risk to water quality. Moreover, the limited field investigations only evaluated the risk of deep-seated landslides and not shallow rapidly moving landslides. PCGP did not perform field investigations for landslide risks for constructing and operating this gas pipeline along the many miles of potential rapidly moving landslide hazards particularly in the Tyee Core Area.</p> <p style="text-align: center;">Examples of Information Lacking in PCGP's Erosion Control & Revegetation Plan</p> <p>PCGP has not provided DEQ with a post-construction stormwater management plan as requested in Comment 35 addressing the plan submission guidelines noted above. PCGP has not demonstrated in its ECRP that it will strategically divert stormwater from the right-of-way to stable and non-convergent slopes. In DEQ's Comment 35, DEQ requested that PCGP develop a post-construction stormwater management plan by providing engineering designs and their technical support for permanent controls for cut and fill slopes. However, PCGP has not provided DEQ this information. In fact, PCGP notes the following in Resource Report 6 for Geologic Resources for BMPs on slopes steeper than 30%:</p> <p style="text-align: center;"><i>Steep side slope Pipeline construction segments will be identified during the final design phase of the Pipeline project. Fill slope construction details and specifications will be designed for the identified steep side slope Pipeline segments.</i></p> <p>As indicated in DEQ's comments, the purpose of DEQ's request for engineered designs for these controls is to evaluate PCGP's efforts to prevent sediment discharge in stormwater and to prevent debris flows from</p>	

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			<p>landslides discharging into streams. Although PCGP refers DEQ to its Erosion Control and Revegetation Plan for this information, the ECRP does not provide this level of detail as noted elsewhere in DEQ's review.</p> <p>In the Erosion Control Revegetation Plan, PCGP provides DEQ with Section 11 on Seep and Rugged Terrain. This section provides no information regarding the discharge points for stormwater relative to unstable slope features. In this section, PCGP provides no information on how it will store construction spoils (e.g., root wads, soil, rock, slash) and logs to avoid adding additional weight to the top of unstable slopes (e.g., headwalls, rapidly moving landslide areas, mapped landslides). The following is what PCGP provides DEQ in its ECRP:</p> <p><i>A significant portion of the Pipeline crosses rugged topography as it traverses the Coast and Cascade Mountain Ranges and foothills. Where the Pipeline passes through the dissected Coast Range and foothills between the Coos River and Myrtle Creek (MPs 9.00 to 81.00) most of the ridgelines run in the opposite direction of the proposed alignment. The orientation of the ridges requires the Pipeline, in numerous areas, to descend and ascend steep ridge slopes to cross stream drainages so that the alignment can proceed in a southeasterly direction toward Myrtle Creek and ultimately the terminus of the pipeline near Malin, Oregon. This similar condition also occurs between MPs 81.00 and 121.00 where the Pipeline traverses the Cascade Range and foothills. During routing, PCGP optimized the alignment along ridgelines, where feasible, to minimize crossing steep slopes and potential geologic hazards, to minimize waterbody crossings, and to minimize the amount of cuts and fill slopes that would be required which reduces the erosion hazard. Areas of steep side slopes (greater than 50% grade) were also avoided as much as practical during routing to minimize the complications associated with construction in these areas as well as potential long-term slope instability hazards.</i></p> <p><i>The Geohazards and Mineral Resources Report (see Resource Report 6) provides a geotechnical hazards review that was conducted during routing and describes the avoidance mitigation measures that were implemented (i.e., minor reroutes) to avoid potential high risk geological hazards areas. Resource Report 7 of PCGP's FERC Certificate application also identifies the miles of soils crossed by the Pipeline which are associated with steep slopes and high erosion hazards. PCGP has noted areas where the proposed route traverses steep, narrow ridges and where it will be infeasible to return these ridges to their original preconstruction contours during final grading. Drawing 3430.34-X-0018 in Attachment C provides a typical construction right-of-way configuration in these sharp ridgeline areas. This drawing shows the construction techniques that will be utilized to ensure safe and feasible construction; minimize overall construction disturbance; and ensure the long-term safety, stability, and integrity of the pipeline. Avoidance of these areas is not feasible because stable alternate pipeline routes were not present along the alignment, except for other similar ridgeline features that would have the same conditions.</i></p> <p><i>During construction across rugged topography, PCGP will utilize the same construction procedures outlined in this ECRP to minimize construction, geologic, and erosion hazards as</i></p>	

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			<p><i>well as to ensure the integrity of the pipeline. In summary these procedures include:</i></p> <ul style="list-style-type: none"> • <i>routing the pipeline to ensure safety and integrity of the pipeline;</i> • <i>identifying adequate work areas to safely construct the pipeline;</i> • <i>utilizing appropriate construction techniques to minimize disturbance and to provide a safe working plane during construction (i.e., two-tone construction; see Drawing 3430.34-X-0019 in Attachment C);</i> • <i>Spoil storage during trench operations on steep slopes (greater than the angle of repose) will be completed using appropriate BMPs to minimize loss of material outside the construction right-of-way and TEWAs. Examples of BMPs that may be used include the use of temporary cribbing to store material on the slope or temporarily end-hauling the material to a stable upslope area and then hauling and replacing the material during backfilling;</i> • <i>optimizing construction during the dry season, as much as practicable;</i> • <i>utilizing temporary erosion control measures during construction (i.e., slope breakers/waterbars);</i> • <i>installing trench breakers in the pipeline trench to minimize groundwater flow down the trench which can cause in-trench erosion;</i> • <i>backfilling the trench according to PCGP's construction specifications;</i> • <i>restoring the right-of-way promptly to approximate original contours or to stable contours after pipe installation and backfilling;</i> • <i>installing properly designed and spaced permanent waterbars;</i> • <i>revegetating the slope with appropriate and quickly germinating seed mixtures;</i> • <i>providing effective ground cover from redistributing slash materials, mulching, or installing erosion control fabric on slopes, as necessary; and</i> • <i>monitoring and maintaining right-of-way as necessary to ensure stability.</i> <p>From the information PCGP provides above, the following - for example - is missing:</p> <ul style="list-style-type: none"> • The design details for BMPs used to stabilize spoil storage on steep slopes to address the geotechnical concerns associated with adding additional weight to the head of unstable slopes. • The use of reinforced fill slopes on steep unstable slopes where PCGP notes that "the proposed route traverses steep, narrow ridges" as recommended in technical manuals for linear infrastructure projects. • The location of construction and post-construction stormwater discharge points relative to unstable landscape features/steep slopes/mapped landslides/Potential Rapidly Moving Landslide Hazards. • The location the discharge points for the hydrostatic test water, trench dewatering, and vehicle/equipment wash water relative to unstable landscape features/steep slopes/mapped landslides/Potential Rapidly Moving Landslide Hazards. • The stormwater management system for the construction right-of-way, for Temporary Extra Work Areas, and for other areas cleared of vegetation relative to unstable landscape features/steep slopes/mapped landslides/Potential Rapidly Moving Landslide Hazards. 	

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			<p>DEQ requests this additional information to determine if the location of construction and post-construction stormwater discharge, other discharge (i.e., hydrostatic, trench dewatering, and equipment wash water), and construction spoil/log storage have the potential to cause a landslide that flow into streams. DEQ also needs information from a geo-engineer's field investigations to identify suitable locations for discharging stormwater to minimize their potential to cause landslides.</p> <p>The limited filed investigations performed by PCGP and highlighted in DEQ's review below do not provide the information necessary to site the discharge of construction stormwater, post-construction stormwater, hydrostatic test water, trench water, and equipment washwater. PCGPs limited investigation of landslide risks focus only on deep-seated landslide risks for only mapped landslides. PCGPs <i>Potential Deep-Seated Landslide Evaluation Forms</i> did not include evaluations of risks associated with discharging stormwater to areas identified as rapidly moving landslides hazards and other unstable landscape features such as headwalls. As noted in the excerpt below, these filed investigation forms and their conclusions focused primarily on the potential risk to the pipeline. PCGP did not evaluate the risks to water quality, for example, from rapidly moving landslides or deep-seated landslides from pipeline construction and operation.</p> <p>Below is an excerpt from <i>Potential Deep-Seated Landslide Evaluation Form</i> for Landslide 34. Landslide 34 is an identified landslide from a published map. PCGP notes this landslide in Figure 24 of 47 in PCGP's Geologic Hazard Maps along Milepost 108.86 - 109.44 of the proposed gas pipeline.</p> <div data-bbox="969 1044 2181 1520" style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;">CONCLUSIONS BASED ON SURFACE OBSERVATIONS</p> <p>Factors Contributing to Cause of Landslide (natural, anthropogenic): Volcanic and tectonic activity.</p> <p>Potential Risk to Pipeline: Low We developed a geologic cross section through LS-34. Based on the location of the inferred slide plane and existing slope geometry, it is our interpretation that the failure plane for this very large landslide feature occurs approximately 100 feet below the ground surface at the location of the proposed pipeline. Excavation for pipeline construction will be typically less than 10 feet in depth and is not anticipated to encounter the inferred basal slide plane of LS-34. The volume of earthwork and depth of excavation required for the pipeline construction is small relative to the size of the landslide and likely depth of the slide plane. For this reason, it is our opinion that there is a low risk of construction adversely impacting the stability of this dormant-mature landslide.</p> </div> <p>The observations noted in the excerpt above do not address the additional stormwater discharge to this unstable landscape feature particularly above East Fork Cow Creek.</p> <p>Moreover, PCGP's field investigation in this area as well as many other areas was limited in scope. For example, PCGP did not investigate the steep slopes surrounding the propose pipeline locations between Mile Posts 109 and 109.8 and between Mile Posts 111 and 112.2 (see the Geologic Hazard Map excerpt below). At these two sections of the proposed gas pipeline, PCGP has not indicated how PCGP will manage</p>	

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			<p>stormwater from the pipeline's construction and post-construction operations nor stabilize the fill slopes or the cut slopes. PCGP's proposed pipeline at Mile Post 109.4 and 109.5 is altering the toe of slope in areas identified as mapped Landslide 34 and as an Area of Rapidly Moving Landslide Hazard. However, PCGP does not provide DEQ with information regarding its design for loading the toe of this cut slope in these areas to prevent destabilizing it and causing a debris torrent to discharge into the East Fork Cow Creek.</p> <p>As documented in DEQ's review above, water plays a key role in the cause and mitigation of landslides. Referring to the map excerpt below, PCGP has not provided DEQ with information on how it will manage stormwater to avoid causing a debris flow below the pipeline in the rapidly moving landslide hazards on each side of the pipeline from Mile Post 111 to Mile Post 112.2. These Areas of RML also coincide with Landslides 37, 38, 42, and 80. Landslide 37, 38, 42, and 80. These are identified landslides from aerial photos. However, PCGP did not include them as part of its field evaluations of landslide risks. PCGP has not provided DEQ with engineering designs to stabilize the proposed pipeline's fill slopes for Landslides 37 and 42 as well as the cut and fill slopes for Landslide 38 and 80. There are numerous other areas of landslide risks where PCGP has provided no field evaluations or engineering analysis for protecting water quality from debris flows potentially precipitated by:</p> <ul style="list-style-type: none"> • Loading additional stormwater at the top of unstable slopes when constructing and operating the gas pipeline. • Cutting into an unstable slope when constructing and operating the gas pipeline. 	

Geologic Hazard Map (Figure 24 of 47) from Resource Report 6 featuring several identified landslides including 34, 37, and 42 discussed

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			<p>In addition to PCGP's typical construction methods noted in the Erosion Control and Revegetation Plan excerpt above, PCGP identifies steep side slopes requiring restoration. PCGP provides the fill slope specifications below to ensure slope stability:</p> <p><i>Fill slopes will be constructed in order to return the site to the approximate pre-construction topography. Fill slopes which exceed a gradient of 3H:1V (Horizontal:Vertical), will be constructed in accordance with the following specifications under the supervision of PCGP's qualified representative:</i></p> <p><u>Materials</u></p> <ol style="list-style-type: none"> 1. Fill materials used for constructing slopes exceeding 3H:1V will be considered structural fill. 2. Materials used as structural fill should be free of roots, organic matter, and other deleterious materials. 3. Fill materials will be at a moisture content suitable for compaction. 4. If on-site soils are unsuitable for use as structural fill, imported structural fill will consist of pit or quarry run rock, crushed rock, crushed gravel and sand, or sand that is fairly well graded between coarse and fine, contains no clay balls, roots, organic matter or other deleterious materials, and has less than 5 percent passing the U.S. No. 200 Sieve. <p><u>Slope Preparation</u></p> <ol style="list-style-type: none"> 1. Slopes to receive fills will be prepared by stripping the existing organic material and topsoil. 2. Construct steps or benches on existing slopes to receive fills that exceed 3H:1V. The bench height to width ratio will be adjusted to match the existing slope gradient. <p><u>Fill Placement and Compaction</u></p> <ol style="list-style-type: none"> 1. Fill soils will be compacted at a moisture content that is suitable for compaction. The maximum allowable moisture content varies with the soil gradation, and will be evaluated during construction. Silt and clay and other fine granular soils may be difficult or impossible to compact during persistent wet conditions. 2. Fill material will be placed in uniform, horizontal lifts. Minimum lift thickness will vary based on material compacted and the type of compaction equipment used. 3. Compact each lift by operating, hauling, and spreading equipment uniformly over the full width of each layer until there is no visible deflection under the load of the hauling and spreading equipment. If each lift of fill cannot be accessed by the hauling and spreading equipment to achieve compaction, then other suitable compaction equipment will be used to obtain the required compaction. Alternative compaction equipment and methods may include tamping with a trackhoe bucket, vibratory plate compactors (hoe-pack) or rollers. 	

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			<p>Based on a review of available technical manuals for slope stabilization, PCGP's generic specifications presented above do not implement the recommendations in several technical guides on stabilizing slopes. PCGP does not provide need site-specific engineering analysis or technical support for the proposed fill slope specifications referenced above to demonstrate these practices are sufficient for each site where PCGP needs to stabilize fill slopes. As noted in PCGP's Resource Report 6 and 7, the alignment for the gas pipeline will traverse the Tyee Core Area an area known for its landslide activity as well as areas with steep slopes and highly erosive soils. The following information is missing from PCGP's specifications for the placement of the alignment on or above steep unstable slopes that are common along a substantial portion of the proposed alignment:</p> <ul style="list-style-type: none"> • Information (i.e., engineering designs and their technical support) for the application of reinforced fill (embankments), retaining walls, buttresses or other techniques designed to stabilize unstable slopes along the gas pipeline alignment such as Areas of Rapidly Moving Landslide Hazards, Headwalls, and Mapped Landslides. • Information (i.e., engineering designs and technical support) on how PCGP will manage stormwater and groundwater on cut slopes into unstable slopes along the gas pipeline such as Areas of Rapidly Moving Landslide Hazards, Headwalls, and Mapped Landslides. • Information (i.e., engineering designs and technical support) on how PCGP will manage runoff onto fill slopes and manage stormwater on terraces constructed on unstable slopes such as Areas of Rapidly Moving Landslide Hazards, Headwalls, and Mapped Landslides.^{xlvi, xlvi} <p>Moreover, for steep slopes with erosive soils and/or with landslide features, PCGP's proposed revegetation BMPs highlighted in the Erosion Control Revegetation Plan may not be sufficient practices. DEQ reviewed the information presented in PCGP's ECRP and found it lacking in engineering designs and their technical support. PCGP's proposed update to address DEQ's Comment 35 must contain engineering designs and their technical support. These engineering designs and technical support must address site-specific constraints encountered as PCGP prepares the erosion and sediment control plan for a NPDES 1200-C Permit and the post-construction stormwater control plan for this proposed gas pipeline. In the development of the Certification Decision, DEQ will not accept qualitative descriptions of BMPs in an updated table as an adequate response to Comment 35.</p> <p>DEQ photographed an Electrical Power Line right-of-way featured in the October 2, 2018 photo below that is close to the PCGP's proposed pipeline alignment. Within the right-of-way for this power line, two small slides developed after the operators established herbaceous and woody vegetation in the right-of-way. PCGP's BMPs for this area are simply to revegetate the slope with herbaceous vegetation following specifications designed for particular land ownership (i.e., Forest Service, BLM, etc.). This power line right-of-way is just east of the proposed gas pipeline alignment in the Tyee Core Area. The power line right-of-way featured in the photo below is on a slope in an area identified as a mapped landslide in the Statewide Landslide Information Database for Oregon. The power line right-of-way is also located in an area identified as an Area</p>	

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			<p>of Rapidly Moving Landslide Hazard in PCGP's Geologic Hazard Map Figure 2 of 27 (See Aerial Photo and Map Figure below). The area where this power line is exhibiting small slope failures and where the proposed gas pipeline alignment is proposed has the following soil types with the following erosion hazard rating:</p> <table border="1" data-bbox="1236 471 1982 848"> <thead> <tr> <th colspan="4">Dominant soil type(s)</th> </tr> <tr> <th>Soil Type</th> <th>Erosion Hazard Rating</th> <th>Hydric Rating</th> <th>Percent Area</th> </tr> </thead> <tbody> <tr> <td>Salander silt loam, 50 to 75 percent slopes</td> <td>Severe</td> <td>No</td> <td>32.07 %</td> </tr> <tr> <td>Templeton silt loam, 30 to 50 percent slopes</td> <td>Severe</td> <td>No</td> <td>17.97 %</td> </tr> <tr> <td>Millicoma-Templeton complex, 50 to 75 percent slopes</td> <td>Severe</td> <td>No</td> <td>9.94 %</td> </tr> <tr> <td>Templeton silt loam, 50 to 70 percent slopes</td> <td>Severe</td> <td>No</td> <td>7.96 %</td> </tr> <tr> <td>Geisel silt loam, 12 to 30 percent slopes</td> <td>Severe</td> <td>No</td> <td>7.27 %</td> </tr> <tr> <td>Templeton-Millicoma complex, 12 to 50 percent slopes</td> <td>Severe</td> <td>No</td> <td>7.00 %</td> </tr> <tr> <td>Templeton silt loam, 30 to 50 percent slopes</td> <td>Severe</td> <td>No</td> <td>6.73 %</td> </tr> <tr> <td>Nestucca-Willanch complex</td> <td>Slight</td> <td>Yes</td> <td>4.47 %</td> </tr> <tr> <td>Geisel silt loam, 12 to 30 percent slopes</td> <td>Severe</td> <td>No</td> <td>2.73 %</td> </tr> <tr> <td>Templeton silt loam, 7 to 30 percent slopes</td> <td>Severe</td> <td>No</td> <td>1.22 %</td> </tr> </tbody> </table> <p>Results from Oregon Explorer's Oregon Rapid Wetland Assessment Protocol and Stream Function Assessment Method Map Viewer for soils in area containing the Electrical Power Line Right-of-Way and a section of PCGP's proposed gas pipeline west of the power line ROW.</p>   	Dominant soil type(s)				Soil Type	Erosion Hazard Rating	Hydric Rating	Percent Area	Salander silt loam, 50 to 75 percent slopes	Severe	No	32.07 %	Templeton silt loam, 30 to 50 percent slopes	Severe	No	17.97 %	Millicoma-Templeton complex, 50 to 75 percent slopes	Severe	No	9.94 %	Templeton silt loam, 50 to 70 percent slopes	Severe	No	7.96 %	Geisel silt loam, 12 to 30 percent slopes	Severe	No	7.27 %	Templeton-Millicoma complex, 12 to 50 percent slopes	Severe	No	7.00 %	Templeton silt loam, 30 to 50 percent slopes	Severe	No	6.73 %	Nestucca-Willanch complex	Slight	Yes	4.47 %	Geisel silt loam, 12 to 30 percent slopes	Severe	No	2.73 %	Templeton silt loam, 7 to 30 percent slopes	Severe	No	1.22 %	
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			<p>Photo to the left taken by DEQ on October 2, 2018 showing two small slides on a revegetated slope of an Electrical Power Line Right-of-Way. Aerial photo in the middle shows this power line right-of-way featured in the photo to the left relative to identified landslides. The topographical map to the right is PCGP's Geologic Hazard Map of this same area delineating the Areas of Rapidly Moving Landslide Hazards in light brown. This topographical map shows that the Electrical right of way moves down an unstable landscape feature referred to as a convergent headwall discussed in DEQ's review of PCGP's response to Comment 15. This unstable landscape feature also contains soils with a severe erosion potential as noted above.</p> <p>PCGP is proposing to construct and operate a right-of-way for a gas pipeline at many locations with similar site constraints without providing DEQ with engineering designs developed to address site constraints presenting real risks to water quality over time. DEQ's request for the detailed information noted above is essential to demonstrate that PCGP will construct and operate this gas pipeline preventing sediment discharge in stormwater and preventing landslides discharging debris flows into streams.</p> <p><u>Comment 36 of AIR-1 (Post-construction Stormwater Plan for Access Roads/Modeling WQ Impact)</u></p> <p>For DEQ's review of PCGP's response to Comment 36, please see DEQ's review of PCGP's response to Comments 26 and 27 provided above. This review for Comment 26 and 27 is also applicable to PCGP's response to Comment 36. Additionally, DEQ does not believe that PCGP's additions to Table A.2-6 in Appendix A.2 of Resource Report 2 will provide DEQ with the level of detail regarding maintenance prescriptions as well as road improvements needed to ensure the use of existing access roads will protect water quality.</p> <p>First, the road segments presented in the table PCGP references in its response (i.e., Table A.2-6) include only those segments within 100 feet of a water body. DEQ is requesting that PCGP's inventory evaluate all existing access roads hydrologically connected to water bodies. The use of an arbitrary distance of 100 feet does not provide DEQ reasonable assurance that PCGP's proposed measures will protect water quality. In AIR-1, DEQ requested the use of a model such as the <u>Geomorphic Road Analysis and Inventory Package (GRAIP)</u> to inventory roads for surface erosion, gully risk, and landslide risk. Using an analytical tool such as GRAIP is a more objective approach rooted in knowledge gained from evaluating the impact of roads on water quality. GRAIP can also identify road segments hydrologically connected to water bodies.</p> <p>To develop its Certification Decision, DEQ will not accept PCGP's focus on only roads within 100 feet of water bodies and a listing of qualitative BMPs in the proposed updated table without the following information:</p> <ul style="list-style-type: none"> • Objective and quantitative support using a model (e.g., GRAIP or comparable model approved by DEQ) to identify the need for BMPs on road segments hydrologically connected to water bodies. • Engineering designs and their technical support addressing the concerns identified employing this model or analytical tool. • A plan requested in DEQ's <i>Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines</i> identifying where these BMPs are 	

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			<p>located on the landscape, their proposed design, and technical support accompanying this design.</p> <p>Finally, PCGP's response to Comment 36 does indicate that PCGP will propose and, once approved, use an analytical model such as <u>X-DRAIN</u> to evaluate siting alternatives for roads and their potential impact to water quality. This is particularly important for the construction of access roads of significant length in locations with steep slopes, unstable slopes, and erosive soils such as Temporary Access Road 101.70 between Mile Posts 101 and 102 discussed in more detail in DEQ's review of PCGP's response to Comment 26 and 27.</p>	
37	<p>Please provide an evaluation of compliance with water quality standards if Jordan Cove Energy Project and Pacific Connector Gas Pipeline will use dredged material in the construction of facilities in uplands and drainage from this dredge material will discharge to waters of the state. This request is to expand upon the Portland Sediment Evaluation Team's assessment (PSET Letters, January 19, 2016) that considered these constructed upland facilities to be outside federal Clean Water Act jurisdiction for the dredged material suitability determination. However, upland constructed facilities using dredged material are not outside the effects considered in a 401 Water Quality Certification of a FERC application for the construction of a gas pipeline.</p>	<p>The management of water quality during the construction of the LNG Terminal, APCO 2, and Kentuck, where dredge material characterized in the referenced 2016 PSET letters, will be addressed in respective 1200-C permits. As noted above, JCEP and PCGP are currently preparing respective 1200-C application materials and anticipate submitting applications to DEQ in Q4 2018.</p>	<p>DEQ anticipates PCGP's response in Q4 2018.</p>	<p>As detailed in response to comment 4/5, following 1200-C applications will be submitted to ODEQ in March 2019:</p> <ul style="list-style-type: none"> • LNG Terminal • Kentuck • APCO 2 • TPP/101
38	<p>Please provide a post-construction stormwater management plans</p>	<p>The location of workforce housing has changed from</p>	<p>DEQ anticipates PCGP's response in Q4 2018.</p>	<p>Post-construction stormwater management plans for the LNG Terminal (including South Dunes site) will be provided to ODEQ in March 2019.</p>

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	<p>addressing DEQ's <i>Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines</i> for North Point Workforce Housing Project noted in the Part 1, Section 404 Permit Application, Attachment F, Portland Sediment Evaluation Team Letters, Section 404 Permit Application. (If this site is not going to be used for the North Point Workforce Housing, please provide the post-construction stormwater plans for the proposed uses.)</p> <p>In addition, please provide the results of the Phase II environmental assessments evaluating the potential for contaminated soils summarized in the "FEIS, Section 4.3.1.3 (Soil Limitations) as noted in these PSET Letters.</p>	<p>the North Spit (a.k.a. APCO Sites 1 and 2) to the South Dunes site to minimize overall project impacts. The nature of existing soil and groundwater conditions for South Dunes has been characterized in a report titled Data Gaps Investigation Report which was provided to ODEQ in August 2018. JCEP is currently preparing a 1200-Z permit application for the LNG terminal which will include South Dunes and anticipates submitting to ODEQ in Q4 2018.</p>		<p>The respective plans for APCO 2, TPP/101 and the Kentuck Project will be provided to ODEQ in April 2019. These will address ODEQ's Section 401 Water Quality Certification Post-Construction Stormwater Management Plan Submission Guidelines.</p> <p>The workforce housing on South dunes is a temporary facility and will be decommissioned prior to the end of construction and final grade will be outlined in the LNG terminal Post-Construction Stormwater Management Plan.</p> <p>As per ODEQ comment 12 above, JCEP will not need to submit an application to ODEQ for a NPDES 1200-Z General Permit for the LNG Terminal.</p>
39, 40, 41, 43	<p><u>Comment 39:</u> The 401 Water Quality Submittal package provides insufficient information concerning the dredging operations for the Marine Slip, Access Channel, and Material Offloading Facility. DEQ used a copy of Resource Report 1 (Section 1.5.5.2) for the development of an environmental Impact</p>	<p>Additional details regarding the construction of the Marine Slip, Access Channel and Material Offloading Facility is provided in the following areas:</p> <ul style="list-style-type: none"> Construction Methodology: Part 1, Attachment A.1 	<p>Summary Statement: DEQ anticipates JCEP will submit additional dredging information, including a pollution control plan, in Q1 2019. Please incorporate responses to the questions in the following section in JCEP's pollution control plan.</p> <p>As JCEP is developing the advanced engineering details regarding dredging execution for Q1 2019, DEQ is providing JCEP with several examples of the questions that arose during DEQ's review of its Section 401 Water Quality submittal and the references JCEP provided in its response to Comments 39, 40, 41, and 43. The information provided in JCEP's response does not change DEQ's request in AIR-1 for a detailed pollution control plan for constructing the Access Channel and Marine Slip. Additionally, in JCEP's response to Comment 43, JCEP must provide information concerning the characterization of dredged material that JCEP proposes to use as fill in various locations. In developing additional information for Q1 2019, DEQ requests JCEP provide this information to ensure that dredged material used as fill does not contaminate the identified disposal sites and lead to pollutant discharge to waters of the state via decant water.</p>	<p>A Dredging Pollution Control Plan, which addresses ODEQ's comments is being prepared and will be submitted in ODEQ in April 2019.</p> <p>Copies of Enclosures 19-22 of Part 1 (Appendix N-5 of the 401 Water Quality Package) where emailed to ODEQ on January 29, 2019.</p>

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	<p>Statement to obtain general information on the dredging operation. To direct the reader to additional information, this resource report references to the Dredge Material Management Plan and Resource Report 7 (Section 7.3.2.5). These two additional references provide few details regarding the water pollution control practices in the Marine Slip and Access Channel dredging operations. In compliance with OAR 340-041-0007(1) and -0036, please provide for DEQ review and approval a detailed pollution control plan for constructing the Access Channel and Marine Slip that provides at least the following information:</p> <ul style="list-style-type: none"> A detailed description of the sequencing of all construction dredging activities associated with the in-water Marine Slip construction, Access Channel construction, and Material Offloading Facility construction. <p><u>Comment 40:</u></p> <ul style="list-style-type: none"> A site map of these construction actions and location of all structural controls to 	<p>of the 404-10 Application (included as Appendix M of the 401 Water Quality Package, issued to ODEQ on 2/6/18).</p> <ul style="list-style-type: none"> Dredge Disposal Location at Roseburg Forest Products: Enclosures 19 - 22 of Part 1, Appendix N-5 of the 401 Water Quality Package issued to ODEQ on 2/6/18. Section 2.1.1.2, Dredging and Shore Protection at 2-21 - 2-26 of the Applicant Prepared Draft Biological Assessment (APDBA), Submitted 9/14/18. Sections 3.5.1.3 and 3.5.4.3, Turbidity Effects from Dredging in Coos Bay on North American Green Sturgeon at 3-316 – 3-320) of the APDBA, Submitted 9/14/18. Section 3.5.4.3, Turbidity Effects 	<p>In reviewing the recently provided references, DEQ is unable to locate Enclosures 19-22 of Part 1 (Appendix N-5 of the 401 Water Quality Package) that JCEP references in its response to Comment 39, 40, 41, and 43. The references JCEP provided in its response do not provide the detailed pollution control plan requested in AIR-1. To ensure compliance with Oregon's turbidity standard (OAR 340-041-0036), JCEP must demonstrate in the pollution control plan requested in Comment 39 that "all practicable turbidity controls have been applied" during JCEP's dredging activities. JCEP's information in the references noted in its response provide a conceptual approach to minimize turbidity and other pollutant discharges. JCEP has not fully developed the details of all its proposed controls and this creates uncertainty regarding their efficacy. For example, PCGP's proposed pollution control plan for dredging must clearly identify:</p> <ul style="list-style-type: none"> The type of pollution controls JCEP will use including its design and specifications. The specific applications for these controls. The specific location where JCEP will employ these controls relative to sensitive sites as well as other landscape features (e.g., drainage pattern, vegetation, etc.). The maintenance schedule for each control. A monitoring plan for evaluating the efficacy of all proposed controls and compliance with the turbidity standard. <p>For example, the Construction Methodology in Part 1 (Attachment A.1) of JCEP's submittal notes the following:</p> <p><i>To the extent feasible, dredging of the access channel and slip will be performed with a CS dredge to minimize turbidity.</i></p> <p><i>The hydraulic dredge transport pipeline for hydraulic transportation of excavated materials (including the decant water return line) will follow the shoreline of the site of the Roseburg Forest Products chip loading facility and will not result in additional land disturbance.</i></p> <p><i>At all points along the pipeline route where the slurry pipeline could rupture and the contents could potentially enter the waters of Coos Bay, secondary containment will be provided around the slurry pipeline.</i></p> <p><i>Eelgrass and estuarine habitat disturbances resulting from the pipeline will be minimized by spanning these eelgrass areas or avoidance through the use of temporary structures or floats.</i></p> <p><i>Material removed by the hydraulic CS dredges will be sent via a submerged and/or floating pipeline to approved disposal sites, where dewatering would occur.</i></p> <p><i>Dredged or other excavated material will be placed on areas having stable slopes, and will be prevented from eroding back into waterways and estuarine wetlands.</i></p>	

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	<p>protect water quality. The site maps must include the following information:</p> <ul style="list-style-type: none"> ○ A delineation of the areas in the Marine Slip that Jordan Cove will dry excavate and dredge. ○ Please include the pollution controls for the dry excavation activities in response to the request above in an Erosion and Sediment Control Plan for a NPDES 1200-C Permit Application. ○ The location of the natural earthen berm separating the upland area of the Marine Slip that Jordan Cove will dry excavate from the remaining portion of the Marine Slip adjacent to the bay that Jordan Cove will dredge. ○ The location of the in-water dredging for the Access Channel and Material Offloading Facility. ○ The location of the slurry/hydraulic transport pipeline(s) for the transportation of 	<p>from Dredging in Coos Bay on Oregon Coast Coho Salmon at 3-522 – 3-525 of the APDBA, Submitted 9/14/18.</p> <p>Further advanced engineering details regarding dredging execution will be provided to ODEQ in Q1 2019.</p>	<p>This information raises the following questions for DEQ that must be addressed in a detailed pollution control plan as DEQ develops its Certification Decision:</p> <ul style="list-style-type: none"> • When a Construction Suction (CS) dredge is not feasible, what other dredge will JCEP use as an alternative? • What control(s) will JCEP use to minimize pollutant discharge when using various dredging equipment? What are the designs and specifications for these controls? How and where will JCEP employ these controls? How will JCEP monitor their effectiveness for complying with the turbidity standard? • What controls – including designs and specifications – will JCEP use to prevent a spill from the hydraulic dredge transport pipeline? Where specifically will JCEP locate these controls on the landscape? What is their containment capacity? Is this capacity sufficient for anticipated spills? Does JCEP have contingency controls to protect sensitive resource should the proposed containment fail? • What controls does JCEP propose as a contingency should the control for spanning the eelgrass and estuarine habitat fail? • If JCEP uses temporary structures or floats to minimize eelgrass and estuarine habitat disturbances, what are these structures/floats, what are their designs and specifications? Does JCEP have contingency controls should the temporary structures/floats fail? • What is the secondary containment including its designs and specifications for the submerged and/or floating pipeline for material removed by the hydraulic CS dredges? • Where is the specific location of the containment system for the placement of dredge material including information on key landscape features such as drainage patterns and the location of freshwater and estuarine wetlands, freshwater streams, salt-tolerant and non-salt tolerant vegetation? Where is the drainage system and the discharge points for decant water? Is the decant water saline or non-saline? What are the receptors for this decant water? <p>For example, in JCEP's response, JCEP refers DEQ to Section 2.1.1.2 (Dredging and Shore Protection) from the Applicant Prepared Draft Biological Assessment for additional information. The draft Biological Assessment notes the following:</p> <p style="padding-left: 40px;"><i>Dredging and Shore Protection</i></p> <p style="padding-left: 40px;"><i>For the capital dredging, about 5.7 million cubic yards (mcy) of material would be removed to create the slip basin and access channel. Of this, about 1.4 mcy would be dry excavated and about 4.3 mcy would be wet dredged. It is proposed that excavated and dredged material be distributed between Ingram Yard, the Roseburg site, the South Dunes site, and the Kentuck Project site.</i></p> <p style="padding-left: 40px;"><i>During the "fresh water" construction phase of the slip about 2.2 mcy of material would be dredged in the pocket behind a temporary construction berm. During the</i></p>	

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	<p>the dredged material.</p> <ul style="list-style-type: none"> ○ The location of all containment systems and/or spill response materials. <p><u>Comment 41:</u></p> <ul style="list-style-type: none"> ● A construction dredging plan providing the following: <ul style="list-style-type: none"> ○ Dredging schedule for the Marine Slip, Access Channel, and Material Offloading Facility. ○ Type (e.g., cutter-suction dredging) and number of dredging plants that Jordan Cove will use during the dredging of the Marine Slip, Access Channel, and the Material Offloading Facility. ○ A description of water pollution controls (operational controls, structural such as floating turbidity curtain etc.) that Jordan Cove will use in dredging and transporting dredged material. ○ Detailed spill response procedures including all emergency shut-off 		<p><i>“salt water” construction phase of the slip, about 0.7 mcy (slip and berm) of material would be dredged during removal of the temporary construction berm and finish dredging of the marine slip, of which about 0.3 mcy may be used for the Kentuck Project. It is also possible that the 0.3 mcy required to facilitate the Kentuck Project could be sourced from the salt water dredge taken from the access channel between the FNC and the proposed LNG Terminal marine slip. A total of about 1.4 mcy of material would be dredged from the bay during construction of the access channel.</i></p> <p><i>The northern slip face would be armored after the slip is dredged but before the earthen barrier berm is removed. The barrier berm would remain unarmored, because it would be removed during the later stages of slip construction.</i></p> <p><i>The estimated excavated and dredged material volumes and their proposed placement location are summarized in table 2.1.1-1 and further discussed in subsequent sections below.</i></p> <p>This information raises the following questions for DEQ that must be addressed in a detailed pollution control plan as DEQ develops its Certification Decision:</p> <ul style="list-style-type: none"> ● Where specifically are the disposal sites for the dredged material deposited in the following locations: <ul style="list-style-type: none"> ○ Ingram Yard Site. ○ Roseburg Site. ○ South Dunes Site. ○ Kentuck Project Site. ○ And all other sites. ● How will JCEP manage the fresh and/or saline decant water if discharged from these sites to the surrounding landscape? ● How will the management of the decant water comply with Oregon’s biocriteria (OAR 340-041-0011) if this decant water is discharged to waters of the state such as fresh or estuarine wetlands? ● What specific controls will JCEP use to remove the temporary construction berm to ensure compliance with the Oregon’s turbidity standard (OAR 340-041-0036) and how will JCEP monitor compliance with this standard? ● What controls will JCEP use to prevent no more than a ten percent increase in turbidity when the temporary construction berm is removed and JCEP dredges the Access Channel? ● Where specifically will JCEP locate the structural controls during the dredging of the Access Channel? <p>In the development of AIR-1, DEQ reviewed the information related to the dredging of the Marine Slip, Access Channel, and Material Offloading Facility in the Dredge Material Management Plan. This information also does not provide DEQ with the level of detail to evaluate the efficacy of JCEPs proposed</p>	

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	<p>procedures and procedures for a spill associated with the hydraulic transport pipeline.</p> <ul style="list-style-type: none"> ○ A description of all operational and structural water pollution controls for breaching and removing the natural earthen berm noted in Section 1.5.5.4 of the Jordan Cove's Resource Report 1. ○ A dredging monitoring plan for DEQ review and approval to evaluate the effectiveness of all proposed controls. <p><u>Comment 43:</u> In compliance with OAR 340-041-0007(1) and -0036, please provide for DEQ review and approval a detailed water pollution control plan presenting all practicable operational and structural control techniques that Jordan Cove Energy Project will employ when constructing the Material Offloading Facility east of the opening for the slip at the Liquefied Natural Gas Terminal.</p> <p>Please include in this plan a characterization of the fill material Jordan Cove will</p>		<p>practices to ensure compliance with the turbidity standard. For example, this plan identifies the Ingram Yard as a disposal site for the dredge material as follows:</p> <p><i>Section 4.4.4 Ingram Yard</i></p> <p><u>Disposal Methods</u></p> <p><i>Excavated and dredged material from the slip and access channel will be transported to the site in dump trucks. Material will be placed and compacted to meet project specifications. Additionally, hydraulically dredged material may be transported via pipeline and discharged within temporary containment berms, allowing material to settle and dewater. The berms will be constructed using existing on-site material initially, followed by incoming dredge material. The disposal methodology will be similar to that listed in Section 4.4.1 above. Decant water will be returned to the dredge as needed pending final design.</i></p> <p><u>Availability</u></p> <p><i>The Ingram Yard disposal site is within the JCEP project area and, therefore, availability of the site for dredged material disposal can be confirmed. JCEP also has access to the Roseburg Site and will manage the placement of material at this site.</i></p> <p>The sampling of information in this plan raises the following questions for DEQ that JCEP must address in a detailed pollution control plan:</p> <ul style="list-style-type: none"> • Will JCEP include the access roads for the dump trucks hauling dredged material and any needed erosion and sediment controls in the plan required for a NPDES 1200-C Permit? • Will JCEP place dredged material from a pipeline conveying dredged material to Ingram Yard and, if so, will JCEP provide secondary containment for this pipeline conveying dredged material? • Where will JCEP locate the containment berms for decanting water from dredged material? How will JCEP manage decant water from dredging to protect non-salt or salt tolerant vegetation in fresh and estuarine wetlands and water ways to comply with the Oregon's biocriteria (OAR 340-041-0011)? <p>The above questions represent a sample of the detailed information DEQ is seeking from JCEP as it develops a detailed pollution control plan for DEQ's review and approval during the development of a Certification Decision.</p>	

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	use to construct this facility that evaluates this fill material for contamination.			
42	<ul style="list-style-type: none"> • A maintenance dredging plan providing the following: <ul style="list-style-type: none"> ○ A site map containing the following: <ul style="list-style-type: none"> ▪ The location of all areas Jordan Cove will dredge. ▪ The location of the slurry/hydraulic transport pipeline(s) for the transportation of the dredged material. ▪ The location of all containment systems and/or spill response materials. ○ Dredging schedule. ○ Type (e.g., cutter-suction dredging) and number of dredging plants that Jordan Cove will use during the maintenance dredging. ○ A description of water pollution controls (operational controls, structural controls such as floating turbidity 	<p>The JCEP Project detailed in the 404-10 application encompasses the dredging required for the Project (Appendix M of the 401 Water Quality Package, submitted to ODEQ on 2/6/18). Any future maintenance dredging activities will be requested under a separate 404-10/401 permit application and will be subject to a separate certification from ODEQ for compliance with section 401 of the CWA, if and when, such activities are required.</p>	<p>Maintenance dredging for the slip and access channel is estimated at 115,000 cy every three years for the first 10 years of operation and about 160,000 cy every five years thereafter. DEQ expects JCEP to apply for and receive authorization from the Army Corps of Engineers and section 401 water quality certification from DEQ prior to undertaking maintenance dredging activities.</p>	<p>No authorization is being sought for maintenance dredging, and therefore certification by ODEQ is not being sought at this time.</p>

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	<p>curtain etc.) that Jordan Cove will use and the location of all structural controls to minimize the migration of turbid water from maintenance dredging activities,</p> <ul style="list-style-type: none"> ○ Detailed spill response procedures including all emergency shut-off procedures and procedures for a spill associated with the hydraulic transport line. ○ A dredging monitoring plan for DEQ review and approval to evaluate the effectiveness of all proposed controls. 			
45	<p>DEQ will perform this review upon the receipt of information requested elsewhere in this matrix. In addition to these requests for information, please provide a copy of the results from the first phase (i.e., desktop data review with maps) of the Shallow Groundwater Study (Revised August 24, 2017 by GeoEngineers) showing suspected locations of shallow groundwater along the pipeline right-of-way. Please expand the maps</p>	<p>The purpose of this plan was to aid pipeline design to account for buoyancy in areas of shallow groundwater. Please see the ECRP for how trench dewatering in shallow groundwater areas will be filtered and released for infiltration to minimize offsite sedimentation.</p>	<p>Summary Statement: DEQ provides the rationale for the information requested below. As discussed in DEQ's review of PCGP's response to Comment 44, PCGP will need to submit a WPCF Permit Application to cover the trench dewatering discharge.</p> <p>As noted in DEQ's review matrix from AIR-1, the intent of DEQ's Comment 45 is to determine compliance with OAR 340-048-0042(2)(e) when reviewing PCGP's proposed activities. The goal of DEQ's review is to determine if PCGP's proposed actions have the potential to modify groundwater quality and how these potential modifications affect surface water quality. Given the presence of Temperature Total Maximum Daily Loads and the influence of the pipeline's construction on compliance with these TMDLs, DEQ has concerns regarding PCGP's approach to mitigate the capture of shallow groundwater in the trench for the pipeline. DEQ will need this information to determine compliance with OAR 340-048-0042(2) (e.g., Section 303 of the Clean Water Act).</p> <p>In its response to Comment 45, PCGP indicates that the purpose of the Shallow Groundwater Study was to aid in pipeline design to account for buoyancy in areas of shallow groundwater. PCGP submitted this study in its 401 Water Quality Certification package to support the certification of the pipeline's construction and operation. When studies are included in a submittal, DEQ expects these studies to encompass water</p>	<p>As discussed during our 401 technical meeting on January 31, 2019, trench dewatering discharge for the pipeline will be covered under the 1200-C permit.</p> <p>Further details are provided in the respective comment responses above:</p> <ul style="list-style-type: none"> • BMP (comments 4/5) • Geohazards (comment 15) • Roads (comment 22)

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	<p>proposed in this study to include suspected locations of shallow groundwater along the proposed route for the 25 miles of Temporary or Permanent Access Roads. When complete, please provide the results from the implementation of the subsurface exploration plan proposed for phase two of this study with an analysis of how the construction and permanent right-of-way will impact shallow groundwater as well as the construction of any proposed new roads. Moreover, please propose practices for how Pacific Connector Gas Pipeline will avoid, minimize, and, if necessary, mitigate the impacts identified in the Shallow Groundwater Study noted above.</p>		<p>quality concerns in addition to, for example, pipeline stability concerns noted in PCGP's response. Both are important, and PCGP must address both in its submittal package.</p> <p>PCGP's referral to the submittal's Erosion Control and Revegetation Plan does not provide DEQ with sufficient detail to evaluate PCGP's effort to mitigate the capture of shallow groundwater during pipeline construction. DEQ requires the following information from PCGP:</p> <ul style="list-style-type: none"> • Please provide a copy of the results from the first phase of the Shallow Groundwater Study showing suspected locations of shallow groundwater along the pipeline right-of-way. • Indicate if these areas of suspected shallow groundwater are in areas where PCGP proposes Temporary and Permanent Access Roads and, if so, propose mitigation measures to manage shallow groundwater. • Provide an analysis demonstrating that the evapotranspiration losses from PCGP's two proposed mitigation approaches will not be significant to affect surface water quality (i.e., temperature) and will not require a third mitigation option such as discharging to an underground injection control device. • Identify PCGP's criteria for using the proposed mitigation measure of filter fabric/hay bales and the mitigation measure using a filter bag. • Provide the specific location for where PCGP will site all trench-dewatering measures. • Provide performance standards for mitigation measures to avoid overflow, prevent runoff, etc. <p>In further reviewing PCGP's submittal, DEQ also has concerns about compliance with Oregon Water Rights Law and Division 33 rules (OAR 690-033) to administer this statute. As discussed above in DEQ's review of PCGP's response to AIR-1, DEQ is concerned that PCGP's proposed trench dewatering approach may cause landslides on unstable slopes by its effect on soil pore pressure depending on its location of discharge. To develop a Certification Decision, DEQ needs the following information from PCGP:</p> <ul style="list-style-type: none"> • Please provide the geo-engineering analysis indicating that the discharge from the trench dewatering measure will not cause a landslide/debris flow when these measures are located above or on unstable landscape features such as headwalls, Areas of Potential Rapidly Moving Landslide Hazard, mapped landslides, steep slopes (greater than 30%), and highly erosive soils. <p>Additionally, PCGP must submit a Water Pollution Control Facility Individual Permit Application to DEQ to cover the discharge from trench dewatering as required by OAR 340-045-0015(1)(a). DEQ considers this groundwater seepage into the pipeline's trench wastewater once it contacts one or more of the following:</p> <ul style="list-style-type: none"> • Sediment from trench construction and potential pollutants (heavy metals such as arsenic, nutrients). • Pollutants arising from construction operations (e.g., oil and grease, welding slag, chemical coatings, etc.). 	
46	Please provide signed Land Use Compatibility Statements from Coos,	Signed LUCS from Coos, Douglas, Jackson, and Klamath Counties will be	DEQ is awaiting PCGP's response.	JCEP submitted a revised LUCS package to ODEQ on January 28, 2019.

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	Douglas, Jackson, and Klamath Counties.	provided in Q4 of 2018.		

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