

## EXECUTIVE SUMMARY

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### INTRODUCTION

On May 21, 2013, Jordan Cove Energy Project, L.P. (Jordan Cove) filed an application with the Federal Energy Regulatory Commission (FERC or Commission) in Docket No. CP13-483-000, under Section 3 of the Natural Gas Act (NGA), seeking authority to construct and operate a new liquefied natural gas (LNG) export terminal at Coos Bay, Oregon. Jordan Cove indicated that the terminal was designed to receive a maximum of 1.03 billion cubic feet per day of natural gas and produce a maximum of 6.8 million metric tons per annum of LNG. Pacific Connector Gas Pipeline, LP (Pacific Connector) filed its companion application with the FERC on June 6, 2013, in Docket No. CP13-492-00, under Section 7 of the NGA, seeking a Certificate of Public Convenience and Necessity for a transmission pipeline capable of transporting up to 1,060,000 dekatherms per day of natural gas from the Malin, Oregon hub to the Jordan Cove terminal. Pacific Connector would obtain natural gas from western Canadian and Rocky Mountain sources, through interconnections with the existing systems of Ruby Pipeline LLC (Ruby) and Gas Transmission Northwest LLC (GTN); and would also serve markets in southern Oregon through an interconnection with the existing Northwest Pipeline GP's (Northwest) Grants Pass Lateral. Hereafter, we<sup>1</sup> refer to these inter-related proposals collectively as the Jordan Cove Energy and Pacific Connector Gas Pipeline (JCE & PCGP) Project, or the Project.

This environmental impact statement (EIS) was produced by the FERC staff and other federal cooperating agencies to comply with the National Environmental Policy Act (NEPA), according to the implementing regulations outlined by the Council of Environmental Quality at Title 40 Code of Federal Regulations (CFR) Parts 1500-1508, and the Commission's regulations at 18 CFR 380. The purpose of this document is to inform the Commission, other permitting agencies, and the public about the potential adverse and beneficial environmental impacts of the Project and its alternatives, and to recommend measures that would avoid, reduce, or mitigate any significant adverse impacts to the extent practicable. We prepared this analysis based on information provided by Jordan Cove and Pacific Connector, independent research, and comments from federal, state, and local agencies, and the public.

The FERC is the federal agency responsible for authorizing onshore LNG terminals and interstate natural gas transmission facilities, as specified in section 311(e)(1) of the Energy Policy Act of 2005 (EPAct) and the NGA. In accordance with section 313(b)(1) of the EPAct, the FERC is the lead federal agency for the coordination of all applicable federal authorizations, and is also the lead federal agency for preparation of this EIS.

The United States (U.S.) Department of Agriculture, Forest Service (Forest Service); U.S. Army Corps of Engineers (COE); U.S. Department of Energy (DOE); U.S. Environmental Protection Agency (EPA); U.S. Department of Homeland Security, Coast Guard (Coast Guard); U.S. Department of the Interior, Bureau of Land Management (BLM), Bureau of Reclamation (Reclamation), and Fish and Wildlife Service (FWS); and the Pipeline and Hazardous Materials Safety Administration (PHMSA) within the U.S. Department of Transportation (DOT) are cooperating agencies, as defined in 40 CFR 1501.6, for the development of this EIS. A

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<sup>1</sup> The pronouns "we," "us," or "our" are used to reference the environmental staff of the FERC's Office of Energy Projects (OEP).

cooperating agency has jurisdiction by law or special expertise with respect to environmental impacts involved with the proposal, and can participate in the NEPA analysis.

For the BLM and Forest Service, the primary purpose of this EIS is to consider and disclose the environmental consequences of construction and operation of the Pacific Connector pipeline on BLM and National Forest System (NFS) lands and to evaluate proposed land management plan (LMP) amendments. The BLM would need specific amendments to its LMPs for the Coos Bay, Roseburg, and Medford Districts, while the Forest Service would need to amend LMPs for the Umpqua, Rogue River, and Winema National Forests to allow for the pipeline. The BLM would also utilize this EIS when it considers Pacific Connector's Right-of-Way Grant application to allow for an easement across federal lands in accordance with the Mineral Leasing Act, with concurrence from the Forest Service and Reclamation.

## PROPOSED ACTION

According to the applicants, the purpose of the Project is to create a new LNG export point on the West Coast of the continental United States to serve overseas markets around the Pacific Rim, using competitively priced natural gas from western Canadian and the Rocky Mountains sources obtained at the Malin hub. Jordan Cove's terminal would include an access channel from the existing Coos Bay navigation channel; marine slip with one LNG berth and a tug boat berth; loading platform and transfer pipeline; two LNG storage tanks; four liquefaction trains; a 420-megawatt South Dunes Power Plant; utility and access corridor between the terminal and the power plant; support buildings; the Southwest Oregon Resource Security Center; and the natural gas treatment plant.

Pacific Connector proposes to construct and operate a 232-mile-long, 36-inch-diameter underground welded steel pipeline between Malin and Coos Bay, crossing portions of Klamath, Jackson, Douglas, and Coos Counties, Oregon. Associated aboveground facilities would include the 41,000 horsepower Klamath Compressor Station; the Klamath-Eagle Meter Station and Klamath-Beaver Meter Station within the compressor station tract; Clarks Branch Delivery Meter Station at the interconnection with Northwest; the Jordan Cove Delivery Meter Station at the interconnection with the Jordan Cove LNG terminal; 5 pig<sup>2</sup> launchers and receivers; 17 mainline block valves; and 11 communication towers co-located with other facilities.

## PUBLIC INVOLVEMENT

We began our environmental review of the Project in May and June of 2012, after approving separate requests from Jordan Cove and Pacific Connector to initiate our Pre-filing review process in Docket Nos. PF12-7-000 and PF12-17-000, respectively. On August 2, 2012, the FERC issued a *Notice of Intent to Prepare an Environmental Impact Statement for the Planned Jordan Cove Liquefaction and Pacific Connector Pipeline Projects, Requests for Comments on Environmental Issues, and Notice of Public Scoping Meetings* (NOI). We sent the NOI to elected federal, state, and local government officials; agency representatives; regional environmental and non-governmental organizations; Indian tribes; affected landowners; and local libraries and newspapers. The NOI encouraged stakeholders to provide comments during a scoping period that lasted until October 29, 2012. Seven public meetings were held jointly with the BLM and Forest Service during the scoping period in Coos Bay (August 27, 2012), Roseburg

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<sup>2</sup> A "pig" is a tool for cleaning and inspecting the inside of a pipeline.

(August 28, 2012), Klamath Falls (August 29, 2012), Medford (August 30, 2012), North Bend (October 9, 2012), Canyonville (October 10, 2012), and Malin (October 11, 2012). Transcripts of comments from the public scoping meeting were placed into the public record of these proceedings.

The FERC issued a Notice of Availability (NOA) of the DEIS on November 7, 2014. The NOA established a 90-day period for comments on the DEIS, ending on February 13, 2015. The 90-day comment period was established to meet public review requirements of the BLM for the proposed amendments to BLM and Forest Service LMPs. Dates and locations of public meetings to take comments on the DEIS announced in the NOA included: Coos Bay on December 8, 2014; Roseburg on December 9, 2014; Canyonville on December 10, 2014; Medford on December 11, 2014; Klamath Falls on December 12, 2014; and Malin on December 13, 2014. Transcripts of the DEIS comment meetings were placed in the public record for these proceedings.

Comments from the public meetings, as well as written comments on the DEIS submitted by the public and agencies, are provided along with our responses in appendix W. The FERC received 443 individual written letters commenting on the DEIS, including 7 letters from federal agencies, senators, and congressmen; 2 letters from Indian tribes; 1 collaborative letter from the various Oregon state agencies; 1 letter from a local government agency; 39 letters from companies and organizations; and 393 letters from individuals. These numbers do not include comments from the public meetings, filings by the applicants, letters that do not contain comments on the DEIS, duplicate or redundant comment letters, letters submitted after the comment period ended, and attachments.

We have made changes in this Final EIS (FEIS) both in response to comments received on the DEIS and as a result of updated information that became available after issuance of the DEIS. This FEIS is being mailed to the agencies, individuals, and organizations on the mailing list that is provided in appendix A, and was submitted to the EPA for formal issuance of a NOA for the FEIS.

## **ALTERNATIVES CONSIDERED**

Alternatives considered in this EIS include the no action alternative, system alternatives, LNG terminal alternatives, pipeline route alternatives, and aboveground facilities alternatives. In the case of the no action alternative, while denying Project approval would avoid the environmental impacts identified in this FEIS, the objectives of the Project would not be met.

We considered the possibility of using existing jurisdictional interstate pipeline systems, including those operated by Northwest, Ruby, and GTN, as potential system alternatives to the Pacific Connector pipeline. We also considered one non-jurisdictional intrastate route, the existing Coos County Pipeline. These system alternatives were rejected as impracticable or infeasible because either the existing pipeline routes do not connect Malin with Coos Bay, or the existing systems would not be able to handle the additional volumes of natural gas required to be transported by Pacific Connector.

We do not consider any of the proposed LNG export terminals on the Gulf Coast or East Coast of the United States to be reasonable or practicable alternatives to the Jordan Cove proposal, because they would not meet one of the main objectives of the Project (to establish an LNG

export point on the West Coast). LNG vessels taking cargo from Gulf Coast or East Coast terminals would have substantially longer and less direct routes to Asian markets than from the West Coast. Furthermore, Jordan Cove proposes to acquire its natural gas from western Canadian and Rocky Mountain sources, while proposed East Coast export terminals would likely receive natural gas from the Appalachian Basin, and Gulf Coast terminals would likely receive natural gas from sources in Louisiana and Texas.

We acknowledge that there are existing LNG terminals in Mexico and Alaska. If one of the existing LNG terminals on the West Coast of Mexico was converted to export, it would not meet Jordan Cove's objective of using western Canadian and Rocky Mountain natural gas. The existing LNG export terminal at Kenai, Alaska, does not have supplies or volume capacity to meet the goals of the Jordan Cove terminal. We also considered if it was possible to convert any of the existing LNG storage facilities (peak shaving plants) in the Pacific Northwest to LNG export terminals, but found they did not have adequate ports for LNG vessel access.

There are other proposals to construct and operate new LNG export terminals in British Columbia, Canada, Alaska, and in Warrenton, Oregon. In the case of the proposed British Columbia terminals, their permitting status appears uncertain and they may not be ready for construction within the same time frame as the Jordan Cove terminal. The two new proposals for LNG export terminals in Alaska would not be able to access natural gas supplies in western Canada and the Rocky Mountains, thus not meeting one of the main objectives of the Project. The Oregon LNG and Northwest Washington Expansion Project (WEP) could meet most of the Project objectives. The FERC issued a DEIS for Oregon LNG and the WEP on August 5, 2015, which appears to show that it would have similar environmental impacts as the JCE & PCGP Project.

We considered alternative designs for Jordan Cove's facilities at Coos Bay, including underground, lower, or wider LNG storage tanks. Underground, wider, or lower LNG storage tanks would be infeasible, given Jordan Cove's need for a certain amount of LNG storage for commercial viability, low groundwater, and configuration within the Ingram Yard to include the LNG vapor exclusion area.

We examined multiple pipeline route alternatives in detail. In the case of the Modified Blue Ridge 2013 Alternative Route, we requested that Pacific Connector provide additional environmental data, including the results of on-the-ground surveys where access could be obtained on BLM lands. Although fewer private parcels would be crossed, our analysis using the additional data confirmed the findings in the DEIS, that the Modified Blue Ridge 2013 Alternative Route does not have significant environmental advantages over the corresponding segment of the proposed route between mileposts (MP) 11.1 and 21.8, because the alternative would affect more old growth forest habitat for marbled murrelet and northern spotted owl. The Shasta View Irrigation District (SVID) Alternative Route would meet Reclamation's goals of avoiding impacts on the SVID facilities; however, we recommended that Pacific Connector could use its proposed route if it can reach an agreement with Reclamation, including mitigation for the SVID. We also assessed alternative locations for Pacific Connector's aboveground facilities, but found the proposed sites to be environmentally preferable.

## PROJECT IMPACTS AND MITIGATION

We evaluated the impacts of the Project on a range of environmental resources, including land use, geology, soils, waterbodies and wetlands, vegetation, wildlife, fisheries, special status species, recreation and visual resources, socioeconomics, cultural resources, air quality, noise, and safety. We also considered cumulative impacts of other proposed activities that may occur in a similar time frame within the same watersheds as the Project.

### Land Use

The upland facilities for the Jordan Cove terminal would be on privately owned lands; zoned for industrial and water dependent use. In total, construction of the terminal facilities would affect 32 acres of open water, 63 acres of open land, 67 acres of forest, and 33 acres of industrial land. Construction of the temporary North Point Workforce Housing Complex (NPWHC) would affect an additional 49 acres of industrial land. No residences are located within 1 mile of the terminal.

The Pacific Connector pipeline route would cross about 157 miles of private lands and about 75 miles of public lands. About 62 percent of the route would cross forest, 16 percent would be agricultural land, 12 percent would be rangelands, and 8 percent would be urban or built-up lands. The pipeline construction right-of-way would be within 50 feet of 10 residences, and Pacific Connector filed site-specific residential construction plans to reduce impacts that were included in the DEIS for public review and comment.

Jordan Cove and Pacific Connector obtained necessary conditional use permits and land use compatibility statements from the affected counties. We recommend that construction not begin until after Jordan Cove and Pacific Connector receive a determination of consistency with the Coastal Zone Management Act (CZMA) from the Oregon Department of Land Conservation and Development (ODLCD) in response to their August 2014 application.

Of the public lands crossed by the Pacific Connector pipeline, about 40 miles would be administered by the BLM, and 31 miles would be NFS lands. The pipeline would also cross about 0.7 mile of Reclamation land and numerous irrigation features that are part of Reclamation's Klamath Project. The Pacific Connector pipeline route would cross certain land allocations defined by the Northwest Forest Plan on federal lands, including 24.1 miles of Late Successional Reserves (LSR), 4.3 miles of unmapped LSRs, 42.7 miles of Matrix, and 5.2 miles of Riparian Reserves. The EIS discusses two site-specific LMP amendments for the BLM's Coos Bay District; three site-specific plan amendments for the BLM's Roseburg District; four site-specific plan amendments for the Umpqua National Forest; six site-specific plan amendments for the Rogue National Forest; five site-specific plan amendments for the Winema National Forest; and one general amendment that applies to all BLM and NFS lands crossed by the proposed pipeline route.

### Storm Surge, Geology, and Soils

The LNG terminal and the far western portion of the Pacific Connector pipeline route are within the Cascadia Subduction Zone (CSZ). This area may be subject to seismic activity, including a potential tsunami generated by a future megathrust earthquake on the CSZ. Tsunami inundation models for the Jordan Cove terminal found that a 2,475-year return period event could result in a tsunami peak run-up elevation of about +33 feet. Therefore, to protect its facilities from a potential future tsunami, Jordan Cove would raise the elevation of its LNG terminal processing

area to +46 feet, and would surround the LNG storage tanks with a storm surge barrier about 60 feet high.

Earthquakes can result in ground subsidence, lateral spreading, and soil liquefaction. Modeling for the Jordan Cove LNG terminal location indicated that the maximum subsidence for the most likely earthquake scenario considered is approximately 8 feet. The majority of the sandy soils encountered below the fill at the LNG terminal site are dense enough to resist liquefaction during design-level earthquakes. Liquefaction/lateral spread mitigation at the terminal would consist of ground improvement by vibro-compaction using on-site sand. Based on the distance of the LNG storage tanks to the edge of the flat slopes, and the limited extent of liquefiable soils, the risk of lateral spreading is low. We recommend that Jordan Cove provide final seismic design data before the Commission allows any construction of the terminal.

We identified five Quaternary and Holocene age fault zones that would be crossed by the pipeline route between MPs 172 and 213 within the Klamath Basin. Pacific Connector indicated it would check the trench for evidence of stratigraphic offsets potentially related to ground rupture. If such features are observed, Pacific Connector would implement additional mitigation measures at these locations, including burying the pipe in a wider trench backfilled with loose gravel or sand. High liquefaction and/or lateral spreading potential were identified at seven sites (Haynes Inlet, Kentuck Inlet, Willanch Slough, Coos River, Willis Creek, Rogue River, and Klamath Valley/Klamath River) along the pipeline route. Pacific Connector would conduct numerical modeling for these sites prior to construction to estimate the magnitude of liquefaction-induced settlement and lateral spreading that would be expected during the design earthquake event. If the numerical modeling indicates that liquefaction settlement and/or lateral spreading would result in excessive pipe stress conditions, further mitigation design would be needed. Mitigation options may include deeper burial below the liquefiable soils, thicker pipe, and/or weighting the pipe with a concrete coating, if necessary.

Pacific Connector selected its pipeline route to avoid areas with high risk of geological hazards such as landslides. The route would cross two known moderate-risk rapidly moving landslide sites (at MP 18.1 and MP 36.9). However, the risks to the pipeline at these sites are not considered hazardous enough to require additional mitigation or rerouting.

The pipeline alignment would be within 500 feet of potential mine hazards at 23 locations, 16 of which are aggregate mines or quarries. The route between MPs 108.6 and 110.9 avoids the Peavine Quarry within the Umpqua National Forest. The alignment at MP 150.5 is within approximately 100 feet northeast of the Heppsie Mountain quarry on BLM land. Between MPs 108.6 and 109.4, the pipeline would be within 200 feet of three historic mercury mines, but would not cross any adits or workings.

The portion of Coos Bay that would be dredged to create the access channel to the Jordan Cove terminal marine slip does not contain any contaminated sediments. Testing at the former Weyerhaeuser mill site, where the South Dune Power Plant is proposed to be located, indicated that concentrations of contaminants are below screening levels that would represent a risk to public health. The Oregon Department of Environmental Quality (ODEQ) recommended “No Further Action” at this location, and approved a closure plan. Jordan Cove would cover the former mill site with clean sediments from the marine slip and access channel to raise the elevation for the planned South Dunes Power Plant and associated facilities. Testing in 2014 at the Ingram Yard, the proposed LNG terminal location, found ash-mended soils, so Jordan Cove

has developed site-specific health and safety plans, and prepared an *Unanticipated Hazardous Waste Discovery Plan*.

From the ODEQ data base, Pacific Connector identified three hazardous waste sites near its facilities; however, the company has filed plans detailing how contaminants at the three sites would be avoided or removed. A *Contaminated Substances Discovery Plan* was developed by Pacific Connector that specifies the measures that would be implemented if unanticipated contaminated soils are encountered during construction.

Within the Jordan Cove terminal area, 56 acres of Heceta Fine Sand and 45 acres of Dune Land soils both have a slight potential for water erosion and high to severe potential for wind erosion. Jordan Cove would reduce the potential for soil erosion by following the measures of the FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan (Plan)* and its own *Erosion and Sediment Control Plan (ESCP)*.

The Pacific Connector pipeline route would cross about 93 miles of soils with a high or severe water erosion potential, and 15 miles of very fine to coarse sand to silt loam soils that are highly susceptible to wind erosion. The pipeline alignment would cross approximately 72 miles of soils classified as prime farmland or farmland of statewide importance. Crops are not grown on all of these soils. None of Pacific Connector's aboveground facilities would be located on prime farmland; so no prime farmland would be taken out of production. Potential impacts on soils, including farmland, would be minimized through measures specified in Pacific Connector's *Erosion Control and Revegetation Plan (ECRP)*.

## **Water and Wetlands**

There are no EPA-designated sole source aquifers near the Project. There are four existing groundwater wells within the Roseburg Forest Products tract near temporary extra workspace areas to be used by Jordan Cove. We recommend that the surface features of those wells be protected from construction activities. To prevent or reduce impacts on groundwater from the accidental release of hazardous materials, Jordan Cove prepared a *Spill Prevention, Containment, and Countermeasures Plan (SPCCP)*.

Jordan Cove estimates that it would need a total of approximately 1.7 billion gallons of water for construction and 1.3 million gallons of water per day during operation of the terminal facilities. Water requirements for the LNG terminal would be supplied by the Coos Bay North Bend Water Board (CBNBWB). The CBNBWB has 18 groundwater wells located within the Oregon Dunes National Recreation Area (ODNRA) to the north of the LNG terminal; however, the closest CBNBWB well is about 3,500 feet away and should not be affected by the Project. The CBNBWB's well field is capable of producing up to 4 million gallons per day of water during normal precipitation years.

There are no public groundwater supply wells within 400 feet of the Pacific Connector pipeline; however, the route would cross six wellhead protection areas. Pacific Connector identified five private wells within 150 feet of the pipeline, but none of these are used for drinking water. Pacific Connector developed a *Groundwater Supply Monitoring and Mitigation Plan* to ensure that wells are not adversely affected, and an SPCCP that outlines measures that would be implemented during construction to avoid or minimize the potential effects of hazardous material spills on groundwater resources.

The access channel from the existing navigation channel to the Jordan Cove marine slip would affect about 30 acres in Coos Bay. The access channel would be created by dredging about 1.3 million cubic yards of material from the bay bottom. Jordan Cove's *Report on Turbidity Due to Dredging* included a model that predicted total suspended solids (TSS) could be expected to be at a maximum of 500 milligrams per liter (mg/l) at the immediate vicinity of a hydraulic cutterhead dredge, but would rapidly reduce to a maximum of 14 mg/l by a distance of 60 meters. Therefore, turbidity from dredging of the access channel would be temporary (lasting about 4 to 6 months during construction) and localized, minimizing impacts on the aquatic environment of the bay.

The pipeline route would cross 19 fifth-field watersheds, with proposed access roads crossing an additional 5 watersheds. The construction of the pipeline would affect waterbodies at 265 locations. The pipeline would be installed under three major rivers (Coos, Rogue, and Klamath) using horizontal directional drills (HDD), while three waterbodies (Kentuck Slough, Catching Slough, and the Medford Aqueduct) would be bored. The South Umpqua River would be crossed using Direct Pipe (DP) technology at one location and with diverted crossing methods at a second location. The bores, DP, and HDDs should avoid direct impacts on those rivers and their aquatic environments. Pacific Connector has prepared an *HDD Contingency Plan and Failure Procedure* that describes measures to contain an inadvertent release of drilling mud during the HDD process.

Only Coos Bay, between about MPs 1.7 and 4.1, would be crossed with a wet open-cut method. According to models run by Pacific Connector, turbidity caused by the crossing of Haynes Inlet would not be more than 10 percent above ambient levels for a maximum distance of 350 feet, with concentrations of TSS over 50 mg/l limited to less than 100 feet from actual trenching. Thus, impacts on the aquatic environment of the bay would be localized, and temporary (for the approximate 16 day construction period). Pacific Connector would minimize impacts from construction in the bay by following the measures outlined in its *Report on Preliminary Pipeline Study of the Haynes Inlet Water Route*, including keeping the backhoe bucket below the water level, following a turbidity monitoring plan, installing turbidity curtains, and fueling and maintaining equipment more than 150 feet from standing water.

The remainder of the waterbodies along the Pacific Connector pipeline route would be dry crossed (using dam-and-pump or fluming methods). All waterbodies would be crossed during the in-water work windows recommended by the Oregon Department of Fish and Wildlife (ODFW), with the pipeline installed below scour depth. Pacific Connector produced a Stream Crossing Risk Analysis, and impacts on waterbodies would be minimized by following the FERC's *Wetland and Waterbody Construction and Mitigation Procedures (Procedures)*. Impacts on dry-crossed streams would be temporary (with most construction occurring at a single crossing within a 48-hour period), and localized, with models predicting TSS levels less than 100 mg/l within 10 meters downstream of the crossing site. Removal of shade by clearing streamside riparian vegetation would not greatly increase water temperatures. The maximum predicted increase was 0.3°F at one 2-foot-wide crossing, and modeling indicated that instream water temperatures would return to ambient conditions within a short distance downstream from all crossings.

Pacific Connector would use about 75,000 gallons of water per day for dust suppression during construction, and approximately 62 million gallons of water would be required for the hydrostatic testing of the pipeline. At the source, hydrostatic test water would be screened, and released under low velocity conditions through energy dissipating devices and sediment filters in vegetated uplands. Pacific Connector developed a *Hydrostatic Testing Plan* that includes measures to prevent the transfer of aquatic invasive species and pathogens from one watershed to another.

Approximately 38 acres of wetlands would be impacted by construction of the Jordan Cove terminal, with approximately 36 acres of wetlands being permanently affected during operation. Jordan Cove developed a *Compensatory Wetland Mitigation Plan* to address unavoidable impacts on wetlands. Impacts on freshwater wetland resources would be mitigated by creation of new upland wetlands at the West Bridge and West Jordan Cove sites. Impacts to estuarine wetland resources would be mitigated by creation of new eelgrass beds in the bay and creation of new tidal wetlands at Kentuck Slough. In this EIS, we recommend that prior to construction Jordan Cove should document approval of its final *Wetland Mitigation Plan* by appropriate regulatory agencies, including the COE, ODEQ, ODFW, and ODSL.

The Pacific Connector pipeline route would cross approximately 9 miles of wetlands. Construction of the pipeline would impact about 196 acres of wetlands. Long-term impacts would occur for about 6 acres of wetlands (with about 1.6 acres of this resulting from wetlands within the 10-foot-wide mowed permanent operational right-of-way). Pacific Connector would minimize impacts on wetlands by following our *Procedures*, and would mitigate impacts in accordance with its *Compensatory Wetland Mitigation Plan* and *Estuarine Wetland/Open Water Mitigation Plan*. Further, the COE would issue permits under the River and Harbors Act (RHA) and section 404 of the Clean Water Act (CWA) for the crossing of waters of the United States, including wetlands, and the ODEQ would issue a Water Quality Certification under section 401 of the CWA. We have included a recommendation in this EIS that construction not begin until all applicable federal permits have been issued.

## **Vegetation**

Construction of the Jordan Cove facilities would result in a total of approximately 397 acres of clearing (about 195 acres of this would result from construction of FERC jurisdictional facilities). Clearing of the terminal and related facilities during construction would affect about 98 acres of forest and about 165 acres of upland herbaceous associations. Jordan Cove would compensate for the loss of vegetative habitats by following the measures of its *Wildlife Habitat Mitigation Plan*.

Construction of the pipeline would impact approximately 4,523 acres of vegetation. This would consist of 2,882 acres of forested lands, 643 acres of grasslands/shrublands, 103 acres of wetland/riparian areas, and 896 acres of agricultural areas. Of the forested land crossed, about 821 acres of late-successional old-growth, 821 acres of mid-seral, and 1,240 acres of clear-cut or regenerating forests would be impacted. Pacific Connector would compensate for the loss of vegetative habitats in accordance with its *Wildlife Habitat Mitigation Plan*. In this EIS, we recommend that prior to construction both Jordan Cove and Pacific Connector should file documentation that their final *Wildlife Habitat Mitigation Plans* were found acceptable by the ODFW.

In accordance with its ECRP, Pacific Connector would replant native conifer species outside of the 30-foot-wide maintenance corridor during restoration of forested area. In addition, Pacific Connector developed an *Integrated Pest Management Plan* to minimize the potential spread of vegetative pests and noxious weeds. Pacific Connector would also fund various projects on federal lands that would improve forest structure and health, and reduce the effects of wildfires.

The applicants conducted botanical surveys to identify plants listed under the Endangered Species Act (ESA) and federal special status species. The Jordan Cove terminal would not affect any federally listed plant species. Along the route of Pacific Connector pipeline, botanical surveys identified 3 vascular plants, 1 bryophyte, and 2 fungi listed as BLM sensitive species, and 66 fungi, 13 lichens, 1 bryophyte, and 3 vascular plants listed as Forest Service Survey and Manage species. Appendices to this EIS include a Survey and Manage Species Persistence Evaluation and a Biological Evaluation for Forest Service Sensitive Species. Four federally listed threatened or endangered plant species are likely to be adversely affected by the pipeline: Applegate's milk-vetch, Gentner's fritillary, large-flowered meadowfoam, and Kincaid's lupine. Pacific Connector developed a *Federally-listed Plant Conservation Plan* to address how avoidance, minimization, propagation, restoration, and other conservation measures would be applied to protected plant species.

### **Wildlife and Aquatic Resources**

Approximately 178 species of amphibians, reptiles, birds, and mammals were observed during surveys in upland habitats on the North Spit in the vicinity of the Jordan Cove terminal. Overall, 47 amphibians and reptiles, 278 birds, and 106 mammal species are known or suspected to occur in upland habitats crossed by the Pacific Connector pipeline route. In general, construction related impacts on wildlife would be short-term, and most mobile species would temporarily relocate to adjacent similar habitats. To reduce impacts on wildlife from operation of the LNG terminal, we recommend that Jordan Cove develop a lighting plan in consultations with the appropriate resource agencies. Both applicants have filed drafts of their *Migratory Bird Conservation Plans*; however, we recommend they document that final plans were approved by the FWS.

The Coos Bay estuary, where the LNG terminal would be located, and which a 2.4-mile-long portion of the pipeline would cross, contains habitats for marine fish, anadromous fish, and shellfish. We identified essential fish habitat (EFH) for groundfish, coastal pelagic species, Pacific Coast salmon, and highly migratory fish. Dredging of the terminal access channel would raise turbidity levels for a short time period over a limited area in the bay. For a mechanical dredge, the maximum TSS concentrations would be 6,000 mg/l at the dredge site, decreasing to 50 mg/l within 660 feet. Because we are concerned that terminal construction, including noise from pile driving in the slip, may affect marine mammals in Coos Bay, we recommend that Jordan Cove develop, in consultation with the U.S. Department of Commerce National Oceanic and Atmospheric Administration National Marine Fisheries Service (NMFS), a *Monitoring and Adaptive Management Plan* for the protection of pinnipeds. We found the potential for shoreline erosion and fish strandings to be low, with LNG vessel wakes lower than natural waves and similar to current deep-draft commercial ship traffic in the bay. Also during terminal operation, there is the potential for LNG vessels at dock to entrain small marine organisms during water intake for engine cooling. However, this minimal loss would be less than expected natural mortality levels for larval stage species in the bay.

The Pacific Connector pipeline route would cross 88 waterbodies that are known or assumed to be inhabited by fish. Excepting the Coos Bay estuary, the waterbodies crossed by the pipeline contain warmwater (such as crappie), coolwater (including bass, perch, suckers, and chub), and coldwater (such as trout) fish species. Pacific Connector would cross most waterbodies using dry techniques such as fluming or dam-and-pump, and impacts would be of limited extent, duration, and effects. Stream crossings would usually be done within 48 hours. At a maximum, we estimated that dry-crossings would generate turbidity levels of less than 100 mg/l TSS within 10 meters.

The applicants conducted biological surveys to identify federally listed threatened and endangered and special status species. The Pacific Connector pipeline may potentially affect 3 mammals, 19 birds, 1 amphibian, 1 reptile, 10 terrestrial invertebrates, 7 aquatic invertebrates, and 6 fish listed as special status species by the BLM and Forest Service. In addition, the pipeline may affect 2 terrestrial mollusks and 2 vertebrates listed as Forest Service Survey and Manage species. Of the ESA species, the Project is likely to adversely affect the fisher, marbled murrelet, northern spotted owl, vernal pool fairy shrimp, and six fish species (green sturgeon, eulachon, two units of coho salmon, Lost River sucker, and shortnose sucker). In February 2015, the FERC submitted an EFH assessment to the NMFS, and a biological assessment (BA) to both the NMFS and FWS. The Services have responded with requests for additional information, that the FERC will address in revisions to the BA. In this EIS, we recommend that construction not begin until after we have concluded formal consultations with the NMFS and FWS.

### **Recreational and Visual Resources**

Recreational activities in the vicinity of Jordan Cove terminal on the North Spit and Coos Bay include hiking, horseback riding, biking, off-road vehicle use, wildlife viewing, hunting, shellfish harvesting, fishing, and boating. The beach from Ten Mile Creek to the mouth of Coos Bay is visited by an average of 38 people on a weekday, and 60 people total on a weekend day. An average of 14,710 recreational crabbing trips per year are taken to Coos Bay. Recreational clamming and crabbing is done on the mudflats outside of the Coos Bay navigation channel, and therefore there would be no direct impacts from LNG vessel traffic to from the terminal on individuals conducting those activities. On average there are about 31,560 trips per year in Coos Bay by recreational boaters, the majority of which are for fishing. We conclude that LNG vessels in the waterway would not significantly impact recreational users of Coos Bay, because the number of LNG vessels would be less than historic numbers of deep-draft cargo ships that used to call at the Port, recreational boaters could simply move out of the way of LNG vessels in the navigation channel, and delays would probably not exceed 30 minutes while an LNG vessel passes in transit. In addition, LNG vessel operators would need to meet any vessel traffic and/or facility control measures determined necessary by the Coast Guard to address navigational safety and maritime security considerations.

There are recreational areas nearby the Jordan Cove terminal on BLM land on the North Spit and NFS lands within the ODNRA. However, we conclude that construction and operation of the Jordan Cove facilities, including noise and traffic, would not have adverse impacts on users of the nearby recreational lands.

The most visible elements of the terminal complex would be the two LNG storage tanks, each to be about 180 feet high and about 276 feet wide, and the three heat recovery steam generators stacks at the power plant that would each be about 100 feet tall. Visual impacts from the Jordan

Cove terminal would be minimized because the terminal would be situated next to an existing industrial facility (Roseburg Forest Products), there is a forested dune behind the terminal, the storage tanks would be surrounded by a 60-foot-high earthen storm barrier, and a reduced lighting plan would be implemented.

The Pacific Connector pipeline route would cross the Haynes Inlet Water Trail, a small segment of the BLM's Upper Rock Creek Area of Critical Environmental Concern (ACEC), three National Scenic Byways (U.S. Highway 101, State Highway 62, and U.S. Highway 97), and one National Scenic Trail (Pacific Crest Trail). The pipeline would be installed under U.S. Highway 101 within the waters of Coos Bay, and Pacific Connector would use HDDs to avoid impacts on State Highway 62 and U.S. Highway 97. Pacific Connector would implement the measures outlined in its *Recreation Management Plan* to minimize impacts on the Haynes Inlet Water Trail, and the Pacific Crest Trail, and their recreational users. In this EIS, we recommend that before construction, Pacific Connector should document consultations with applicable resource agencies regarding the crossing of the Haynes Inlet Water Trail, and their review and approval of the *Recreation Management Plan*. Pacific Connector developed an *Upper Rock Creek ACEC Crossing Plan* to reduce impacts on that land parcel that the BLM found acceptable.

The clearing of forest for the pipeline right-of-way and introduction of new aboveground facilities would have long-term and permanent visual impacts. Pacific Connector has developed an *Aesthetics Management Plan* to lessen visual impacts at key observation points, such as heavily traveled highway crossings. We conducted a new analysis of key observation points for the crossing of the Pacific Crest Trail, and outlined new design features to mitigate impacts on the trail. In this EIS, we recommend that before construction, Pacific Connector should revise its *Recreation Management Plan*, *Aesthetics Management Plan*, and *Leave Tree Protection Plan* to incorporate our new measures, and file approval of the revised plans by the Forest Service. A number of the Forest Service plan amendments address impacts on visual resources on NFS lands.

### **Socioeconomics and Transportation**

Jordan Cove's LNG terminal would be constructed over a 42 month period, with an average workforce of 922 employees. At the peak of construction, there would be about 1,800 non-local workers needing housing in Coos County. These non-local workers, and their families, could compete for housing with visitors to Coos County, especially during the summer tourist season. Therefore, Jordan Cove would offer housing for its employees at the NPWHC.

Jordan Cove estimated that construction of its LNG terminal and related facilities would cost about \$3 billion. About \$2.6 billion would be for materials, equipment, and other expenditures, with \$653 million of that amount spent in the states of Oregon and Washington combined. Total wages during terminal construction would be \$412 million. To operate its LNG terminal and related facilities, Jordan Cove would employ about 145 full-time workers, at an average annual salary of \$80,000, generating a total of almost \$12 million in direct annual wages. During operation of the terminal, Jordan Cove would pay \$20 million a year in funding for education and \$10 million for urban renewal.

Construction of the Pacific Connector pipeline would extend over two years, with an average monthly workforce of 1,400 people, and a peak workforce of 1,844 people spread over five construction spreads. The average workforce for each construction spread would be about 280

workers per month, with a peak of 369 workers mid-season. Pacific Connector estimates that approximately 50 percent of the construction jobs for the pipeline would be filled by non-local workers. The number of non-local hires would average 700 workers and peak at approximately 922 workers. The average non-local workforce for each construction spread would be about 140 workers per month, with a peak of 184 workers. Pacific Connector would not provide temporary construction camps along the pipeline route to house non-local employees. Instead, non-local workers would have to seek housing from the available stock, which is estimated to include 21,169 rental houses, 7,889 hotel-motel rooms, and 4,460 recreational vehicle hook-ups in the four affected counties combined.

Pacific Connector intends to spend about \$1.7 billion to build its facilities. Total construction payroll is estimated to be \$240 million. Costs for materials and equipment bought in or brought to Oregon are estimated at about \$464 million. About \$33 million would be spent during construction for local contracted services, such as logging and hauling, road improvements, and professional services. Federal taxes on construction payroll would be about \$46 million, with \$19.2 million generated in state income taxes. Temporary workers would spend approximately \$99,000 in state lodging taxes. During its first year of operation the pipeline would generate an estimated total of \$11.1 million in property tax revenues.

During construction of the Jordan Cove LNG terminal, equipment would be brought in by train, boats and barges, and trucks. The only material planned to come to the terminal by rail would be sheet pile, which would be delivered by approximately 25 railcars. Over a two-year period during construction of the terminal, Jordan Cove expects deliveries by about 82 cargo ships and 18 barges, in total. Jordan Cove estimated that deliveries by trucks to the terminal during construction would number 1,996 in year one; 17,840 in year two; reach a peak of 48,990 in year three; and reduce to 35,232 in year four. Jordan Cove intends to bus construction workers to the terminal from the NPWHC and two other off-site parking lots. Bus trips would number about 5,850 in year one, 42,250 in years two and three, and 13,000 in year four. In this EIS, we recommend that Jordan Cove revise its *Traffic Impact Analysis* to account for truck and bus traffic during construction, document approval of the revised plan by the Oregon Department of Transportation, Coos County, and the City of North Bend, and include road improvements and other mitigation measures required by the agencies.

The Southwest Oregon Regional Airport is located in the City of North Bend, directly across Coos Bay and less than 1 mile from the LNG terminal. The end of the runway at the airport is about 1.1 miles from the terminal LNG storage tanks. In 2014, the Federal Aviation Administration (FAA) issued four Notices of Presumed Hazard for the two LNG storage tanks at the terminal and two towers at the South Dune Power Plant. In this EIS, we recommend that construction should not begin until after Jordan Cove files determinations from the FAA, including the resolution of the hazard findings, and the results of any additional airport studies.

About 709 existing roads would be used to access the Pacific Connector pipeline right-of-way and move construction equipment, materials, and personnel. Pacific Connector estimated that 80 percent of the workforce would be transported from contractor yards to and from the right-of-way on crew buses. Impacts on local traffic would be minimized by following the measures outlined in Pacific Connector's *Transportation Management Plans*.

## Cultural Resources

Cultural resource inventories have been conducted covering the Jordan Cove LNG terminal facilities; except the NPWHC. These investigations identified three archaeological sites, which require additional testing and monitoring.

For the Pacific Connector Project, surveys have covered about 201 miles of the pipeline route, the compressor station and meter station locations, 26 pipe or contractor yards, 16 rock source or disposal areas, 497 access road segments, and 98 temporary extra workspace areas (92 fully surveyed, 6 partly surveyed). These investigations resulted in the identification of 104 archaeological sites within the area of potential effect; with 79 of these sites on non-federal land, and 25 sites on federal land. We made determinations of eligibility for the National Register of Historic Places (NRHP) and Project effects after consultations with the Oregon State Historic Preservation Office (SHPO), applicable federal land management agencies, and interested Indian tribes. We determined that 21 sites on non-federal land are not eligible for the NRHP and require no further work, and 19 sites can be avoided or the Project would have no adverse effects on them. There are 27 sites on non-federal land that are unevaluated and require additional investigations. Twelve sites on non-federal land are eligible for the NRHP and cannot be avoided, and require data recovery excavations as treatment. Of the sites identified on federal lands, 14 are not eligible for the NRHP and require no further work. Three sites should be avoided, and we found that the Project would have no adverse effects on two sites. Additional information is needed for one site. Five sites on federal land are eligible for the NRHP and cannot be avoided, and require data recovery excavations as treatment.

The resolution of adverse effects at historic properties that would be adversely affected by the Project would be conducted as outlined in a Memorandum of Agreement (MOA) filed with the Advisory Council on Historic Preservation in August 2011 under the previous LNG import and sendout pipeline projects in Docket Nos. CP07-441-000 and CP07-444-000. The MOA also detailed procedures for phased additional investigations in areas where access was previously denied. If the Project is authorized by the Commission, we would amend the MOA. In this EIS we recommend that construction not begin until after Jordan Cove and Pacific Connector file additional inventory and testing reports; the review of those reports by the SHPO, federal land managing agencies, and interested Indian tribes; and the FERC staff amends the MOA.

We have conducted government-to-government consultations with Indian tribes that may attach religious or cultural significance to sites in the region, or may be interested in potential Project impacts on cultural resources. While the applicants have also communicated with interested Indian tribes, we are recommending that before construction can begin, Jordan Cove should finalize its Memorandum of Understanding with interested Indian tribes, and Pacific Connector should document meetings and agreements with the Cow Creek Band of Umpqua Tribe of Indians and the Klamath Tribes.

## Air Quality and Noise

Jordan Cove's Prevention of Significant Deterioration (PSD) preconstruction permit application demonstrates compliance with all requirements. The airshed basin that contains the project area is in attainment with General Conformity requirements. During construction, a temporary reduction in ambient air quality may result from emissions and fugitive dust generated by equipment. Construction of the LNG terminal would not result in a significant impact on

regional air quality or result in any violation of applicable ambient air quality standard. The PSD permit application showed that during terminal operations all carbon monoxide impacts and annual impacts from sulfur dioxide, nitrous oxide (NO<sub>2</sub>), and particulate matter with a diameter of less than 10 microns (PM<sub>10</sub>) were below significant levels. For all pollutants generated during terminal operations, the combined impacts at the points of highest concentration are well below the applicable National Ambient Air Quality Standards (NAAQS) and the PSD increments.

The airsheds through which the Pacific Connector pipeline route would pass all attain the ambient air quality standards, with one exception. About 4.3 miles of pipeline route and the Klamath Compressor Station would be located within the Klamath Falls PM<sub>2.5</sub> nonattainment area, and about 325 feet of pipeline route within the PM<sub>10</sub> maintenance area. Pipeline construction would not result in significant impacts on regional air quality or result in any violation of applicable ambient air quality standard. Operation of the Klamath Compressor Station could have 1-hour NO<sub>2</sub> impacts that approach the NAAQS. Potential emissions of Hazardous Air Pollutants from the turbines, boiler, and generator at the station are estimated to be just 1.3 tons per year. Both Jordan Cove and Pacific Connector would obtain required permits issued by the ODEQ under the Clean Air Act (CAA) prior to construction.

Operation of the Project would be a significant source of greenhouse gas (GHG) emissions (2.1 million metric tonnes of carbon dioxide equivalent per year). However, the Project could be an important reducer of global GHG to the extent that it displaces current (and projected increasing) coal use in Asia. The type of displacement that would actually occur depends on a multitude of complex geopolitical and economic factors that cannot reasonably be foreseen.

Noise from construction of the LNG terminal is expected to be similar to typical commercial structure construction programs, which average from 47 to 57 A-weighted decibels (dBA) at 2,000 feet. These levels would be reduced by more than 15 dBA at the 1.4-mile distance to the nearest noise sensitive area (NSA). Noise from operation of the LNG terminal is predicted to have a day-night sound level (L<sub>dn</sub>) of about 51.4 dBA at one NSA. This would be below the FERC standard of an L<sub>dn</sub> of 55 dBA.

Noise from construction of the Pacific Connector pipeline would be temporary, and would dissipate with distance. Pipeline construction noise is predicted to be 95 dBA at 50 feet, and would attenuate to 87 dBA and 74 dBA at 100 feet and 300 feet, respectively. HDDs for the pipeline would generate estimated L<sub>dn</sub> sound levels between 59.6 to 72.7 dBA at the four nearest residences to the Coos River crossing, 62.6 to 70.8 dBA at the three nearest residences to the Rogue River crossing, and 57 to 58.4 dBA at the three nearest residences to the Klamath River crossing. We are recommending that Pacific Connector implement noise mitigation for all HDDs to reduce the noise levels below 55 dBA.

During operation of the Klamath Compressor Station noise levels are estimated to vary between 47.5 and 56.1 L<sub>dn</sub> dBA at the closest residences. Pacific Connector has agreed to acquire the two closest houses to the station where operational noise levels may be above our standard of an L<sub>dn</sub> of 55 dBA. We are also recommending that both Jordan Cove and Pacific Connector file the results of noise surveys after putting their facilities into service, to document compliance with our standard.

## Reliability and Safety

As part of the NEPA review, Commission staff must assess whether the proposed facilities would be able to operate safely and securely. As a result of our technical review of the preliminary engineering design and our recommended mitigation, we conclude that the facility design proposed by Jordan Cove includes acceptable layers of protection or safeguards which would reduce the risk of a potentially hazardous scenario from developing into an event that could impact the off-site public.

As a cooperating agency, DOT assisted FERC staff in evaluating whether Jordan Cove's proposed design would meet the DOT siting requirements. On June 18, 2014, DOT provided a letter to the FERC staff stating that DOT had no objection to Jordan Cove's methodology for determining the single accidental leakage sources for candidate design spills to be used in establishing the 49 CFR Part 193 siting requirements for the proposed LNG liquefaction facilities. Based on the hazardous area calculations we reviewed, we conclude that potential hazards from the siting of the facility at this location would not have a significant impact on public safety. The areas impacted by these design spills also appear to meet the DOT's exclusion zone requirements by either being within the facility property boundary, within land controlled by Jordan Cove, or over a navigable body of water. If the facility is constructed and becomes operational, the facility would be subject to DOT's inspection and enforcement program. Final determination of whether a facility is in compliance with the requirements of 49 CFR 193 would be made by DOT staff.

As a cooperating agency, the Coast Guard analyzed the suitability of the waterway for LNG marine traffic. Based on its review and its own independent risk assessment, the Coast Guard has determined that the waterway could be made suitable for the type and frequency of LNG marine traffic associated with the proposed Jordan Cove LNG facility. This opinion was contingent upon the availability of additional measures necessary to responsibly manage the maritime safety and security risks. If appropriate resources are not in place prior to LNG vessel movement along the waterway, then the Coast Guard would consider at that time what, if any, vessel traffic and/or facility control measures would be appropriate to adequately address navigational safety and maritime security considerations.

## Cumulative Impacts

Construction of the Project, in addition to other projects within the same watersheds, would have cumulative impacts on a range of environmental resources. This EIS addresses those cumulative impacts by resource. For the federal projects, there are laws and regulations in place that protect waterbodies and wetlands, threatened and endangered species, and historic properties, and limit impacts from air and noise pollution. The BLM and Forest Service have requirements in their LMPs to protect resources on the lands they manage. For some resources, there are also state laws and regulations that apply to private projects. The design features, best management practices, permitting requirements, and proposed mitigation measures for this Project should reduce impacts on environmental resources. The analysis area is vast; the 19 fifth-order watersheds crossed by the pipeline route include more than two million acres. We conclude that the Project would not have significant adverse cumulative impacts when added to other projects in a watershed, because the total percentage of land impacted by the combined projects within a watershed would be minimal at the landscape scale.

## MAJOR CONCLUSIONS

We conclude that construction and operation of the Project would result in some limited adverse environmental impacts. However, most of these impacts would be reduced to less-than-significant levels with the implementation of the applicants' proposed mitigation measures and the additional measures we recommend in this EIS. The primary reasons for our decision are:

- LNG marine traffic in the waterway would be required to adhere to any vessel traffic and/or facility control measures determined necessary by the Coast Guard to address navigational safety and maritime security considerations;
- the final engineering design for the LNG terminal would incorporate detailed seismic specifications and other measures to protect the terminal from future earthquakes and potential tsunamis, and mitigation measures would be implemented by Pacific Connector to address landslides and other geological hazards along the pipeline route;
- Jordan Cove would implement the measures outlined in the FERC's *Plan and Procedures* and its own ESCP, and Pacific Connector would implement the measures its project-specific ECRP, which would minimize impacts on soils, waterbodies, and wetlands;
- Jordan Cove would implement the measures of its *Project Compensatory Wetland Mitigation Plan* to mitigate for the loss of wetlands, and its *Wildlife Habitat Mitigation Plan* to mitigate for the loss of vegetation at the terminal location;
- Pacific Connector would implement the measures in its *Stream Crossing Risk Analysis, Report on Preliminary Pipeline Study of the Haynes Inlet Water Route, HDD Contingency Plan and Failure Procedures*, and *Hydrostatic Testing Plan* to minimize impacts on waterbodies, and its *Integrated Pest Management Plan* to minimize the potential spread of vegetative pests and noxious weeds;
- the COE and ODEQ may issue permits to Jordan Cove and Pacific Connector under the RHA, CWA, and CAA that would contain measures to minimize impacts on water quality and air quality;
- Jordan Cove and Pacific Connector would obtain a determination from ODLCD that the Project is consistent with the CZMA;
- If the Project is approved, then the BLM and Forest Service could amend their respective LMPs in the appropriate Districts and National Forests to allow for the pipeline, and the BLM could issue a Right-of-Way Grant to Pacific Connector for an easement over federal lands, to be concurred with by the Forest Service and Reclamation, based on the implementation of an approved Plan of Development that includes additional measures to minimize impacts on environmental resources;
- Pacific Connector would implement the measures in its *Compensatory Mitigation Plan* to mitigate for impacts on federally listed threatened and endangered species;
- The FERC would revise its BA, enter into formal consultations with the NMFS and FWS, and the Services would issue biological opinions that include additional conservation measures to assure that the Project would not jeopardize the continued existence of any species under their jurisdiction and would not adversely modify or destroy designated critical habitat;
- adverse effects on historic properties would be resolved through an amended Project MOA;
- the LNG terminal would meet the federal safety regulations regarding the thermal radiation and flammable vapor dispersion exclusion zones and appropriate design

standards, and Pacific Connector's natural gas facilities would also be designed, constructed, and operated in accordance with DOT safety standards; and

- an environmental inspection and mitigation monitoring program would be implemented to ensure compliance with all mitigation measures that become conditions of any FERC authorization.

In addition, we recommend that the Commission Project Order include as an environmental appendix the 102 conditions listed in section 5.2 of this FEIS. Jordan Cove and Pacific Connector should be required to implement those environmental conditions and mitigation measures to further reduce the impacts that may result from construction and operation of their facilities. We determined that these additional measures are necessary to reduce adverse impacts associated with the Project, and, in part, we are basing our conclusions in the FEIS on the implementation of the measures.